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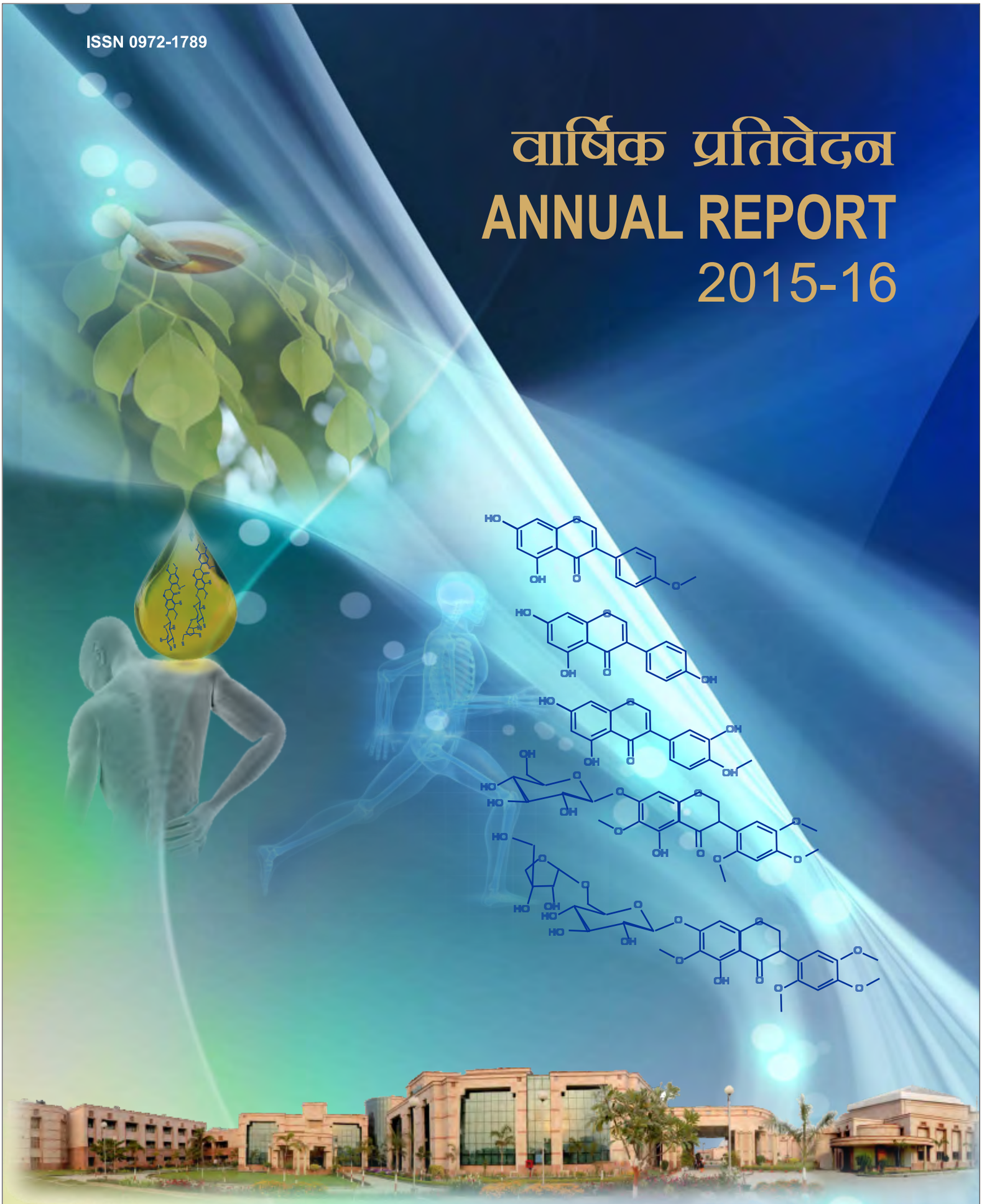
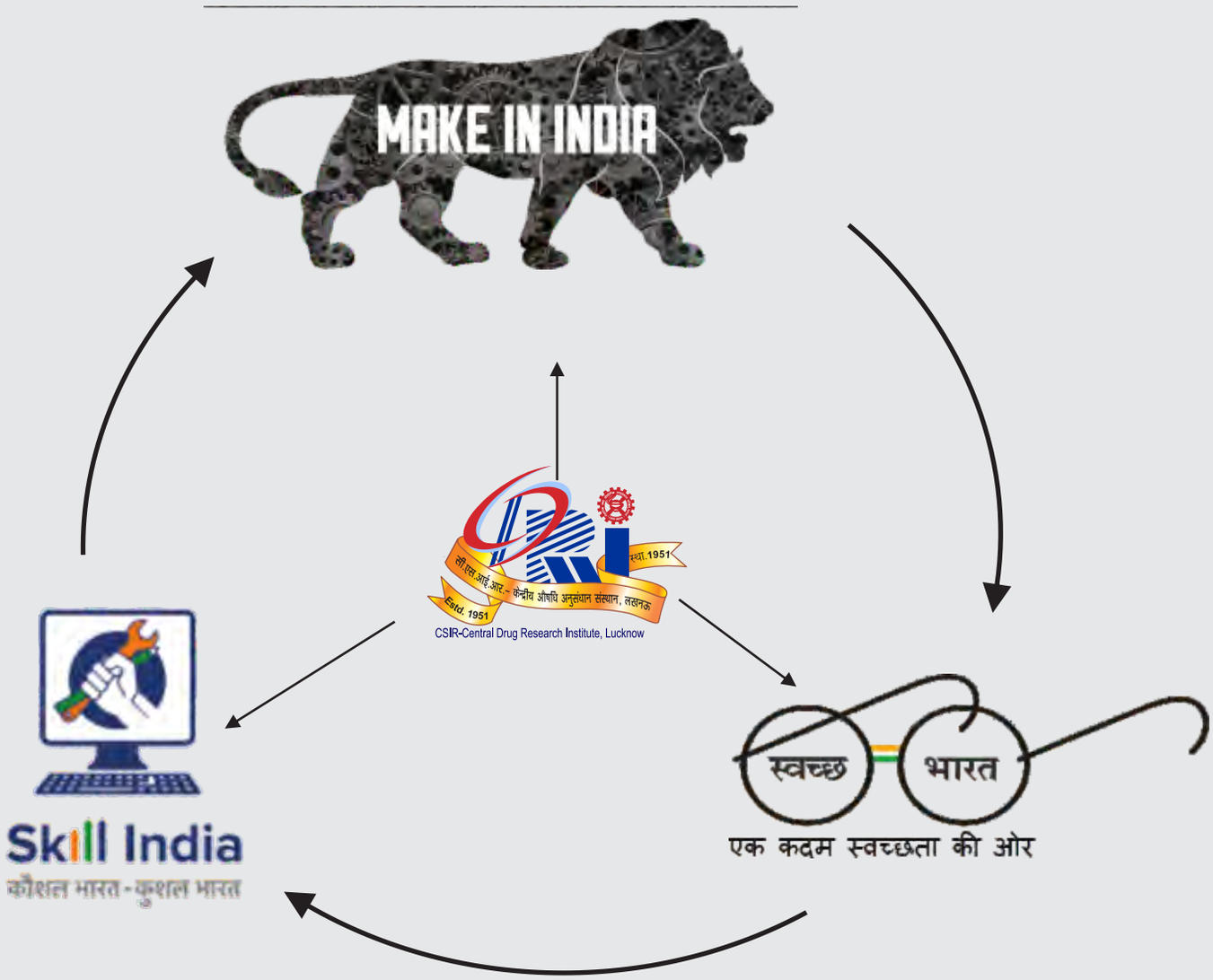
वार्षिक प्रतिवेदन
ANNUAL REPORT
2015-16



सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्)

CSIR-Central Drug Research Institute, Lucknow
(Council of Scientific & Industrial Research)



With a strength of more than

120 multidisciplinary scientists,

>450 research fellows and >210 technical

staff, Institute is poised to make an

everlasting impact in the health

and pharma sector with

global impact.

With best compliments from

Dr Madhu Dikshit, **FNA, FASc, FNASc, JC Bose National Fellow**
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Lucknow - 226 031, UP, India
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2015-16

सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्)

CSIR-Central Drug Research Institute, Lucknow

(Council of Scientific & Industrial Research)

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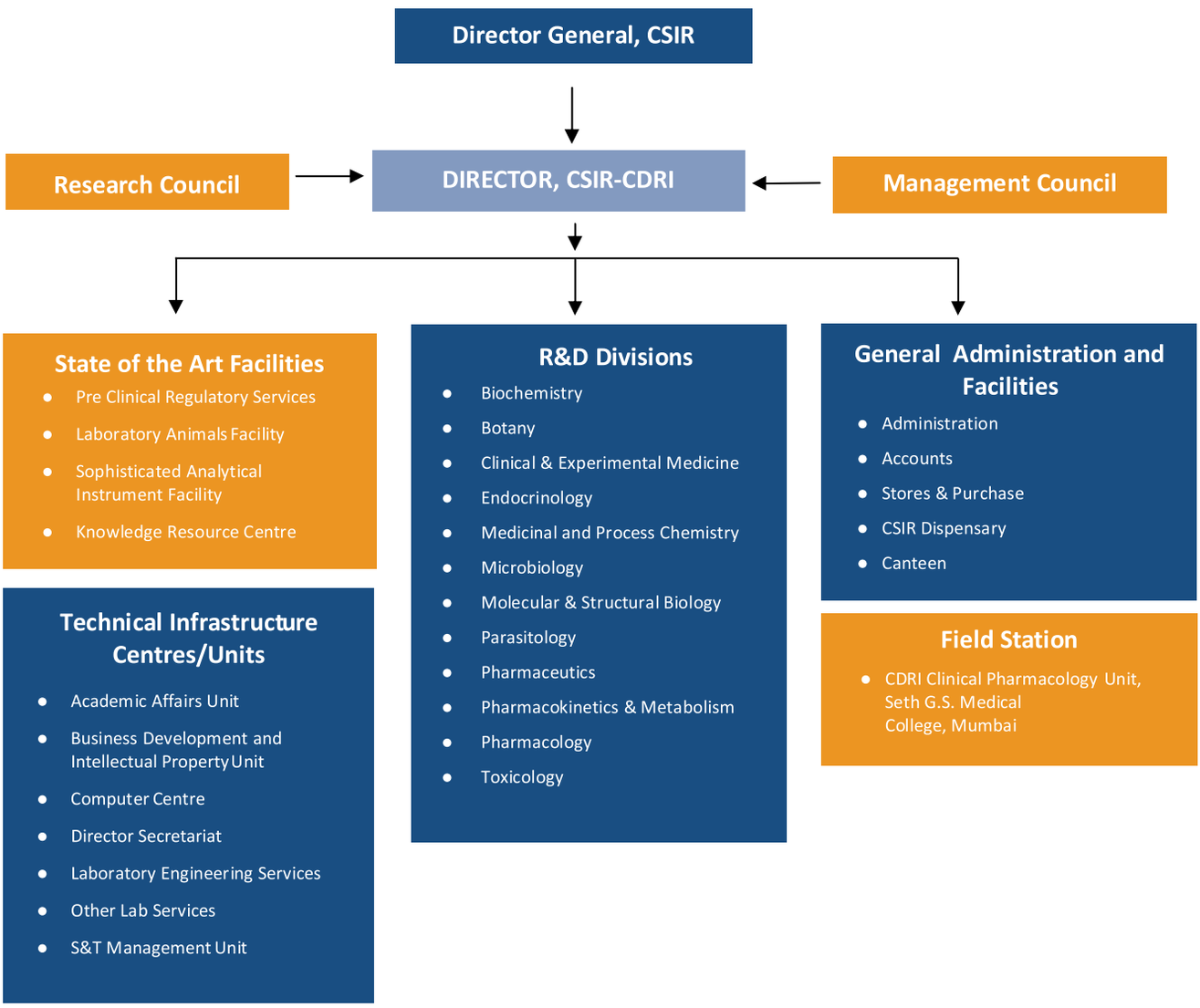
Organizational Structure



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Highlights of Achievements

Patents
Filed Abroad: **14**
Filed in India: **5**
Granted Abroad: **16**
Granted in India: **2**

External Budgetary Resources
ECF : **1239.69**
LRF : **41.69**
EBR : **1281.38**

Publications
SCI Journals : **365**
Average IF : **3.51**
Publications with
IF >8 : **14**
IF 6-8 : **11**
IF 5-6 : **27**

Technology Licensing
Herbal Medication for Bone Health

Awards
- Technology Award for Innovation
- Outstanding Translational Research Institute Award
- JC Bose Fellowships
- Fellow of Academic Sciences

HRD
Ph.D. Thesis Submitted : **101**

Post Graduate Training : **105**

New Projects Initiated
Grant-in-Aid : **19**
Sponsored : **4**

Provisional Data as on 31/1/2016

The Charter

- Development of new drugs and diagnostics;
- Cellular and molecular studies to understand disease processes and reproductive physiology;
- Development of contraceptive agents and devices;
- Systematic evaluation of medicinal properties of natural products;
- Development of technology for drugs, intermediates and biologicals;
- Dissemination of information in the field of drug research, development and production;
- Consultancy and development of technical manpower.

Thrust Areas of Research

1. **Malaria and other Parasitic Diseases**

   - Development of new drugs/drug combinations as therapeutic interventions for malaria, leishmaniasis and filariasis;
   - Establish novel target based drug assay protocols for identification of new leads;
   - Knowledge generation on parasite biology and host parasite interactions.

2. **Reproductive Health Research, Diabetes and Energy Metabolism**

   - Development of novel agents for fertility regulation (male/female) and management of endocrine disorders through modern drug design, scientific validation of traditional remedies and generation of new knowledge

3. **Tuberculosis and Microbial Infections**

   - Simplification and shortening of treatment for drug-sensitive tuberculosis and search of new treatments for MDR-TB
   - Development of new drugs for bacterial, fungal, viral (HIV & JEV) infections and tuberculosis.

4. **CVS, CNS and Related Disorders**

   - Development of new target based drugs to alleviate CVS, CNS and related disorders;
   - Carry out excellent basic research to delineate the molecular mechanisms of these pathologies so as to identify suitable targets for drug discovery, as well as to analyze the possible mechanism(s) of action of the candidate drugs.

5. **Cancer and Related Areas**

   - Lead identification/optimization to obtain drug-like molecules.
   - Creation of appropriate platform for interdisciplinary collaborative research;
   - Creation of knowledge base in cancer biology;

6. **Translational Research**

   - Pre-clinical, clinical development and commercialization of new generation affordable drugs for diseases of national importance and international relevance;
   - Creation of center of excellence in the field of Clinical trials, Regulatory toxicology, Safety pharmacology, Pharmaceutics and Pharmacokinetics & metabolism and catering to the needs of pharmaceutical industries.

Contents

अनुक्रमणिका

निदेशक की कलम से

वर्ष 2015-16 की सीएसआईआर-सीडीआरआई की वार्षिक रिपोर्ट प्रस्तुत करना मेरे लिये एक गौरव का क्षण है। इस प्रतिष्ठित संस्थान का नेतृत्व करने का अवसर प्राप्त होना वास्तव में मेरे लिये एक बड़े सम्मान का विषय है, जिसने देश के औषधि क्षेत्र को एक आकार प्रदान किया और मेरे जैसे विभिन्न शोधकर्ताओं की आकांक्षाओं को साकार किया।

यह एक सुखद संयोग है कि निदेशक के रूप में कार्यभार ग्रहण करने के एक वर्ष के अन्दर हम अस्थि स्वास्थ्य हेतु नई हर्बल औषधि को विपणन हेतु लॉन्च कर रहे हैं। यह लॉन्च इसलिये भी महत्त्वपूर्ण है क्योंकि इसके पूर्व सीडीआरआई द्वारा विकसित नई औषधि 'कॉनसैप' को वर्ष 2004 में लॉन्च किया गया था। अस्थि टीम की यह सफलता मेरे सभी सहयोगियों में नए आत्मविश्वास का निश्चित रूप से संचार करेगी और एप्लाइड रिसर्च हेतु उत्साह को भी संचारित करेगी। मैं इस अति महत्त्वपूर्ण और असाधारण कार्य के लिये बोन बायोलॉजी के वैज्ञानिकों तथा हमारे उद्योग सहभागी फार्मेंजा की टीम को बधाई देती हूँ। यह महत्त्वपूर्ण है कि इस उत्पाद की लाइसेन्सिंग के पश्चात् 10 माह की लघु अवधि में फार्मेंज़ा ने सभी आवश्यक अध्ययन, औपचारिकताएं पूरी करके इस उत्पाद को विपणन हेतु लॉन्च करने के लिये तैयार कर दिया। आने वाले वर्षों में मैं इस प्रकार के और भी पल देखने की आशा रखती हूँ।

भारत में शक्तिशाली सामाजिक पारिस्थितिकी के अंतर्गत, सभी पक्षों में बड़ी ऊँचाइयों तक पहुँचने के लक्ष्य को देखते हुए हमारे लिये अपनी प्रसांगिकता सिद्ध करना-एक चुनौती है। भारत में परजीवी और संक्रामक बीमारियों की घटनाएं तबाही ला रही हैं जबकि लाइफ़ स्टाइल संबंधी विकृतियाँ समाज को पंगु बना रही हैं जैसा कि पहले नहीं था। सीएसआईआर-सीडीआरआई इन चुनौतियों का सामना करने के लिये प्रतिबद्ध है और संक्रामक तथा लाइफ स्टाइल संबंधी बीमारियों के प्रति नैतिक ज़िम्मेदारी को मूल शक्ति के रूप में देखता है। हम आज की बीमारियों हेतु उत्पाद के विकास के लिये ही नहीं बल्कि भविष्य की चुनौतियों के लिये जीवविज्ञान में मौलिक अनुसंधान के प्रति भी प्रतिबद्ध हैं। हमने हाल ही में एक बड़ी भर्ती प्रक्रिया प्रारंभ की है जिससे नई औषधियों की खोज और विकास में लगी हुई हमारी टीम को मज़बूत करने के लिये खाली पड़े हुए वैज्ञानिक पदों को भरा जा सके। मुझे पूर्ण आशा है कि वे सभी संस्थागत माध्यमों के द्वारा राष्ट्रीय मिशन को पूरा करने के उद्देश्यों पर काम करने के साथ-साथ विशेषज्ञता का उपयुक्त स्थान भी बनाएंगे।

निदेशक के रूप में इस महत्त्वपूर्ण संस्थान का कार्यभार ग्रहण करने के तुरंत बाद मैंने विज्ञान एवं प्रौद्योगिकी तथा पृथ्वी-विज्ञान मंत्री तथा सीएसआईआर के उपाध्यक्ष माननीय डा. हर्षवर्धन द्वारा बुलाए गए सीएसआईआर निदेशकों के एक सम्मेलन में भाग लिया। देहरादून की बैठक के दौरान चर्चा का परिणाम राष्ट्र के आर्थिक विकास के लिये विज्ञान एवं प्रौद्योगिकी को एक इंजन जैसी भूमिका निभाने और हमारे अनुसंधान को उत्पादनोन्मुखी बनाने के सामूहिक विज़न के रूप में सामने आया। मैं अपने सहयोगियों की देहरादून घोषणापत्र और राष्ट्रीय मिशनों के प्रति वचनबद्धता की सराहना करती हूँ और एक रूपान्तरित सीडीआरआई देखने की आशा करती हूँ। हम सभी जानते है कि राष्ट्रीय रूपान्तरण हेतु विज्ञान एक उपकरण है और हमारा संस्थान आने वाले वर्षों में मानव कल्याण और आर्थिक विकास के लक्ष्य के प्रति योगदान करने के लिये संकल्प लेता है।

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सीडीआरआई के छत्र तले हम अपने पुराने परिसर में बायोफ़ार्मा इन्डस्ट्री इन्क्यूबेटर स्थापित करने, इन्वेस्टीगेशनल न्यू ड्रग स्टडीज़ की संपूर्ण रेंज हेतु जीएलपी प्रमाणित प्रयोगशालाएं और प्रयोगशाला जन्तुओं के लिये नैशनल सेन्टर स्थापित करने के लिये काम कर रहे हैं। ये निर्णायक कदम निश्चित रूप से नई

मधु दीक्षित

17 फरवरी, 2016

(मधु दीक्षित)

From the **Director's Desk**

It is a proud moment for me to present the Annual Report 2015-16 of CSIR-CDRI. It is indeed a great honor to receive opportunity to lead this glorious institute, which has shaped Pharma space in the country and also given shape to the aspirations of numerous researchers like me.

It is indeed a pleasant coincidence, that within a year of my taking over the charge as the Director, we are launching today a new herbal medication for bone health for marketing. This launch is important for us in the context that previous CDRI developed new drug Consap launch was in 2004. This success of Asthi team will certainly reinvigorate the confidence in all my colleagues and instill enthusiasm for applied research. I congratulate the team of Scientists in the area of Bone Biology and Pharmanza, our Industry partner, for this momentous feat. It is to be noted that in a short span of 10 months after licensing of this product, Pharmanza has completed all the necessary studies, formalities, and made this product launch ready for marketing. I hope to see many more such moments in the coming years.

Under the invigorated social ecosystem in India, aiming to reach greater heights in all aspects, it is a challenge to prove our relevance. In India, incidences of parasitic and infectious diseases are creating havoc while life style disorders are crippling the society like never before. CSIR-CDRI is committed to take up these challenges owing to its fundamental strength in the infectious and life style diseases. We commit ourselves not only to the product development for the diseases of today but also to fundamental research biology to be ready for future challenges. We have recently initiated a major recruitment process for filling in vacant scientist positions to strengthen our teams engaged in discovery and development of new drugs. I am hopeful that all of them will establish niche areas of expertise while working in a synergism towards realizing the National missions through Institutional means.

Just after taking over the charge as Director of this premier Institute, I participated in the CSIR Directors Conference at Dehradun called upon by Hon'ble Dr. Harsh Vardhan, Minister of Science & Technology and Earth Sciences and Vice President, CSIR. The outcome of the discussions during the Dehradun meeting was a collective vision for making Science & Technology the engine for economic growth of nation and making our research product oriented. I appreciate the commitment of our colleagues towards Dehradun Declaration and National Missions and hope to see a transformed CDRI. We all know that Science is a tool for National Transformation and our institute logically resolves to contribute to the goals of human welfare and economic development in coming years.

We are working on setting up a Biopharma Industry Incubator at our old campus, GLP certified labs for complete range of Investigational New Drug studies, and a National Centre for Laboratory Animals under the umbrella of CSIR-CDRI, Lucknow. These crucial steps will definitely have tremendous impact on new drug development, and also on revenue generation. I am happy to report that GLP compliant labs for safety pharmacology & toxicity GLP, are almost ready and we shall soon be applying for the necessary accreditations.

I believe that networking and linkages are going to be powerful tools in achieving our goals. The Institute is looking to re-establish a strong linkage with Industries and Academia in a mutually benefitting way. We have initiated interactions with several major biopharma industries towards initiating joint programme in drug discovery. Several major Academic Institutes and Universities, including IITs, IISERs, NIPERs IISc, have joined with us in our ambitious program on new drug discovery through National Repository of Organic Compounds. In the coming years, we will try to expand the scope and involve many more Academic Institutes and industries to network for drug discovery for diseases of national importance.

Under the ambitious Skill Development program, Institute is a major contributor to the highly skilled manpower for the nation. During 2015, 101 research students completed their Ph.D., an all-time high in the history of CSIR-CDRI. More than 105 post graduate students received training in different aspects of Biomedical research and more than 100 young researchers were benefited through short term hands-on trainings and workshops. More than 400 students from various schools and colleges visited CSIR-CDRI, and got exposure to the wonders of science. In the coming years, we wish to expand this activity through more focused programs under CSIR800 and will make efforts to reach the unreached.

The year 2015-16, was one of the most fruitful year in terms of measurable performance. Institute shared CSIR Technology Award for Innovation 2015 for contribution in development of Ashwagandha, a widely acclaimed medicinal plant. South Asian Chapter of American College of Clinical Pharmacology conferred Outstanding Translational Research Institute Award to the CSIR-CDRI for its contributions over last 60 years to drug discovery. Institute Scientists continued to fetch National Recognitions including JC Bose National Fellowship, Fellowship of Academy of Sciences, Bengaluru, etc. In terms of new knowledge generation, during the year 2015, we have published 365 Research papers with average IF of 3.51, setting a new bench mark in quality publications. During same period, we have filed 5 patents in India and 14 patents abroad, while 2 Indian Patents and 16 foreign Patents were granted.

I take this opportunity to thank all the Staff, Students and other Stake holders for their valuable contributions and look forward for their continued support in our endeavors for Swasth Bharat, Sashakt Bharat, and Swachh Bharat.

M. Dikshit

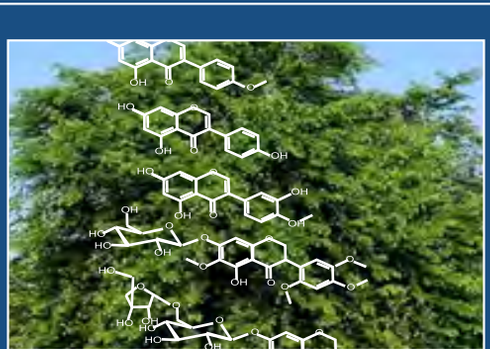
(Madhu Dikshit)

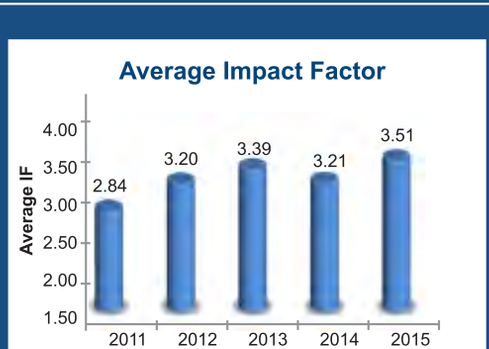
17 February 2016

CSIR-Central Drug Research Institute, Lucknow

- Technology
- Intellectual Property
- Publication
- Human Resource Development
- Honours and Awards
- *Budget and Resources*

Performance Report





Performance Report

Success Story of Development of A New Herbal Medication for Bone Health

Standardized Extract of *Dalbergia sissoo*
for rapid fracture healing and management of post-menopausal osteoporosis

Phytochemistry

Isolated 16 compounds from the Standardized extract, out of these, four compounds were found to be active. One novel compound has-been identified the quantity of which is present in abundance in the extract. It exhibits osteogenic activity and was used as marker compound.

In vitro activities of the Extract and Active Compound

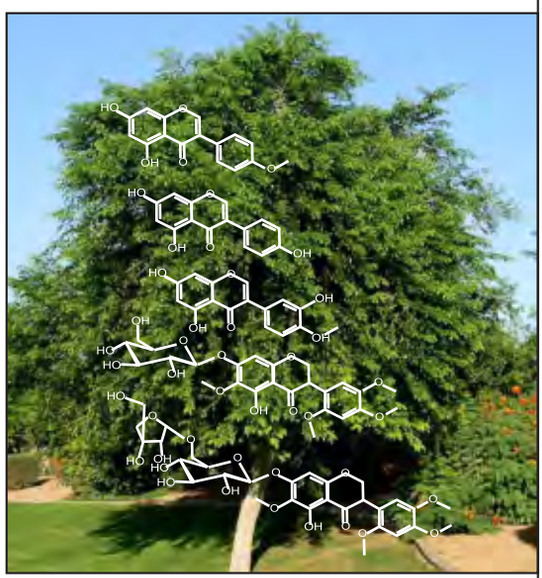
- Alkaline phosphatase activity and bone mineralization in rat calvarial osteoblast cells.
- Treatment of compound to osteoblast cells leads to increased transcript levels of osteogenic marker genes.

In vivo activities of the Extract and Active Compound

- Compound increases osteogenic and chondrogenic differentiation of cells.
- Adult female osteopenic rat model for osteoporosis: Treatment at 50.0 and 100 mg/kg body weight dose led to increased mineral apposition and bone formation rate thus increased bone mineral density.
- In Rat Rapid Fracture Healing Model, extract treatment stimulated callus and fracture healing at dose as low as 250.0 mg/kg body weight.
- The novel compound was evaluated in mice in post- menopausal model for osteoporosis & rapid fracture healing model (1 & 5 mg/kg body weight). It stimulated fracture healing by activating Wnt/β catenin signaling pathway.
- Compound is devoid of any uterine estrogenicity, thus is safe for consumption.

Licensing & Clinical Trials

- Licensed to Pharmanza Herbal Pvt. Ltd. Gujarat on April 10, 2015.
- Clinical trial on standardized extract was registered on June 03, 2015 (registration number CTRI/2015/06/005850).
- Clinical trial on accelerated fracture healing by Standardized extract started from July 2015 at Karandikar Hospital and Research Center, Nasik, Maharastra.
- Clinical trial for preventing post-menopausal osteoporosis has been initiated from September 2015 at Nanavati Hospital, Mumbai and Tanvir Hospital, Hyderabad, Andhra Pradesh



***Dalbergia sissoo* Tree & Bioactive compounds isolated from standarized extract**

Product launched for marketing on 17 February 2016

Technology Licensing (10 April 2015)

Technology Demonstration (June 2015)

CSIR-CDRI Products Pipeline

Products Under Development

Pre-clinical Studies

Anti-malarial
- S011-1793

Fracture healing
- CDR914K058* / KM
- S007-1500

Osteoprotective
- CDR1020F147

Anti-thrombotic
- S007-867
- S002-333

Anti-dyslipidemic
- CDR267F018
- CDR4655K09

Anti-cancer
- S007-1235

Anti-stroke
- NMITLI-118R(T+)
- Herbal Medicament

Phase I Clinical Trial

Anti-malarial
- 97-78

Anti-osteoporotic
- 99/373

Anti-diabetic
- CDR134 F194*

Phase II Clinical Trial

Anti-dyslipidemic
- 80/574

Open for licensing

Formulations:

- A **Dry Powder Inhalation** (DPI) for use as **adjunct therapy of tuberculosis** comprising a fixed-dose combination of isoniazid (INH) and rifabutin (RFB) has completed all studies required for filing an IND application
- A **nanoparticle formulation** prepared by an industrially-scalable, 'layer-by-layer' nanofabrication process has demonstrated pre-clinical proof of concept of targeting drugs to the bone marrow.

Ready for Launch

Anti-osteoporotic
- CDR4744 F004*

Launched on 17 February 2016

Anti-diabetic
- CDR-134 D123*

(i) Phase I Completed

(ii) Completion of Clinical Trials and Marketing under Ayush

** Licensed to industry for further development and commercialization.*
Products with Green fonts are Natural Products

Provisional Data as on 31/1/2016

Team NMITLI, CSIR-CDRI

CSIR Technology Award for Innovation 2015

For contribution in development of improved varieties and promotion of cultivation of medicinally important Ashwagandha for improving the economy of small and marginal farmers in semi-arid tropical (SAT) regions of Deccan plateau. Awards shared with **CSIR labs: CIMAP, NBRI, IICB**

Important Awards to CSIR-CDRI

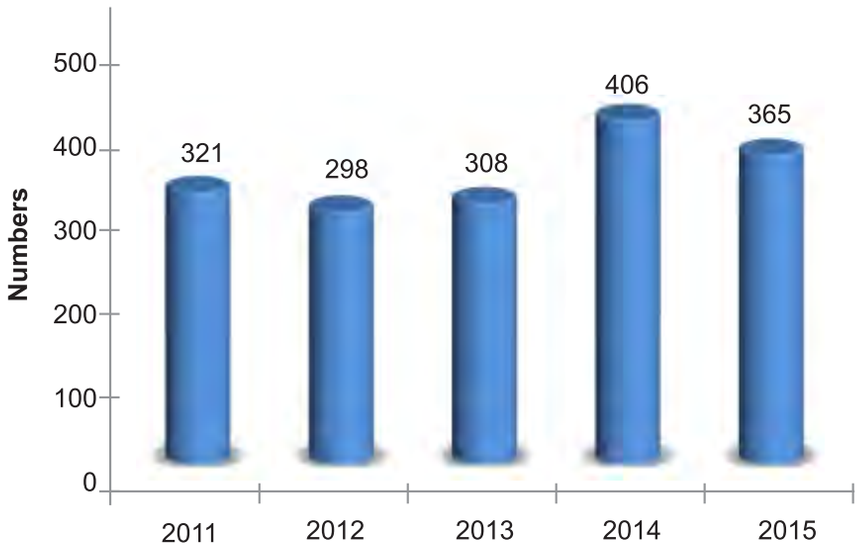
Outstanding Translational Research Institute Award

For contributions over last 60 years to drug discovery from synthetics and natural sources, training large number of outstanding researchers for India and World for academic institutions and industry, Awarded by South Asian Chapter of American College of Clinical Pharmacology

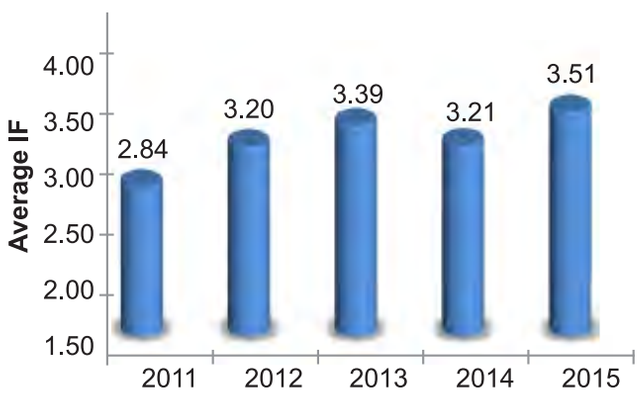
Dr. Shailja Bhattacharya, Chief Scientist received the award on behalf of the Director, CSIR-CDRI

Publications

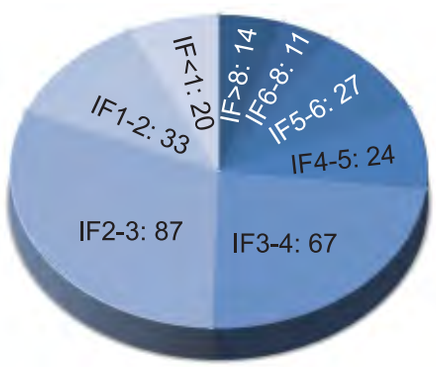
Total Number of SCI Publications



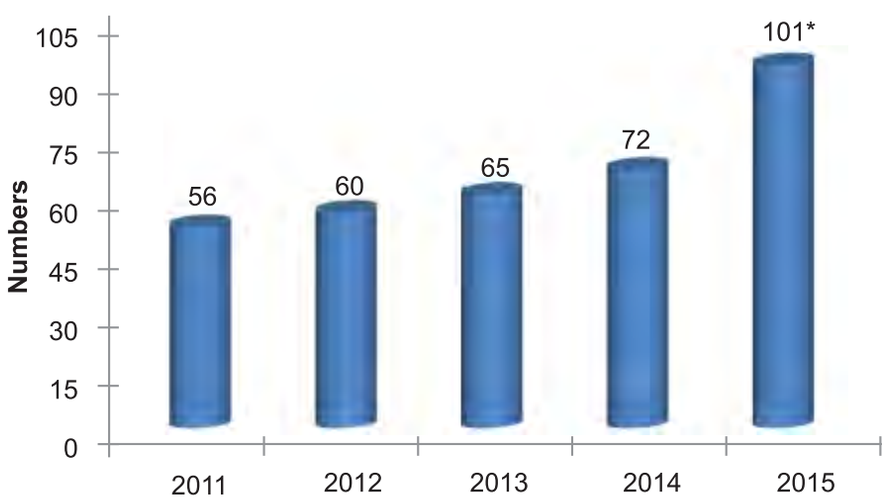
Average Impact Factor



Impact Factor wise No. of Publications 2015



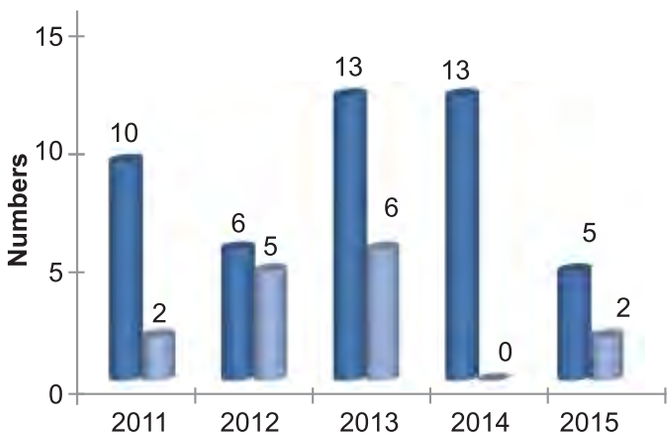
Ph.D. Thesis Submitted



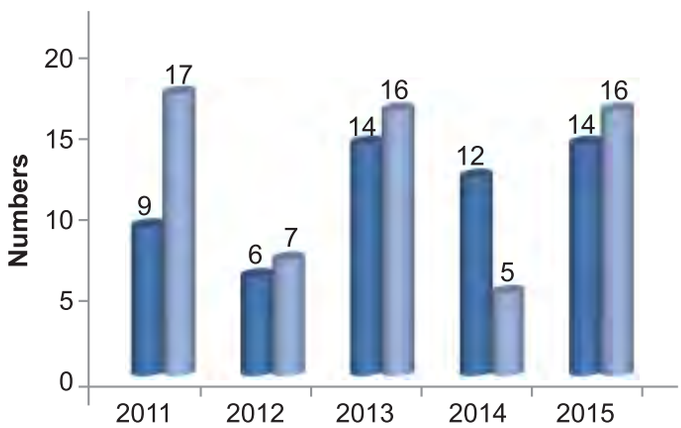
*Provisional data as on 31/01/2016

Intellectual Property

Indian Patents



Foreign Patents



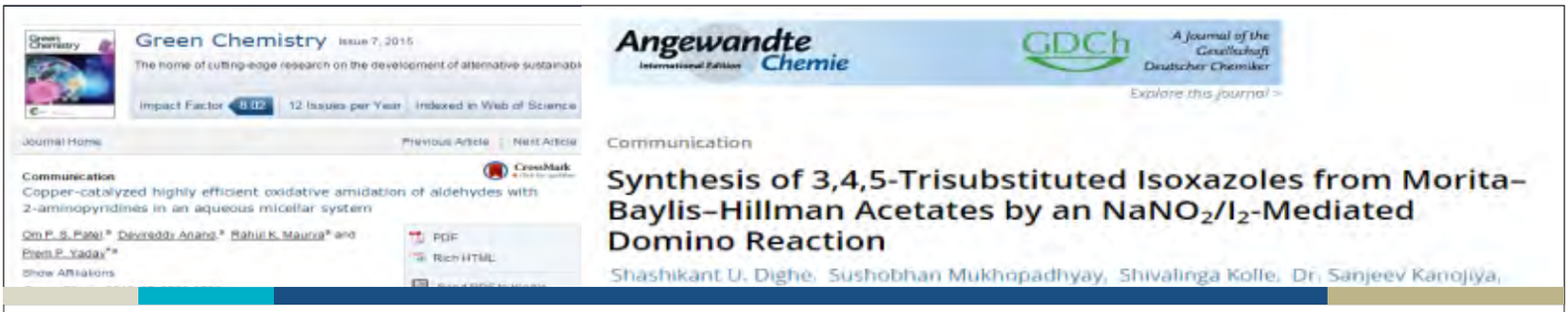
Filed Granted

Provisional Data as on 31/1/2016

New Facilities Created

Orbitrap mass spectrometer equipped with an electrospray ionization source (ESI) Mass range: up to 4000 Da for singly charged molecules Resolution: up to 100,000 at 400 Da

Intra-vital Imaging Facility Olympus BX61-FV1200-MPE (Funded by CSIR-THUNDER Project and MOES)



Some Important Publications 2015

Chemical Sciences

Title	Author	Journal, Vol., Issue, Pages	I F 2014
Thiol-Ene "click" reaction triggered by neutral ionic liquid: The ambiphilic character of [hmim]Br in the regioselective nucleophilic hydrothiolation	Kumar R Saima, Shard A, Andhare NH, Richa and Sinha AK*	**Angewandte Chemie-International Edition**, 54(3), 828-832	11.261
Palladium-catalyzed regio- and stereoselective cross-addition of terminal alkynes to ynol ethers and synthesis of 1,4-enyn-3-ones	Babu MH, Dwivedi V, Kant R and Reddy MS*	**Angewandte Chemie-International Edition**, 54(12). 3783-3786	11.261
Metal-free decarboxylative cyclization/ring expansion: Construction of five-, six-, and seven-membered heterocycles from 2-alkynyl benzaldehydes and cyclic amino acids.	Samala S, Singh G, Kumar R, Ampapathi RS and Kundu B*	**Angewandte Chemie-International Edition**, 54(33), 9564-9567	11.261
Synthesis of 3,4,5-trisubstituted isoxazoles from morita-baylis-hillman acetates by an nano(2) /i(2) -mediated domino reaction.	Dighe SU, Mukhopadhyay S, Kolle S, Kanojiya S, Batra S*	**Angewandte Chemie-International Edition**, 54(37), 10926-10930	11.261
β-cyclodextrin catalysed C-C bond formation via C(sp^3)-H functionalization of 2-methyl azaarenes with diones in aqueous medium	Kumar A* and Shukla RD	**Green Chemistry**, 17(2), 848-851	8.02
Copper-catalyzed highly efficient oxidative amidation of aldehydes with 2-aminopyridines in an aqueous micellar system	Patel OPS, Devireddy A, Maurya RK, Yadav PP*	**Green Chemistry**, 17(7), 3728-3732	8.02
Molecular Iodine catalysed One-Pot synthesis of Chromeno[4,3-*B*] Quinolin-6-Ones under microwave irradiation	Sashidhara KV*, Palnati GR, Singh LR, Upadhyay A, Avula SR, Kumar A and Kant R	**Green Chemistry**, 17, 3766-3770	8.02
A dual colorimetric-ratiometric fluorescent probe NAP-3 for selective detection and imaging of endogenous labile iron(iii) pools in *C. elegans*	Goel A*, Umar S, Nag P, Sharma A, Kumar L, Shamsuzzama, Hossain Z, Gayen JR and Nazir A	**Chemical Communications**, 51(24), 5001-5004	6.834
N-substitution dependent stereoselectivity switch in palladium catalyzed hydroalkynylation of ynamides: A regio and stereoselective synthesis of ynenamides	Dwivedi V, Babu MH, Ruchir Kant R and Reddy MS*	**Chemical Communications**, 51(81), 14996-14999	6.834

Biological Sciences

Title	Author	Journal, Vol., Issue, Pages	IF 2014
Variants of self-assembling peptide, KLD-12 that show both rapid fracture healing and antimicrobial properties	Tripathi JK, Pal S, Awasthi B, Kumar A, Tandon A, Mitra K, Chattopadhyay N* and Ghosh JK*	**Biomaterials**, 56, 92-103	8.557
Pathophysiological mechanism of bone loss in Type 2 diabetes involves inverse regulation of osteoblast function by PGC-1α and skeletal muscle atrogenes: AdipoR1 as a potential target for reversing diabetes-induced osteopenia	Khan MP, Singh AK, Joharapurkar AA, Yadav M, Shree S, Kumar H, Gurjar A, Mishra JS, Tiwari MC, Nagar GK, Kumar S, Ramachandran R, Sharan A, Jain MR, Trivedi AK, Maurya R, Godbole MM, Gayen JR, Sanyal S* and Chattopadhyay N*	**Diabetes**, 64 (7), 2609-2623	8.095
Inhibition of NADPH oxidase-4 potentiates 2-deoxy-d-glucose induced suppression of glycolysis, migration and invasion in glioblastoma cells: Role of the Akt / HIF1α / HK-2 signaling axis	Gupta P, Jagavelu K and Mishra DP*	**Antioxidants & Redox Signaling**, 23(8), 665-681	7.407
Proteasome inhibition mediates p53 reactivation and anti-cancer activity of 6-gingerol in cervical cancer cells	Rastogi N, Duggal S, Singh SK, Porwal K, Srivastava VK, Maurya R, Bhatt MLB and Mishra DP*	**Oncotarget**, 6, 41, 43310-25	6.359
Investigating the role of pluronic-g-cationic polyelectrolyte as functional stabilizer for nanocrystals: Impact on paclitaxel oral bioavailability and tumor growth	Sharma S, Verma A, Pandey G, Mittapelly N and Mishra PR*	**Acta Biomaterialia**, 26, 169-183	6.025
Involvement of interleukin-1 receptor-associated kinase-1 in vascular smooth muscle cell proliferation and neointimal formation after rat carotid injury	Jain M, Singh A, Singh V and Barthwal MK*	**Arteriosclerosis Thrombosis And Vascular Biology**, 35 (6), 1445-1455	6
Antigen presenting cells targeting and stimulation potential of lipoteichoic acid functionalized lipo-polymerosome: A chemo-immunotherapeutic approach against intracellular infectious disease	Gupta PK, Jaiswal AK, Asthana S, Dube A and Mishra PR*	**Biomacromolecules**, 16(4), 1073-1087	5.75
L-Plastin S-glutathionylation promotes reduced binding to β-actin and affects neutrophil functions.	Dubey M, Singh AK, Awasthi D, Nagarkoti S, Kumar S, Ali W, Chandra T, Kumar V, Barthwal MK, Jagavelu K, Sanchez-Gomez FJ, Lamas S and Dikshit M*	**Free Radical Biology and Medicine**, 86, 1-15	5.736
NOD2 activation induces oxidative stress contributing to mitochondrial dysfunction and insulin resistance in skeletal muscle cells.	Maurya CK, Arha D, Rai AK, Kumar SK, Pandey J, Avisetti DR, Kalivendi SV, Klip A and Tamrakar AK*	**Free Radical Biology and Medicine**, 89, 158-169	5.736

Budget

Expenditure Against CSIR Allocation & LRF

Rs. in Lakh

Heads		2011-12	2012-13	2013-14	2014-15	2015-16* (Allocated)
(A)	**Recurring**					
	Pay and Allowances	3926.863	4340.300	4631.798	4834.234	4640.959
	Contingencies	409.510	797.111	910.384	1011.075	922.000
	HRD	4.00	4.000	-	-	-
	Maintenance	283.125	475.374	416.574	560.000	350.000
	Chemical and Consumables	1041.550	1092.250	260.000	860.000	934.000
	Sub-Total	**5665.048**	**6709.035**	**6218.756**	**7265.309**	**6846.959**
(B)	**Capital**					
	Works and Services/ Electrical Installation	-1682.478	98.522	96.326	7.189	100.000
	Apparatus and Equipments/ Computer Equipments	3466.500	820.000	286.834	650.000	439.000
	Office Equipments, Furniture and Fittings	6.950	7.000	4.019	-	10.000
	Library Books and Journals	240.587	175.000	75.469	250.000	250.000
	Sub-Total	**2031.559**	**1100.522**	**462.648**	**907.189**	**799.000**
	Total (A+B)	**7696.605**	**7809.557**	**6681.404**	**8172.498**	**7645.959**
(C)	**Special Projects SIP/NWP/IAP / /HCP/ BSC/CSC**	**995.599**	**1901.464**	**3543.532**	**2199.945**	**2485.094**
(D)	**CMM0015 (New CDRI)**	**3843.710**	**-**	**-**	**4000.000**	**1097.000**
	Grant Total (A+B+C+D)	**12535.914**	**9711.021**	**10224.936**	**14372.443**	**11228.053**

*Provisional data as on 31/01/2016

External Budgetary Resources

External Cash Flow

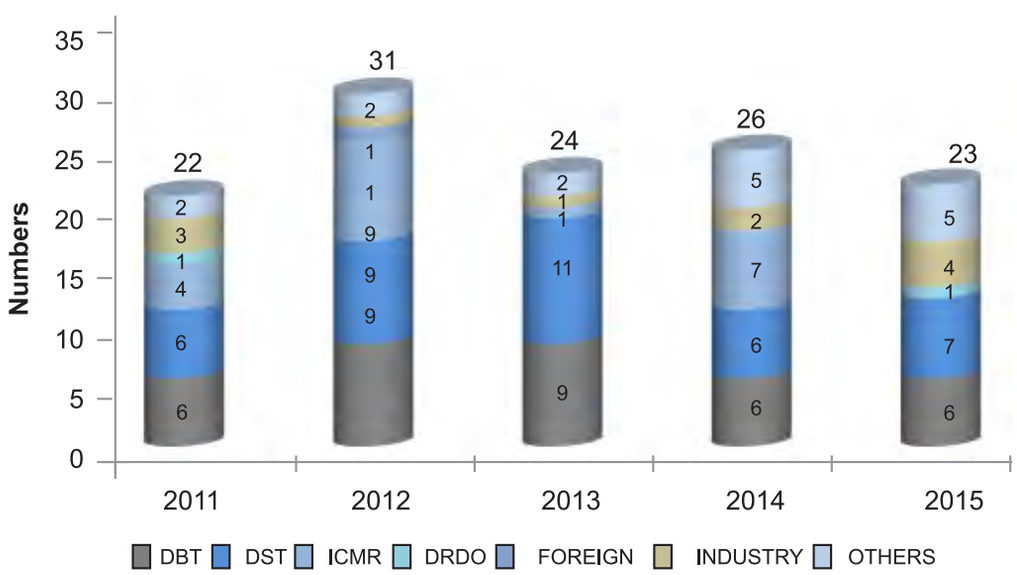
(Including Govt Agencies, Foreign Agencies and Industries)

Lab Reserve Fund Generated

Total External Budgetary Resources

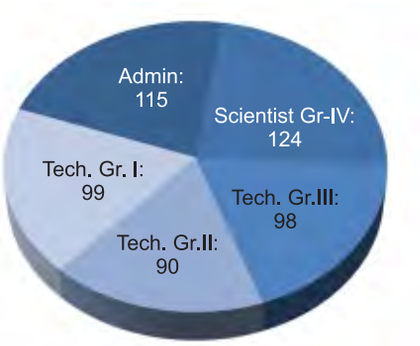
Provisional Data as on 31/1/2016

New Inter-Agency Projects Initiated

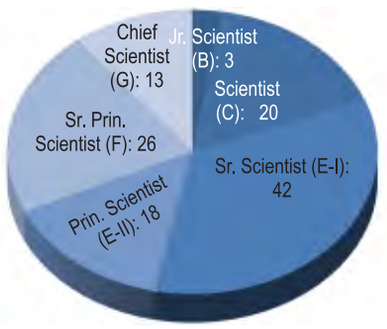


Manpower

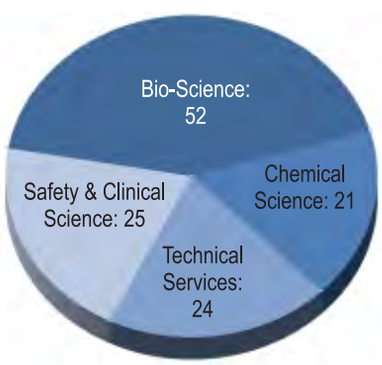
Total Staff



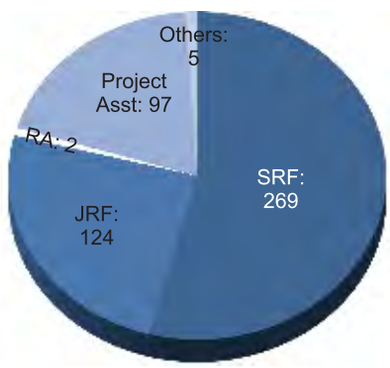
Designation-wise Strength of Scientists



Area-wise Strength of Scientist



Research Fellow and Project Assistants



ANNOUNCEMENT — CDRI Awards 2016

The prestigious CDRI Awards 2016 for Excellence in Drug Research in Life Sciences category has been awarded to **Prof. Patrick D'Silva**, Associate Professor, Department of Biochemistry, IISc, Bengaluru for his work on "*Development of a cytoprotective anti-oxidant as well as ROS scavenging Isoselenazoles towards treatment of oxidative stress disorders. It also recognizes his work on protein misfolding, protein transport mechanisms, and Fe-S cluster biogenesis in genetic disorders*".

In the Chemical Sciences category, the award has gone to **Dr. Anthony Addlagatta**, Principal Scientist, CSIR-IICT, Hyderabad for his work on "*Medicinal chemistry and unravelling the structure function relationship of important proteins associated with the ribosomes at the exit tunnel*"

Our heartiest congratulations to both the awardees!

The felicitation ceremony will be held on 26th September 2016

Societal Activities

Activity	Numbers of Programs	Beneficiaries (Persons)
Health awareness programs at rural areas	03	>400
Programs for motivation of students and faculty	10	>425
CSIR-800 exploratory societal projects initiated at rural areas under AcSIR program	10	>800
Popular lecture by CDRI Scientist at Navodaya and other Schools and Colleges	05	>250
Open-Day for public to connect common man with Institute	01	>100
Advance training and skill development programs for researchers	08	>175
Technical support in biological activity screening to Universities and colleges from different areas of country	112 Samples	24 Universities

Research Council

(August 2013- July 2016)

Chairman

Prof. N.K. Ganguly
Distinguished Biotechnology Professor,
C/o National Institute of Immunology
Aruna Asaf Ali Marg
New Delhi – 110 067

Members

Dr. Shahid Jameel
CEO, The Welcome Trust /
DBT India Alliance,
H.No. 8-2-684/3/K/19,
I[st] Floor, Road No. 12, Banjara Hills,
Hyderabad 500 034

Dr. Subrata Sinha
Director
National Brain Research Centre
Manesar, Gurgaon Dist.
Haryana-122 051, India

Dr. Chandrima Shaha
Director
National Institute of Immunology,
Aruna Asaf Ali Marg,
New Delhi 110 067

Cluster Director
Dr. Ram A. Vishwakarma
Director
CSIR-Indian Institute of
Integrative Medicine
Canal Road Jammu-180001

Dr. T.S. Balganesh
Distinguished Scientist
CSIR-Centre for Mathematical
Modelling and Computer
Simulation (C-MMACS),
NAL Belur Campus, Bangalore–560037

Sister Laboratory
Prof. AK. Tripathi
Director
CSIR-Central Institute of Medicinal &
Aromatic Plants
Lucknow–226015

Prof. A. Surolia
Molecular Biophysics Unit
Indian Institute of Science
Bangalore - 560 012

Director
Dr. Madhu Dikshit
Director
CSIR-Central Drug Research Institute
Lucknow – 226 031

Dr. K. Nagarajan
Corporate Advisor
Hikal Ltd., R & D Centre
Kalena Agrahara Bannerghatta Road
Bangalore – 560 076

Permanent Invitee
Dr. Sudeep Kumar
Head, Planning & Performance Division
Council of Scientific & Industrial
Research Anusandhan Bhawan,
2, Rafi Marg, New Delhi - 110 001

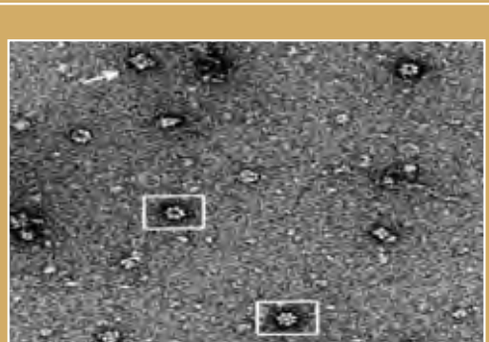
Dr. R. Nagaraj
Chief Scientist
CSIR-Centre for Cellular and
Molecular Biology
Hyderabad- 500 007

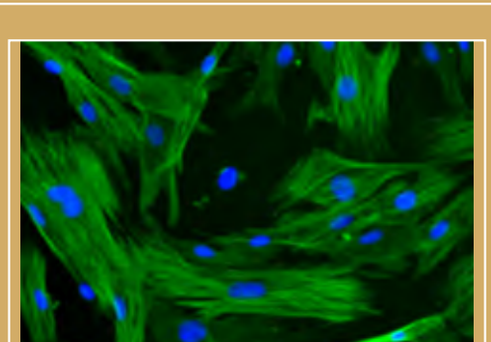
Secretary
Dr. Saman Habib
Senior Principal Scientist
Molecular & Structural Biology Division
CSIR-Central Drug Research Institute
Lucknow – 226 031

CSIR-Central Drug Research Institute, Lucknow

- Malaria & other Parasitic Diseases
- Reproductive Health Research, Diabetes & Energy Metabolism
- Tuberculosis & Microbial Infections
- CVS, CNS & Related Disorders
- Cancer & Related Areas
- Safety & Clinical Development

Progress in Research Projects





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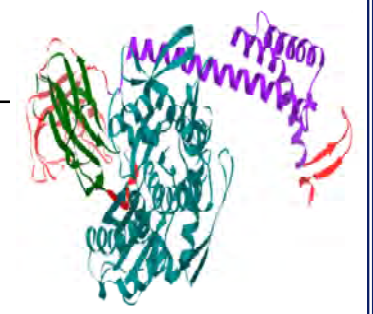


MALARIA AND OTHER PARASITIC DISEASES

Area Coordinators: Dr. Saman Habib, Dr. Sanjay Batra, Dr. Neena Goyal

Parasitic infections cause tremendous burden of disease in tropics and subtropics as well as in more temperate climates. Malaria, Leishmaniasis and Filariasis are the three main parasitic disease areas being vigorously pursued at the institute. With prevalence in more than 100 countries and more than 4 billion people worldwide at combined risk, these three parasitic diseases represent a major biomedical challenge. Researchers at the institute address issues pertaining to design and development of novel drug molecules as well as optimization and preclinical development of lead molecules and combination therapy regimens, besides investigating of novel drug delivery systems. A significant basic research component of the program focuses on identification and characterization of novel drug targets, understanding mechanisms of drug action and drug resistance, investigating of aspects of parasite biology and host-parasite interaction, immunoprophylaxis and immuno-diagnosis. The contribution of host genetic factors in malaria susceptibility in Indian populations is also under investigation. The structural biology component of the program aids in molecular modeling and X-ray structure determination.

1

1.1 Malaria

1.1.1 Synthesis and Screening

1.1.1.1 Screening against *Plasmodium falciparum in vitro*

During the reporting period approximately 411 novel compounds, synthesized at the institute and 27 compounds received from various research organizations across the country, were screened against the human malaria parasite, *P. falciparum.* These 411 novel chemical moieties belonged to diverse chemical classes such as pyrazoloisoquinolines, *N*-(2-hydroxyphenyl) pyrazoles, *N*-phenyl pyrazole dimer, bis-pyrazoles, phenylethyl benzamides, 3-nitroisoxazoles, 3-aminoisoxazoles, allylnitro furans, diamino-2-benzoylacrylates, dibenzo azonine carboxamides, benzoxazines, pyrazole derivatives, 1,3,5-triazine derivatives, β-carboline derivatives, 5,6-dihydro canthinones, aryl (β-carbolin-1-yl) methanones, quinazolinone-benzothiazole hybrids, dihydroquinolones, chloroquinolinyl-arylsulfonamides, 2,3-disubstituted-quinolin-4-ones, thiazolidinedione derivatives, β-aminoalcohol, polyphenols, biaryls, stilbenoids, quinolones, sugar quinazolinones, triazoles, pyrroloquinazolinones, pyrazole pyrimidines and quinoline derivatives. Two stilbenoids (S015-870 and 871) exhibited IC_{50} values 78 and 173 nM, respectively against CQ sensitive strain and 54 and 942 nM, respectively against CQ resistant strain. A few compounds belonging to *N*-(2-hydroxyphenyl) pyrazole, benzoxazine, 1,3,5-triazine derivative, β-Carboline derivative, 5,6-dihydro canthinone and stilbenoid class exhibited IC_{50} values between 0.5 µM and 1 µM against both CQ sensitive 3D7 and CQ resistant K1 strains. Most of these molecules were also evaluated for cytotoxic profile against vero cell line.

1.1.1.2 Establishment of an Arteether resistant *in vitro* model of *P. falciparum* using Indian field isolates

Four field isolates (MZR-I, MZR-II, MZR-III & MZR-IV) of *P. falciparum,* collected from Mizoram (NE state of India) were procured from National Institute of Malaria Research, New Delhi. These were characterized for their susceptibility to standard antimalarials and two antibiotics (Azithromycin & Doxicycline). Results revealed that all the field isolates exhibited high IC_{50} values of CQ, QUIN and DHA when compared with 3D7 and K1 parasites. In order to select Arteether tolerant phenotype (AR), the MZRI parasites which exhibited highest IC_{50} values of CQ, QUIN and DHA were allowed to grow under intermittent (for 72 h) drug pressure over a period of 586 days. Results revealed that after 13 drug exposures with 1 nM drug, parasites became tolerant to subsequent drug pressure and after 43rd drug exposure more than 3-fold decreased sensitivity to Arteether was observed (**Fig.** 1). The selection was stable after cryopreservation with no change in sensitivity to standard antimalarials & antibiotics.

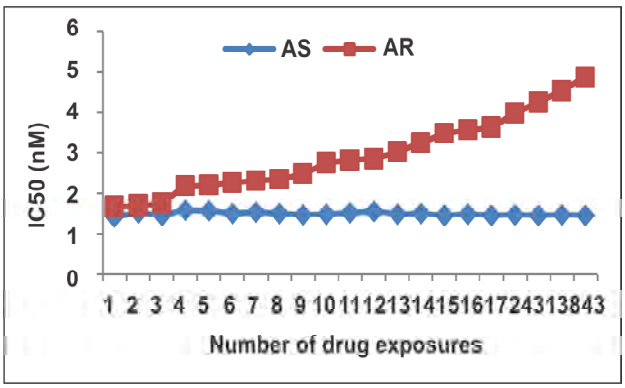


Fig.1. IC_{50} values of Arteether as observed at 21 occasions against arteether tolerant phenotype (MZRI-AR) and wild type (MZRI-AS) parasites

1.1.1.3 In vivo screening

In vivo antimalarial evaluation of five compounds was carried out against Swiss mice infected with *P. yoelli nigeriensis* MDR. These compounds were tested at dose 100 mg/kg/day for 4 days. Out of these, three compounds (S014-1054, S014-1057, S015-0870) showed 100% parasite suppression on day 4 but were not curative on day 28.

1.1.1.4 In vivo antimalarial profile of S011-1793 against CQ resistant *P. yoelii* N67 and MDR *P. yoelii nigeriensis*

The identified compound S011-1793 triphosphate salt was tested against CQ resistant *P. yoelii N67* strain and multidrug resistant strain *P. yoelii nigeriensis* in Swiss mice. This triphosphate salt was 100% curative against chloroquine resistant strain at the dose of 40 mg/kg x 4 days orally while it was 93.3% curative at the dose of 200 mg/kg x 4days against MDR strain.

1.1.1.5 Arteether nanoemulsion for enhanced efficacy

Nanoemulsions (NEs) loaded with arteether (ART) were prepared using high pressurehomogenization (HPH) with the aim of improving the bioavailability of ART. Formulations were optimized for globule size (~150 nm), surface charge (-25 mV) NEs were stable in terms of globule size and size distribution at different pH and released 62% of their drug content within 12 h. Pharmacokinetics of ART resulting from oral administration of NEs versus ART dissolved in groundnut oil indicated significantly enhanced bioavailability of ART NE. Administration of NE significantly enhanced efficacy of ART in the mouse model of malaria, showing 80% cure rate at 12.5 mg/kg when given orally for 5 days, in comparisonto 30% cure rate of ART in groundnut oil at the same daily dose. A cure rate of 100% was observed when NE was administered intramuscularly at ART dose of 12.5 mg/kg for 5 days. ***[Colloids and Surfaces B: Biointerfaces 1;126:467-75 (2015)]***

1.1.1.6 Low-cost nanoparticles targeting antimalarials to infected red blood cells

Nanoparticles made of potato starch and containing CDRI Compound 97/63 or chloroquine free base were prepared by a simple process. These were intended for targeting the glucose transporter protein (GLUT) expressed on the surface of red blood cells (RBC), which binds hexose. Specific targeting to GLUT, enhanced uptake by infected RBC in comparison to uninfected RBC, and reduction of efficacious dose were demonstrated in cultured RBC infected with the malaria parasite. [**International Journal of Pharmaceutics 2015, 483 (1-2), 57-62**]

1.1.1.7 Pharmacokinetics of anti-malarial compound S014-0952

LC-MS/MS method (LLOQ, 1 ng/mL; linearity, 1-200 ng/mL and recovery, >90%) for quantitative estimation of S014-0952 was developed and then applied for the pharmacokinetics of S014-0952 in the male *Sprague Dawley* rats. Following 100 mg/kg oral dose, the compound exhibited good oral exposure along with multiple peak phenomenon, high extravascular distribution and half-life of 12 ± 2.7 h suggesting a potentially long acting profile [***Eur J Med Chem 2015; DOI: 10.1016/j.ejmech.2015.12.038***].

1.1.2 Basic Research

1.1.2.1 Exploration of the mechanism involved in synergistic interaction of mefloquine and clarithromycin against *P. falciparum*

Many important drugs like mefloquine are not being used because of the development of resistance and other related issues. Therefore, explored *in vitro* interaction of clarithromycin (CLTR), and mefloquine (MQ) against *Pf*3D7 and *Pf*K1 strains. CLTR showed its delayed antimalarial effect by its low IC_{50} values in second cycle which indicates its effect on apicoplast. Down regulation of *tuf*A expression on both mRNA and protein level supports this hypothesis. MQ and CLTR showed synergism/additiveness (mean Σ FICs = 0.89 and 1.26) against *Pf*3D7 and

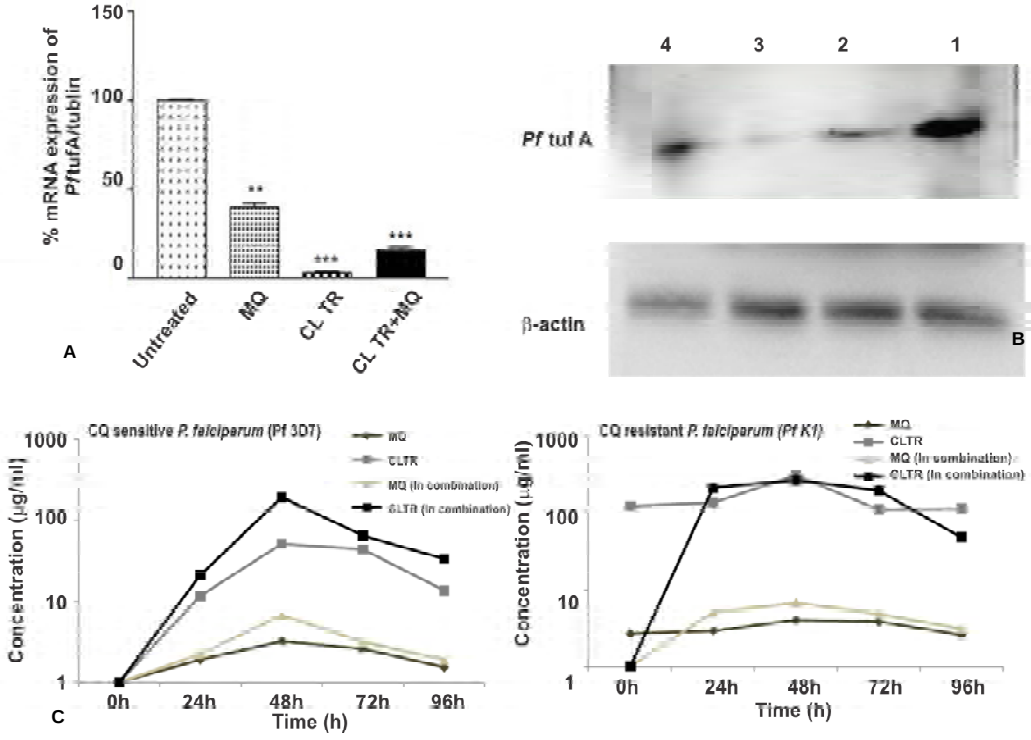


Fig. 2 (A) qRT- PCR analysis of apicoplast marker gene (tufA) of *P. falciparum* after 96h exposure of drugs. α tublin was used as endogenous control. **(B)** Effect of MQ, CLTR/combination on *P. falciparum* apicoplast. Western blot analysis for *Pf* tufA was performed from cell lysate collected after 28h treatment. β-actin was used as endogenous control. Untreated parasite lysate (Lane1), treated with 32nM MQ (Lane 2), 32µM CLTR (Lane 3) and combination of both the drugs (Lane 4). **(C)** Concentration of both drugs at different time intervals in parasite lysate. Concentration of MQ in pRBCs treated with 32 nM MQ (—◆—), concentration of CLTR in pRBCs treated with 32 µM CLTR (—■—), concentration of MQ in pRBCs treated with 32 nM MQ and 32 µM CLTR (—▲—), concentration of CLTR in pRBCs treated with 32 nM MQ and 32 µM CLTR (—▬—).

*Pf*K1 respectively. It is evidenced from HPLC data that CLTR might have reduced metabolism of MQ in *P. falciparum*, leading to increased levels of MQ to produce enhanced antimalarial activity. On the basis of these findings it was concluded that CLTR enhances the antimalarial efficacy of mefloquine via its increased bioavailability and disrupting *P. falciparum* apicoplast (Fig. 2). This study reveals that broad spectrum biological activities (i.e. antimalarial and antiviral) of MQ can be saved by using suitable partner drug like CLTR. This study also shows that CLTR increases the concentration of MQ and disrupts the apicoplast.

1.1.2.2 Cerebral Malaria

In this study, effect of Vitamin D alone and Arteether in combination with Vitamin D was assessed as adjunct therapy in late stage murine malaria after onset of symptoms. Mice were infected with *Plasmodium berghei* ANKA (*Pb*A) by intraperitoneal injection of $3X10^6$ infected red blood cells. After onset of symptoms on day 6, mice were randomized in 4 groups:

- PbA-infected (PbA),
- PbA-infected VD supplemented (PbA+VD),
- PbA-infected α/β Arteehter treated (PbA+ART) and
- PbA-infected α/β Arteether and VD supplemented group(PbA+ART-VD)

A significant difference in survival was observed in all the treatment groups vs Infected control group (p^{**}=0.004 PbA vs PbA+VD, p^{*}=0.013 (PbA vs PbA+ART), p^{***}=0.0001 (PbA vs PbA+ART-VD). In the PbA+VD and PbA+ART group, more than half of the mice died even before completion of treatment. In the PbA+ART-VD group the significant survival of 73% was observed as compared to other treated groups (p^{**}=0.004 PbA+ART vs PbA+ART-VD, p^{*}=0.0001 (PbA+VD vs PbA+ART-VD), p^{***}=0.0001 (PbA vs PbA+ART-VD) (**Fig.** 3a). The parasitemia of mice in PbA+ART-VD and PbA+ART group declined after first dose and the treated mice remained negative throughout. VD has no affect on parasitemia (**Fig.** 3b).

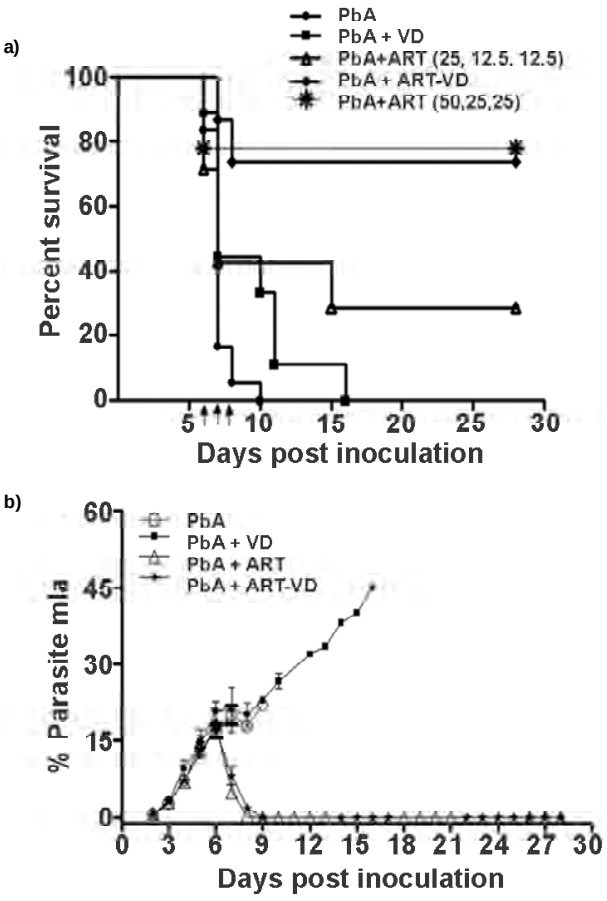


Fig. 3. Treatment of mice with ART-VD combination improves survival in mice and prevents ECM

1.1.2.3 Translation initiation in the apicoplast and mitochondrion of *P. falciparum*

Initiation of translation is a complex step wherein initiation factors (IFs) act in a regulated manner to form an initiation complex. Putative organellar initiation factors were identified and the targeting, structure and function of IF1, IF2, and IF3 homologues encoded by the parasite nuclear genome was investigated. A single *Pf*IF1 was found to target to the apicoplast. Apart from its critical ribosomal interactions, *Pf*IF1 also exhibited nucleic-acid binding and melting activities and mediated transcription anti-termination. This suggested a prominent ancillary function for *Pf*IF1 in destabilization of DNA and RNA hairpin loops encountered during transcription and translation of the A+T rich apicoplast genome. Of the three putative IF2 homologues, only one (*Pf*IF2a) was an organellar protein with mitochondrial localization. An IF3 (*Pf*IF3a) that localized exclusively to the mitochondrion was also identified as was another protein, *Pf*IF3b, that was apicoplast-targeted. *Pf*IF3a exhibited ribosome anti-association activity, and monosome splitting by *Pf*IF3a was enhanced by ribosome recycling factor (*Pf*RRF2) and *Pf*EF-G_{Mit}. These results fill a gap in understanding of organellar translation in *Plasmodium* [***Mol. Microbiol.*, 2015 *PMID: 25689481].**

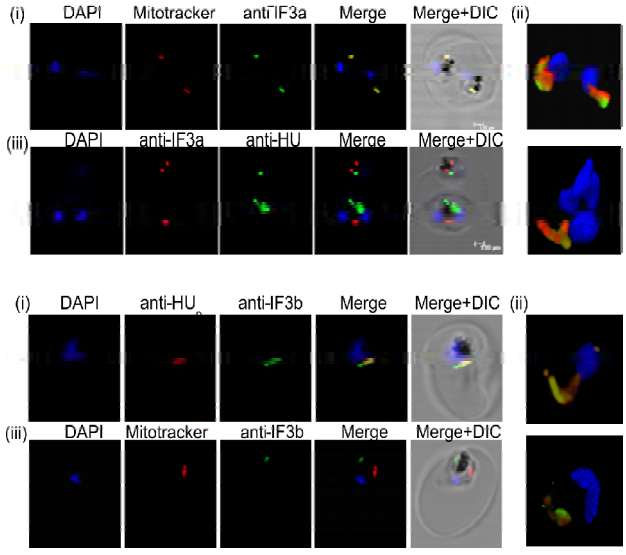


Fig. 4. Immunofluorescence localization of *Pf*IF3a and *Pf*IF3b. (**A**) Panel i, *P. falciparum*-infected erythrocytes stained with Mitotracker Red and probed with *Pf*IF3a antiserum; panel ii, 3-dimensional reconstruction after z-sectioning shows clear overlay of the *Pf*IF3a signal with the mitochondrion; panel iii, Absence of overlap of the *Pf*IF3a signal with apicoplast *Pf*HU. (**B**) Panel i, parasitized erythrocytes probed with anti-IF3b and anti-HU_p anti-sera; panel ii, 3-dimensional reconstruction shows overlap of IF3b with apicoplast HU_p; panel iii, *Pf*IF3b signal does not overlap with Mitotracker Red. Nuclear DNA is stained with DAPI

1.1.2.4 Scaffold assembly of the apicoplast SUF pathway

The SUF pathway of [Fe-S] biogenesis in the apicoplast of *Plasmodium* species is an essential pathway required for apicoplast maintenance and consequent parasite growth. Characterization of the first step of the pathway, namely mobilization of sulphur from L-cysteine by the action of *Pf*SUfS and *Pf*SufE, had been reported last year. A conditional knockout of SufS showed the essential role of the protein in mosquito and liver stages. Subsequent analysis of the components of the scaffold that mediate the next step of Fe-S assembly revealed the involvement of apicoplast-encoded SufB and apicoplast-targeted SufC and SufD which form a complex in the molar ratio of 1:2:1. The interaction between components of the scaffold was confirmed by cross-linking experiments both *in vitro* and *in vivo* and the assembled scaffold was shown to be able to bind [4Fe-4S] clusters. *Pf*SufC is an ATPase whose activity is enhanced by interaction with *Pf*SufD. *In silico* docking of compounds from a commercial library to the *Pf*SufC-D interaction pocket identified several hits which are being evaluated for inhibitory activity.

1.1.2.5 Polymorphisms of NOSII, C-reactive protein, and adhesion molecules thrombospondin and E-selectin are risk factors for *P. falciparum* malaria

Cytoadherence of *Plasmodium falciparum*-infected RBCs in host microvasculature and complex regulation of the immune response are important contributors to the clinical outcome of disease. Association of 23 SNPs and a microsatellite repeat in adhesion molecule genes *THBS1* and *ESEL*, and immune regulatory molecule genes *NOSII*, *CRP* and *MBL2* with falciparum malaria was tested in populations residing in a malaria endemic and a non-endemic region of India. The *THBS1* haplotype CCCCA (rs1478604, rs7170682, rs2664141, rs12912082, rs3743125) was a risk factor in the endemic region (Relative Risk=3.78) and an *ESEL* SNP (rs5368, His468Tyr) associated with cerebral malaria (CM) [CM vs. NCM, OR=2.23, P=0.03]. In the non-endemic region, an *ESEL* 3'UTR SNP (rs5359) associated with enhanced risk of disease (OR=3.62, $P=1\times10^{-4}$) and the CT genotype of the *CRP* promoter SNP (C/T/A) strongly associated with protection (severe vs. control, OR=0.29, $P=6\times10^{-5}$). Long repeat alleles of the *NOSII* promoter microsatellite $(CCTTT)_n$ exhibited strong association with protection and the *NOSII* ATG haplotype (rs3729508, rs2297520, rs9282801) was strongly protective against severe malaria in both the regions (endemic, severe vs. control, OR=0.05, P=0.0001; non-endemic, severe vs. control, OR=0.3, $P=1\times10^{-5}$). These results suggest differential contribution of variants of investigated genes in determining the outcome of malaria in Indian populations [***Eur. J. Clin. Med. Infect. Dis*., 2015** PMID: 26194693]

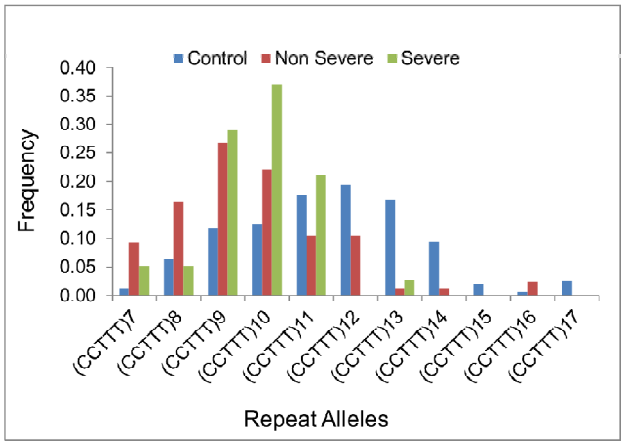


Fig. 5. Frequency distribution of *NOSII* $(CCTTT)_n$ microsatellite repeat alleles in patient and control sets of the endemic region.

1.1.2.6 Understanding the auxiliary roles of HSP110 in *Plasmodium falciparum*

To identify the important components of protein folding machinery involved in maintenance of *P. falciparum* proteome, a proteome-wide phylogenetic profiling across various species was performed. It was found that the parasite has lost all other cytosolic nucleotide exchange factors and retained only HSP110 which is essential for regulating HSP70. Evolutionary and structural analysis shows that besides its canonical interaction with HSP70, PfHSP110 has acquired sequence insertions for additional dynamic interactions. Molecular co-evolution profile depicts that the co-evolving proteins of PfHSP110 belong to distinct pathways like genetic variation, DNA repair, fatty acid biosynthesis, protein modification/trafficking, molecular motions, and apoptosis. This suggests that HSP110 may serve as an important hub to coordinate the protein quality control, survival and immune evasion pathways in the *P. falciparum*. This data open avenues for experimental validation of auxiliary functions of *Pf*HSP110 and their exploration for design of better antimalarial strategies. ***[Proteins, 2015, 83(8):1513]***

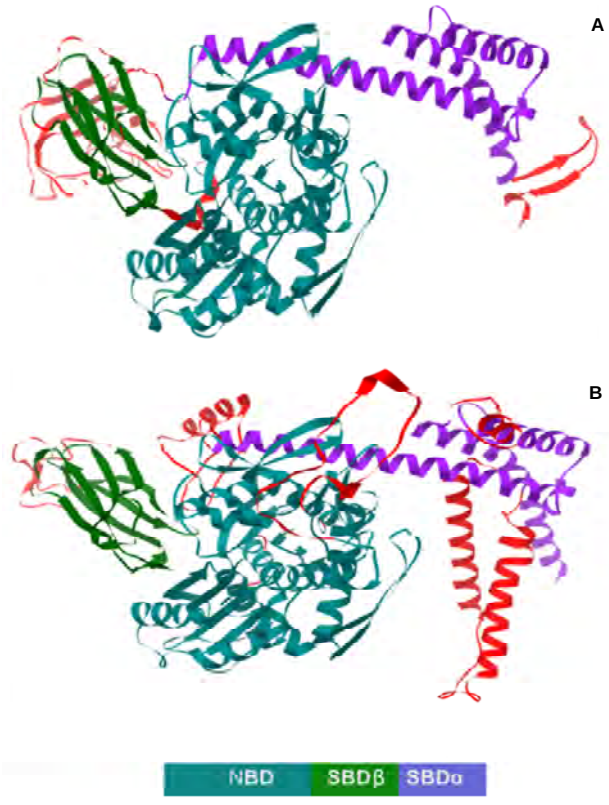


Fig. 6. Structural analysis of HSP110 homolog in (A) human and (B) *P. falciparum* using yeast HSP110 (PDB: 2QXL). Nucleotide binding domain is denoted as NBD and substrate binding domain is denoted as SBD. The insertions in the protein are shown in red.

1.1.2.7. Maintenance of *Anopheles stephensi* colony and *Plasmodium berghei* sporozoites.

An *Anopheles stephensi* colony is being maintained at CDRI for following the entire life cycle of the malaria parasite.

This will aid in evaluation of liver stage effects of drugs as well as to generate mutant parasite lines for drug target validation.

1.1.2.8 Genetic manipulation and functional drug targeting

Genetic manipulation and drug targeting approaches against *Plasmodium* sporozoite specific proteins are being addressed. The laboratory has generated several knockouts using the *Plasmodium berghei* model. In mammalian cells, eIF2α-P is de-phosphorylated by protein phosphatase 1 (PP1). To test whether PP1 phosphorylates eIF-2α in *Plasmodium,* attempted to knock out *pp1* in *P. berghei* but failed. This suggests that gene might be essential in *Plasmodium* blood stages. So, did conditional knockout (cKO) of *pp1* using the FlpL/FRT site-specific recombination system. The *pp1* locus in cKO parasites was intact in the blood stages and it got excised in sporozoites, when passed through mosquito. The development of *pp1* cKO parasite was normal in mosquito and liver stages, but excised parasites failed to initiate blood stages [**PLoS Pathogens, accepted**]. Conditional knockout of another candidate SUFs have been generated and initial results suggest that gene is essential throughout the *Plasmodium* life cycle stages. Several other knock outs have been generated and their role is under investigation.

1.2 Leishmaniasis

1.2.1 Synthesis and Screening

Novel synthetic moieties representing several prototypes viz. Tryptamine tetrazole hybrids, Indole Beta carbolinone hybrids, Quinazolinone benzothiazole hybrids, Quinolones, Isoxazole, beta carboline derivatives, Pyrano-piperazine and Pyrimidine Quinolines Pyranone Quinoline-4-ones, Phenoxazinone , 2,3,4-trisubstituted Quinoline Chalconethiazolyl- hydrazone hybrids, 2, 3 di substituted Quinoline-4-ones, Iridoids, β amino acid derivatives, Phenoxazone derivatives, 2-methyl derivatives and K09 analogues, were synthesized and screened for antileishmanial activity against experimental models. 192 synthetic compounds were evaluated at 50 μM and 25 μM concentrations, respectively against *in vitro* macrophage-amastigote model out of which 11 compounds of Quinolones (2), Quinazolinone-benzothiazole hybrid (2), Tryptamine tetrazole hybrid (3) and Isoxazole (4) series showed significant activity (>90% inhibition of parasite multiplication. One compound belonging to beta amino acid derivatives showed 80% antileishmanial activity in hamster model. Further studies are in progress.

1.2.2. Formulations

1.2.2.1. Lipoteichoic acid functionalized lipo-polymerosomes: A chemo-immunotherapeutic approach against intracellular infectious disease

Pathogenic organisms that colonize antigen presenting cells (APC) often induce overexpression of a variety of receptors for pathogen associated molecular pathways on host cells. Lipoteichoicacid (LTA), a surface glycolipid of Gram-positive bacteria is recognized by APC receptors that transduce signals for pro-inflammatory cytokine secretion. The nanoarchitechture of APC-targeted LTA functionalized lipo-polymerosomes containing amphotericin B (LTA-AmB-L-Psome) was reported. These L-Psomes are self-assembling nanostructures, formed when a synthesized glycol chitosan-stearic acid copolymer (GC-SA) and cholesterol are mixed in defined proportions. L-Psomes tagged with a fluorescent dye (FITC) were internalized to a greater extent by J774A and RAW264.7 macrophages, and in macrophage-rich organs like the liver, lung and spleen. LTA-AmB-L-Psomes mitigated drug toxicity and significantly inhibited parasite growth compared to commercial AmB, both *in vitro* (macrophage-amastigote system; IC50, 0.082 ± 0.009 μg/mL) and *in vivo* (*Leishmania donovani* infected hamsters; 89.25 ± 6.44% parasite inhibition). Moreover, LTA-AmB-L-Psome stimulated the production of protective cytokines like interferon-γ (IFN-γ), interleukin-12 (IL-12), tumor necrosis factor-α (TNF-α), and inducible nitric oxide synthase and nitric oxide with down-regulation of anti-inflammatory cytokines like transforming growth factor-β (TGF-β), IL-10, and IL-4. These results demonstrate the potential of LTA-functionalized lipo-polymerosome as a biocompatible nanotherapeutic platform for overcoming toxicity and improving drug efficacy along with induction of robust innate immune responses for effective therapeutics of intracellular infections. ***[Biomacromolecules 13;16(4):1073-87 (2015)]***

1.2.2.2. Lactoferrin appended PLGA nanoparticles for safe and effective chemotherapy of visceral leishmaniasis

A nanoparticle system for targeted delivery of Amphotericin B (AmB) to the Leishmania parasite resident in macrophages was developed with the aim to reduce systemic toxicity and increase therapeutic efficacy. Nanoparticles of poly lactic-co-glycolic acid functionalized with lactoferrin were prepared and characterized for various physicochemical properties. These were evaluated in close comparison with unmodified nanoparticles, and commercially-available formulations: Ambisome and Fungizone. Lactoferrin-decorated nanoparticles showed greater internalization by J774A.1 macrophages compared to unmodified nanoparticles, further confirmed by rapid clearance from blood and higher accumulation in liver and spleen. Experimental IC_{50}against macrophage-resident amastigoteswas 0.15±0.05 μg/mL. In *Leishmania donovani* infected hamsters, 88.61±2.15% parasite inhibition was observed. Indications of immuno-modulatory response [up-regulated interleukin-12 (IL-12), tumor necrosis factor-α, and inducible nitric oxide synthase, and down-regulated transforming growth factor-β, IL-10 and IL-4] illustrated the higher efficacy of LcfPGNP-AmB to augment antileishmanial activity of AmB. Preliminary cytotoxicity and haemotoxicity studies revealed safe. Decreased systemic toxicity was indicated by lower drug accumulation in kidney and the histologyof kidney sections. ***[Nanomedicine, 2015, 10(7), 1093-109]***

1.2.3 Mechanism of Drug Resistance

1.2.3.1 Over-expression of Cysteine Leucine rich protein is related to SAG resistance in clinical isolates of *Leishmania donovani*

Resistance emergence against antileishmanial drugs, particularly Sodium Antimony Gluconate (SAG) has severely hampered the therapeutic strategy against visceral leishmaniasis, the mechanism of resistance being indistinguishable. Cysteine leucine rich protein (CLrP), was recognized as one of the overexpressed proteins in resistant isolates, as observed in differential proteomics between sensitive and resistant isolates of *L. donovani*. In pursuance of deciphering the role of CLrP in SAG resistance, gene was cloned, overexpressed in *E. coli* system and thereafter antibody was raised. The expression profile of CLrP and was found to be over-expressed in SAG resistant clinical isolates of *L. donovani* as compared to SAG sensitive ones when investigated by real-time PCR and western blotting. CLrP has been characterized through bioinformatics, immunoblotting and immunolocalization analysis, which reveals its post-translational modification along with its dual existence in the nucleus as well as in the membrane of the parasite. Further

investigation using a ChIP assay confirmed its DNA binding potential. Over-expression of CLrP in sensitive isolate of *L. donovani* significantly decreased its responsiveness to SAG (SbV and SbIII) and a shift towards the resistant mode was observed. Further, a significant increase in its infectivity in murine macrophages has been observed. Results indicate the possible contribution of CLrP to antimonial resistance in *L. donovani* by assisting the parasite growth in the macrophages. ***[PLOS Neglected Tropical Diseases, 21, (2015) 9(8): e0003992]***

1.2.3.2. MAPK1 of *Leishmania donovani* modulates Antimony susceptibility by downregulating P-Glycoprotein efflux pumps

Mitogen-activated protein kinases (MAPKs) are well-known mediators of signal transduction of eukaryotes, regulating important processes, like proliferation, differentiation, stress response, and apoptosis. In *Leishmania*, MAPK1 has been shown to be consistently downregulated in antimony-resistant field isolates, suggesting that it has a role in antimony resistance. The present work investigates the molecular mechanism of MAPK1 in antimony resistance in *Leishmania donovani*. The *L. donovani* MAPK1 (LdMAPK1) single-allele replacement mutants exhibited increased resistance to Sb(III) (5.57-fold) compared to wild-type promastigotes, while overexpressing parasites became much more susceptible to antimony. The LdMAPK1-mediated drug sensitivity was directly related to antimony-induced apoptotic death of the parasite, as was evidenced by a 4- to 5-fold decrease in cell death parameters in deletion mutants and a 2- to 3-fold increase in MAPK1-overexpressing cells. LdMAPK1-underexpressing parasites also exhibited increased P-glycoprotein (P-gp)-mediated efflux pump activity, while a significant decrease in pump activity was observed in overexpressing cells. This change in efflux pump activity was directly related to expression levels of P-gp in all cell lines. However, episomal complementation of the gene restored normal growth, drug sensitivity, P-gp expression, and efflux pump activity. The data indicate that LdMAPK1 negatively regulates the expression of P-glycoprotein-type efflux pumps in the parasite. The decrease in efflux pump activity with an increase in Ld-MAPK1 expression may result in increased antimony accumulation in the parasite, making it more vulnerable to the drug. ***[Antimicrobial Agents and Chemotherapy 2015, 59, 3853-3863]***

1.2.4 Immunobiology

1.2.4.1 Recombinant NAD-dependent SIR-2 protein of *Leishmania donovani*: Immunobiochemical characterization as a potential vaccine against Visceral Leishmaniasis

L. donovani NAD+-dependent Silent Information Regulatory-2 (SIR2 family or sirtuin) protein (LdSir2RP) was successfully cloned, expressed and purified. The gene was present as a monomeric protein of ~45 kDa and further established by the crosslinking experiment. rLdSir2RP shown cytosolic localization in *L. donovani* and demonstrating NAD+-dependent deacetylase activity. Bioinformatic analysis also confirmed that LdSir2RP protein has NAD binding domain. The rLdSir2RP was further assessed for its cellular response by lymphoproliferative assay and cytokine ELISA in cured Leishmania patients and hamsters (*Mesocricetus auratus*) in comparison to soluble Leishmania antigen and it was observed to stimulate the production of IFN-γ, IL-12 and TNF-α significantly but not the IL-4 and IL-10. The naïve hamsters when vaccinated with rLdSir2RP alongwith BCG resisted the *L. donovani* challenge to the tune of ~75% and generated strong IL-12 and IFN-γ mediated Th1 type immune response thereof. The efficacy was further supported by remarkable increase in IgG2 antibody level which is indicative of Th1 type of protective response. Further, with a possible implication in vaccine design against VL, identification of potential T-cell epitopes of rLdSir2RP was done using computational approach. The immunobiochemical characterization strongly suggest the potential of rLdSir2RP as vaccine candidate against VL and supports the concept of its being effective T-cell stimulatory antigen. ***[PLOS Neglected Tropical Diseases (2015) Mar 6;9(3):e0003557]***.

1.2.4.2 Immunological consequences of stress-related proteins – cytosolic tryparedoxin peroxidase and chaperonin TCP20 – identified in splenic amastigotes of *Leishmania donovani* as Th1 stimulatory, in experimental visceral leishmaniasis

In earlier studies, proteomic characterization of splenic amastigote fractions from clinical isolates of *L. donovani,* exhibiting significant cellular responses in cured Leishmania subjects, led to the identification of cytosolic tryparedoxin peroxidase (LdcTryP) and chaperonin-TCP20 (LdTCP20) as Th1-stimulatory proteins. Both the proteins, particularly LdTCP20 for the first time, were successfully cloned, overexpressed, purified and were found to be localized in the cytosol of purified splenic amastigotes. When evaluated against lymphocytes of cured Leishmania-infected hamsters, the purified recombinant proteins (rLdcTryP and rLdTCP20) induced their proliferations as well as nitric oxide production. Similarly, these proteins also generated Th1-type cytokines (IFN-γ/IL-12) from stimulated PBMCs of cured/ endemic Leishmania patients. Further, vaccination with rLdcTryP elicited noticeable delayed-type hypersensitivity response and offered considerably good prophylactic efficacy (~78% inhibition) against *L. donovani* challenge in hamsters, which was well supported by the increased mRNA expression of Th1 and Th2 cytokines. However, animals vaccinated with rLdTCP20 exhibited comparatively lesser prophylactic efficacy (~55%) with inferior immunological response. The results indicate the potentiality of rLdcTryP protein, between the two, as a suitable anti-leishmanial vaccine. Since, rLdTCP20 is also an important target, for optimization, further attempts towards determination of immunodominant regions for designing fusion peptides may be taken up. ***[Parasitology (2015), 142, 728–744]***

1.2.4.3. Immunostimulatory potential and proteome profiling of *Leishmania donovani* soluble exogenous antigens

Isolation of the soluble exogenous antigens (SEAgs), its immune response study and proteome profiling is an essential prerequisite for understanding the molecular pathogenesis of *L. donovani*. The immunostimulatory potential of *L. donovani* SEAgs, purified from culture of *L. donovani* clinical isolate, was evaluated for their ability to induce cellular responses in treated/cured hamsters. SEAgs induced significant proliferative responses in lymphocytes (SI 5.6 ± 2.3; $P < 0.01$) isolated from cured hamster.

In addition, significant NO production in response to SEAgs was also noticed in macrophages of hamsters, mouse and human cell lines (J774A-1 and THP1). Western blot analyses with antibodies against proteophosphoglycan (PPG; surface-expressed and secreted molecule) of *L. donovani* revealed that PPG molecules are also present in *L. donovani* SEAgs. Mass spectrometry (MS)-based proteome analysis of 12 protein bands of SEAgs through MALDITOF/TOF endorsed the identification of some Th1-stimulatory immunogenic proteins. These immunogenic proteins may offer increased hope for the discovery of new

promising vaccine candidates against visceral leishmaniasis (VL). The overall results suggest that immunostimulatory molecules are present in the SEAgs, which may be further exploited, for developing a subunit vaccine against VL a fatal human disease ***[Parasite Immunology, 2015, 37, 368–375]***.

1.2.5 Drug Target Identification and Characterization

1.2.5.1 Actin-network in *Leishmania* parasites

Aiming towards functional characterization of actin network and its involvement in flagellum assembly pathway in *Leishmania*, seven key flagellar proteins that are involved in paraflagellar rod (PFR) assembly were recently identified. All the seven PFR genes have been subjected to RNAi knockdown in *L. braziliensis* and the functional characterization is underway.

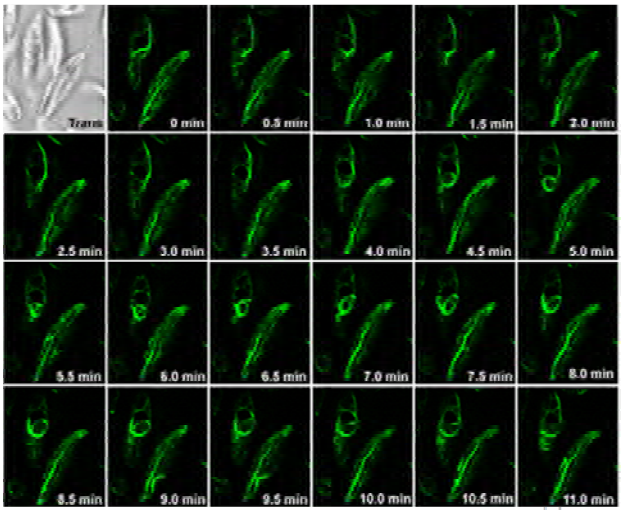


Fig. 7. Actin-filament dynamics monitored by GFP-coronin in *Leishmania*.

One of the actin monomer-binding proteins, twinfilin, has been functionally characterized in *Leishmania*. The study shows involvement of this protein in orchestrating cell division by coordinating mitotic spindle formation and DNA replication.

Further studies on *Leishmania* coronin reveals that it binds with actin through its unique region and not with its beta-propeller domain as observed in other coronins. This protein has been found to communicate with actin and ADF/cofilin to regulate length of actin-filaments in these parasites.

1.2.5.2. Recombinant *Leishmania* Rab6 (rLdRab6) is recognized by sera from Visceral Leishmaniasis patients

Sera from acute visceral leishmaniasis patients from Bihar and West Bengal had notably high levels of antibody to recombinant (r) LdRab6. Sera of patients from another intracellular pathogenic infection, *Mycobacterium tuberculosis*, did not contain any significant levels of anti-rLdRab6 antibody suggesting that rLdRab6 accuracy in visceral leishmaniasis (VL) diagnosis makes it a promising antigen for clinical use.

1.2.5.3. Structural and functional studies on proteins from pathogens

Trypanosomatids including *L. donovani* depend on cellular stores of trypanothione and other polyamines in fighting reactive oxidative species generated by macrophages during host-pathogen interactions, thus making enzymes of the trypanothione biosynthesis pathway potential targets for therapeutic processes. γ-glutamylcysteine synthetase (gcs) is an essential enzyme that catalyzes the first and rate limiting step in the trypanothione biosynthesis pathway, the ATP-dependent ligation of L-Glutamate and L-Cysteine to form Gamma-glutamylcysteine. Various constructs of Gcs have been cloned, expressed and functionally characterized, while structure elucidation experiments are in progress. Studies on the enzyme show that the presence of Mg is essential for its ATPase activity, while being independent of substrates. Biophysical studies have shown that the protein has maximum affinity for ATP, followed by L-glutamate and L-cysteine, leading to a functional hypothesis. Computational studies have also identified residues important for the protein's function, based on which mutants have designed and some of them show reduced activity.

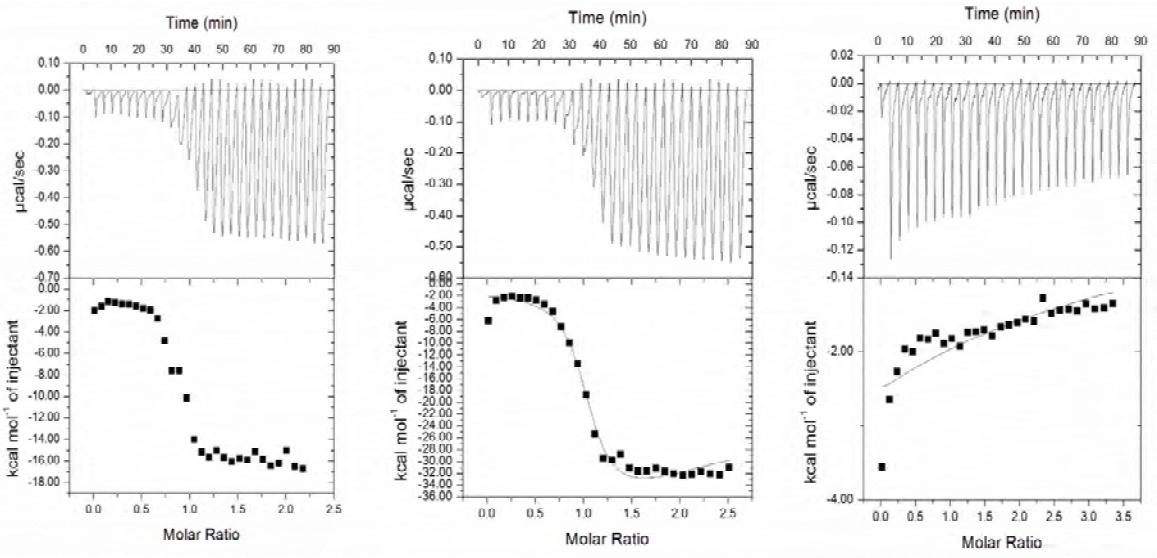


Fig. 8. Thermogram of LdGCS with ATP (left), and substrates L-glutamate (middle) and L-cysteine (right). 15 µM of the recombinant protein was titrated against 200 µM of the substrates.

1.2.5.4. The TCP1c subunit of *Leishmania donovani* forms a biologically active homo-oligomeric complex

In the present study, the TCP1c subunit was expressed in *Escherichia coli* to investigate whether it forms chaperonin- like complexes and plays a role in protein folding. LdTCP1c formed high-molecular-weight complexes within *E. coli* cells as well as in Leishmania cell lysates. The recombinant protein is arranged into two back-to-back rings of seven subunits each, as predicted by homology modelling and observed by negative staining electron microscopy. This morphology is consistent with that of the oligomeric double-ring group I chaperonins found in mitochondria. The LdTCP1c homo-oligomeric complex hydrolysed ATP, and was active as assayed by luciferase refolding. Thus, the homo-oligomer performs chaperonin reactions without partner subunit(s). Further, co- immunoprecipitation studies revealed that LdTCP1c interacts with actin and tubulin proteins, suggesting that the complex may have a role in maintaining the structural dynamics of the cytoskeleton of parasites**. (FEBSJ, 2015 online)**

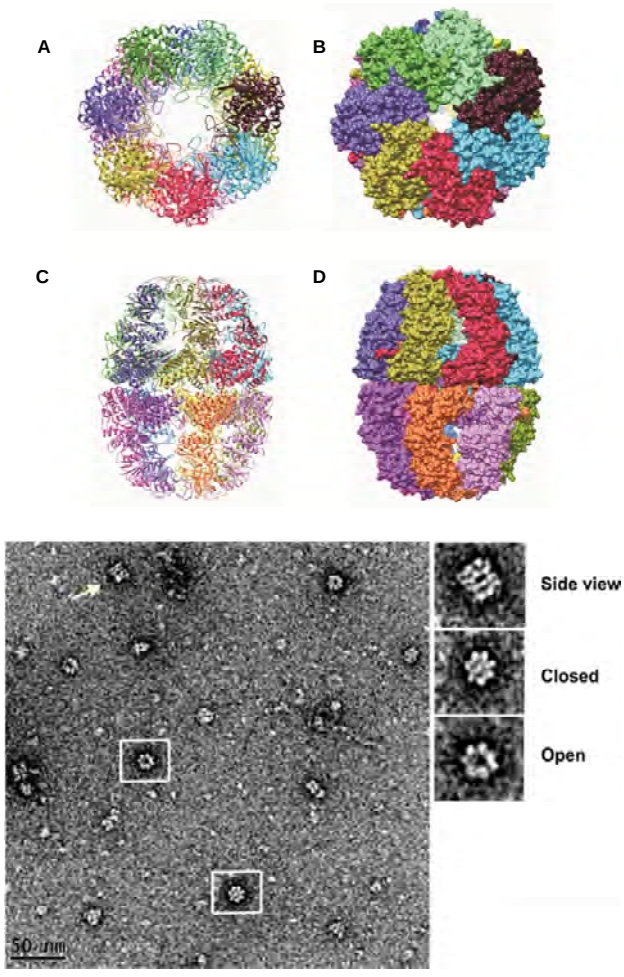


Fig. 9. (i). Modelled 14 mer homo-oligomeric structure of LdTCP1γ. (A) Top view of 14 mer complex in ribbon and (B) surface representations to show 7 ring structure. (C) Side view and (D) surface representations showing upper and lower rings. (ii) **TEM image of negatively stained LdTCP1γ.** LdTCP1γ oligomer complex revealing seven folds symmetry (boxed) of the complex (Top view). Side view of the complex (arrow) reveals double ring structure. Inset shows different views of the complex. Bar indicates 50nm

1.3 Filariasis

1.3.1 Antifilarial drug discovery

1.3.1.1 Antifilarial activity of target based inhibitors

A. DNA ligase of the *Wolbachia* symbiont of *Brugia malayi* (*w*Bm-LigA)

NAD^+-dependent DNA ligase is an essential enzyme of DNA replication, repair, and recombination and therefore, studied as the antifilarial drug target using dispiro-cycloalkanone compounds. Seven Dispiro-cycloalkanones were tested and found that they specifically inhibited the nick-closing and cohesive-end ligation activities of the enzyme without inhibiting human or T4 DNA ligase. The mode of inhibition was competitive with the NAD^+cofactor. Docking studies also revealed the interaction of these compounds with the active site of the target enzyme. The adverse effects of these inhibitors were observed on adult and microfilarial stages of *B. malayi in vitro*, and the most active compounds were further monitored *in vivo* in jirds and mastomys rodent models. Compounds 1, 2, and 5 had severe adverse effects *in vitro* on the motility of both adult worms and microfilariae at low concentrations. Compound 2 was the best inhibitor, with the lowest (IC50) (1.02µM), followed by compound 5 (IC50, 2.3 µM) and compound 1 (IC50, 2.9 µM). These compounds also exhibited the same adverse effect on adult worms and microfilariae *in vivo* (P<0.05). These compounds also tremendously reduced the wolbachial load, as evident by qRT- PCR (P<0.05). *w*Bm-LigA thus shows promise as an antifilarial drug target, and dispiro-cycloalkanone compounds present the lead antifilarial molecules. ***[Antimicrobial Agents Chemotherapy. 2015, 59(7), 3736-3747]***

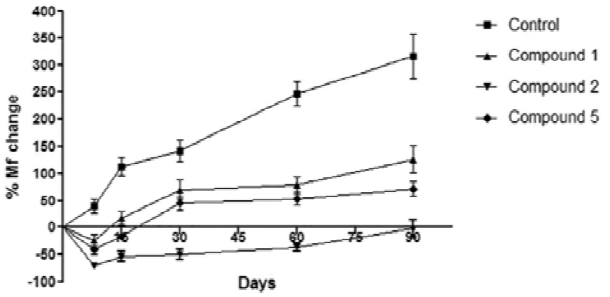


Fig. 10. Percent change in mf load in *Mastomys coucha.*

B. *Brugia malayi* thymidylate kinase (BmTMK)

A series of novel chalcone-benzothiazole hybrids have been synthesized and evaluated for their *B. malayi* thymidylate kinase (BmTMK) enzyme inhibition activity. Their selectivity towards BmTMK was studied and compared to the human TMK

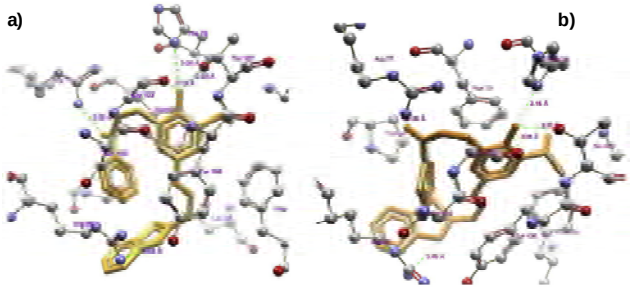


Fig. 11. The molecular interactions of compound 34 and 42 with BmTMK binding site are shown in a and b, respectively

(HsTMK) *in silico*. Out of seventeen derivatives, compounds 34 and 42 showed higher interactions with the BmTMK active site and found to be active. Compound 34 showed IC50 = 4.34 µM and 2.64 µM and compound 42 revealed IC50 = 2.12 µM and 1.63 µM on adult worm and microfilariae respectively. The findings suggest that these hybrids are selective towards the BmTMK enzyme and may serve as potential therapeutic agents against filariasis. ***[European Journal of Medicinal Chemistry. 2015, 103, 418-28]***

C. Molecular characterization of Wolbachia endosymbiont protein of B. malayi as antifilarial drug target

To understand the role of Wol Tl IF-1 in filarial biology, a mutant (R45D) was constructed by replacing Arg with Asp. Both wild and mutant were biochemically active with monomeric native conformation. Wol Tl IF-1 exhibited binding with ssRNA/ssDNA fragments in nonspecific manner under electrostatic conditions whereas mutant failed to show any binding. However, none of them was able to bind with ds DNA. Wol Tl IF-1 was able to catalyze annealing and displacement activities of RNA strands while the mutant exhibited trivial strand annealing activity without any strand displacement. This demonstrates that point mutation impaired RNA chaperone activity of the mutant and its interaction with nucleotides.

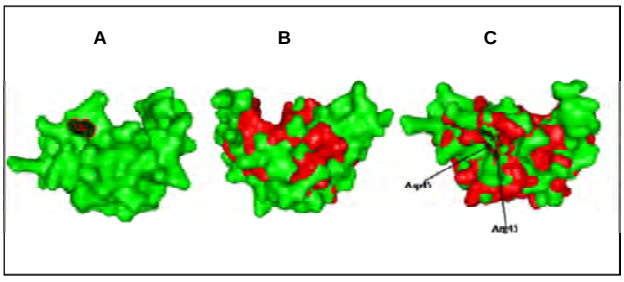


Fig. 12. *In silico* surface model and superimposition of Wol Tl IF-1R45D

1.3.1.2 Drug delivery

Chitosan (Chi) coated alginate micro particles (MPs) were prepared by a spray drying for effective delivery to lymphatics via combination therapy. Further *in vitro* antifilarial activity studies demonstrated notable killing by the combination therapy compared to individual treatments with Chi–DOX MPs and Chi–DEC MPs. A combined dose of 25 mg kg^{-1} and 10 mg kg^{-1} in a 2.5 : 1 ratio of DEC and DOX respectively, following the oral MP therapy, significantly improved the microfilaricidal and macrofilaricidal action of the *in vitro* estimations. *In vivo* experiments in infected jirds (*Meriones unguiculatus*) demonstrated enhancement of adulticidal action by 2 fold with Chi–DOX MPs in combination with Chi–DEC MPs, macrofilaricidal enhancements of the Chi–DEC & Chi–DOX combination are also inferred. ***[RSC ADVANCES. 2015, 5, 69047-69056]***

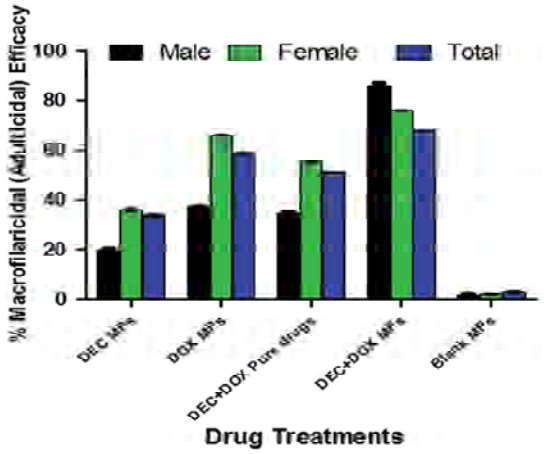


Fig. 13. Chi–DOX MPs, Chi–DEC MPs, (Chi–DEC + Chi–DOX) MPs combination, (DEC + DOX) plain drug combination and blank MPs on the percentage of macrofilaricidal (adulticidal) efficacy.

1.3.2 Filarial Immunobiology

1.3.2.1 Parasite clearance by Regulatory T-cell neutralization in mice

Filarial infection leads to profound impairment of parasite-specific T helper type 1 (Th1) and Th2 immune responses and significantly increases the expression of regulatory networks and regulatory effectors which together play an important role in immunosuppression. Administration of neutralizing antibodies against the Treg cell-associated markers CD25 and GITR not only arrested the accumulation of Treg cells and reduced arginase activity, but also led to an increase in the percentages of Th17 cells in the secondary lymphoid organs of mice. Elevated levels of interferon-γ and decreased levels of interleukin-10 were also noted in the culture supernatants of mouse splenocytes that were treated with neutralizing antibodies. Furthermore, treatment with neutralizing antibodies enhanced the expression of inducible nitric oxide synthase on host macrophages and CD40 on host dendritic cells with concomitant decreased expression of alternative activation markers Arg1, Ym1 and Fizz1, which together lead to reduced parasite burden in treated animals. Thus, administration of neutralizing antibodies helps in breaking the regulatory network in mice and limits parasite-induced immunosuppression at the earliest host–parasite interface. ***[Immunology. 2016, 147(2), 190-203]***

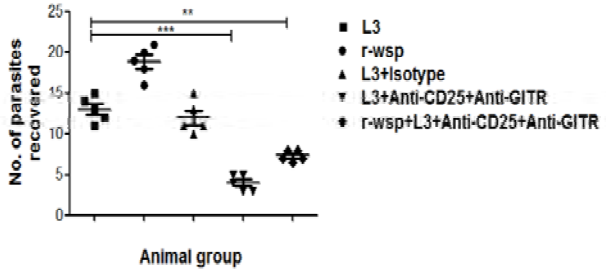


Fig. 14. Parasite load in different groups of mice.

1.3.2.2 *B. malayi* myosin as DNA/Protein Prime Boost Vaccine

Immunoprophylactic efficacy of recombinant heavy chain myosin (Bm-Myo) of *B. malayi* has been enhanced by employing alternate approaches such as homologous DNA (pcD-Myo) and heterologous DNA/protein prime boost (pcD-Myo+Bm-Myo) in BALB/c mouse. The gene bm-myo was cloned in a mammalian expression vector pcDNA 3.1(+) and protein expression was confirmed in mammalian Vero cell line. A significant degree of protection (79.2%±2.32) against L3 challenge in pcD-Myo+Bm-Myo immunized group was observed which was much higher than that exerted by Bm-Myo (66.6%±2.23) or pcD-Myo (41.6%±2.45). In the heterologous immunized group, the percentage of peritoneal cells such as macrophages, neutrophils, B cells and T cells marginally increased and their population augmented significantly following L3 challenge. pcD-Myo+Bm-Myo immunization elicited robust cellular and humoral immune

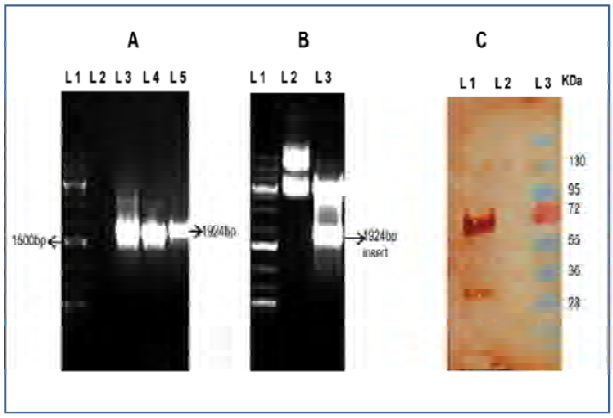


Fig. 15. Cloning in mammalian expression vector

responses as compared to pcD-Myo and Bm-Myo groups as evidenced by an increased accumulation of CD4+, CD8+ T cells and CD19+ B cells in the mouse spleen and activation of peritoneal macrophages. Though immunized animals produced antigen-specific IgG antibodies and isotypes, sera of mice receiving pcD-Myo+Bm-Myo or Bm-Myo developed much higher antibody levels than other groups and there was profound antibody-dependent cellular adhesion and cytotoxicity (ADCC) to *B. malayi* infective larvae (L3). pcD-Myo+Bm-Myo as well as Bm-Myo mice generated a mixed T helper cell phenotype as evidenced by the production of both pro-inflammatory (IL-2, IFN-γ) and anti-inflammatory (IL-4, IL-10) cytokines. Mice receiving pcD-Myo on contrary displayed a polarized pro-inflammatory immune response. DNA followed by protein booster generates heightened and mixed pro- and anti-inflammatory immune responses that are capable of providing high degree of protection against filarial larval invasion. ***[PLoS ONE. 2015, 10(11) e0142548]***

1.3.2.3 Circulating filarial antigen detection in brugian filariasis

The success of global elimination programmes for LF depends upon effectiveness of tools for diagnosis and treatment. In this study on stage-specific antigen detection in brugian filariasis, L3, adult worm and microfilarial antigenaemia were detected in around 90–95% of microfilariae carriers (MF group), 50–70% of adenolymphangitis (ADL) patients, 10–25% of chronic pathology (CP) patients and 10–15% of endemic normal (EN) controls. The sensitivity of the circulating filarial antigen (CFA) detection in serum samples from MF group was up to 95%. In sera from ADL patients, unexpectedly, less antigen reactivity was observed. In CP group all the CFA positive individuals were from CP grade I and II only and none from grade III or IV, suggesting that with chronicity the adult parasites lose fecundity and start to disintegrate and die. Amongst EN subject, 10–15% had CFA indicating that few of them harbour filarial adult worms, thus they might not be truly immune as has been conventionally believed. The specificity for antigen detection was 100% when tested with sera from various other protozoan and non-filarial helminthic infections. ***[Parasitology, 2015 PMID: 26646772]***

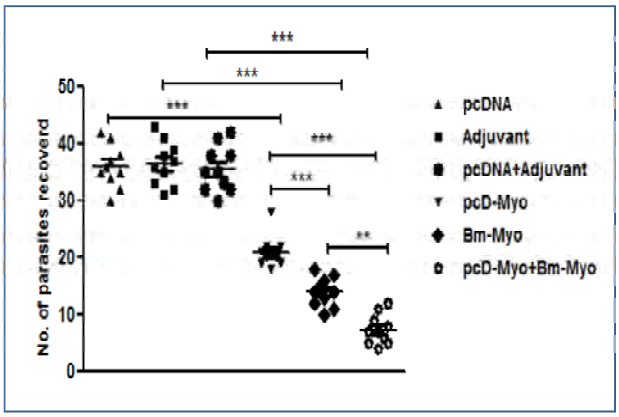


Fig. 16. Worm recovery post L3 challenge

1.3.2.4 Role of lung eosinophils and macrophages during Tropical Pulmonary Eosinophilia

Role of eosinophils in the pathogenesis of Tropical Pulmonary Eosinophilia (TPE), a rare, but fatal manifestation of Filariasis was elucidated by establishing a mouse model of TPE that mimicked filarial manifestations as seen in humans. Using flow cytometry assisted cell sorting and Real time RT-PCR we showed that TPE mice exhibited increased levels of IL4, IL5, CCL5 and CCL11 in the Brochoalveolar lavage fluid and lung parenchyma along with elevated titres of IgE and IgG subtypes in the serum. AMΦ from TPE mice displayed decreased phagocytosis, attenuated Nitric Oxide production and reduced T-cell proliferation capacity while FACS sorted lung eosinophils from TPE mice upregulated transcript levels of Ficolin A and anti-apoptotic gene Bcl2, but pro-apoptotic genes Bim and Bax were downregulated. Similarly, flow-sorted lung macrophages upregulated transcript levels of TLR-2, TLR-6, Arginase-1, Ym-1 and FIZZ-1, but downregulated NOS-2 levels signifying their alternative activation. Collectively, it is showed that pathogenesis of TPE is marked by functional impairment of AMΦ, alternative activation of lung macrophages and upregulation of anti-apoptotic genes by eosinophils which cause severe lung inflammation and compromises lung immunity, hence interventions that can boost lung immunity may provide relief to patients suffering from TPE. ***[J Leukoc Biol., 2015 PMID: 26489428]***

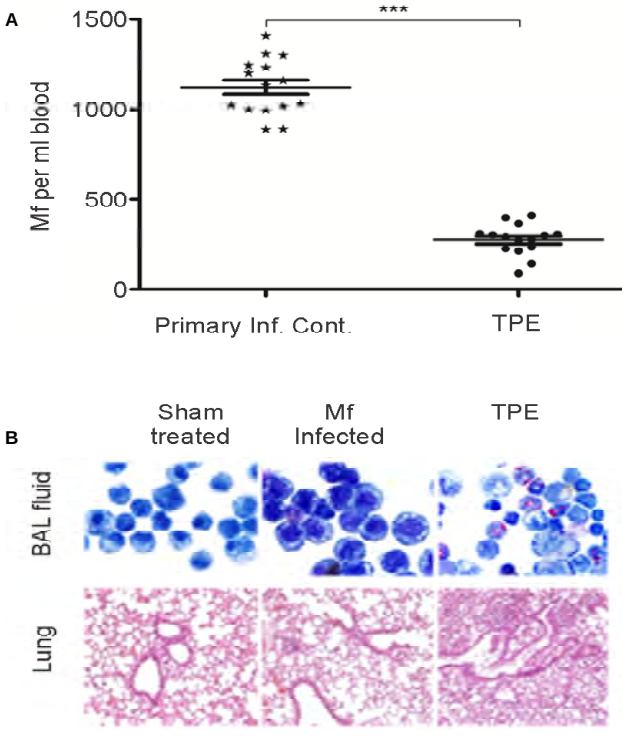
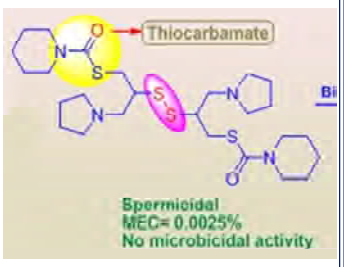


Fig. 17. A. Microfilariae (mf) counts in peripheral blood of Cont. and TPE mice, B. Lung histopathology



REPRODUCTIVE HEALTH RESEARCH, DIABETES & ENERGY METABOLISM

Area Coordinators: Dr. Gopal Gupta, Dr. Sabyasachi Sanyal and Dr. Atul Goel

2

This area is broadly divided into two sections; a) Reproductive health research and b) Diabetes and energy metabolism research. Objectives followed by significant research progress made under these two sections are described subsequently.

1) Reproductive health research

The prime objectives are: I) Drug Design and synthesis of novel molecules and extracts/isolates from natural sources and their bio evaluation for generating new leads and to develop them as potential female or male contraceptives, spermicides with anti-STI properties; II) Development of new bone anabolic and/or anti-catabolic agents for the management of post-menopausal osteoporosis and other related endocrine disorders; III) Undertake basic research to identify mode of action of promising agents and to generate new knowledge in the area of female and male reproductive health.

2) Diabetes and energy metabolism

The prime objectives are: I) Discovering of targeted therapeutic leads in type II diabetes mellitus (T2DM) and hyperlipidemic condition for potential preclinical development and II) Understanding pharmacological basis of actions of existing and potential therapeutics in type II diabetes and hyperlipidemic condition.

2.1 Reproductive health research

2.1.1 Male/Female Reproductive Biology, Contraception and Infertility

2.1.1.1 Primary screening of CDRI compounds for spermicidal activity

During the period under report 51 synthetic compounds (S-015-20-45, 225-230, 789-801, 1187-1192) were evaluated for spermicidal activity, *in vitro*. Activity was detected in 27 compounds. However, promising activity was exhibited by 2 compounds (S-015-225, 226).

2.1.1.2 Ammonium salts of carbamodithioic acid as potent vaginal trichomonacides and fungicides

Chemical attenuation of the reactive oxygen species (ROS)-sensitive anaerobe *Trichomonas vaginalis*, the most prevalent non-viral sexually transmitted infection, along with two often coexisting opportunistic vaginal infections, *Candida albicans* and *Staphylococcus aureus*, was attempted with novel ammonium salts of carbamodithioic acid through inhibition of free thiols. *In vitro* and *in vivo* efficacies of the designed compounds were evaluated as topical vaginal microbicides. Five compounds showed exceptional activity against drug-resistant and –susceptible strains with negligible toxicity to host (HeLa) cells *in vitro* in comparison with the standard vaginal microbicide nonoxynol-9 (N-9), without disturbing the normal vaginal flora (i.e. Lactobacillus). The compounds significantly inhibited the cytopathic effects of Trichomonas on HeLa cells *in vitro* with efficacies comparable with metronidazole (MTZ); however, their efficacy to rescue host cells from co-infection (protozoaland fungal) was greater than that of MTZ. The compounds inhibited β-haemolysis of red blood cells caused by Trichomonas and were found to be active *in vivo* in the mouse subcutaneous abscess assay. Some compounds rapidly immobilized human sperm. A mechanism involving inhibition of free thiols and consequently the cysteine proteases of *T. vaginalis* by the new compounds has been proposed. Thus, a unique scaffold of antimicrobial agents has been discovered that warrants further investigation for development as contraceptive vaginal microbicides. ***[International Journal of Antimicrobial Agents 47 (2016) 36–47]***

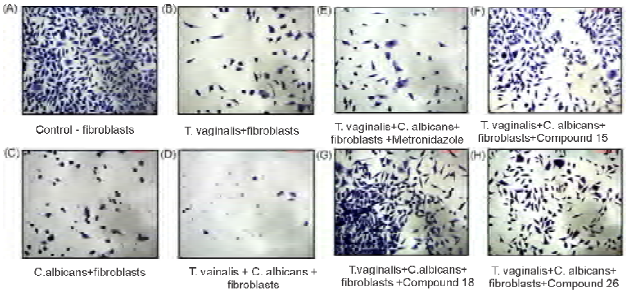


Fig. 1. (A) Control fibroblasts (L929) cells. (B-D) L929 infected with *Trichomonas vaginalis* (B), *Candida albicans* (C) or both (D) for 24 h in the presence of vehicle. (E-H) L929 co-infected with *T. vaginalis* and *C. albicans* and incubated in the presence of 3.12 mg/L metronidazole (E) or compounds 15, 18 and 26 (1.56 mg/L) (F-H, respectively) for 24 h

2.1.1.3 Innovative disulfide esters of Dithiocarbamic acid as women-controlled contraceptive microbicides: A Bioisosterism approach

In an ongoing effort to discover an effective, topical, dual-function, non-surfactant contraceptive vaginal microbicide, a novel series of 2,2'-disulfanediylbis(3-(substituted-1-yl)propane-2,1-diyl) disubstituted-1-carbodithioates were designed by using a bioisosterism approach. Thirty-three compounds were synthesized, and interestingly, most demonstrated multiple activities: they were found to be spermicidal at a minimal effective concentration of 1-0.001 %, trichomonacidal against drug-susceptible and resistant Trichomonas strains at minimal inhibitory concentration (MIC) ranges of 10.81-377.64 and 10.81-754.14 μM, respectively, and fungicidal at MIC 7.93-86.50 μM. These compounds were also found to be non-cytotoxic to human cervical (HeLa) epithelial cells and vaginal microflora (Lactobacilli) *in vitro*. The most promising compound, 2,2'-disulfanediylbis(3-(pyrrolidin-1-yl)propane-2,1-diyl)dipyrrolidine-1-carbodithioate, exhibited strong spermicidal activity in comparison to the marketed

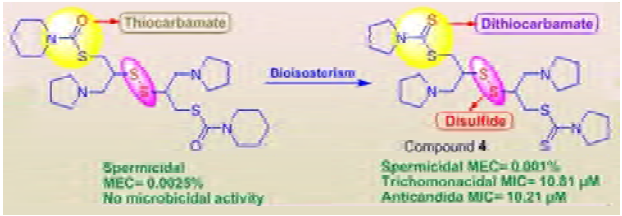
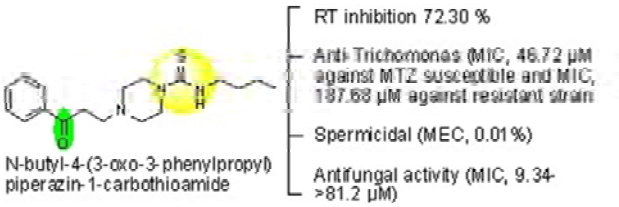


Fig. 2. Bioisosterism : Rational approach for targeting sulfhydryl groups

spermicide Nonoxynol-9 (N-9) and also demonstrated microbicidal potency. To identify common structural features required for spermicidal activity, a 3D-QSAR analysis was carried out, as well as *in vivo* efficacy studies and fluorescent labeling studies to determine the biological targets of compound ***[ChemMedChem 2015;10(10):1739-53]***

2.1.1.4 N-Alkyl/aryl-4-(3-substituted-3-henylpropyl) piperazine-1-carbothioamide as dual-action vaginal microbicides with reverse transcriptase inhibition

The growing population and health-care burden (due to STIs and HIV) imposes a particular economic crisis over resource-scarce countries. Thus a novel approach as vaginal microbicides emerges as integrated tool to control both population and anti-STIs/HIV. Our continued efforts in this field led to the synthesis of fifteen N-alkyl/aryl-4-(3-substituted-3-phenylpropyl)



piperazine-1-carbothioamide (12-26) derivatives as topical vaginal microbicides which were evaluated for anti-Trichomonas, spermicidal, antifungal and reverse transcriptase (RT) inhibitory activities. All compounds were also tested for preliminary safety through cytotoxicity assays against human cervical cell line (HeLa) and the vaginal flora, Lactobacillus. Docking studies were performed to gain an insight into the binding mode and interactions of the most promising compound 12 [oxo derivative], comprising of reverse transcriptase (RT) inhibitory (72.30%), spermicidal (MEC 0.01%), anti-Trichomonas (MIC 46.72 µM) and antifungal (MIC 9.34-74.8 µM) activities, along with its hydroxyl (17) and O-alkylated 4-trifluoromethylphenoxy (22) derivative, with similar activities. The stability of compound 12 in simulated vaginal fluid (SVF) and its preliminary *in vivo* pharmacokinetics performed in female NZ-rabbits signifies its clinical safety in comparison to marketed spermicide Nonoxynol-9. ***[Eur J Med Chem 2015, 28;101:640-50]***

2.1.1.5 Differential genes expression between fertile and infertile spermatozoa revealed by transcriptome analysis

It was believed earlier that spermatozoa have no traces of RNA because of loss of most of the cytoplasm. Recent studies have revealed the presence of about 3000 different kinds of mRNAs in ejaculated spermatozoa. However, the correlation of transcriptome profile with infertility remains obscure. Total RNA from sperm (after exclusion of somatic cells) of 60 men consisting of individuals with known fertility (n=20), idiopathic infertility (normozoospermic patients, n=20), and asthenozoospermia (n=20) was isolated. Comparison between all three groups revealed that two thousand and eighty one transcripts were differentially expressed. Analysis of these transcripts showed that some transcripts [ribosomal proteins (*RPS25*, *RPS11*, *RPS13*, *RPL30*, *RPL34*, *RPL27*, *RPS5*), *HINT1*, *HSP90AB1*, *SRSF9*, *EIF4G2*, *ILF2*] were up-regulated in the normozoospermic group, but down-regulated in the asthenozoospermic group in comparison to the control group. Some transcripts were specific to the normozoospermic group (up-regulated: *CAPNS1*, *FAM153C*, *ARF1*, *CFL1*, *RPL19*, *USP22*; down-regulated: *ZNF90*, *SMNDC1*, *c14orf126*, *HNRNPK*), while some were specific to the asthenozoospermic group (up-regulated: *RPL24*, *HNRNPM*, *RPL4*, *PRPF8*, *HTN3*, *RPL11*, *RPL28*, *RPS16*, *SLC25A3*, *C2orf24*, *RHOA*, *GDI2*, *NONO*, *PARK7*; down-regulated: *HNRNPC*, *SMARCAD1*, *RPS24*, *RPS24*, *RPS27A*, *KIFAP3*). A number of differentially expressed transcripts in spermatozoa were related to reproduction (n = 58) and development (n= 210). Some of these transcripts were related to heat shock proteins (*DNAJB4*, *DNAJB14*), testis specific genes (*TCP11*, *TESK1*, *TSPYL1*, *ADAD1*), and Y-chromosome genes (*DAZ1*, *TSPYL1*). Thus a complex RNA

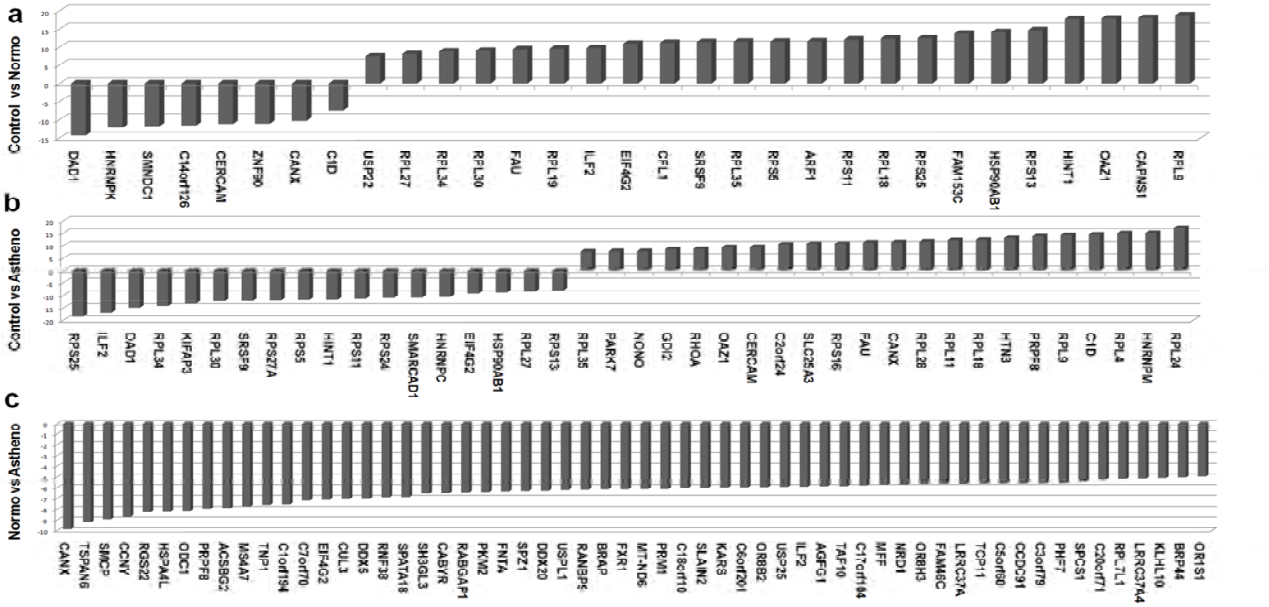


Fig. 4. Two group comparison (feature set = 100) and up- and down- regulated genes. Bar graph shows up- and down-regulated genes when the three groups were compared with each other.

population in spermatozoa consisted of coding and non-coding RNAs. A number of transcripts that participate in a host of cellular processes, including reproduction and development were differentially expressed between fertile and infertile individuals. Differences between comparison groups suggest that sperm RNA has strong potential of acting as markers for fertility evaluation. ***[PLoS One 2015; 10(5):e0127007]***

2.1.1.6 Regulation of cyclooxygenase-2 expression in rat oviductal epithelial cells: Evidence for involvement of GPR30/Src kinase- mediated EGFR signaling

The oviduct plays a crucial role in female reproduction by regulating gamete transport, providing a specific microenvironment for fertilization and early embryonic development. Cyclooxygenase (COX)-derived prostaglandins play essential role in carrying out these oviduct-specific functions. Estrogen upregulates COX-2 expression in rat oviduct; however, the mechanisms responsible for regulation of COX-2 expression in rat oviductal epithelial cells (OECs) remain unclear. In the present study, proposed that estrogen induces COX-2 expression via G-protein coupled receptor i.e., GPR30 in OECs. To investigate this hypothesis, examined the effects of E2-BSA, ICI 182,780, GPR30 agonist and GPR30 antagonist on COX-2 expression and explored potential signaling pathway leading to COX-2 expression. Co-localization experiments revealed GPR30 to be primarily located in the peri-nuclear space, which was also the site of E2-BSA-fluorescein isothiocyanate (E2-BSA-FITC) binding. The E2-BSA induced-COX-2 and prostaglandin release were subjected to regulation by both EGFR and PI3K signaling as inhibitors of c-Src kinase (PP2), EGFR (EGFR inhibitor) and PI-3 kinase (LY294002) attenuated E2-BSA mediated effect. These results suggest that EGFR transactivation leading to activation of PI-3K/Akt pathway participates in COX-2 expression in rat OECs. Interestingly, E2-BSA induced COX-2 expression and subsequent prostaglandin release were abolished by NF-κB inhibitor. In addition, E2-BSA induced the nuclear translocation of p65-NF-κB and up-regulated the NF-κB promoter activity in rat OECs. Taken together, results demonstrated that E2-BSA induced the COX-2 expression and consequent PGE2 and PGF2α release in rat OECs. These effects are mediated through GPR30-derived EGFR transactivation and PI-3K/Akt cascade leading to NF-κB activation. ***[J Steroid Biochem Mol Biol.154:130-41, 2015]***

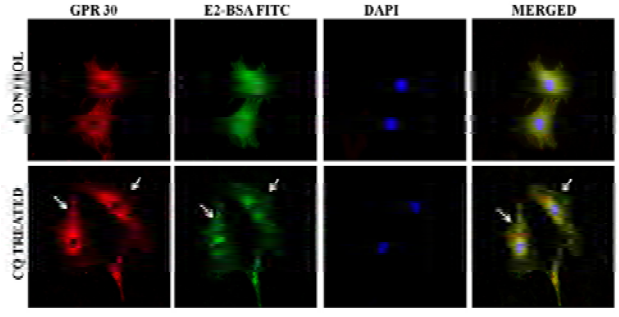


Fig. 5. Co-localization and accumulation of GPR30 receptors and E_2-BSA FITC at plasma membrane in the presence of chloroquine (CQ), inhibitor of clathrin-dependent endocytosis in OECs(white arrow). Cells, pre-treated with 200 μM CQ at 37°C for 1 h, were stimulated with E_2-BSA FITC for 15 min at 37°C and analyzed for immunofluorescence imaging

2.1.1.7 Integrin beta 8 (ITGB8) regulates embryo implantation potentially via controlling the activity of TGF-B1 in mice

Integrins (ITGs) are mediators of cell-cell and cell-matrix interactions, which are also associated with embryo implantation processes by controlling the interaction of blastocyst with endometrium. During early pregnancy, ITGbeta8 (ITGB8) has been shown to interact with latent transforming growth factor (TGF) beta 1 (TGFB1) at the fetomaternal interface. However, the precise role of ITGB8 in the uterus and its association with embryo implantation has not been elucidated. Therefore, attempted to ascertain the role of ITGB8 during the window of embryo implantation process by inhibiting its function or protein expression. Uterine plasma membrane-anchored ITGB8 was augmented at peri-implantation and postimplantation stages. A similar pattern of mRNA expression was also found during the embryo implantation period. An immunolocalization study revealed the presence of ITGB8 on luminal epithelial cells along with mild expression on the stromal cells throughout the implantation period studied; however, an intense fluorescence was noted only during the peri- and postimplantation stages. Bioneutralization and mRNA silencing of the uterine Itgb8 at preimplantation stage reduced the rate/frequency of embryo implantation and subsequent pregnancy, suggesting its indispensable role during the embryo implantation period. ITGB8 can also regulate the liberation of active TGFB1 from its latent complex, which, in turn, acts on SMAD2/3 phosphorylation (activation) in the uterus during embryo implantation. This indicates involvement of ITGB8 in the embryo implantation process through regulation of activation of TGFB1. ***[BiolReprod 2015;92(4):109]***

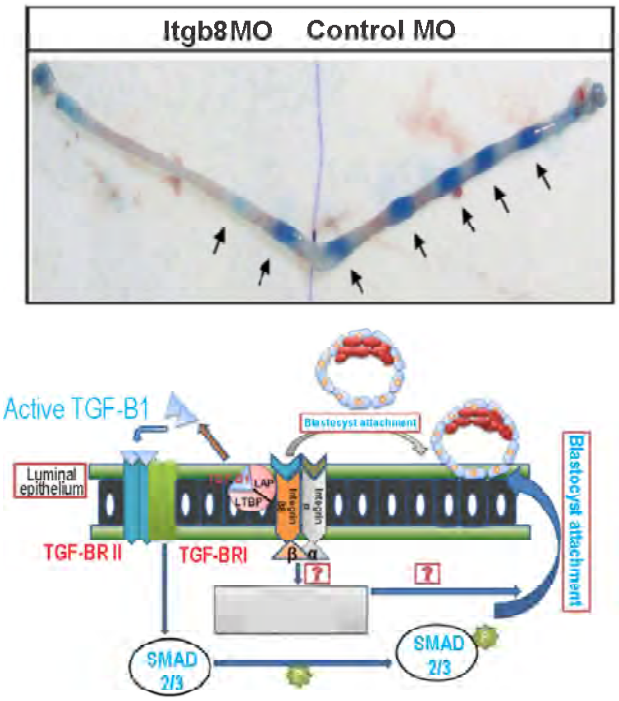


Fig. 6. Effect of integrin beta8 knockdown in the implantation sites of embryo and schematic presentation of possible signaling of integrin beta8 in the uterus during window of embryo implantation.

2.1.2 Osteoporosis and other Related Endocrine Disorders

2.1.2.1 Primary screening of CDRI compounds for anti-osteoporotic activity

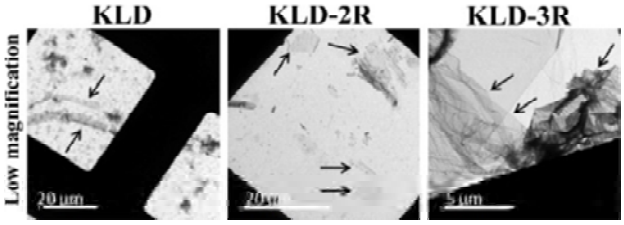
During the period under report a total of 129 synthetic compounds were screened for anti-osteoporotic activity using the ALP activity assay in mouse osteoblast cells, *in vitro*. Eight compounds (S-013-0107, S-014-1571, 1580, 1584, S-015-677, 695, 774, 972) were found active. Compounds S013-107 and S015-972 were also active *in vivo*.

2.1.2.2 Neoflavonoid dalbergiphenol from heartwood of *Dalbergia sissoo* acts as bone savior in an estrogen withdrawal model for osteoporosis.

Dalbergiphenol (DGP) is a neoflavonoid isolated from heartwood of *Dalbergia sissoo*. The objective of the present study was to investigate the biological effects of DGP on bone loss in ovariectomized mice. In this investigation, OVX resulted in a marked increase in body weight and a decrease in femoral and vertebral trabecular bone volume that were prevented by DGP or E2 treatment. DGP treatment increased bone biomechanical strength and new bone formation rate in ovariectomized mice, comparable with E2 treatment. However, increase in uterine weight and estrogenicity were observed in E2-treated ovariectomized mice, but not in response to DGP treatment. Treatment with DGP increased messenger RNA expression of runt-related transcription factor 2, osterix, and collagen type I, and decreased messenger RNA expression of tartrate-resistant acid phosphatase and the osteoprotegerin-to-receptor activator of nuclear factor-κB ligand ratio in the femur of ovariectomized mice. Overall findings suggest that DGP treatment can effectively prevent OVX-induced increase in bone loss and decrease in bone strength possibly by increasing osteoblastic activities and by decreasing osteoclastic activities. ***[Menopause 2015; 22(11):1246-55]***

2.1.2.3 Variants of self-assembling peptide, KLD-12 that show both rapid fracture healing and antimicrobial properties

KLD-12 (KLD) is a 12-residue self-assembling peptide that can adopt nano-structure and is known for its tissue-engineering properties. Our objective was to introduce antimicrobial attribute to KLD so that it became capable of preventing secondary infection associated with external application of such tissue engineering materials. Considering the net charge of KLD-12, varying number of cationic arginine residues were added to its N-terminal. KLD variants showed appreciable bactericidal properties without any significant increase in cytotoxicity against tested mammalian cells. Further, these variants adopted b-sheet structure and self-assembled into nano-structures comparable to that of KLD. Interestingly, the KLD variants with two (KLD-2R) and three (KLD-3R) arginine residues added to its N-terminus showed significant osteogenic effect which was comparable or better than the original peptide as evident from the assay of alkaline phosphatase activity, mineralized nodule formation and expression of different osteogenic genes. Particularly, application of KLD-2R in rats to the site of a drill-hole (0.8 mm diameter) that was created in the femur metaphysis displayed significantly higher bone regeneration compared with KLD.The results demonstrate a simple way to improve biological property of a self-assembling peptide with tissue engineering property.***[Biomaterials. 2015; 56:92-103]***



2.1.2.4 Pathophysiological mechanism of bone loss in type 2 diabetes involves inverse regulation of osteoblast function by PPARγ coactivator-1α and skeletal muscle atrogenes: adiponectin receptor 1 as a potential target for reversing diabetes-induced osteopenia

Type-2 diabetes is associated with increased fracture risk and delayed facture healing; the underlying mechanism however remains poorly understood. Here a systematic investigation of skeletal pathology in leptin receptor-deficient diabetic mouse in C57/BLKS background (db) was made. Compared with wild-type (wt), db mice displayed reduced peak bone mass and age-related trabecular and cortical bone loss. Poor skeletal outcome in db was contributed by high glucose and non-esterified fatty acid (NEFA)-induced osteoblast apoptosis that was associated with PPARγ coactivator 1-a (PGC-1α) downregulation and upregulation of skeletal muscle atrogenes in osteoblasts. Osteoblast depletion of the atrogene, muscle ring finger protein-1 (MuRF1) protected against gluco- and lipotoxicity-induced apoptosis. Osteoblast-specific PGC-1α upregulation by 6-C-β-d-glucopyranosyl-(2S,3S)-(+)-5,7,3',4'-tetrahydroxydihydroflavonol (GTDF), an adiponectin receptor 1 (AdipoR1) agonist as well as metformin in db mice that lacked AdipoR1 expression in muscle but not bone, restored osteopenia

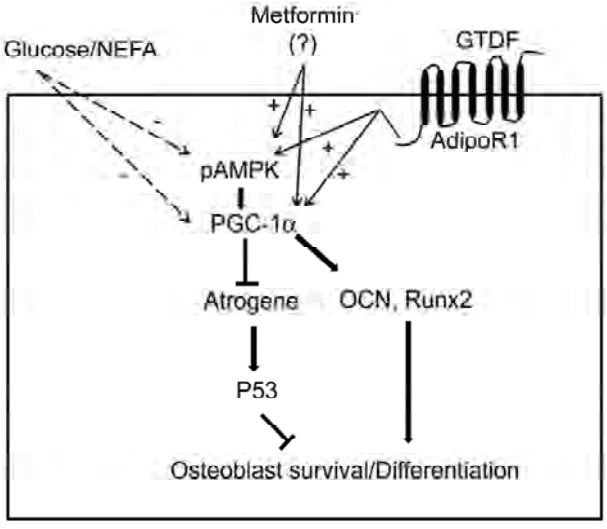


Fig. 8. GTDF selectively binds to its target receptor, AdipoR1, on osteoblast and induces AMPK, a key downstream mediator of the AdipoR1 signaling. Phosphorylation of AMPK augments PGC-1α level. This in turn enhances the expression of osteogenic markers, OCN and Runx2. On the other hand, PGC-1α activation downregulates expression of the atrogene and subsequently p53, a negative regulator of osteoblast differentiation. Thus GTDF promotes osteogenesis by directly enhancing the expression of osteogenic markers (OCN, Runx2) and osteoblast survival. Metformin is known to follow the same pathway but its molecular target is still a topic of debate. Conversely, glucose or NEFA inhibits AMPK phosphorylation and PGC-1α activation, resulting in upregulation of atrogene and p53 levels, which mitigates osteoblasts survival and differentiation with diminished osteogenesis.

to wt levels without improving diabetes. Both GTDF and metformin protected against gluco- and lipotoxicity-induced osteoblast apoptosis and depletion of PGC-1α abolished this protection. While AdipoR1 but not AdipoR2 -depletion abolished protection by GTDF, metformin action was not blocked by AdipoR-depletion. It is concluded that PGC-1α upregulation in osteoblasts could reverse type 2 diabetes-associated deterioration in skeletal health. ***[Diabetes. 2015;64(7):2609-23]***

2.1.2.5 E3 ubiquitin ligase Fbw7 negatively regulates osteoblast differentiation by targeting Runx2 for degradation

Runx2, a master regulator of osteoblast differentiation, is tightly regulated at both transcriptional and post-translational levels. Post-translational modifications such as phosphorylation and ubiquitination have differential effects on Runx2 functions. Here, it is showed that the reduced expression and functions of Runx2 upon its phosphorylation by GSK3β are mediated by its ubiquitin-mediated degradation through E3 ubiquitin ligase Fbw7α. Fbw7α through its WD domain interacts with Runx2 both in a heterologous (HEK293T cells) system as well as in osteoblasts. GSK3β was also present in the same complex as determined by co-immunoprecipitation. Furthermore, overexpression of either Fbw7α or GSK3β was sufficient to down-regulate endogenous Runx2 expression and function; however, both failed to inhibit endogenous Runx2 when either of them was depleted in osteoblasts. Fbw7α-mediated inhibition of Runx2 expression also led to reduced Runx2 transactivation and osteoblast differentiation. In contrast, inhibition of Fbw7α restored Runx2 levels and promoted osteoblast differentiation. We also observed reciprocal expression levels of Runx2 and Fbw7α in models of bone loss such as lactating (physiological bone loss condition) and ovariectomized (induction of surgical menopause) animals that show reduced Runx2 and enhanced Fbw7α, whereas this was reversed in the estrogen-treated ovariectomized animals. In addition, methylprednisolone (a synthetic glucocorticoid) treatment to neonatal rats showed a temporal decrease in Runx2 with a reciprocal increase in Fbw7 in their calvarium. Taken together, these data demonstrate that Fbw7α negatively regulates osteogenesis by targeting Runx2 for ubiquitin-mediated degradation in a GSK3β-dependent manner and thus provides a plausible explanation for GSK3β-mediated bone loss as described before. ***[J Biol Chem. 2015 Dec 25;290(52):30975-87]***

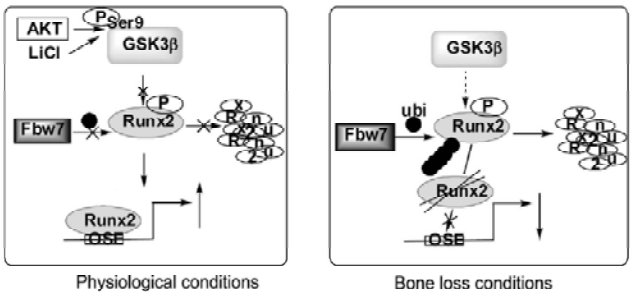


Fig. 9. Reciprocal relationship between Runx2 and Fbw7 *in vivo*. Fbw7 negatively regulates osteogenesis by targeting Runx2 for ubiquitin-mediated degradation in a GSK3b-dependent manner. Under physiological condition, Runx2 degradation by Fbw7 in osteoblasts is restrained due to limited expression of Fbw7, however, under the condition of bone loss such as estrogen deficiency and lactation, higher levels of Fbw7 lead to increased Runx2 degradation.

2.1.2.6 Adipose-derived mesenchymal stem cells prevent systemic bone loss in collagen-induced arthritis.

In this study, the effect of adipose-derived Mesenchymal stem cells (MSCs) on *in vitro* formation of bone-resorbing osteoclasts and pathological bone loss in the mouse collagen-induced arthritis (CIA) model of Rheumatoid arthritis (RA) was investigated. It was observed that adipose-derived MSCs (ASCs) significantly inhibited receptor activator of NF-κB ligand (RANKL)-induced osteoclastogenesis in both a contact-dependent and -independent manner. Additionally, ASCs inhibited RANKL-induced osteoclastogenesis in the presence of proinflammatory cytokines such as TNF-α, IL-17, and IL-1β. Furthermore, treatment with ASCs at the onset of CIA significantly reduced clinical symptoms and joint pathology. Interestingly, ASCs protected periarticular and systemic bone loss in CIA mice by maintaining trabecular bone structure. Further, observed that treatment with ASCs reduced osteoclast precursors in bone marrow, resulting in decreased osteoclastogenesis. Moreover, ASCs suppressed autoimmune T cell responses and increased the percentages of peripheral regulatory T and B cells. Thus, this study provides strong evidence that ASCs ameliorate inflammation-induced systemic bone loss in CIA mice by reducing osteoclast precursors and promoting immune tolerance. ***[J Immunol. 2015 Dec 1;195(11):5136-48]***

2.1.2.7 Prunetin signals via G protein coupled receptor, GPR30: stimulation of adenylyl cyclase and cAMP-mediated activation of MAPK signaling induces Runx2 expression in osteoblasts to promote bone regeneration

Prunetin is found in red clover and fruit of *Prunus avium* (red cherry). The effect of prunetin on osteoblast function, its mode of action and bone regeneration *in vivo* was investigated. Cultures of primary osteoblasts, osteoblastic cell line and HEK293T cells were used for various *in vitro* studies. Adult female rats received drill-hole injury at the femur diaphysis to assess the bone regenerative effect of prunetin. Prunetin at 10nM significantly increased a) proliferation and differentiation

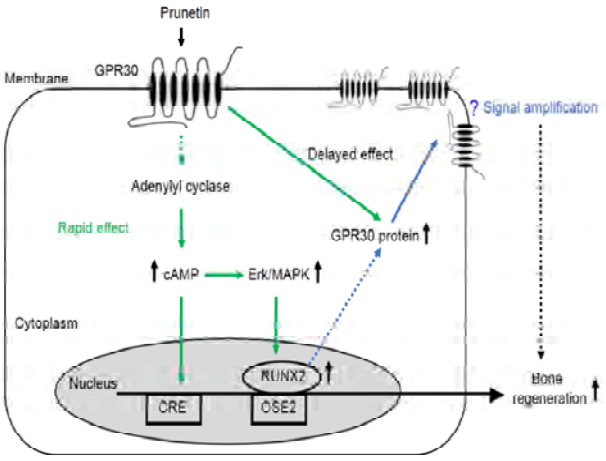
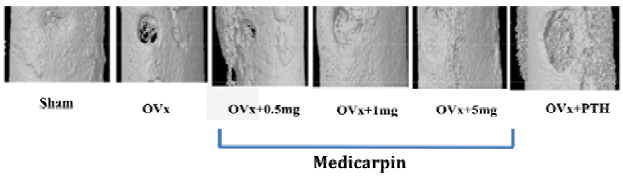


Fig. 10. Schematic diagram outlining the osteoanabolic mechanism of prunetin. Prunetin rapidly stimulates GPR30, a membrane bound ER causing an increased production of cAMP which then transactivates cAMP responsive element (CRE) that is upstream of Runx2 gene resulting in the elevation of Runx2 levels. Further, increased cAMP by prunetin activates Erk/MAPK pathway to upregulate Runx2. Prunetin upregulates GPR30 in osteoblasts rather sluggishly (delayed effect) which could be a downstream event of elevated Runx2 levels. By this mechanism, Prunetin could both activate and upregulate GPR30 and likely amplify its osteogenic impact.

of primary cultures of osteoblasts harvested from rats and b) promoted formation of mineralized nodules by bone marrow stromal/osteoprogenitor cells. At this concentration prunetin did not activate any of the two nuclear estrogen receptors (a and b). However, prunetin triggered signaling via a G protein-coupled receptor, GPR30 and enhanced cAMP levels in osteoblasts. G15, a selective GPR30 antagonist abolished prunetin-induced increases in osteoblast proliferation, differentiation and intracellular cAMP. In osteoblasts, prunetin upregulated runt-related transcription factor 2 (Runx2) protein through cAMP-dependent Erk/MAP kinase activation that ultimately resulted in the upregulation of GPR30. Administration of prunetin at 0.25mg/kg given to rats stimulated bone regeneration at the site of drill-hole and upregulated Runx2 expression in the fractured callus and the effect was comparable to human parathyroid hormone, the only clinically used osteogenic therapy. It was concluded that prunetin promotes osteoinduction *in vivo* and the mechanism is defined by signaling through GPR30 resulting in the upregulation of the key osteogenic gene Runx2 which in turn upregulates GPR30. ***[J Nutr Biochem. 2015; 26(12):1491-501]***

2.1.2.8 Medicarpin, a natural Pterocarpan, heals cortical bone defect by activation of Notch and Wnt canonical signaling pathways

Bone regeneration and healing effect of Medicarpin (med) was evaluated in cortical bone defect model that heals by intramembranous ossification. For the study, female Sprague-Dawley rats were ovariectomized and rendered osteopenic. A drill hole injury was generated in mid femoral bones of all the animals. Med treatment was commenced the day after and continued for 15 days. PTH was taken as a reference standard. Fifteen days post-treatment, animals were sacrificed. Bones were collected for histomorphometry studies at the injury site by micro-computed tomography (μCT) and confocal microscopy.



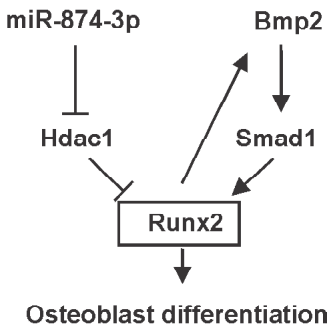
RNA and protein was harvested from newly generated bone. For immunohistochemistry, 5μm sections of decalcified femur bone adjoining the drill hole site were cut. By μCT analysis and calcein labeling of newly generated bone it was found that med promotes bone healing and new bone formation at the injury site and was comparable to PTH in many aspects. Med treatment led to increase in the Runx-2 and osteocalcin signals indicating expansion of osteoprogenitors at the injury site as evaluated by qPCR and immunohistochemical localization. It was observed that med promoted bone regeneration by activating canonical Wnt and notch signaling pathway. This was evident by increased transcript and protein levels of Wnt and notch signaling components in the defect region. Finally, confirmed that med treatment leads to elevated bone healing in pre-osteoblasts by co localization of beta catenin with osteoblast marker alkaline phosphatase. In conclusion, med treatment promotes new bone regeneration and healing at the injury site by activating Wnt/canonical and notch signaling pathways. This study also forms a strong case for evaluation of med in delayed union and non-union fracture cases. ***[PLoS One, 2015, 11;10(12):e0144541].***

2.1.2.9 9-Demethoxy-medicarpin promotes peak bone mass achievement and has bone conserving effect in ovariectomized mice: Positively regulates osteoblast functions and suppresses osteoclastogenesis

In this study a new bone anabolic and anti-catabolic pterocarpan 9-demethoxy-medicarpin (DMM) has been reported for the management of postmenopausal osteoporosis. DMM promoted osteoblast functions via activation of P38MAPK/BMP-2 pathway and suppressed osteoclastogenesis in bone marrow cells (BMCs). In calvarial osteoblasts, DMM blocked nuclear factor kappaB (NFκB) signaling and inhibited the mRNA levels of proinflammatory cytokines. DMM treatment led to increased OPG (osteoprotegrin) and decreased transcript levels of TRAP (tartarate resistant acid phosphatase), RANK (receptor activator of NFκB) and RANKL (RANK ligand) in osteoblast–osteoclast co-cultures. Immature female SD rats administered with DMM exhibited increased bone mineral density, bone biomechanical strength, new bone formation and cortical bone parameters. Ovx mice administered with DMM led to significant restoration of trabecular microarchitecture and had reduced formation of osteoclasts and increased formation of osteoprogenitor cells in BMCs. DMM exhibited no uterine estrogenicity. Overall, these results demonstrate the therapeutic potential of DMM for the management of postmenopausal osteoporosis. ***[Mol Cell Endocrinol. 2015;411:155-66]***

2.1.2.10 MicroRNA-874-3p exerts skeletal anabolic effects epigenetically during weaning by suppressing Hdac1

Embryonic skeletogenesis and post-natal bone development require the transfer of calcium from the mother to the offspring during pregnancy and lactation. Bone resorption in the mother thus becomes elevated during these periods, resulting in significant maternal skeletal loss. There follows an anabolic phase around weaning, during which there is a remarkable recovery of the maternal skeleton. However, the mechanism(s) of this anabolic response remains largely unknown. Eight differentially expressed miRNAs were identified by array profiling, of which miR-874-3p was highly expressed at weaning, a time when bone loss was noted to recover. This weaning-associated miRNA is an anabolic target. Thus, an agomir of miR-874-3p induced osteoblast differentiation and mineralization. These actions were mediated through the inhibition of Hdac1 expression and enhanced Runx2 transcriptional activation. When injected *in vivo*, the agomir significantly increased osteoblastogenesis and mineralization, reversed bone loss due to ovariectomy, and increased bone strength. It was speculated that elevated miR-874-3p expression during weaning enhances bone formation, and that this miRNA may become a potentially exciting therapeutic target for conditions of bone loss. ***[J Biol Chem. 2015 Dec 9. pii: jbc.M115.687152]***



2.1.2.11 Preventive effects of Withaferin A isolated from the leaves of an Indian medicinal plant *Withania somnifera* (L.): Comparisons with 17-β-estradiol and alendronate

Bone protective effects of withaferin A (WFA) from leaves of *Withania somnifera* (L.) were evaluated in preventive model of Balb/c mice with 17 β-estradiol (E2) and alendronate (ALD). WFA administration increased new bone formation, as well as improving microarchitecture and biomechanical strength of the bones. It prevented bone loss by reducing expression of osteoclastic genes tartrate resistant acid phosphatase (TRAP) and receptor activator of nuclear factor κ B (RANK). Increase in bone turnover marker, osteocalcin (OCN) and inflammatory cytokine tumor necrosis factor-alpha (TNF-α) because of ovariectomy were reduced with WFA treatment, with effects comparable to E2 administration. Histomorphometric analysis of uterus shows that WFA was not fraught with estrogenic or antiestrogenic effects. At cellular level, WFA promoted differentiation of bone marrow cells (BMCs) and increased mineralization by inducing expression of osteogenic genes. WFA has bone protective potential as its treatment prevents bone loss that is comparable to ALD and E2. It is surmised that WFA in preclinical setting is effective in preserving bone loss by both inhibition of resorption and stimulation of new bone formation before onset of osteoporosis with no uterine hyperplasia. ***[Nutrition. 2015;31(1):205-13].***

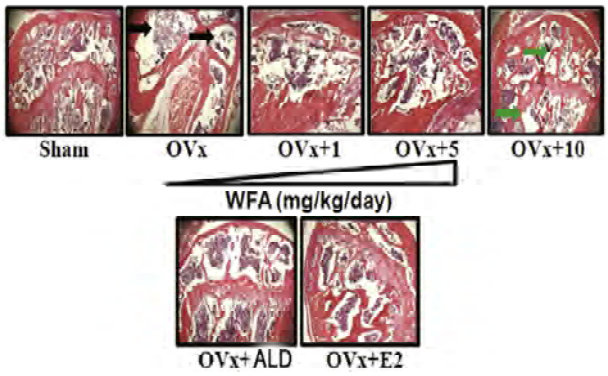


Fig. 11. Photomicrographs of femur epiphysis trabecular structure at 10X. values are expressed as Mean ±SD; n = 10 mice/group. *P<0.05 and **P<0.01 and compared with the OVx+vehicle group.

2.2 Diabetes and energy metabolism

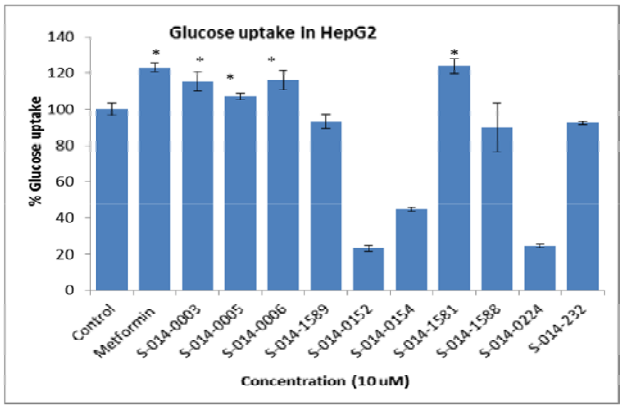
2.2.1 Phenotype-based screening of anti-diabetic compounds

2.2.1.1 Skeletal muscle Glucose uptake

A total of 90 compounds were received for *in vitro* evaluation of antidiabetic activity through glucose uptake stimulatory effect in L6 skeletal muscle cell lines and enzyme inhibition assay. Few of them showed significant stimulation of glucose uptake, but the effect was not comparable to the standard drug. In the preclinical development of active molecules, compound S-007-1261 was re-evaluated for its antihyperglycemic efficacy in validated animal models. Under *in-vitro* cell-based systems the compound was found to stimulate glucose uptake and GLUT4 translocation in skeletal muscle cells, inhibited the glucose release from the liver cells and enhanced the lipolysis in adipocytes. Moreover, the compound was found to be a selective activator of bile acid receptor TGR5. Further validation of compound S-007-1261 to develop as a lead molecule is under progress.

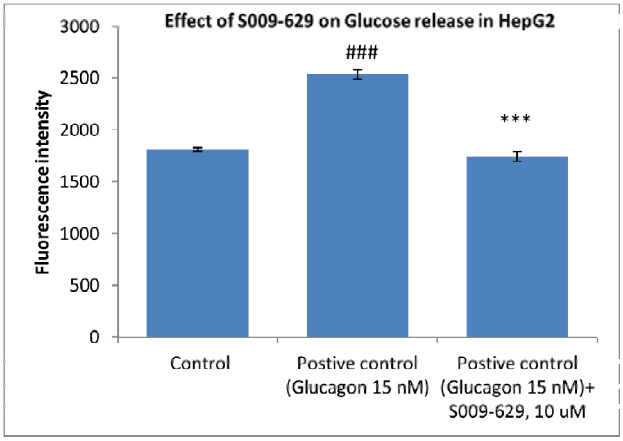
2.2.1.2 Hepatic Glucose uptake

Glucose uptake: Compounds at 10 µM are tested for their effect on glucose uptake in HepG2 (hepatocyte) cells. Cells were incubated overnight with test sample and glucose uptake was assessed for 5 min in HEPES-buffered saline containing 10 µM 2-DG (0.5 µCi/ml 2-[^{3}H] DG) at room temperature. Rate of glucose uptake was determined by measuring the amount of radioactivity incorporated inside the cell, Glucose uptake was normalized to total protein and activity is expressed as percent stimulation with respect to control cells. Positive control was metformin (100µM) and negative control was vehicle. The selected compounds were assessed for glucose release as well.



2.2.1.3 Hepatic Glucose release

Glucose release: Compounds at 10µM are tested for their effect on glucose release in HepG2 (hepatocyte) cells. Cells are incubated 24h with test sample and glucose release is assessed for 4 h in glucose production media. Media was collected, concentrated and glucose was measured using amplex red fluorescence method. Glucose release was normalized to total protein and activity is expressed as percent inhibition with respect to control.



2.2.2 Target-based screening of anti-diabetic compounds

2.2.2.1 Pancreastatin inhibitors against Diabetes

Eight pancreastatin (PST) inhibitory peptides and two *retro-inverso* peptides were designed and synthesized which have showed anti-PST activity and promoting insulin function in

HepG2, 3T3L1, L6 cells. Further *in vivo* works are going on in different animal models.

2.2.2.2 Screening for small molecule GLP-1R agonists:

A total of 44 compounds were screened for their GLP-1R agonistic activity in HEK-293 cells transfected with GLP-1R or pcDNA3 vector only, where a cyclic-AMP driven luciferase reporter (CRE-Luc) was used to estimate the activation of GLP-1R by test compounds. One compound showed promising activity in the assay and was evaluated for detailed efficacy on GLP-1R and glucagon receptor (GCGR).

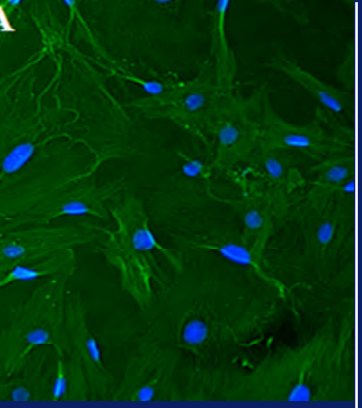
2.2.3 Pharmacokinetics of anti-diabetic compound S012-1965

LC-MS/MS method (LLOQ, 0.1 ng/mL; linearity, 1-200 ng/mL and recovery, >95%) for quantitative estimation of S012-1965 was developed for the following *in vitro* and *in vivo* pharmacokinetic studies. It was found stable in simulated gastric and intestinal fluids. Following its 1 mg/kg intravenous administration, the rats showed low systemic availability (1162 ng h/mL), high clearance (6.3±1.2 L/h/kg) and large volume of distribution (10.1±2.8 L/kg). It was quickly absorbed, distributed and slowly eliminated after 100 mg/kg per oral dose in rats. However, the compound exhibited poor oral bioavailability (2.1%).

2.2.4 Basic research

2.2.4.1 NOD2 activation induces oxidative stress contributing to mitochondrial dysfunction and insulin resistance in skeletal muscle cells

Nucleotide binding oligomarization domain protein-2 (NOD2) activation in skeletal muscle cells has been associated with insulin resistance, but the underlying mechanisms are not yet clear. We demonstrate the implication of oxidative stress in the development of mitochondrial dysfunction and insulin resistance in response to NOD2 activation in skeletal muscle cells. Treatment with the selective NOD2 ligand, muramyl dipeptide (MDP) increased mitochondrial reactive oxygen species (ROS) generation in L6 myotubes. MDP-induced ROS production was associated with increased levels of protein carbonyls, and reduction in citrate synthase activity, cellular ATP level and mitochondrial membrane potential, as well as altered expression of genes involved in mitochondrial function and metabolism. Antioxidant treatment attenuated MDP-induced ROS production and restored mitochondrial functions. In addition, the presence of antioxidant prevented NOD2-mediated activation of MAPK kinases and the inflammatory response. This was associated with reduced serine phosphorylation of insulin receptor substrate-1(IRS-1) and improved insulin-stimulated tyrosine phosphorylation of IRS-1 and downstream activation of Akt phosphorylation. These data indicate that oxidative stress plays a role in NOD2 activation-induced inflammatory response, and that MDP-induced oxidative stress correlates with impairment of mitochondrial functions, and induction of insulin resistance in skeletal muscle cells. ***[Free Radical Biology & Medicine 2015; 89: 158-169]***



TUBERCULOSIS & MICROBIAL INFECTIONS

Area Coordinators: Dr. K.K. Srivastava, Dr. B.N. Singh, Dr. Gautam Panda

Aims and objectives of the research area Microbial Infections focus on Mycobacterial, Fungal and Viral infections. Using different screening formats *viz*. *in vitro*, *ex vivo*, *in vivo* and BACTEC, natural products and synthetic compounds are screened for antitubercular, antifungal, antibacterial and antiviral activities and work towards the identification and validation of novel drug targets, developing rationale based screen system, resolving the structure of candidate mycobacterial proteins, analysing host-pathogen kinase interaction and sigma factors regulon to understand the molecular mechanisms of mycobacterial pathogenesis.

3

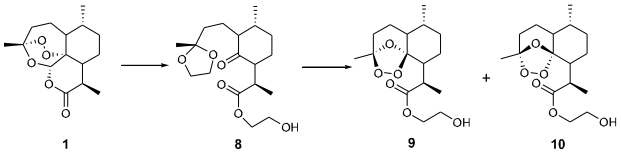
3.1 Screening and Discovery

3.1.1 Anti-mycobacterial Screening

A total of 847 compounds were screened for anti-mycobacterial activity by different screening systems. Out of these, 75 compounds were found to be active in *in vitro* against H37Ra. Fifty nine of the compounds were active at 50 µM, nine were active at 25 µM and the rest were active at 12.5 µM or less. For identification of new chemical entities the different strategies were also opted:

3.1.1.1 Stable tricyclic antitubercular ozonides derived from Artemisinin

New, highly stable tricyclic antitubercular ozonides **9** and **10** derived from Artemisinin are reported in 39% and 9% yields, respectively. The ozonide groups of **9** and **10** were found to be stable under the strong basic and acidic conditions. The absolute configuration of ozonides **9** was confirmed by X-ray crystallography. Ozonides **9** show promising antitubercular activity against *M. tuberculosis* H_{37}Ra and *M. tuberculosis* H_{37}Rv with the MIC values of 0.39 and 3.12 µg/mL, respectively. ***[Organic Letters, 2015, 17: 4948-4951]***



3.1.1.2 Synthesis and antitubercular activity of conformationally-constrained and bisquinoline analogs of TMC207.

The recent success of the quinoline derivative, TMC207, as an anti-tubercular agent constitutes a major breakthrough in the battle against multi drug-resistant tuberculosis (MDR-TB). To investigate the potential of the structural scaffold of TMC207, a series of TMC207 derivatives were synthesized and evaluated their anti-tubercular activity. Making the lateral chain of the drug rigid by linking it to an adjacent phenyl substituent resulted in a decrease in activity. In contrast, replacing a phenyl substituent of TMC207 with a quinoline moiety gave bisquinolines that demonstrated potent antitubercular activity in *in vitro* experiments on mycobacterial cultures, in *ex vivo* mouse bone marrow macrophage assays, and also in *in vivo* mouse models of the disease. ***[ChemComm, 2015, 6: 1554- 1563]***

3.1.1.3 Antitubercular agents from *Glycyrrhiza glabra*

Bioactivity guided isolation of *Glycyrrhiza glabra* (Leguminosae / Fabaceae) roots resulted in the characterization of 18β-glycyrrhetinic acid as a major anti-tubercular agent. Further, GA-1 was semi-synthetically converted into its nine derivatives, which were *in vitro* evaluated for their anti-tubercular potential against *Mycobacterium tuberculosis* H37Rv. All the derivatives were active, but the benzylamide (GA-8, MIC 12.5µg/ml) and ethyl oxylate (GA-3, MIC 25.0 µg/ml) derivatives were significantly active against the pathogen. This was further supported by the molecular docking studies, which showed adequate docking (LibDock) scores for GA-3 (120.3) and GA-8 (112.6) with respect to the standard anti-tubercular drug, rifampicin (92.94) on the DNA-directed RNA polymerase subunit beta (rpoB) target site. Finally, the *in silico* pharmacokinetic and drug-likeness studies showed that GA-3 and GA- 8 possesses drug-like properties. This is the first ever report on the anti-tubercular potential of GA and its derivatives. ***[Current Topics in Medicinal Chemistry, 2015, 15:990-1002]***

3.1.2 Antibacterial screening

A series of aryl sulfide/diaryldisulfides analogues have been synthesized with potent anti-MRSA activity. Among this series, two compounds demonstrated potent activity against drug-resistant clinical isolates of *S. aureus* including VRSA with MIC 2 mg/L. The selectivity index of these compounds was ranging from 25-30 and found to be non-haemolytic against human RBCs, signifying specificity for bacterial cells. Additionally, these compounds exhibited concentration dependent bactericidal activity with a ~10 log killing at 24 h in comparison to drug free control. Further, to decipher their mechanism of action, resistant mutants with an MIC of 64 mg/L were generated (frequency of ~107) for characterization at the molecular level. At *in vivo* level, these compounds demonstrated promising results by reducing the bacterial burden by ~1 $\log_{10}$ in 24 h which was comparable to vancomycin. Taken together, these compounds represent an exciting new avenue for novel drug development targeting *S. aureus*.

3.1.3 Screening of compounds against non-tububerculous mycobacteria

In this investigation, M. fortuitum strain from murine brain was isolated and screened ~ 2000 compounds from CSIR-IIIM, Jammu against the bacilli and found two hit molecules with MIC 0.19 µM and selective index (SI) >300. In another independent primary screening, 18 compounds (from CSIR-NCL, Pune) were screened and got 5 hit molecules with MIC ranging from 0.5-2µg/

ml. These compounds were tested and found to be non- toxic with a SI value ranging from 12.5-50 µg/ml and exhibited bactericidal nature. None of the compounds showed significant activityagainst *M. abscessus*.

3.1.4 Anti-fungal Screening:

A total of 488 (synthetic 287, marine 190, and plants 11) compounds/extracts were evaluated for *in vitro* antifungal and antibacterial activity by microbroth dilution method using standard protocol (as per CLSI guide lines) initially against 6 human bacteria viz. *1. E. coli* (ATCC 9637), *2. Pseudomonas aerµginosa* (ATCC BAA-427), 3. *Staphyloccus aureus* (ATCC 25923), 4. *Klebsiella pneumoniae* (ATCC 27736), 5. *Staphyllococcus aureus* (ATCC 700699 MRSA), *Staphyllococcus aureus* (ATCC 29213), and six human fungi viz. 1.*Candida albicans* 2.*Cryptococcus neoformans* 3.*Sporothrix schenckii, 4.Trichophyton mentagrophytes, 5.Aspergillusf umigatus* 6.*Candida parapsilosis* (ATCC-22019).

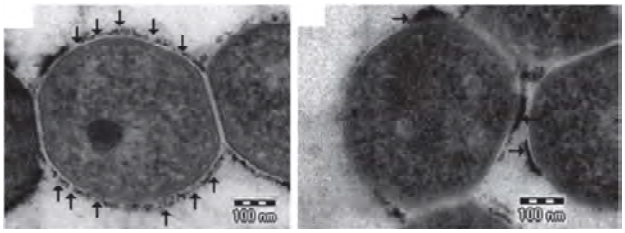
Among the synthetic compounds, 9 exhibited antifungal activity against the tested fungi in the range of 3.12 – 12.5 µg/ml and two compounds were active against the *Staphyllocccus aureus* and its resistant strains (MIC 6.25-12.5 µg/ml). The synthetic peptides P15 WILD, P15 MUT 13, P15 MUT 18, P15 MUT 26, P15 MUT 27 and two more exhibited antibacterial (including the resistant strains of *S. aureus*) activity in the range of 3.12 12.5 µg/ml. Three compounds from marine sources exhibited antifungal activity in the range of 6.25-12.5 µg/ml while two compounds were active against *S. aureus* and its resistant strains (MIC 3.12-6.25 µg/ml).

The *in vitro* screening of CDRI compounds has led to the discovery of a novel series of quaternary ammonium compounds (QACs) with very high potency against fungal and bacterial species. Compounds with 9-11 methyl linkers were found active against all tested fungal strains with MIC_{90} values ranging from 0.5-6.25 µM which is at least 4X less than the cytotoxicity concentration against human cell lines. These compounds were also highly active against Multi Drug Resistant (MDR) strains of *Candida* species and *MRSA* (Methicillin resistant *Staphylococcus aureus*) and Gentamicin resistant strains of bacteria at the same concentrations that kill the susceptible strains. The lead compounds show higher potency towards gram +ve bacteria. The lead compound (S-012-1399) is also able to inhibit various stages of fungal biofilms which conventional antifungal drugs cannot. The mechanism of action of these compounds seems to be membrane polarization (charge reversal) rather than cell lysis. Lead optimization of these compounds may lead to molecules with high therapeutic index and *in vivo* activity.

3.2 Host-pathogen Interactions and New Models

3.2.1 SigF modulates cell wall architecture by affecting GPL distribution and lipid biosynthesis in mycobacteria.

Overexpression of *SigF*in *M. tuberculosis* was reported to alter the regulation of many cell wall-associated proteins, suggesting a role for *SigF* in maintaining cell wall architecture in mycobacteria. To examine the effect of *SigF* deletion on the cell wall architecture in *M. smegmatis*, transmission electron microscopy was performed using *M. smegmatis* WT and Δ*sigF* mutant cells. Micrographs showed uniform distribution of GPLs on the surface of WT cells, while Δ*sigF* mutant cells displayed patchy GPLs distribution (**Fig.** 1).



A B

Fig. 1. Transmission electron micrographs showing structure of cell envelope of *M. smegmatis* wild type (A) and Δ*sigF* mutant (B) strains. Note the even distribution of GPLs around wild type cells while distribution of GPLs is patchy in mutant cells

Next, the total GPLs in wild type and Δ*sigF* mutant was analysed by TLC and mass analysis, but no difference was found in GPLs profile of Δ*sigF* mutant, suggesting that the uneven distribution of GPLs in the Δ*sigF* mutant cells is not due to difference in overall content and type of GPLs (Fig. 2). TLC analysis of polar lipids also did not reveal any differences, but nonpolar lipids showed distinct TLC profiles. Lipids spots present in wild type cells (Fig. 2A and C) were conspicuously missing in Δ*sigF* mutant cells (Fig. 2B and D). Also noticed distinct differences in trehalose containing lipids (Fig. 2E and F), an important component for cell wall integrity, indicating that the *SigF* alters the cell wall lipid composition by modulating the lipid biosynthesis pathway ***[MicrobiologyOpen, 2015].***

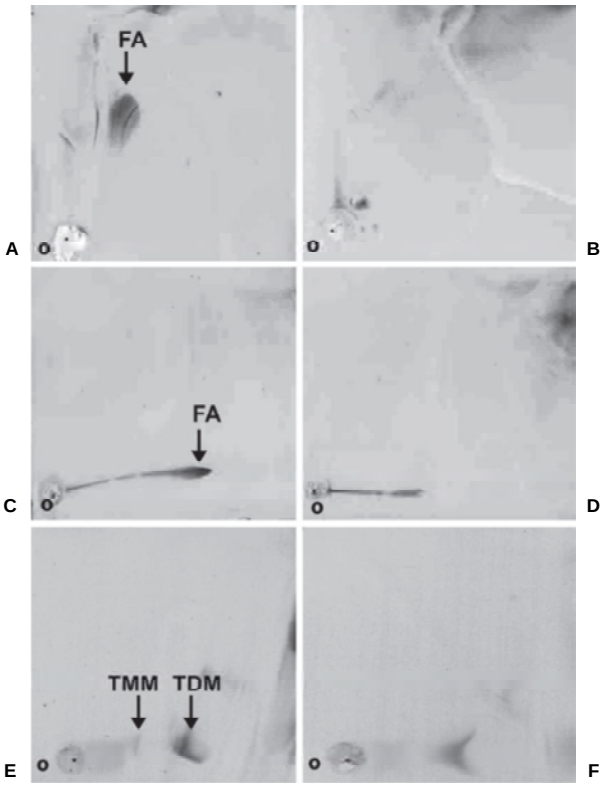


Fig. 2. 2D TLC analysis of nonpolar lipids from *M. smegmatis* wild type (A, C, E) and ΔsigF mutant (B, D, F). Different solvent systems, described in methods, were used to develop TLC plates: A and B developed with solvent system B, C, and D developed with solvent system C, E, and F developed with solvent system D. The arrows indicate the missing fatty acids (FA) in ΔsigF mutant (B and D) and TMM (Trehalose monomycolate), TDM (Trehalose dimycolate) in panel F

3.2.2 Studies on the role of lung fibroblasts in tuberculosis

The role of primary mouse lung fibroblasts on *M. tuberculosis* (*Mtb*) -infected mouse bone marrow macrophages and the effect of infection on fibroblast properties were studied. It was observed that with fibroblasts in the vicinity, infected naive macrophages restricted the bacterial growth, while activated macrophages turned more bactericidal with concomitant increase in nitrite production. Neutralizing IL-1α in fibroblast supernatant reduced the nitrite production by infected macrophages. Secretion of IL-6 and MCP-1 was down- regulated, while TNF-α was up-regulated in infected naive macrophages. In infected activated macrophages, the secretion of IL-6 was up-regulated, while that of MCP-1 and TNF-α was unaffected. The 'fibroblast effects' were enhanced when the fibroblasts too were infected. *Mtb* induced IL-1 secretion and pro-fibrotic responses by fibroblasts. *Mtb*-induced myofibroblast conversion was blocked by rapamycin suggesting the involvement of signaling via mTOR. ***[Tuberculosis (Edinb). 2015, doi: 10.1016/j.tube.2015.10.009]***

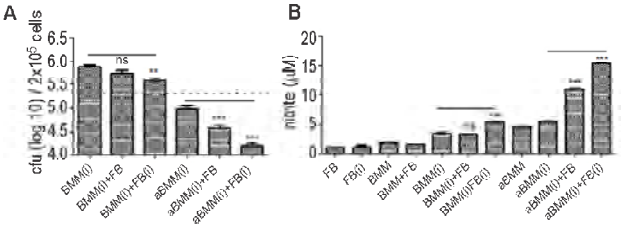


Fig. 3. (A) Intracellular CFUs after 48 h in *Mtb*-infected naive oR IFN-y activated mouse bone marrow macrophages, cultured along or in in-direct co-culture with un-infected or infected primary mouse lungs fibroblasts (FB). Dotted lined indicates teh time zero CFUs. (B) Nitrite in culture supernatants after 48h. The values for co-cultures are normalised for the FB contribution

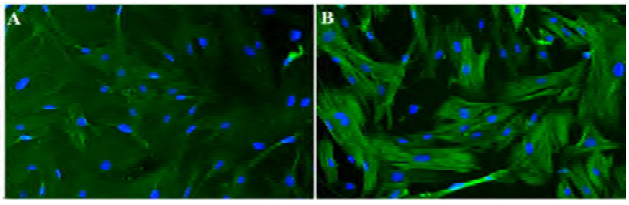


Fig. 4. *Mtb* stimulates mouse lung fibroblasts to proliferate and differentiate into myofibroblasts (A) un-infected and (B) *Mtb*-infected mouse fung fibroblasts immunostained for a-smooth muscle actin.

3.2.3 Development of Murine brain infection model of *Mycobacterium fortuitum*

Mycobacterium fortuitum (Mf) is a member of non-tububerculous mycobacteria (NTMs). Historically, Mf infected mice were shown to demonstrate "spinning disease", the symptoms of which include twitching and shaking of head, tilting motion and spinning movement. To find the underlying mechanism behind these phenomena, a model for brain infection caused by Mf in mice was established. Infected mice demonstrate all the neurological abnormality like twitching, tilting motion, spinning movement etc. It was also demonstrated that this infection triggers a series of signaling cascades resulting in down-regulation of Dopamine and Parkin, which are directly implicated in Parkinsonism. Additionally, it was showed that this down-regulation of Parkin triggers an uncontrolled oxidative stress which leads to an increased Endoplasmic Reticulum (ER) stress in the infected brain, thus triggering apoptotic cascade, finally leading to neuronal death. Taken together, for the first time it has been demonstrated that (1) *M. fortuitum* is capable of readily crossing BBB and establishes infection in murine brain in contrast to slow growing mycobacteria. (2) Mf is capable of infecting neuronal and glial cells *in vitro*. (3) Amongst the probable causes of "spinning disease" caused by Mf infection, is down-regulation of Dopamine and Parkin, increased ER and oxidative stress leading to apoptosis and neuronal death.

3.3 Target Identification

3.3.1 Functional characterization of tyrosine phosphatases from pathogenic and nonpathogenic mycobacteria and identification of inhibitors

M. tuberculosis (Mtb) possesses a wide range of signal transduction systems, including two Protein Tyrosine Phosphatases (PtpA and PtpB). Since functional diversities between PTPases are illustrated by regulatory domains and subunits, the nature of tyrosine phosphatases from slow-grower pathogenic species Mtb and from fast-grower nonpathogenic species *Mycobacterium smegmatis* (MS) were characterized. The findings delineate that the enzymes present in MS have significantly lesser phosphatase activity than PTPases of Mtb as evidenced by low K cat/K m of recombinantly expressed proteins. The K cat/K m for Mtb PtpA was 500-1000-fold higher than MS PTPases. Phenyl cyclopropyl methyl-/phenyl butenyl azoles were designed and synthesized, which inhibit growth of mycobacteria, in culture and in macrophages. The mechanism of efficacy of these compounds against mycobacteria was identified and suggested that the inhibition may possibly be mediated via the targeting of Mtb tyrosine phosphatase. The results further added that these compounds exclusively inhibit PtpA of Mtb ***[Appl Microbiol Biotechnol. 2015 Sep;99(18):7539-48)]***

3.3.2 Study of carbon and nitrogen metabolic pathways of *Mtb* for their suitability as a source of new drug targets.

Mycobacterium tuberculosis H37Ra (*Mtb*-Ra) ORF MRA_1916 is annotated to be a D-amino acid oxidase (DAO); however its physiological significance remains poorly described. Recombinant *Mtb*-Ra with DAO gene knockdown was developed to study its growth on glycerol, glycine, serine and glyoxylate with or without additional supplementation with acetate or glyoxylate (5mM). Enhanced growth retardation was observed in recombinant strain compared to WT while using glycine or serine as a carbon source. Additional supplementation of glyoxylate failed to restore growth. No growth deficiency was observed on glycerol and its combinations. The DAO localization study showed its significant distribution in cytoplasmic fraction compared to cell wall (p=0.0001) and membrane fractions (p=0.0004). The immunoblot and transcript profiling studies suggested that DAO expression was repressed under hypoxic conditions irrespective of the carbon source used ***[Scientific Reports, 5:16131, DOI: 10.1038/srep16131]***. A DAO knockout has been developed and further studies with DAO knockout are under progress.

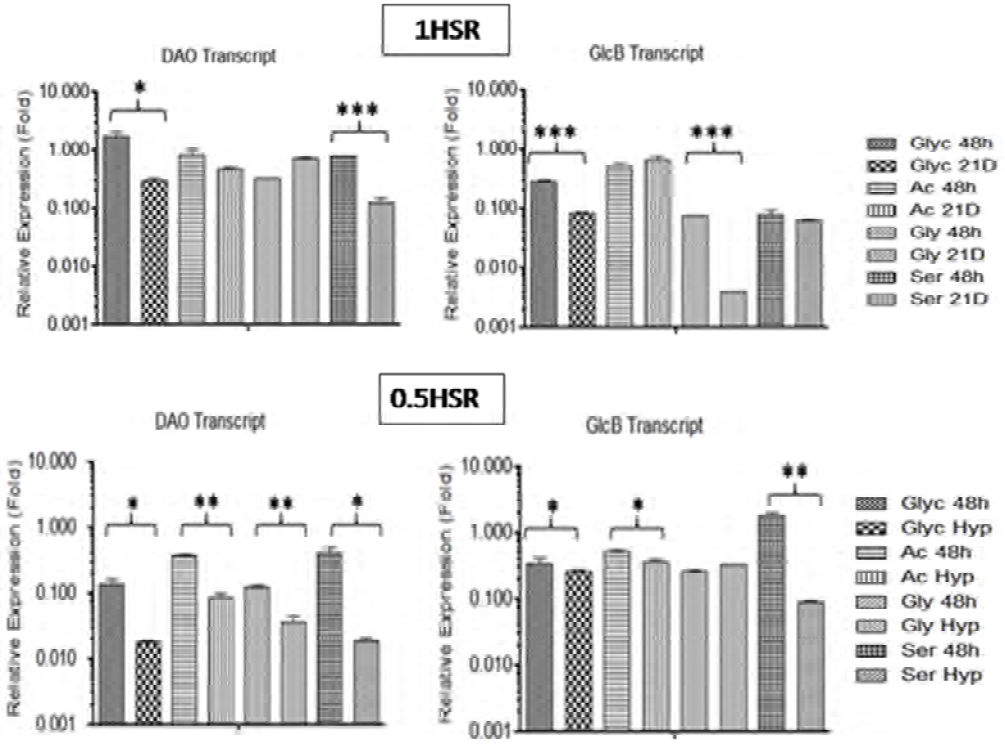


Fig. 5. Expression studies by quantitative real-time PCR: Glyc, Ac, Gly and Ser refer to glycerol, acetate, glycine and serine respectively. Relative transcript profile of DAO and GlcB in 1HSR and 0.5HSR at 48 h and 21st day (1HSR) and after development of hypoxia (0.5HSR). 16S rRNA was used as a reference.

3.3.3 Bacterial Peptidyl-tRNA Hydrolase (Pth)

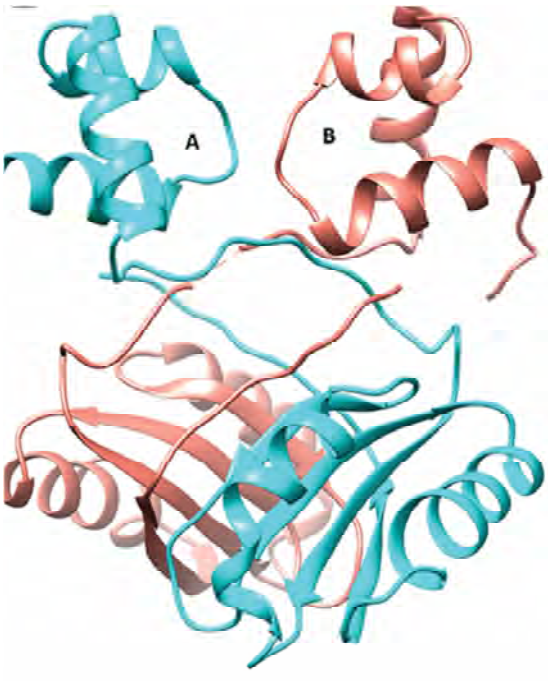
Pth is a potential drug target as it is essential for bacterial survival. In this respect, the structure and dynamics of *Vibrio cholera* peptidyl-tRNA hydrolase (VcPth) and its seven conserved active-site point mutants were characterized using NMR spectroscopy and X-ray crystallography. The dynamic behavior of VcPth and its mutants was characterized using NMR relaxation study as well as by molecular dynamics simulations study. Docking and simulation study of a substrate mimic (trialanyl-adenine) was also performed with VcPth. pH dependent structural variations in wt-VcPth, and thermal denaturation study of wt-VcPth and its mutants was carried out by using NMR spectroscopy and Differential Scanning Colorimetry (DSC). These studies are aimed at understanding the plasticity of the highly conserved substrate binding site to enable design of inhibitors against this anti-microbial drug target enzyme.

3.3.2 Structure Related Functional Studies of Proteins

3.4.1 Crystal structure of *M. tuberculosis* AldR, a Feast/famine protein that regulates the expression of L-Alanine Dehydrogenase

The crystal structure of the regulatory protein has been solved to 2.95 Å and has identified that the N-terminal DNA-binding domains are swapped to form dimers.The asymmetric unit contains 2 such dimers that forms an octamer through crystal symmetry. The C-terminal domain is involved in oligomeric interactions that stabilise the oligomer, and contains the effector-binding sites.

It has been identified that AldR binds to the region upstream to the *ald* gene that codes for L-alanine dehydrogenase and is highly-upregulated in nutrient starved models of tuberculosis. In a virtual screening strategy based on the Mtb AldR crystal structure and the CDRI database, identified small-molecule inhibitors of the Mtb AldR-DNA complex. The latter inhibitors represent the very first ones against the Feast-Famine regulatory



proteins from any source. It sets the stage for exploring Mtb AldR as an anti-TB target.

3.4.2 Identification of novel inhibitors of *Mycobacterium tuberculosis* PknG using pharmacophore based virtual screening, docking, molecular dynamics simulation, and their biological evaluation

The essential role of PknG in the pathogenesis and survival of the tubercle bacillus within host by preventing phagosome-lysosome fusion as well as in developing intrinsic antibiotic resistance makes it an attractive drug target. Therefore, pharmacophore-based virtual screening was carried out and the proposed hits were subjected to *in vitro* experiments. Three out of six tested molecules showed significant inhibitory activity against Mt PknG. In addition, inhibitory studies of mycobacterial growth in infected THP-1 macrophages demonstrated considerable growth inhibition of *M. bovis* BCG induced through compound NRB04248 without any cytotoxic effect against host macrophages, suggesting its suitability for further design and optimization of MtPknG inhibitors ***[J Chem Inf Model. 2015 Jun 22;55 (6):1120-9. doi: 10.1021/acs.jcim.5b00150].***

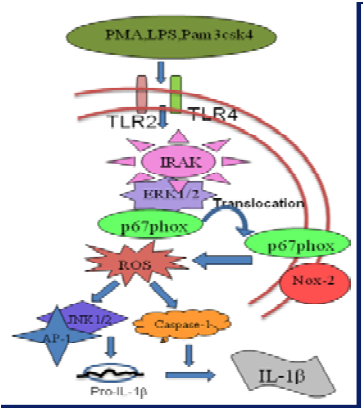
3.4.3 3D-QSAR and molecular modeling studies on 2,3-dideoxy hexenopyranosid-4-uloses as anti-tubercular agents targeting alpha-mannosidase.

Ligand and structure-based methods were applied in combination to exploit the physicochemical properties of 2,3-dideoxy hex-2-enopyranosid-4-uloses for designing novel anti-tubercular agents. Furthermore, 3 selected inhibitors from this class of compounds with known anti-Mtb α-mannisidase activity were used for the molecular interaction analysis to correlate the proposed QSAR guidelines with molecular basis of binding affinity with the homology model on Zn-dependent Mtb α-mannosidase. Synergistic complementation between the results obtained from both the approaches could be helpful in rationalizing and optimizing the anti-tubercular activities and design of new 2,3-dideoxy hex-2-enopyranosid-4-uloses analogs ***[Bioorg Chem. 2015 Apr;59:91-6. doi: 10.1016/j.bioorg.2015.02.001].***

3.5 Immunological Studies and Subunit proteins

3.5.1 The immunological response elicited by four culture filtrate proteins from ESAT-6 family of *Mycobacterium tuberculosis* H37Rv viz. Rv1197, Rv1198, Rv3444c, and Rv3445c, in BALB/c mice, was under investigation. The IgG titers against these proteins in the sera of respective immunized mice have been determined. The lymphocyte proliferative responses and cytokines secretion from the *in vitro* culture of splenocytes of immunized mice, in response to sensitization with Rv1197, Rv1198, Rv3444c and Rv3445c, respectively, have been evaluated and are further being rechecked. In addition, the immuno-dominance of these proteins and MoaC1 has been evaluated by checking the sero-reactivity of TB patient serum against these proteins. These studies are aimed at evaluating the vaccine and diagnostic potential of secreted antigens of *M. tuberculosis* H37Rv ***[BBA General Subjects 2016 (In Press)]***

3.5.2 *Aspergillus fumigatus* an opportunistic fungus and a major causative agent for allergic broncho-pulmonary aspergillosis (ABPA), aspergilloma and invasive aspergillosis (IA) in immune-compromised patient. Cell surface proteins are involved in adhesion and colonization and play an important role as they directly interact with mammalian host cells and therefore may be an important target for new antifungal drug development. In this direction the proteome analysis of cell surface protein of *Aspergillus fumigatus* for the identification of potential therapeutic target molecules has been initiated. The cell surface proteins were isolated using ammonium carbonate buffer and methanol precipitated from 5 days old culture of *A. fumigatus* in Sabouraud' dextrose broth and the proteome was analyzed.



4

CVS, CNS AND RELATED DISORDERS

Area Coordinators: Dr. Manoj Barthwal, Dr. Prem N Yadav, Dr. MS Reddy

The various research and development activities in CVS-CNS and related disorders comprises design, synthesis and development of new drugs from synthetic, plant or marine sources to treat pathologies related to:

- Cardiovascular system (Hypertension, Pulmonary hypertension, Dyslipidemia, Atherosclerosis, Thrombosis and Myocardial Infarction)
- Central nervous system (Depression, Neurodegeneration, Dementia and Stroke)
- Related disorders (Inflammation)

In addition, a cell based assay to determine LDL uptake, 2D echocardiography system to investigate various cardiac parameters in rodents, and neuropathic pain models were standardized during the reporting period. Molecular mechanisms of pathologies and action of the test drugs in the above mentioned disorders were explored to understand the disease process and discover lead molecules for development of drugs.

4.1 Drug discovery and animal models

4.1.1 Biological Screening

A total 1889 compound/extracts were screened during the reporting period. These compounds (synthetic compounds from CDRI - 1503; natural products - 22; marine extracts/ compounds through MOES- 158, and 228 compounds from outside of CSIR-CDRI) were tested for various bio-activities (GPCR profiling, anti-Histaminic activity, anti-inflammatory anti-hypertensive, vasoreactivity, anti-ulcer, antipsychotic/anti-anxiety anti-thrombotic/anti-platelet, neuroprotective). Several primary hits were identified and their characterization is in progress.

4.1.1 CDR267F018 reduces isoproterenol induced cardiac hypertrophy in rats

The present study evaluated the effect of CDR267F018 in cardiac hypertrophy (Fig 1). CDR267F018 treatment significantly reduced the isoproterenol induced left ventricle hypertrophy better than the standard compound propranolol as assessed by 2D echocardiography and gross morphometry of the heart.

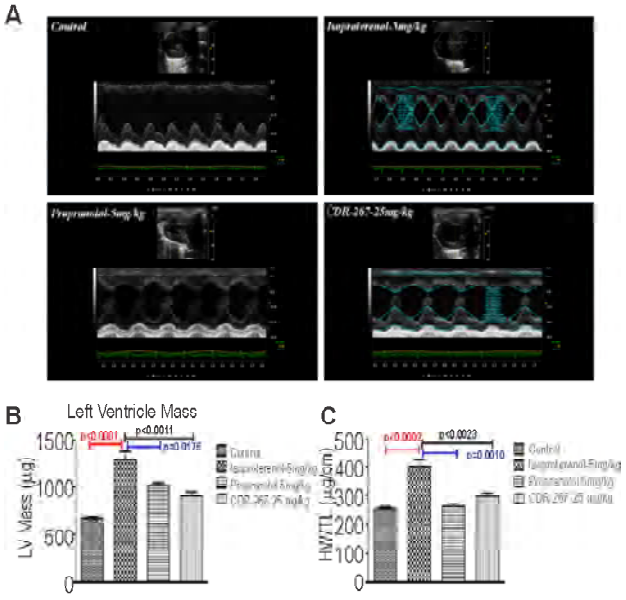


Fig. 1: CDR267-F018 corrects cardiac hypertrophy. 2D Echocardiograhpy showing left ventricle in PSLA mode of different treatments (A). Histogram showing reduced left ventricle mass after treatment with CDR-267F018 compared to control and Isoproterenol (B).Histogram showing reduced gross heart weight in CDR-267F018 treated rats (C).

Molecular markers of hypertrophy like ANP and BNP were significantly reduced upon treatment with CDR267F018 as compared to control. Mechanistically, CDR267F018 reduces inflammation, matrix deposition and the levels of AKT and ERK in the left ventricle. Further, CDR267F018 showed similar inhibitory effect on angiogtensin II induced hypertrophy in endothelial cells. These, observations revealed that CDR267F018 protects isoproterenol induced hypertrophy in rats.

4.1.2 Wild variety of *Cucumis melo* extract as potential anti-dyslipidemic agent

Oral administration of water and hexane fraction of *Cucumis melo* extract (CMHF) reduced the total cholesterol, triglycerides, low density lipoprotein cholesterol, and very low density lipoprotein cholesterol levels in high fat diet-fed dyslipidemic hamsters (Fig. 2). CMHF also modulated expression of genes involved in lip genesis, lipid metabolism, and reverse cholesterol transport ***[Pharmacognosy Magazine 2015, 11(44), suppl 4: S501-10]***

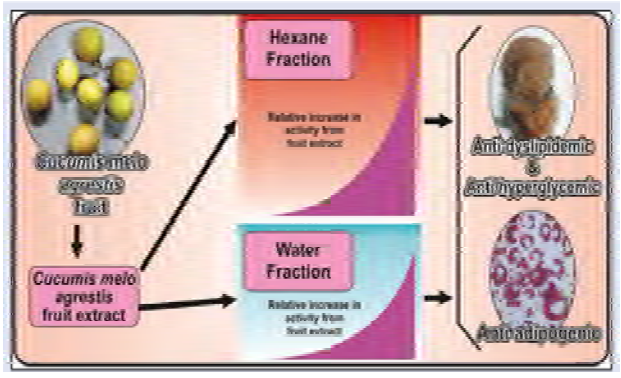


Fig. 2. Schematic representation of antidyslipidemic activity of *Cucumis melo ssp. Agrestis*. CMA possesses anti-dyslipidemic and anti-hyperglycemic activity in Syrian golden hamster. Moreover, CMA also inhibited adipogenesis in 3T3-L1 adipocytes

4.1.3 Screening of samples for anti-inflammatory/ TNFa inhibition activity.

Total 16 CDRI samples and 17 samples of DBT project were received and screened for TNF-α inhibition activity (*in vitro*) in whole blood assay using ELISA. Anti-inflammatory activity was evaluated in carrageenin induced paw oedema in mice. 10 samples showed promising TNF inhibition activity. Out of them only S015-0855 showed good anti-inflammatory activity *in vivo*

4.1.4 Development of Chronic Constriction Injury (CCI) model of neuropathic pain

To discover GPCR based novel drug candidates and also to elucidate role of various GPCRs in neuropathy pain, unilateral sciatic nerve chronic constriction injury (CCI) model was optimized with minor modification. Briefly, CCI was performed with the sciatic nerve on one side exposed by making a skin incision, and cutting through the connective tissue between the gluteus superficialis and biceps femoris muscles. Three silk sutures (6-0) are tied loosely around the sciatic nerve at 1 mm intervals, to just occlude but not arrest epineural blood flow. The animal was then allowed to recover from surgery for 24 hrs before pain hypersensitivity testing begins. As reported by several groups, it was found that CCI to sciatic nerve significantly induces neuropathic pain like behavioral symptoms in mice (**Fig. 3**.). Specifically, significant increase in mechanical allodynia (measured by von Frey hair threshold) and cold allodynia (measured by acetone drop test) was observed. It was also found that neuronal growth factor (NGF), a widely reported neurotrphin in neuropathy, is significantly increased in spinal cord of CCI mice. In order to find novel druggable target, this model will be used to delineate molecular mechanism underlying neuropathy.

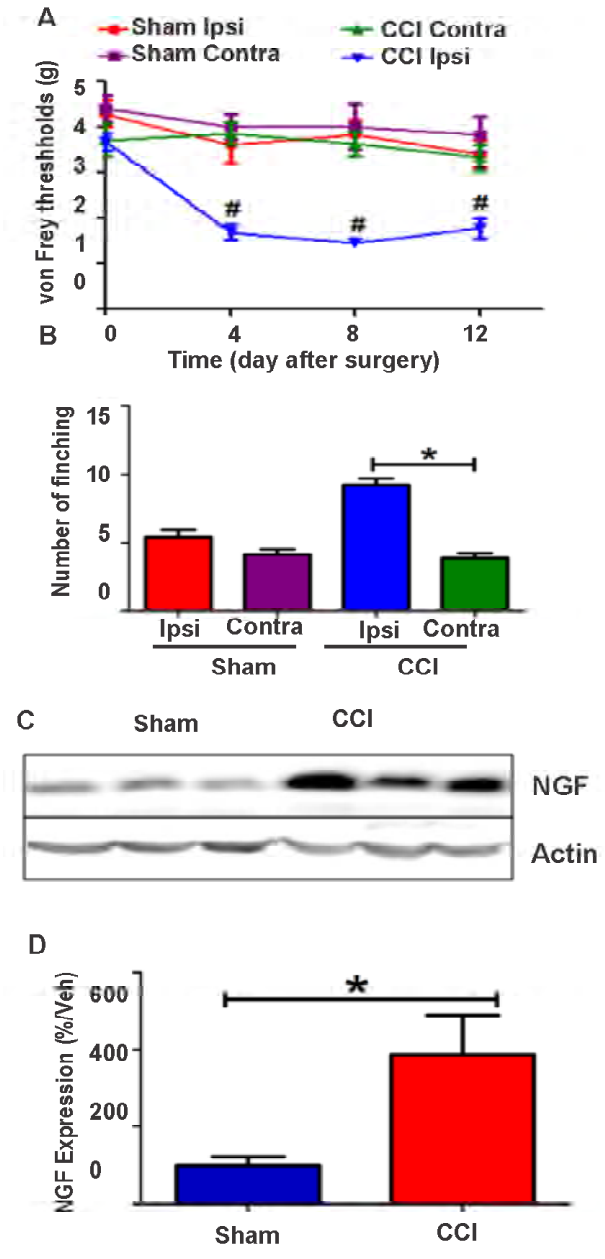


Fig. 3. Development of allodynia following *CCI* in mice. (A) Time dependent increase in allodynia, a reduction in paw withdrawal threshold to von Frey hair. (B) Flinching in response to evaporative cooling was measured for 30 sec following application of acetone to the ipsilateral hind paw compared to the contralateral hind paw. **(C)**. Representative western blot showing NGF expression in lumber region (L4/L5) of spinal cord, after 12 days CCI surgery, or sham surgery. (D) Densitometric analysis of western blot to determine the quantitative changes. *p<0.05, unpaired t-test (N=3-4); #p<0.001, One way ANOVA (N=12-14).

4.1.5 Establishment of a cell based assay to monitor low density lipoprotein internalization in liver

To systematically identify factors that regulate low density lipoprotein receptor (LDLR) activity, a microscope based screening assay to monitor DiI (1,1'-Dioctadecyl-3,3,3',3'-Tetramethylindocarbocyanine Perchlorate**)** LDL uptake in human HEPG2 cells was developed. DiI LDL was prepared by labelling of LDL with lipophilic fluorescent dye DiI followed by sequential ultracentrifugation. HEPG2 cells (2 x 10^4 cells) were treated with increasing concentrations of DiI LDL (5µg/ml, 10µg/ml, 20µg/ml and 40µg/ml) for 4 hr, and LDL uptake was monitored by florescent microscopy (Leica fluorescence microscope DMI 6000, Germany). A dose dependent uptake of LDL in a concentration dependent manner (5-40 µg/ml, p<0.05-0.001) was observed (**Fig. 4, 5a**). Similar results were obtained using flow cytometric analysis of DiI LDL uptake in HEPG2 cells. Fluorescence of minimum 10,000 cells was acquired by flow cytometry in FL-2 channel and subsequently analyzed using Cell Quest program FACS Calibur. DiI LDL uptake in HEPG2 cells increased in dose dependent manner, 5µg/ml (4fold), 10µg/ml (5 fold), 20µg/ml (6fold)

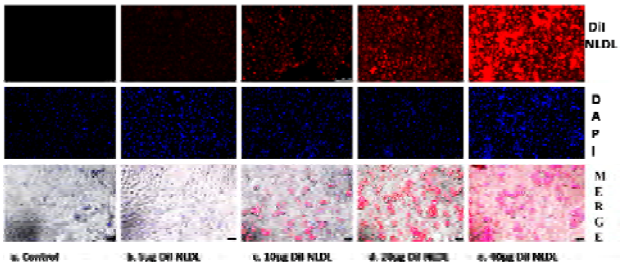


Fig. 4. Fluorescence labelled Native LDL uptake in human hepatocellular HEPG2 cells, a. Control (untreated), b. 5 µg/ml DiI LDL, c. 10 µg/ml DiI LDL, d. 20 µg/ml DiI LDL and e. 40 µg/ml DiI LDL treated with dose dependent concentration of DiI LDL for 4hr

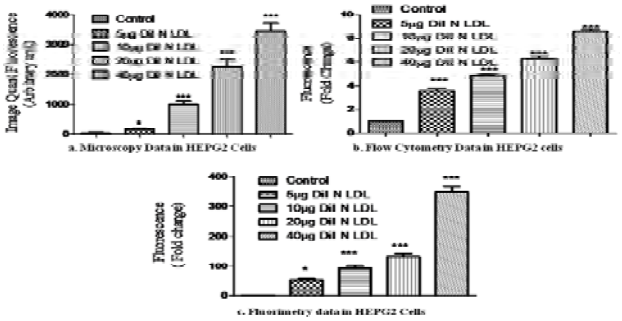


Fig. 5 Mean average fluorescence intensity of DiI LDL in HEPG2 cells incubated with 5-40µg/ml DiI LDL for 4hr. Values represent mean ± SEM; *p<0.05 control vs. 5µg/ml DiI LDL, ***p < 0.001 ctrl vs. 10µg/ml, 20µg/ml and 40µg/ml DiI LDL

and 40µg/ml (8fold) with respect to untreated (control) (Fig. 5b). Further, the fluorescence labeled DiI LDL uptake in HEPG2 cells (1 x 10^6 cells) was measured by using fluorescence plate reader at excitation and emission wavelengths of 485 and 535 nm, respectively. DiI LDL uptake in HEPG2 cells increases in dose dependent manner 5µg/ml (50fold), 10µg/ml (100 fold), 20µg/ml (130fold) and 40µg/ml (350fold) (Fig. 5c).

4.2 Clinical Research Studies

4.2.1 The Clinical evaluation of biomarkers in chronic kidney disease patients:

It is very important for clinicians to have sensitive and reliable markers that can promptly identify renal dysfunction from its initial stage in order to adopt the necessary preventive and supportive measures for avoiding or containing the development of renal damage. It has been unambiguously proven that serum creatinine values vary with age, gender and body mass. The study has been undertaken in 50 Patients in collaboration with Dept. of Internal Medicine, KGMU Lucknow to evaluate the newer biomarkers in blood for chronic kidney disease patients.

4.2.2 The study of biomarkers in non-alcoholic fatty liver disease.

The incidence of non-alcoholic fatty liver disease is increasing in Indian population. The gold standard marker of liver injury is liver biopsy but as it is an invasive procedure and tissue sample drawn from unaffected area of liver may give rise to false results, newer biomarkers are being studied. The study has been undertaken in 120 patients in the Dept. of Internal Medicine, KGMU, for assessment of newer biomarkers in patients of nonalcoholic fatty liver disease.

4.2.3 Role of protein derivatives in erythropoietin resistance.

Anemia occurs in the majority of chronic kidney disease patients and it can be corrected effectively using erythropoiesis-stimulating agents. The study was undertaken in patients of Erythropoietin resistance from Department of Internal Medicine, KGMU to evaluate the various indices of anemia, iron metabolism, inflammation and role of protein derivatives.

4.3 Basic Studies

4.3.1 CDR4655-K09 as an anti-obesogenic and anti-dyslipidemic natural product.

CDR4655-K09 has earlier been reported for anti-dyslipidemic natural product from CSIR-CDRI. As reported in previous year, correlation between anti-adipogenic and anti-dyslipidemic activities was observed (Fig. 6). With this background, earlier reported the anti-adipogenic potential of CDR4655-K09 and studied this molecule *in vivo* for therapeutic aspect of obesity. In high fat diet (HFD) fed C57B6 mice when BMI crosses 30, initiated 8 weeks treatment with this compound and continued HFD feeding. Compound treatment showed improvement in obesity and dyslipidemia parameter. Compound treated group showed decreased fat mass/weight, significant reduction of circulating triglyceride and cholesterol levels ***[Mol Cell Endocrinol. 2015, 399:373-85**.]*.

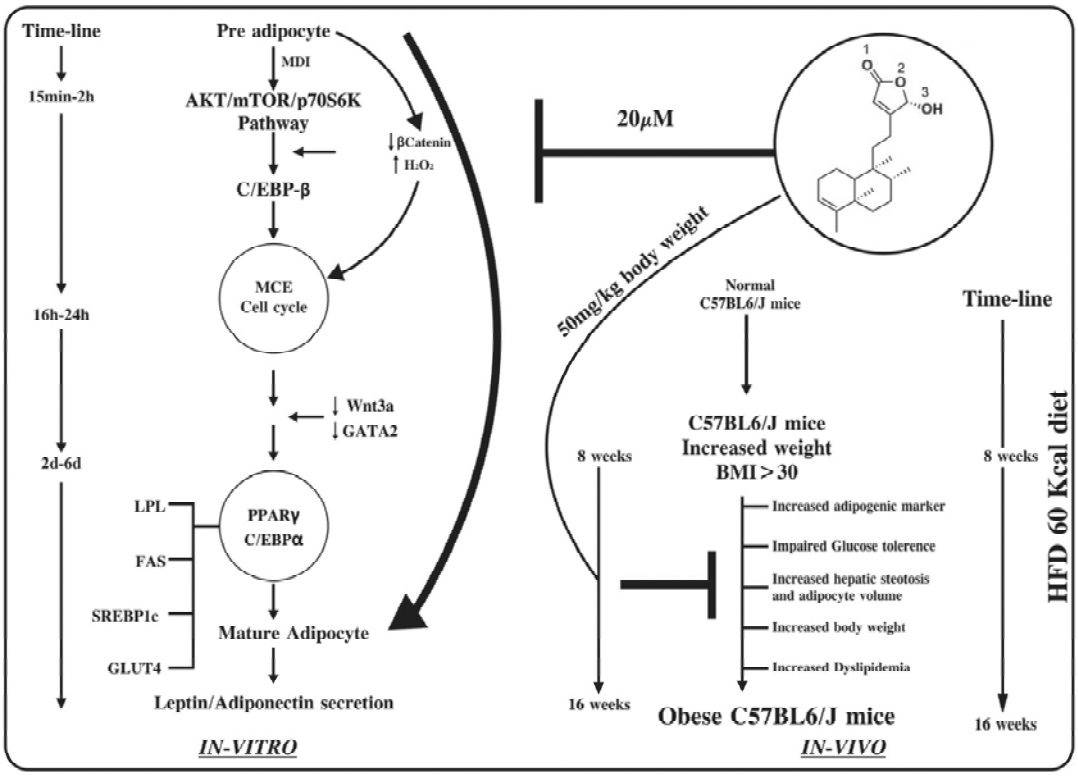


Fig. 6. Schematic representation of *in vitro* and *in vivo* anti-obesity action of K09**.** Compound inhibits adipogenesis in 3T3-L1 cells by blocking early MDI induced signaling. Furthermore Compound 1 like Orlistat ameliorates obesity, weight gain, impaired glucose tolerance, inflammatory markers and lipid parameters when given *in-vivo*

4.3.2 Fatty acid synthase plays a role in the metabolic dysfunction in pulmonary hypertension.

Recent studies have shown that like cancer, metabolic dysfunction plays an important role in cellular proliferation and apoptosis resistance in pulmonary hypertension (PH). As proliferating cells exhibit higher rate of *de novo* fatty acid synthesis to provide lipids for energy production, it was hypothesized that modulating *de novo* fatty acid synthesis by targeting Fatty acid synthase (FAS) may prove beneficial for PH. Inhibition of FAS by siRNA increased the glucose oxidation / glycolysis ratio and apoptosis but decreased proliferation, autophagy and insulin resistance in HPASMCs (Fig. 7). FAS inhibition by siRNA also improved the mitochondrial dysfunction by increasing mitochondrial reactive oxygen species and

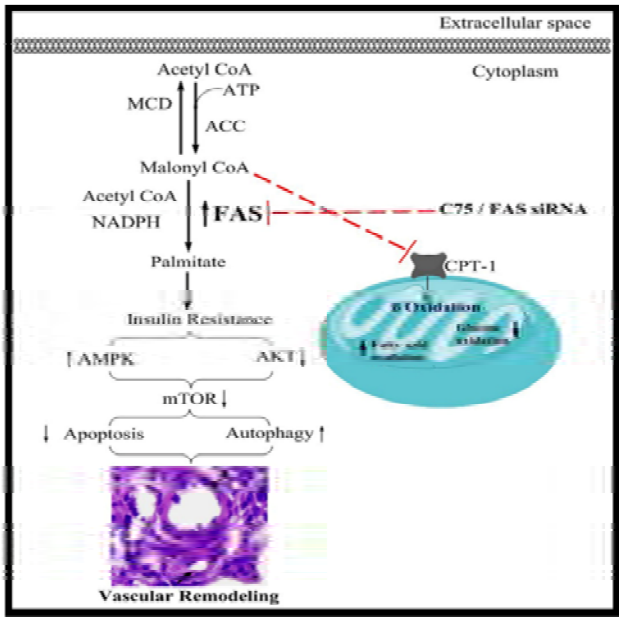


Fig. 7. Schematic representation of role of FAS in vascular remodelling in pulmonary hypertension.

attenuated the hyperpolarisation of membrane which ultimately lead to apoptosis. Preventive and curative inhibition of FAS also decreased the right ventricle pressure and cardiac hypertrophy along with pulmonary vascular remodelling in monocrotaline induced PH in rats. Our results demonstrated that *de novo* fatty acid synthesis plays a critical role in metabolic remodelling and may serve as a new therapeutic target for PH.

4.3.3 AT1 receptor blockade inhibits glial activation and neuroinflammation better than ACE inhibition.

Various clinical reports showed better neuroprotection by AT1 receptor blockade (ARB) than Angiotensin converting enzyme inhibition (ACEi) but experimental evidences for this observation are lacking. Therefore, the present study investigated the effect of ARB, using Candesartan, and ACEi, using Perindopril, in equimolar concentrations in astroglial (C6) and microglial (BV2) cells employing lipopolysaccharide (LPS) to induce neuroinflammation. Further, Candesartan (0.1 mg/kg) and Perindopril (0.1 mg/kg) were orally administered in male SD rats for five consecutive days and on the fifth day, rats were challenged with LPS (i.p.; 250 μg/kg) and sacrificed after 24 hours. LPS induced neuroinflammation (increased astroglial and microglial activation, IκBα degradation, NFκB nuclear translocation, STAT3 activation and TNF-α release) was more

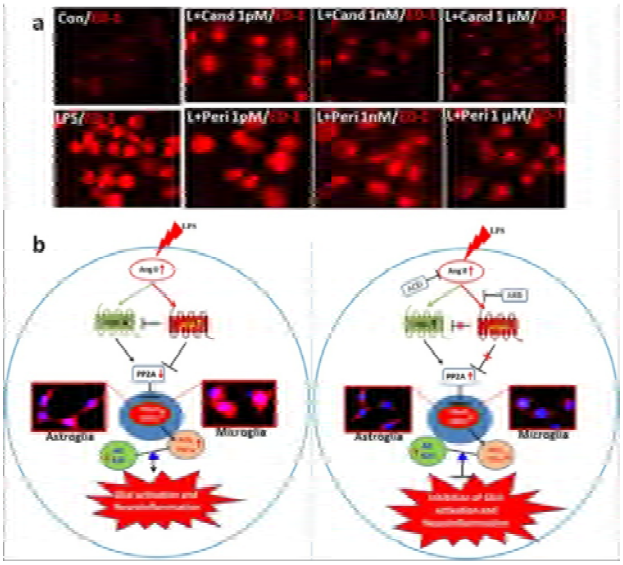


Fig. 8. Blockade of AT1 receptor glial mediated inflammation

efficiently prevented by Candesartan at lower concentration than Perindopril in both the cell types. Even in rat model of neuroinflammation, candesartan was more effective than perindopril at the same dose (Fig. 8). In addition, increased AT1 receptor (AT1R) and decreased AT2 receptor (AT2R) expression was observed in LPS induced neuroinflammation in both *in vitro* and *in vivo* studies. Candesartan, as compared to Perindopril, increased the expression of AT2R, resposible for neuroprotection, in both the experimental conditions. Finally, data demonstrate that superiority of Candesartan as compared to Perindopril, is due to better activation of AT2R which results in PP2A activation, IκBα stabilization and suppression of NFκB and STAT3 inflammatory signalling ***[Mol Neurobiol. 2015, in press]***.

4.3.4 Acetyl-L-carnitine (ALCAR) exert neuroprotective effect in hemiparkinsonian rats

Acetyl-L-carnitine (ALCAR), present in almost all body cells, increases endogenous antioxidants and regulates bioenergetics. Currently, no information is available about the putative mechanism and neuroprotective effects of ALCAR in 6-hydroxydopamine (6-OHDA)-induced rat model of PD-like phenotypes. Herein, the effect of ALCAR on death/survival of DAergic neurons, neuroblasts and NSCs and associate mechanism of neuroprotection in 6-OHDA-induced rat model of PD-like phenotypes was investigated (Fig. 9). ALCAR (100 mg/kg/day, intraperitoneal (i.p.)) treatment started 3 days prior to 6-OHDA lesioning and continued for another 14 day post-lesioning. It was found that ALCAR pretreatment in 6-OHDA-lesioned rats increased expression of neurogenic and the Wnt pathway genes in the striatum and substantia nigra pars compacta (SNpc) region. It suppressed the glial cell activation, improved antioxidant status, increased NSC/neuroblast population and rescued the DAergic neurons in nigrostriatal pathway. ALCAR pretreatment in 6-OHDA-lesioned rats decreased GSK-3β activation and increased nuclear translocation of β-catenin. Functional deficits were restored following ALCAR pretreatment in 6-OHDA-lesioned rats as demonstrated by improved motor coordination and rotational behaviour, confirming protection of DAergic innervations in lesioned striatum. These results indicate that ALCAR exerts neuroprotective effects through the activation of Wnt/β-catenin pathway, suggesting its therapeutic use to treat neurodegenerative diseases by enhancing regenerative capacity ***[Mol Neurobiol. 2015, in press]***

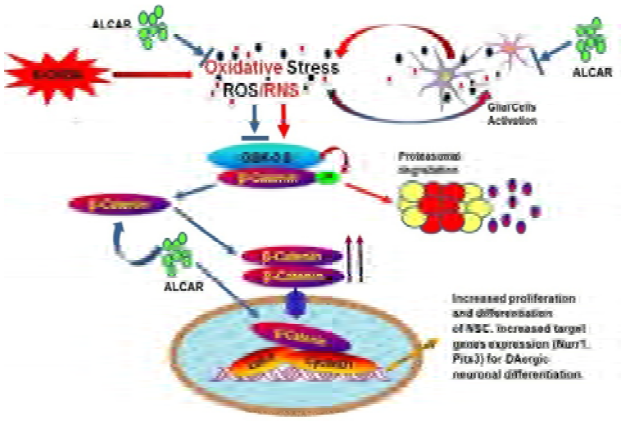


Fig. 9. Schematic representation of mechanism by which ALCAR exert neuroprotective effect in hemiparkinsonian rats. Our experimental studies demonstrate that ALCAR decrease oxidative stress, enhance NSCs proliferation and protects DAergic neurons through activation of Wnt/β-catenin pathway by inhibiting GSK-3β. 6-OHDA mediated increased oxidative stress and glial cell activation results in activation of GSK-3β which phosphorylates β-catenin and provokes proteasomal degradation of β-catenin. ALCAR attenuates oxidative stress derived glial cells activation and inhibits GSK-3β activation which leads to increased level of cytosolic β-catenin.

4.3.5 Memantine displays protective effect against streptozotocin-induced amyloidogenesis, neurotrophic factor decline and oxidative-nitrostative in astrocytes.

The present study was undertaken to investigate the effect of memantine on neurotrophic factors, oxidative-nitrostative stress and amyloidogenesis in STZ treated astrocytes. STZ (100 μM) treatment for 24 h in astrocytes, resulted significant decrease in brain derived neurotrophic factor (BDNF), glial cell line-derived neurotrophic factor (GDNF) and insulin-degrading enzyme (IDE) expression in astrocytes. Treatment with memantine (1-10 μM) improved STZ induced neurotrophic factor decline (Fig. 10). Further, memantine attenuated STZ-induced amyloid precursor protein (APP), β-site APP-cleaving enzyme-1 and amyloid-β_{1-42} expression. In addition, memantine also displays protective effects against STZ-induced oxidative-nitrostative stress as shown by the reduction of ROS generation, iNOS expression and NO level. The results suggest that besides the NMDA receptor antagonisic activity, effect on neurotrophic factor and oxidative stress may also be an important factor in the beneficial effect of memantine in AD pathology. ***[Mol Neurobiol, 2015,in press]***

4.3.6 Protection by perindopril on LPS induced neurodegeneration and memory dysfunction in SHRs.

The present study was aimed to explore the effect of perindopril (ACE inhibitor) on LPS induced neurodegeneration and memory dysfunction in SHRs. LPS (25 μg ICV) caused memory impairment in SHRs with increased ACE activity and expression, neuroinflammation (increased TNF-α, GFAP, COX-2 and NF-kB), oxidative stress (increased iNOS, ROS and nitrite levels), TLR-4 expression and TUNEL positive cells in the cortex and hippocampus regions (Fig. 11). Oral administration of perindopril (ACE inhibitor), at non-antihypertensive dose (0.1 mg/kg), for 15 days attenuated LPS induced deleterious changes in both NWRs and SHRs ***[Pharmacol Biochem Behav, 2015, 133: 132-145]***.

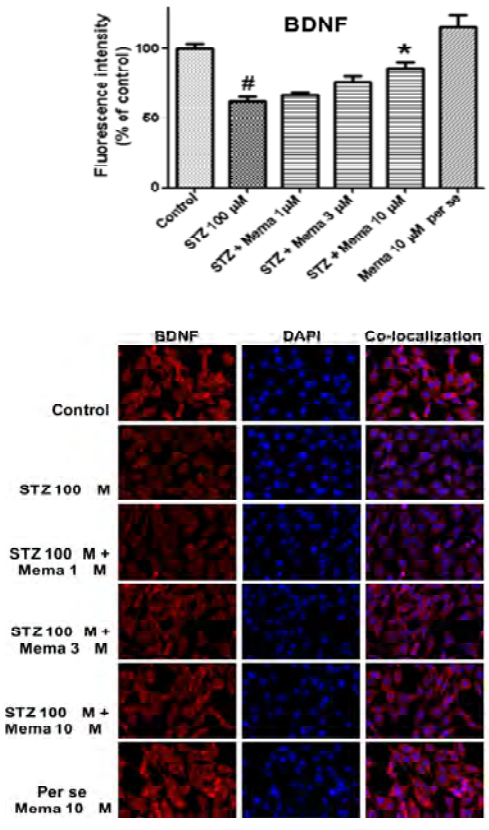


Fig. 10. Effect of Memantine against streptozotocin-induced neurotrophic factor decline

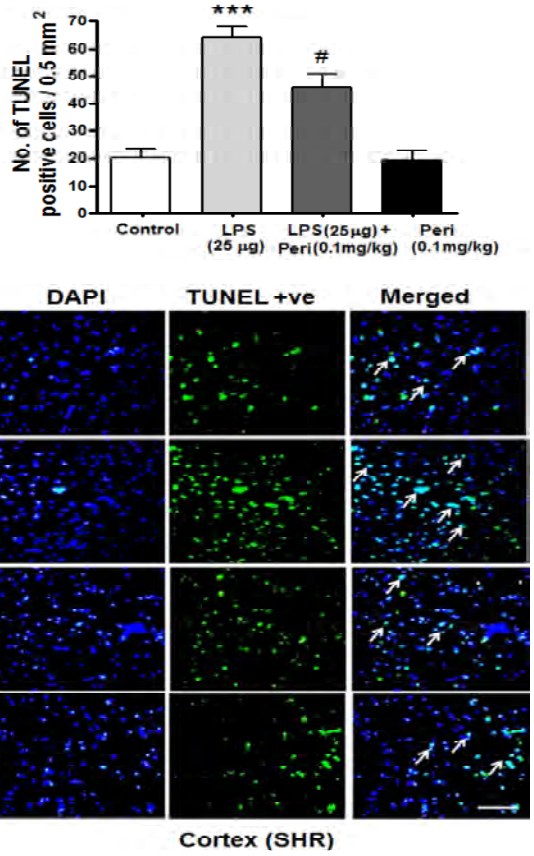


Fig. 11. Effect of perindopril (0.1 mg/kg) on LPS induced neurodegeneration

4.3.7 Streptozotocin Induced Neurotoxicity Involves Alzheimer's Related Pathological Markers: a Study on N2A Cells.

The present study was conducted to investigate the STZ induced cellular and molecular alterations in mouse neuronal N2A cells. The N2A cells were treated with STZ (10μM, 50μM, 100μM, 1000μM) for 48 h and different assays were performed. STZ treatment caused significant decrease in cell-viability, choline levels, increased acetylcholinesterase (AChE) activity, tau phosphorylation and amyloid aggregation. STZ treatment also led to low levels of glucose uptake, elevated mitochondrial stress, translocation of cytochrome-c in cytosol, phosphatidylserine externalization, increased expression of caspase -3 and DNA damage. Co-treatment of clinically used drug donepezil (1μM) offered significant protection against STZ induced neurotoxicity. Donepezil treatment significantly inhibited the STZ induced neurotoxicity, altered choline level, AChE activity, lowered glucose uptake and mitochondrial stress. However, the caspase-3 expression remains unaltered with co-treatment of donepezil. In conclusion, findings showed that STZ treated N2A cells exhibited the AD related pathological markers which are attenuated with co-treatment of donepezil. Findings of the study suggested the potent use of STZ treated N2A cells as *in vitro* experimental test model to study the disease mechanism at cellular level. ***[Mol Neurobiol. 2015, in press]***

4.3.8 A Systematic RNAi Screen of Neuroprotective Genes Identifies Novel Modulators of Alpha-Synuclein-Associated Effects in Transgenic *Caenorhabditis elegans*.

The present studies were carried out towards identifying novel genetic modulators of PD-associated effects employing a transgenic Caenorhabditis elegans model expressing human alpha-synuclein. Employing a systematic RNA interference (RNAi)-based screening approach, studied a set of neuroprotective genes of *C. elegans* with an aim of identifying genes that exhibit protective function under alpha-synuclein expression conditions. Our results reveal a novel set of alpha-synuclein effector genes that modulate alpha-synuclein aggregation and associated effects. The identified genes include those from various gene families including histone demethylase, lactate dehydrogenase, small ribosomal subunit SA protein, cytoskeletal protein, collapsin response mediator protein, and choline kinase. The functional characterization of these genes reveals involvement of signaling mechanisms such as Daf-16 and acetylcholine signaling (**Fig. 12**). Further elucidation of mechanistic pathways associated with these genes will yield additional insights into mediators of alpha-synuclein-induced cytotoxicity and cell death, thereby helping in the identification of potential therapeutic targets for PD. ***[Mol Neurobiol. 2015, in press]***

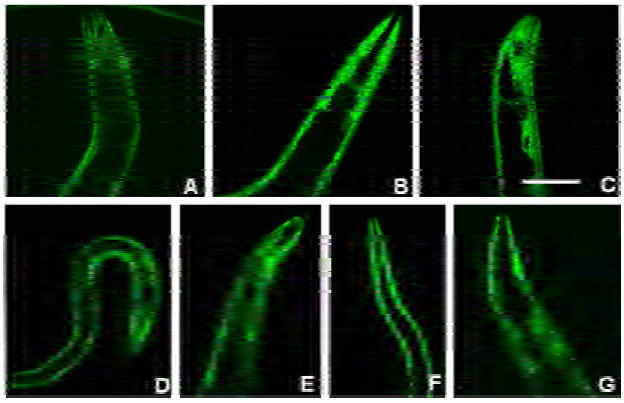


Fig. 12. Alpha synuclein aggregation in NL5901 strain of *C. elegans* treated with OP50 (A), RNAi induced gene silencing of spr-5 gene (B), cka-2 (C), act-5 (D),ldh-1 (E), unc-33 (F), rps-0 (G). Scale bar, 50 μm.

4.3.9 The IRAK-ERK-p67phox-Nox-2 axis mediates TLR4, 2-induced ROS production for IL-1β transcription and processing in monocytes.

The present study investigated the role of interleukin-1 receptor-associated kinase (IRAK), extracellular signal-regulated kinase (ERK), p67phox and Nox-2 in TLR4- and TLR2-induced ROS generation during interleukin-1 beta (IL-1β) transcription, processing, and secretion. An IRAK1/4 inhibitor, U0126, PD98059, an NADPH oxidase inhibitor (diphenyleneiodonium (DPI)), and a free radical scavenger (N-acetyl cysteine (NAC))-attenuated TLR4 (lipopolysaccharide (LPS))- and TLR2 (Pam3csk4)-induced ROS generation and IL-1β production in THP-1 and primary human monocytes. An IRAK1/4 inhibitor and siRNA-attenuated LPS- and Pam3csk4-induced ERK-IRAK1 association and ERK phosphorylation and activity. LPS and Pam3csk4 also induced IRAK1/4-, ERK- and ROS-dependent activation of activator protein-1 (AP-1), IL-1β transcription, and IL-1β processing because significant inhibition in AP-1 activity, IL-1β transcription, Pro- and mature IL-β expression, and caspase-1 activity was observed with PD98059, U0126, DPI, NAC, an IRAK1/4 inhibitor, tanshinone IIa, and IRAK1 siRNA treatment. IRAK-dependent ERK-p67phox interaction, p67phox translocation, and p67phox-Nox-2 interaction were observed. Nox-2 siRNA significantly reduced secreted IL-1β, IL-1β transcript, pro- and mature IL-1β expression, and caspase-1 activity indicating a role for Nox-2 in LPS- and Pam3csk4-induced IL-1β production, transcription, and processing. In the present study, It has been demonstrated that the TLR4- and TLR2-induced IRAK-ERK pathway cross-talks with p67phox-Nox-2 for ROS generation, thus regulating IL-1β transcription and processing in monocytic cells. ***[Cell Mol Immunol. 2015, in press]***

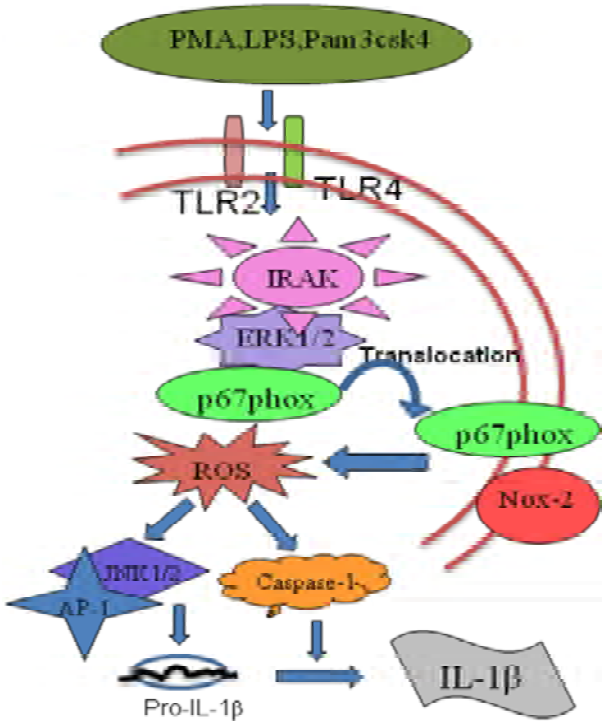


Fig. 13. Role of ROS in monocytes/macrophages IL-1B production

4.3.10. Curcuma oil ameliorates insulin resistance & associated thrombotic complications in hamster & rat.

Curcuma oil (C. oil) isolated from turmeric (*Curcuma longa* L.) has been shown to have neuro-protective, anti-cancer, antioxidant and anti-hyperlipidaemic effects in experimental animal models. However, its effect in insulin resistant animals remains unclear. The present study was carried out to investigate the disease modifying potential and underlying mechanisms of the C. oil in animal models of diet induced insulin resistance and associated thrombotic complications. Male Golden Syrian hamsters on high fructose diet (HFr) for 12 wk were treated orally with vehicle, fenofibrate (30 mg/kg) or C. oil (300 mg/kg) in the last four weeks. Wistar rats fed HFr for 12 wk were treated orally with C. oil (300 mg/kg) in the last two weeks. To examine the protective effect of C. oil, blood glucose, serum insulin, platelet aggregation, thrombosis and inflammatory markers were assessed in these animals.

Animals fed with HFr diet for 12 wk demonstrated hyperlipidaemia, hyperglycaemia, hyperinsulinaemia, alteration in insulin sensitivity indices, increased lipid peroxidation, inflammation, endothelial dysfunction, platelet free radical generation, tyrosine phosphorylation, aggregation, adhesion and intravascular thrombosis. Curcuma oil treatment for the last four weeks in hamsters ameliorated HFr-induced hyperlipidaemia, hyperglycaemia, insulin resistance, oxidative stress, inflammation, endothelial dysfunction, platelet activation, and thrombosis. In HFr fed hamsters, the effect of C. oil at 300 mg/kg was comparable with the standard drug fenofibrate. Curcuma oil treatment in the last two weeks in rats ameliorated HFr-induced hyperglycaemia and hyperinsulinaemia by modulating hepatic expression of sterol regulatory element binding protein 1c (SREBP-1c), peroxisome proliferator-activated receptor-gamma co-activator 1 (PGC-1)α and PGC-1α genes known to be involved in lipid and glucose metabolism.

High fructose feeding to rats and hamsters led to the development of insulin resistance, hyperglycaemia, endothelial dysfunction and oxidative stress. C. oil prevented development of thrombotic complications associated with insulin resistance perhaps by modulating genes involved in lipid and glucose metabolism. Further studies are required to confirm these findings. ***[Indian J Med Res. 2015 Jun;141(6):823-32]***

4.3.11. Involvement of interleukin-1 receptor-associated kinase-1 in vascular smooth muscle cell proliferation and neointimal formation after rat carotid injury.

Reduced frequency of atherosclerotic plaques is observed in interleukin-1 receptor-associated kinase-1 (IRAK1)-deficient mice; however, the underlying mechanism is not clear. Therefore, this study investigate the role of IRAK1 in vascular smooth muscle cell proliferation and neointimal hyperplasia.Stimulation of rat primary vascular smooth muscle cells with fetal bovine serum (10%) or platelet-derived growth factor-BB (20 ng/mL) for 15 minutes to 24 hours induced a time-dependent increase in IRAK1 and extracellular signal-regulated kinase (ERK) activation, proliferating cell nuclear antigen upregulation and p27Kip1 downregulation as assessed by Western blotting. Inhibitors of

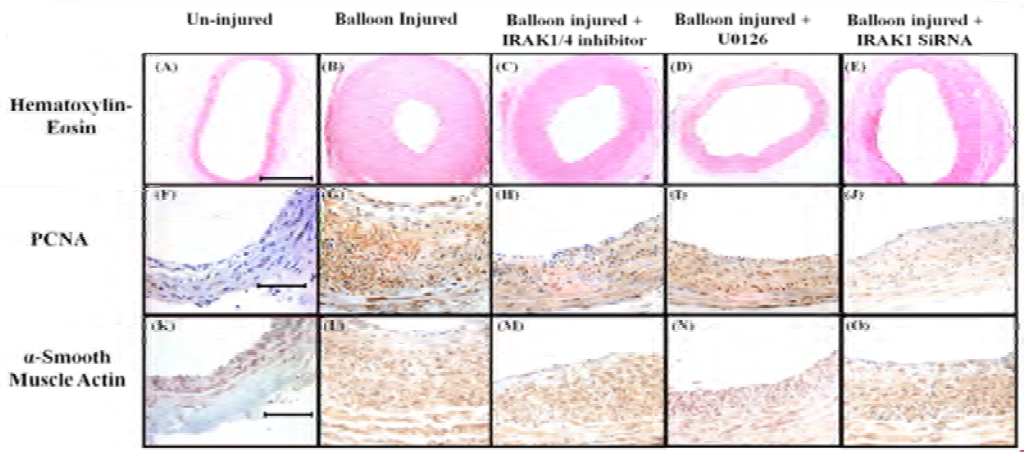


Fig. 14. IRAK-ERK Axis Mediates Balloon Injury Induced Neo-intimal Cell Proliferation and Hyperplasia

ERK pathway (U0126, 10 μmol/L), IRAK (IRAK1/4, 3 μmol/L), protein kinase C (PKC; Ro-31-8220, 1 μmol/L), siRNA of toll-like receptor-4 (200 nmol/L), and PKC-ε (200 nmol/L) significantly attenuated these changes. Platelet-derived growth factor induced endogenous IRAK-ERK-PKC-ε association in a toll-like receptor-4 and PKC-ε-dependent manner. A time-dependent increase in IRAK1 and ERK activation was observed after 15 minutes, 30 minutes, 1 hour, 6 hours, 12 hours, and 24 hours of carotid balloon injury in rats. Balloon injury induced endogenous IRAK-ERK-PKC-ε interaction. Perivascular application of IRAK1/4 inhibitor (100 μmol/L), U0126 (100 μmol/L), and IRAK1 siRNA (220 and 360 nmol/L) in pluronic gel abrogated balloon injury-induced ERK phosphorylation, activation, and p27Kip1 downregulation (Fig. 14). Hematoxylin and eosin staining and immunohistochemistry of proliferating cell nuclear antigen and smooth muscle actin demonstrated that balloon injury-induced intimal thickening and neointimal vascular smooth muscle cell proliferation were significantly abrogated in the presence of IRAK1/4 inhibitor, IRAK1 siRNA, and U0126.

IRAK1 mediates vascular smooth muscle cell proliferation and neointimal hyperplasia by regulating PKC-ε-IRAK1-ERK axis. ***[Arterioscler Thromb Vasc Biol. 2015; 35(6):1445-55.]***

4.3.12 Gingerol Inhibits Serum-Induced Vascular Smooth Muscle Cell Proliferation and Injury-Induced Neointimal Hyperplasia by Suppressing p38 MAPK Activation.

Gingerol inhibits growth of cancerous cells; however, its role in vascular smooth muscle cell (VSMC) proliferation is not known. The present study investigated the effect of gingerol on VSMC proliferation in cell culture and during neointima formation after balloon injury.

Rat VSMCs or carotid arteries were harvested at 15 minutes, 30 minutes, 1, 6, 12, and 24 hours of fetal bovine serum (FBS; 10%) stimulation or balloon injury, respectively. Gingerol

prevented FBS (10%)-induced proliferation of VSMCs in a dose-dependent manner (50 μmol/L-400 μmol/L). The FBS-induced proliferating cell nuclear antigen (PCNA) upregulation and p27Kip1 downregulation were also attenuated in gingerol (200 μmol/L) pretreated cells. Fetal bovine serum-induced p38 mitogen-activated protein kinase (MAPK) activation, PCNA upregulation, and p27Kip1 downregulation were abrogated in gingerol (200 μmol/L) and p38 MAPK inhibitor (SB203580, 10 μmol/L) pretreated cells. Balloon injury induced time-dependent p38 MAPK activation in the carotid artery. Pretreatment with gingerol (200 μmol/L) significantly attenuated injury-induced p38 MAPK activation, PCNA upregulation, and p27Kip1 downregulation. After 14 days of balloon injury, intimal thickening, neointimal proliferation, and endothelial dysfunction were significantly prevented in gingerol pretreated arteries. In isolated organ bath studies, gingerol (30 nmol/L-300 μmol/L) inhibited phenylephrine-induced contractions and induced dose-dependent relaxation of rat thoracic aortic rings in a partially endothelium-dependent manner.

Gingerol prevented FBS-induced VSMC proliferation and balloon injury-induced neointima formation by regulating p38 MAPK. Vasodilator effect of gingerol observed in the thoracic aorta was partially endothelium dependent. Gingerol is thus proposed as an attractive agent for modulating VSMC proliferation, vascular reactivity, and progression of vascular proliferative diseases. ***[J Cardiovasc Pharmacol Ther. 2015, in press]***

4.3.13. Oxidised LDL induced extracellular trap formation in human neutrophil via TLR-PKC-IRAK-MAPK and NADPH oxidase activation.

In the present study effect of Oxidized low density lipoprotein (oxLDL) on Neutrophil extracellular traps (NETs) formation was investigated and elucidated the underlying signalling mechanism. Treatment of oxLDL to adhered PMNs led to a time and concentration dependent ROS generation and NETs formation. OxLDL induced free radical formation and NETs release were significantly prevented in presence of NADPH oxidase (NOX) inhibitors suggesting role of NOX activation in oxLDL induced NETs release. Blocking of both toll like receptor (TLR) -2 and 6 significantly reduced oxLDL induced NETs formation indicating requirement of both the receptors. We further identified Protein kinase C (PKC)-Interleukin-1 receptor associated kinase (IRAKs)-mitogen-activated protein kinase (MAPK) pathway as downstream intracellular signalling mediators involved in oxLDL induced NETs formation. OxLDL components such as oxidized phospholipids (lysophosphatidylcholine (LPC) and oxidized 1-palmitoyl-2-arachidonyl-sn- glycero-3-phosphorylcholine (oxPAPC)) were most potent NETs inducers and might be crucial for oxLDL mediating NETs release. Other components like, oxysterols, malondialdehyde (MDA) and 4-hydroxynonenal (4-HNE) were however less potent as compared to oxidized phospholipids. This study thus demonstrates for the first time that treatment of human PMNs with oxLDL or its various oxidized phopholipid component mediated NETs release, implying their role in the pathogenesis of inflammatory diseases such as SIRS ***[Free Radic Biol Med, 2016, In press]***

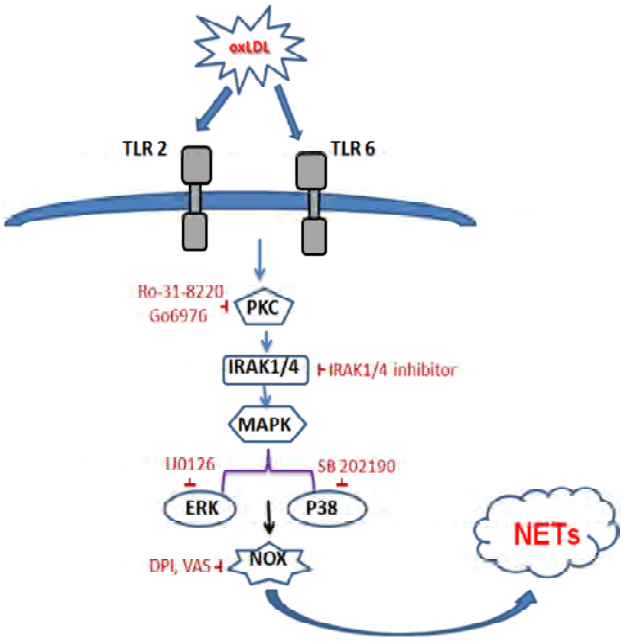
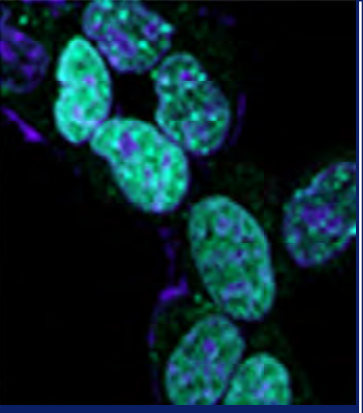


Fig. 15. Schematic representation of oxLDL induced signaling pathway leading to NETosis in human PMNs



CANCER AND RELATED AREAS

Area Coordinators: Dr. Dipak Datta, Dr. Arun K Trivedi, Dr. Atul Kumar

Aims and Objectives of the Project area are :

- Creation of appropriate platform for interdisciplinary collaborative research;
- Creation of knowledge base in cancer biology;
- Lead identification/optimization to obtain drug-like molecules.

5.1 Drug discovery

5.2 Basic research

5

5.1. Drug Discovery

5.1.1 Biological screening

Biological Screening: Anticancer screening has been conducted in six different cancer types (Breast, Colon, Head & Neck, Cervical, Lung, Ovary) that are relevant to Indian scenario. During the year a total of 85 plant extracts and 546 pure compounds received for screening. Among the received compounds, 493 pure compounds, and 85 extracts were subjected for primary screening using NCI approved Sulphorhodamine Assay (SRB). From the secondary screening, 21 pure compounds and 1 plant extract received from NBRI has shown promising activity. Secondary screening results of 13 plant extracts and 53 pure compounds is awaited

5.1.2 Assay/method development

Besides, phenotype based anticancer screening, Target based anticancer screening has newly been introduced in Cancer Area. Biochemical assay for four clinically validated targets (HDAC, m-TOR, AKT, and Proteasome) has been established and screening of compounds is underway. These clinically validated targets were selected purely on the basis that either there is no drug available so far or very few drugs with lesser efficacy are available in the clinics which makes hunt for newer drugs against these targets a necessary need. Following biochemical assays for these targets has been established:

HDAC inhibition Assay: It is a cell-free assay system. SAHA and TSA will be used as positive controls.

Anti-AKT screening assay: Screening will be done by ELISA based non-radioactive *in vitro* kinase assay. A443654 will be used as positive while DMSO as negative control.

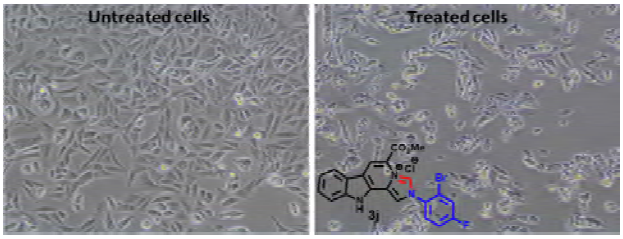
Anti-mTOR screening: Screening using a Dot-blot based non-radioactive *in vitro* kinase assay. Rapamycin+FKBP12 used as positive control.

Anti-Proteasome screening: Evaluation for Proteasome (chymotrypsin like activity) inhibition will be performed using proteasome enriched lysates of Jurkat cells and a fluorogenic substrate. MG132/Bortezomib will be used as positive

5.1.3 Design and Synthesis of anti cancer Compounds

5.1.3.1 Synthesis of β-Carboline-based N-Heterocyclic Carbenes and their antiproliferative and antimetastatic activities against human breast cancer cells.

A series of novel β-carboline-based *N*-heterocyclic carbenes was prepared via Mannich reaction between methyl 1-(dimethoxymethyl)-9*H*-pyrido[3,4-*b*]indole-3-carboxylate, formaldehyde and primary amines. Evaluation of compounds revealed that several of them displayed IC_{50} less than 10 µM



against human breast cancer MDA-MB-231 cells. Pharmacologically these compounds lead to G_2/M phase cell cycle arrest and induction of cellular apoptosis by triggering intrinsic apoptotic pathway through depolarization of mitochondrial membrane potential and activation of caspases. At lower concentrations, these compounds also showed anti-migratory and anti-invasive effects against highly metastatic human breast cancer MDA-MB-231 cells via aberration of MAP-kinase signalling and by the inhibition of matrix metalloproteinases. But these analogues lacked *in vivo* effect in mouse model possibly due to their strong affinity to HSA. ***[J. Med. Chem. 2015, 58, 3485-3499]***

5.1.3.2 Screening, identification and characterization of 1,2,3 triazole analogues as anti-breast cancer compound

The lead molecule, S011-0012 [1-(1-benzyl-5-(4-chlorophenyl)-1H-1,2,3-triazol-4-yl)-2-(4-bromophenylamino)-1-(4-chlorophenyl)ethanol] induced significant cell cycle arrest, mitochondrial membrane depolarization, apoptosis and autophagy in MCF-7 and MDA-MB-231 cells. S011-0012 also increased reactive oxygen species and its inhibition by N-acetyl-L-cysteine protected breast cancer cells from autophagy and apoptosis. Autophagy inhibitor, 3-methyladenine abolished S011-0012 induced apoptosis, mitochondrial membrane depolarization and reactive oxygen species generation. Thus, it was established that S011-0012 induced autophagy facilitated cell death rather than the usual cell survival role of autophagy. Pan-caspase inhibition did not abrogate S011-0012 induced autophagy, suggesting that autophagy precedes apoptosis. In addition, S011-0012 inhibited cell survival pathway signaling proteins, Akt, mTOR and Erk1/2. S011-0012 was evaluated using syngenic rat mammary tumor model and significant regression of tumor with oral dose of as low as 10 mg/kg bodyweight in rat mammary tumor without any apparent toxicity was noted.

In presence of reactive oxygen species inhibitor (N-acetyl-L-cysteine) and autophagy inhibitor (chloroquine), S011-0012 induced mammary tumor regression in animal model was significantly decreased. In summary, S011-0012 is a potent inducer of autophagy-dependent apoptosis in breast cancer cells both *in vitro* and *in vivo* and can serve as an important lead in development of new anti-tumor therapy. ***[Int J Biochem Cell Biol. 2015 Aug;65:275-287]***

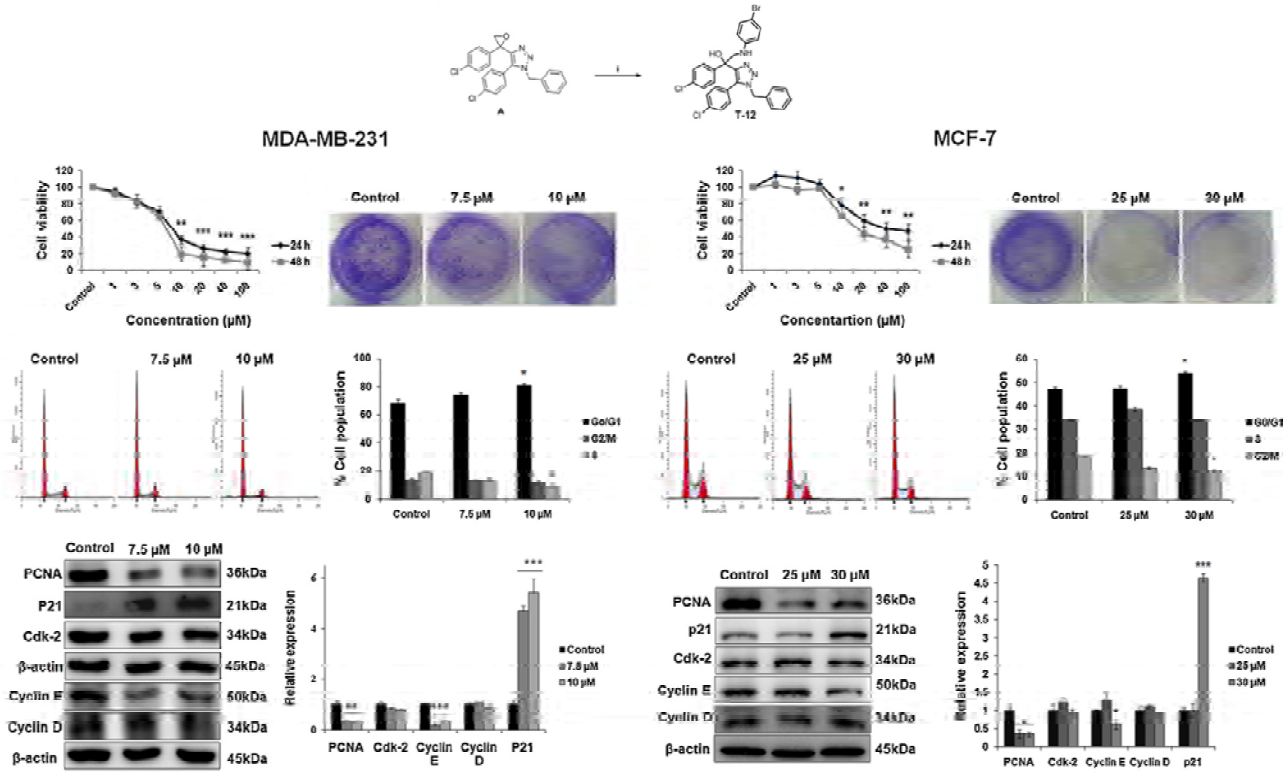


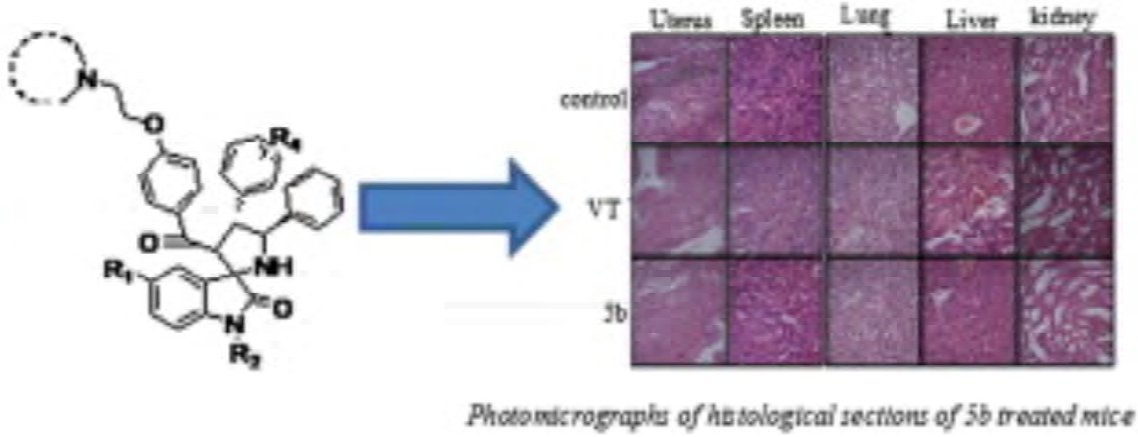
Fig. Structure of S011-0012 and its effect of on cell proliferation, cell cycle progression and associated biological markers in breast cancer cells (MDA-MB-231 and MCF-7).

5.1.3.3 Design and synthesis of new bioisosteres of spirooxindoles (MI-63/219) as anti-breast cancer agents

Design and synthesis of bioisosteres of spirooxindole (MI-63/219), a small-molecule inhibitors of the MDM2–p53 interaction as anti-breast cancer agents is reported. Compound 5b has been exhibiting significant anti-proliferative activity in nude mice bearing MCF-7 xenograft tumor. The compound 5b was found to act via modulation of MDM2 and p53 expression in breast cancer cells expressing wild type p53. Compound5b stimulated p53 activation, caused modulation of downstream effectors p21, pRb, and cyclin D1 which regulate cell cycle. Thus, compound triggered G1–S phase cell cycle arrest, which was evident by flow cytometric analysis of treated breast cancer cells. Thus, compound 5b restores the p53 function, which triggers molecular events consistent with cell cycle arrest at G1/S phase. ***[Bioorganic & Medicinal Chemistry, 2015, 23, 839-348]***

5.1.3.4 Spiro-oxindole derivative 5-chloro-4',5'-diphenyl-3'-(4-(2-(piperidin-1-yl) ethoxy) benzoyl) spiro[indoline-3,2'-pyrrolidin]-2-one triggers apoptosis in breast cancer cells via restoration of p53 function

Designed, synthesized and identified novel spiro-oxindole derivative G613 i.e. Spiro-oxindole derivative 5-chloro-4',5'-diphenyl-3'-(4-(2-(piperidin-1-yl) ethoxy) benzoyl) spiro[indoline-3,2'-pyrrolidin]-2-one, which has shown growth inhibitory activity in breast cancer cells. The present study was aimed to explore the mechanism of anti-tumorigenic action of this newly identified spiro-oxindole compound.



Photomicrographs of histological sections of 5b treated mice

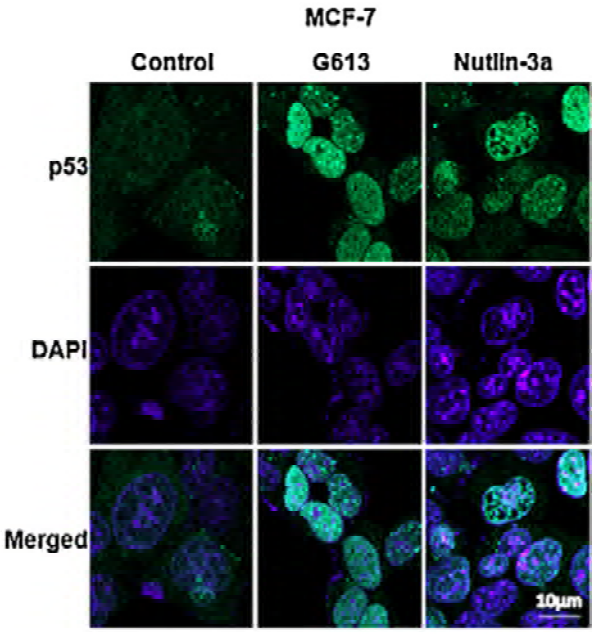


Fig. Confocal microscopy to demonstrate the effect of compound on localization pattern of p53. MCF-7 breast cancer cells were treated with vehicle or 7.5uM of G613 and Nutlin-3a for 24 h. Cells were fixed, permeabilized, incubated with p53 antibody for overnight, and incubated with FITC-conjugated anti-rabbit antibody for 1 h. The preparations were washed and counterstained with DAPI. Representative micrographs demonstrating the distribution of p53 are shown. Magnification63×, Scale bar = 10-m.

Compound G613 inhibited the Mdm2–p53 interaction in breast cancer cells and tumor xenograft. It caused restoration of p53 function by activating its promoter activity, triggering its nuclear accumulation and preventing its ubiquitination and proteasomal degradation. Supportively, molecular docking studies revealed considerable homology in the docking mode of G613 and the known Mdm2 inhibitor Nutlin-3, to p53 binding pocket of Mdm2. The activation of p53 led to upregulation of p53 dependent pro-apoptotic proteins, Bax, Puma and Noxa and enhanced interaction of p53 with bcl2 member proteins thus triggering both transcription-dependent and transcription-independent apoptosis, respectively. Additionally, the compound decreased estrogen receptor activity through sequestration of estrogen receptor by p53 thereby causing a decreased transcriptional activation and expression of proliferation markers. In conclusion, G613 represents a potent small-molecule inhibitor of the Mdm2–p53 interaction and can serve as a promising lead for developing a new class of anti-cancer therapy for breast cancer patients. ***[The International Journal of Biochemistry & Cell Biology 2016,70;105-117]***

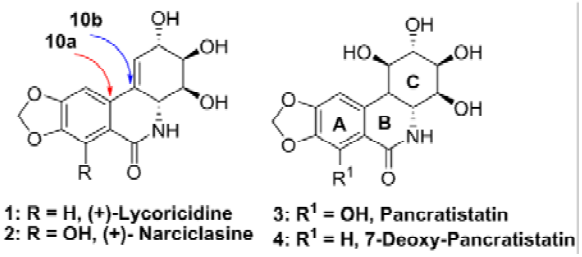
5.1.3.5 Molecular hybridization based design

Molecular hybridization (MH) is one of the emerging strategy for rational drug designing, where multiple targets can be engaged with a combination of two or more active groups to tackle both the tumor growth and metastasis. *N*-acylhydrazone and its mimics, hybridized, with chalcones which are important class of natural compounds having anticancer activity. The exquisite potency of chalcones is due to their interaction with various proteins related to cell apoptosis and proliferation. Based on this rationale, we envisaged that a compound containing both semicarbazone and chalcone could selectively inhibit tumor cell growth as well as their metastasis to distant organs, without having toxic side effects. Thus a series of hybrids (**S011-2100** to **S011- 2116**) were synthesized and evaluated for their anti cancer activity. Some of these compounds have shown significant and selective anticancer activities. Particularly compound **S-011-2101** showed an IC_{50} values 1.07 and 4.91 ìM against MCF-7 and T47D respectively and was nontoxic to normal cell lines. The mechanistic studies that underlie their selective anti breast cancer activity are under investigation.

5.1.4 Natural Product Chemistry:

5.1.4.1 Total synthesis of 3-*epi*-(+)-lycoricidine

The evaluation of the pancratistatin's cytotoxic pharmacophore and synthesis of structurally simplified analogues is currently pursued by a number of laboratories. All three rings A, B, and C have been targeted to obtain Structure Activity Relationship (SAR) data. The importance of ring B has been



addressed by Chapleur and co-workers, who showed that lycoricidine analogues with the open ring B (absent C10a-C10b bond in 1) or the ester group in lieu of the amide were both devoid of anticancer activity. Additionally, Hudlicky and co-workers synthesized the C10b-epimer of 7-deoxypancratistatin (4) and found that it was inactive. Thus, it appears that the configuration at the position C10b is critical for activity as well.

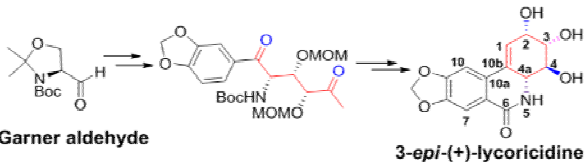


Fig. A highly efficient total synthesis of 3-*epi*-(+)-lycoricidine has been described for the first time from easily available (*S*)-Garner aldehyde with an overall yield of 7% in 20 steps. Stereoselective nucleophilic addition, Sharpless asymmetric dihydroxylation, Dess-Martin periodinane oxidation, intramolecular Aldol cyclization and Luche reduction are the salient features of this approach.

5.1.4.2 α-Solanine induces autophagy in human cancer cells:

α-Solanine is a glycoalkaloid found in species of the nightshade family including potato. It was primarily reported to have toxic effect in humans. However, there is a growing body of literature demonstrating *in vitro* and *in vivo* anticancer activity of α-solanine. Most of these studies have shown activation of apoptosis as the underlying mechanism in anti-tumor activity of α-solanine. In the present study, report α-solanine as a potential inducer of autophagy which might act synergistically or in parallel with apoptosis to exert its cytotoxic effect.

Induction of autophagy was demonstrated by several assays including electron microscopy, immunoblotting of autophagy markers and immunofluorescence for LC3 puncta. α-solanine induced autophagic flux was demonstrated by additionally enhanced -turnover of LC3-II and -accumulation of LC3 specific puncta after co-incubation of cells with either of the autophagolysosome inhibitors -chloroquine and -bafilomycin

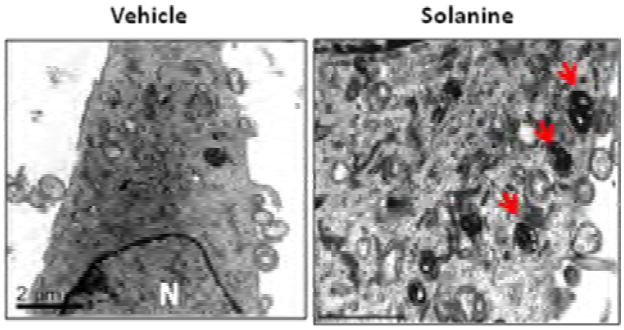


Fig. α-Solanine treatment caused autophagosome–lysosome fusion.

A1. Also demonstrated α-solanine induced oxidative damage in regulating autophagy where pre-incubation of cells with ROS scavenger resulted in suppression of CM-H_2DCFDA fluorescence as well as decrease in LC3-II turnover. α-solanine treatment caused an increase in the expression of ER stress proteins (BiP, ATF6, XBP1, PERK, IRE1, ATF4 and CHOP) suggesting activation of unfolded protein response pathway. Moreover, we found down regulation of phosphorylated Akt (Thr^{308} and Ser^{473}), mTOR (Ser^{2448} and Ser^{2481}) and 4E-BP1 ($Thr^{37/46}$) by á-solanine implying suppression Akt/mTOR pathway. Collectively, our results signify that α-solanine induces autophagy to exert anti-tumor activity by triggering ER stress and inhibiting Akt/mTOR signaling pathway. ***[Cell Death Dis. 2015;6:e1860]***

5.1.5 Bioprospection of plant resources for affordable healthcare

Bioprospection of a promising plant species (CDRIMK24) from India was carried out targeting pyranocarbazoles (antiproliferative agents) accumulation in plant. 32 leaf samples from 18 states were collected and analysed to explore chemical diversity of pyranocarbazoles. 11 pyranocarbazoles were isolated and characterised, of which 04 had shown significant anti-proliferative activity in Breast and Colon cancer cell lines. These 04 compounds were identified as validated anti-proliferative chemical markers. Sample collected from central part of India with Field No. 24700 was identified as the elite chemotype in respect to all 04 antiproliferative chemical markers.

In an another effort, *Alstonia scholaris* (L.) R. Br., belonging to the family Apocynaceae, is a rich source of indole alkaloids, has been reported as an antiproliferative agent and targeted for cancer chemotherapy. The main component echitamine and its derivatives are mainly concentrated in stem bark and root of the plant but bulk collection of these parts from nature is not recommended. The present study is the first attempt to standardize the induction and proliferation of callus from leaf explants of A. scholaris along with in vitro biosynthesis of echitamine. Quantitative estimation of echitamine was performed by using ultra performance liquid chromatography mass spectrometry. The medium used for callus induction and proliferation was Murashige and Skoog which was optimized with various combinations and concentrations of different auxins and cytokinins. Best induction and proliferation of callus was noted in 2,4-dichlorophenoxyacetic acid (2,4-D) and 6-furfurylaminopurine (FAP) combination with their specific concentration at 0.5:0.5 mg L-1. Furthermore, the data indicated that both auxin/cytokinin ratio as well as their independent concentration was important for the same. Echitamine biosynthesis was observed in 0.5:0.5 and 0.5:0.3 mg L-1 of 2,4-D and FAP under 16:8 h light–dark cycle. However, production of echitamine was increased more than twofold in 0.5:0.3 mg L-1 of 2,4-D and FAP containing medium upon application of yeast extract at 150 mg L-1 with 5 days incubation period. Thus, *in vitro* biosynthesis may offer an alternative source of echitamine without harming natural plant population. ***[Plant Cell, Tissue and Organ Culture. 120: 367-372]***

5.1.6 Repositioning of drugs

Drug repurposing, that is using approved and marketed drugs for one particular disease as a therapy in other diseases has gained popularity in recent times since this approach is cost-effective in comparison to new chemical entities. Such strategy can be particularly beneficial in leukemia therapy where most of the prescribed drugs are expensive. We are currently screening a library of FDA-approved drugs against chronic myelogenous leukemia (CML) and acute myelogenous leukemia (AML). After screening 1200 FDA-approved drugs we have found a number of hits among which 2 drugs show promising anti-cancer activity in cell lines and patient samples. Currently, detailed investigations into the mechanism of action of these drugs are being pursued.

5.1.7 *CTA as novel diagnostic marker*

Cancer Testis Antigens have emerged as potentially reliable targets for immunotherapy of cancer because of their limited expression in normal tissues. This inventions relates to the Genes expressed both in normal testis as well as in malignancies (Cancer/ Testis associated genes – CTA) and these proteins have become the most prominent antigen group in the field of tumor immunology, stem cell expansion and their correlation with cancer and other useful applications. Presently, characterizing five major CTAs, viz., PP1γ2, CABYR, SAS1B, POTEE and Ecat1; where the expression of PP1γ2 & CABYR have been explored in cervical cancer patient samples. This research further relates to target tumour cells specifically which express these particular proteins and will be helpful to develop a novel diagnostic strategy to detect early stages of cancer.

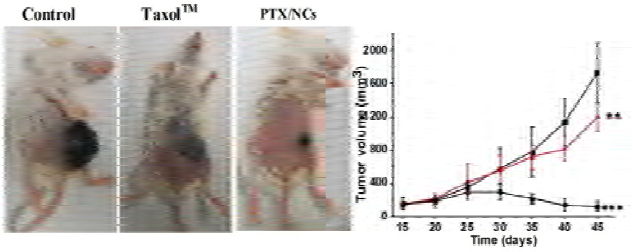
5.1.8 Drug Formulations

5.1.8.1 Docetaxel nanocrystals: Therapeutic implications of physical state morphs

Taxotere®, a marketed formulation of the anti-cancer drug Docetaxel (DTX) is not free of toxicity. To improve the safety profile of DTX, nanocrystals (DTX-NCs) were prepared by high pressure homogenization (HPH) using a pharmaceutically-acceptable stabilizer. DTX-NCs displayed higher *in vitro* efficacy, arrest of cancer cells in the G2/M phase of the cell cycle and potential to induce programmed cell death (apoptosis) in MCF-7 breast cancer cells when compared to Taxotere® and free DTX. DTX-NCs did not lyse red blood cells as extensively as the free drug or Taxotere® and were safer than the marketed formulation when studied *in vivo* for toxicity in mice. DTX-NCs could be a viable alternative to commercial formulation for treatment of breast cancer. ***[J Biomed Nanotechnol. 2015. 11(10), 1747-63]***

5.1.8.2 Pluronic-g-Cationic polyelectrolyte as functional stabilizer for nanocrystals: Impact on Paclitaxel oral bioavailability and tumor growth

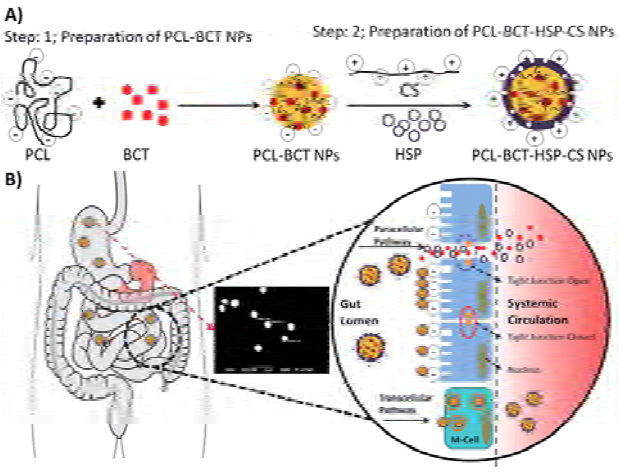
Paclitaxel (PTX) is a potent anticancer drug which suffers limitations of extremely low oral bioavailability due to low solubility, rapid metabolism and efflux by P-gp transporters. A novel pluronic-grafted chitosan (Pl-g-CH) copolymer was synthesized and employed as a functional stabilizer for PTX nanocrystals (NCs). NCs of particle size ~200 nm and zeta potential of (+) 40 mV generated greater accumulation of PTX inside Caco-2 cells than Taxol™ and drug efflux by P-gp was inhibited by Pl-g-CH.A significant decrease in Trans Epithelial Electrical Resistance



(TEER) of Caco-2 cell monolayers was observed with NCs as well as with free PI-g-CH added with Taxol™ compared to only Taxol™. This finding supports our view that the stabilizer helps in reversible opening of tight junctions between cells to allow paracellular transport of drug. NCs resulted in 12.6-fold improvement in relative bioavailability, efficacy against B16 F10 murine melanoma also improved, with significant reduction in tumor growth compared to Taxol™ and control. Nanocrystals with functional stabilizers are a promising approach for oral delivery of anticancer drugs that are P-gp substrates. ***[Acta Biomaterialia 26, 169-183 (2015)]***

5.1.8.3 Polycaprolactone-Bicalutamide-Chitosan-Hesperetin nanoparticles and self-emulsifying delivery systems

Nanoparticles were optimized and characterized for physical parameters *In vitro* activities of bicalutamide, hesperetin, and PCL-BCT-HSP-CS nanoparticles were assessed against androgen independent PC-3 cancer cell lines. Cytotoxicity cell cycle analysis, apoptosis, mitochondrial membrane potential and cell uptake were studied. Oral bioavailability and drug distribution of bicalutamide and hesperetin in nanoparticles were compared with equivalent oral doses of the drugs in aqueous suspension at 20mg/kg. Liver function (SGPT) and kidney function (serum creatinine and urea) were assessed after a single oral dose of the self-emulsifying system at 20mg/kg for a period of 14 days. ***[RSC Advances, 2016, 6, 5925-5935]***



5.2 Basic Research

5.2.1 Proteasome inhibition mediates p53 reactivation and anti-cancer activity of 6-gingerol in cervical cancer cells.

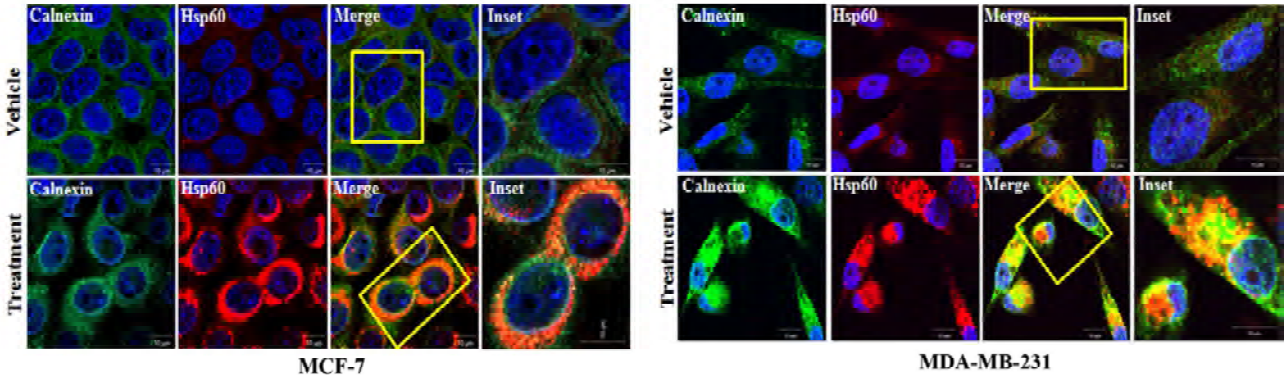
Human papilloma virus (HPV) expressing E6 and E7 oncoproteins, is known to inactivate the tumor suppressor p53 through proteasomal degradation in cervical cancers. Therefore, use of small molecules for inhibition of proteasome function and induction of p53 reactivation is a promising strategy for induction of apoptosis in cervical cancer cells. The polyphenolic alkanone, 6-Gingerol (6G), present in the pungent extracts of ginger (*Zingiber officinale* Roscoe) has shown potent anti-tumorigenic and pro-apoptotic activities against a variety of cancers. In this study, explored the molecular mechanism of action of 6G in human cervical cancer cells *in vitro* and *in vivo*. 6G potently inhibited proliferation of the HPV positive cervical cancer cells. 6G was found to: (i) inhibit the chymotrypsin activity of proteasomes, (ii) induce reactivation of p53, (iii) increase levels of p21, (iv) induce DNA damage and G2/M cell cycle arrest, (v) alter expression levels of p53-associated apoptotic markers like, cleaved caspase-3 and PARP, and (vi) potentiate the cytotoxicity of cisplatin. 6G treatment induced significant reduction of tumor volume, tumor weight, proteasome inhibition and p53 accumulation in HeLa xenograft tumor cells *in vivo*. The 6G treatment was devoid of toxic effects as it did not affect body weights, hematological and osteogenic parameters. Taken together, data underscores the therapeutic and chemosensitizing effects of 6G in the management and treatment of cervical cancer. ***[Oncotarget. 2015 Dec 22;6(41):43310-25].***

5.2.2 Proteomic discovery of MNT as a novel interacting partner of E3 ubiquitin ligase E6AP and a key mediator of myeloid differentiation-

Perturbed stability of regulatory proteins is a major cause of transformations leading to cancer, including several leukemia subtypes. In a bid to define role of E6-associated protein (E6AP) in myeloid leukemia pathogenesis, using 2DE based proteomics approach we identified MAX binding protein MNT as a protein interacting with E6AP. MNT is a member of the Myc/Max/Mad network of transcription factor that regulates cell proliferation, differentiation, cellular transformation and tumorigenesis. Wild-type E6AP promoted proteasome dependent degradation of MNT, while catalytically inactive E6AP having cysteine replaced with alanine at amino-acid 843 position (E6APC843A) rather stabilized it. Further, these proteins physically associated with each other both in non-myeloid (HEK293T) and myeloid cells. MNT overexpression induced G0-G1 growth arrest and promoted myeloid differentiation while its knockdown mitigated even ATRA induced differentiation suggesting MNT to be crucial for myeloid differentiation. Further showed that ATRA inhibited E6AP and stabilized MNT expression by protecting it from E6AP mediated ubiquitin-proteasome degradation. Notably, E6AP knockdown in HL60 cells restored MNT expression and promoted myeloid differentiation. Taken together, these data demonstrated that E6AP negatively regulates granulocytic differentiation by targeting MNT for degradation which is required for growth arrest and subsequent myeloid differentiation by various differentiation inducing agents. Thus, targeting E6AP or enhancing expression of MNT can have therapeutic implications in rescuing myeloid differentiation in leukemia and other cancers where MNT is a potential transcriptional repressor. ***[Oncotarget 2015, doi: 10.18632/oncotarget.6156]***

5.2.3 Anti-breast tumor activity of Eclipta extract *in-vitro* and *in-vivo*: novel evidence of endoplasmic reticulum specific localization of Hsp60 during apoptosis.

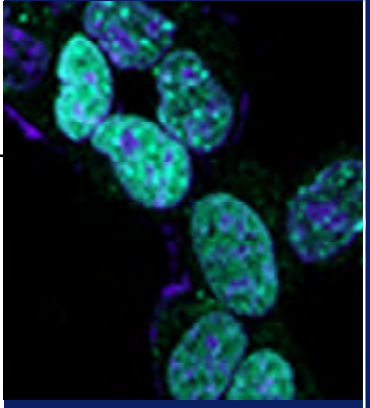
Major challenges for current therapeutic strategies against breast cancer are associated with drug-induced toxicities. Considering the immense potential of bioactive phytochemicals to deliver non-toxic, efficient anti-cancer therapeutics, we performed bio-guided fractionation of *Eclipta alba* extract and discovered that particularly the chloroform fraction of *Eclipta*



alba (CFEA) is selectively inducing cytotoxicity to breast cancer cells over non-tumorigenic breast epithelial cells. Unbiased mechanistic hunt revealed that CFEA specifically activates the intrinsic apoptotic pathway by disrupting the mitochondrial membrane potential, upregulating Hsp60 and downregulating the expression of anti-apoptotic protein XIAP. By utilizing Hsp60 specific siRNA, identified a novel pro-apoptotic role of Hsp60 and uncovered that following CFEA treatment, upregulated Hsp60 is localized in the endoplasmic reticulum (ER). This is the first evidence of ER specific localization of Hsp60 during cancer cell apoptosis. Further, our LC-MS approach identified that luteolin is mainly attributed for its anti-cancer activities. Moreover, oral administration of CFEA not only offers potential anti-breast cancer effects *in-vivo* but also mitigates tumor induced hepato-renal toxicity. Together, our studies offer novel mechanistic insight into the CFEA mediated inhibition of breast cancer and may potentially open up new avenues for further translational research. ***[Scientific Reports 2015, 17; 5:18457. doi: 10.1038/srep18457]***

5.2.4 Centchroman altered the expressions of tumor-related genes through active chromatin modifications in mammary cancer.

Centchroman (CC), a female oral contraceptive, has been shown to possess breast anti-cancer activities. Recently, we have shown CC-mediated antimetastatic effect through reversal of epithelial-to-mesenchymal transition (EMT) in breast cancer. The loss of tumor suppressor genes (TSGs) has been shown to promote EMT in breast cancer. Therefore, in the present study, we investigated the effect of CC-treatment on the expression of tumor-related genes including both tumor suppressor- and tumor promoter genes in breast cancer. CC treatment resulted in G_0 / G_1 phase cell cycle arrest in human breast cancer MDA-MB-231, SK-BR-3, and ZR-75-1 cells with the concomitant induction of TSGs such as $p21^{WAF1/CIP1}$, $p16^{INK4a}$, and $p27^{Kip1}$. In addition, CC treatment also resulted in the downregulation of tumor promoter gene, human telomerase reverse transcriptase (hTERT). The induction of TSGs and downregulation of hTERT was found to be correlated with decreased expression levels of histone deacetylases (HDACs) and DNA methyltransferases (DNMTs). Further, mechanistic studies revealed CC-induced global DNA demethylation and alterations in the enrichment of chromatin modification markers at the promoters of p21 and hTERT. These *in vitro* results were corroborated with *in vivo* findings in 4T1-syngeneic mouse model, where CC-treatment resulted in tumor growth reduction accompanied with the induction of TSGs and alterations in the expression levels of HDACs, DNMT1, and histone modification markers. Overall, our findings suggest that CC-treatment induces the expression of TSGs and downregulates hTERT through histone modifications and DNA methylation changes. Therefore, CC could be further developed into a promising drug candidate against breast cancer. ***[Int J Biochem Cell Biol. 2015 Oct 14. doi: 10.1002/mc.22424]***



SAFETY AND CLINICAL DEVELOPMENT

6

The report embodies the studies conducted on CDRI drug candidate molecules for IND enabling at Pharmaceutics, Pharmacokinetic & Metabolism, Pharmacology, Toxicology and Clinical and Experimental Medicine divisions.

6.1 Pharmaceutics
6.2 Pharmacokinetics & Metabolism
6.3 Regulatory Toxicology
6.4 Clinical & Experimental Medicine

Translational Research Team
Chairperson:
Dr Madhu Dikshit
Members:
Dr Rakesh Maurya, Dr Ashim Ghatak, Dr AK Dwivedi, Dr Jawahar Lal, Dr SK Rath, Dr Amit Misra, Dr Sripathi Rao Kulkarni and Mr Naseem Siddiqui,

6.1 Pharmaceutics

6.1.1 *Pharmaceutical analysis*

Comprehensive pharmaceutical analysis of 72 samples of drugs/drug candidates was conducted during the reporting period with respect to purity and stability of synthetic compounds, plant extracts and industrial production batches. The average sample turnover time this year was 9.2 days, compared to 9.5 days in the previous year.

In addition, >2000 samples of drug content, drug release, stability and impurity profiling were analyzed as part of various formulation development exercises. New HPLC Methods developed for compounds S-012-1332, S-012-1785, S-013-1593, S-013-1304, S-013-1311, S-007-1499, S-015-0755, S-015-0756, S-014-1581, S-011-1559, S-011-1992, S-011-2111, S-010-1255, S-011-1992, S011-1793, its phosphate salt, and its optical isomer S012-0585.

6.1.2 Preparation of reference standards (MIST Project)

Preparation and analytical studies on reference materials for Verapamil hydrochloride, Curcumin, Aspirin were prepared and submitted to CSIR-NPL, New Delhi. Participated in proficiency testing on reference materials for Centchroman, Primaquine, Atenolol.

6.1.3 Pre-formulation and stability studies

Pre-formulation studies including validated HPLC method development as per ICH guidelines for CDRI compounds S-012-1332, S-012-1785, S-013-1593, S-013-1304, S-013-1311, S-007-1499, S-015-0755, S-015-0756, S-014-1581, S-011-1559, S-011-1992, S-011-2111, S-010-1255, S-011-1992 was were carried out.

6.1.4 Inhalable particles containing anti-tuberculosis agents

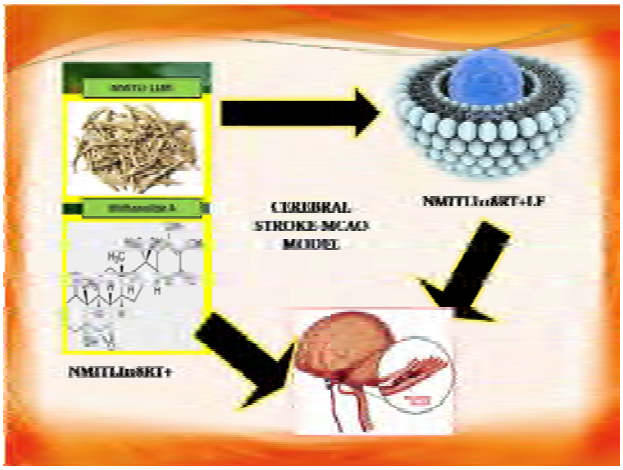
A meeting of an Expert Group constituted by Director, CSIR-CDRI and Director-General ICMR and Secretary Department of Health, Govt. of India met and evaluated the status of the formulation under development at CDRI. Additional experiments were recommended to estimate efficacy and early bactericidal activity of the formulation in comparison to all four drugs used in the DOTS regimen of the Revised National Tuberculosis Control Program. These are underway in collaboration with the National JALMA Institute of Leprosy and Other Mycobacterial Diseases, Agra.

6.1.5 Herbal medicament

Bio-analytical method of HM based on two major markers compounds ar-turmerone and α,β-turmerone was developed. Pharmacokinetic parameters based on two marker compounds ar-turmerone and α,β-turmerone after HM administration in mice were determined. **[Journal of Functional Foods, 2015, 16: 152-63.]**

6.1.6 NMITLI118RT+ Project

Vesicular systems containing NMITLI118RT+ were prepared and characterized on the basis of drug content, in vitro dissolution, compatibility studies based on FT-IR and DSC-TGA, morphological studies based on SEM and determination of physical stability by zeta potential measurements. In vivo activity to determine their neuroprotective potential against cerebral ischemia in rats was determined. **[Drug Delivery, 1-12, 2015.]**



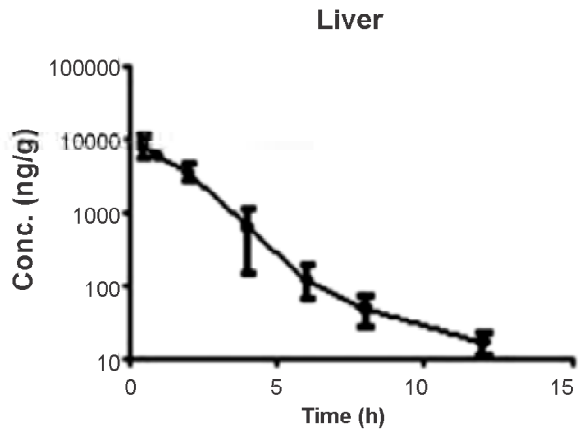
6.2 Pharmacokinetics & Metabolism

6.2.1 Pharmacokinetic studies of Ashwagandha [NMITLI-118R(T+)]

The finger printing study was performed to investigate the peaks which were detected in NMITLI-118R(T+) extract and in NMITLI-118R(T+) treated rat plasma. NMITLI-118R extract was suspended in 0.5% w/v sodium carboxy methyl cellulose (SCMC) suspension and was administered orally at the dose of 50 mg/kg and 100 mg/kg to rat. The blood samples were collected after 15 min post dosing using light ether anesthesia from the retro-orbital plexus of rats using heparin sodium as anticoagulant. All the samples were stored at -20°C. Blank rat plasma treated as control. Eight compounds were detected in NMITLI-118R(T+) extract and NMITLI-118R(T+) treated plasma but not in blank plasma. This confirms oral absorption of NMITLI-118R(T+) extract. Withanolide-A was not detectable in rat plasma treated with extract at 50 or 100 mg/kg oral dose. But at 4 g/kg oral dose Withanolide-A was detected upto the desired time points and a complete PK profile with bioavailability was calculated using Phoenix WinNonlin software. The oral bioavailability was 5.08% in rats.

6.2.2. Pharmacokinetics, tissue distribution and excretion studies of a novel antiplatelet agent S-007-867 in rats

S-007-867 is a promising novel antiplatelet agent with better efficacy and lesser bleeding risk than existing agents. A simple and robust ultra-fast liquid chromatography-tandem mass spectrometry (UFLC-MS/MS) bioanalytical method was used to determine S-007-867 in various matrices. Following oral administration, the compound was quickly dispersed in the various tissues and peak concentration levels were achieved within 0.5–1 h. Overall, exposure of drug, i.e., AUC in different tissues was found in the order of small intestine >liver >heart >spleen > lungs >kidney >brain. The total recoveries of the S-007-867 within 96 h were 3.36% in urine and feces. This might be due to a first-pass effect by the liver and intestine as most of the drug was eliminated as its metabolite. [***Drug testing and analysis 2015; DOI: 10.1002/dta.1811***]

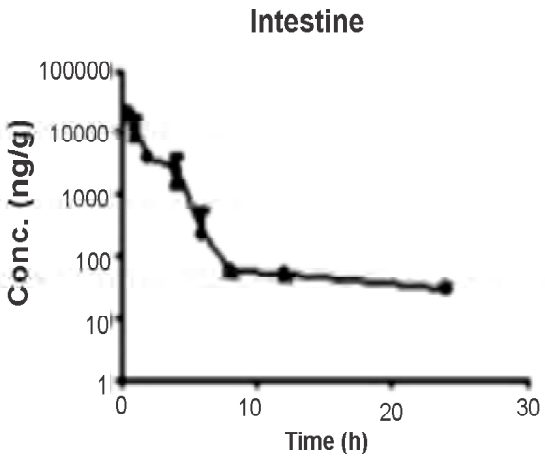


6.2.3 *In vitro* and *in vivo* pharmacokinetic studies of S-011-1793 and its Phosphate salt

To evaluate the stability of the compound S-011-1793 in different conditions encountered after oral administration, the *in vitro* SGF, SIF, metabolic stability and plasma stability studies were performed. The compound was found to be more than 97% stable in both acidic (SGF) and basic (SIF) conditions up to 2 h. The half-life of S-011-1793 was found to be 15.635±2.28 min. The compound was found to be high clearance compound. The plasma stability of S-011-1793 was found to be 96.13% after 2h. The oral bioavailability of S-011-1793 and its phosphate salt were investigated in male *Sprague Dawley* rats. The peak plasma concentrations of the free base are increased significantly with the salt form due to improved absorption from the intestine The double peak phenomenon observed may be due to so absorption from multiples sites and entero-hepatic recirculation. The oral bio-availabilities (%F) of S-011-1793 and its salt form are found to be 25.31% and 64.47%, respectively, indicating that the salt form has better pharmacokinetic properties than its free base.

6.2.4 Pharmacokinetics and tissue distribution study of novel potent antiplatelet agent S-007-867 in mice

The pharmacokinetics and tissue distribution of S-007-867 was characterized in a mouse model. The chromatographic separation was performed on Waters Symmetry Shield C18 column (150 × 4.6 mm, 5 µm) using methanol and ammonium acetate buffer. S-007-867 was rapidly absorbed and distributed to various tissues. Following single oral administration of S-007-867 in the mouse, the concentration was in the order of $C_{intestine} > C_{liver} > C_{kidney} > C_{heart} > C_{spleen} > C_{lungs} > C_{brain}$. Tissue to plasma area under the plasma curve ratio suggested that the maximum amount of drug was found in the intestine and liver. Half-life of S-007-867 was found longer in the heart (8.08 h), spleen



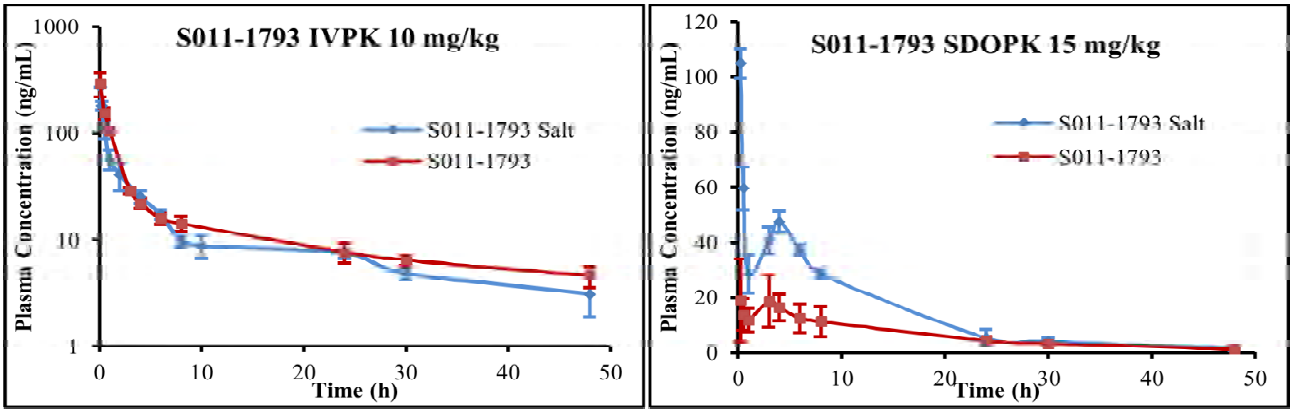


Fig.: Plasma concentration-time profile of S-011-1793 free base and phosphate salt upon i.v. and oral administration. Data represented as mean±S.D. (n=4)

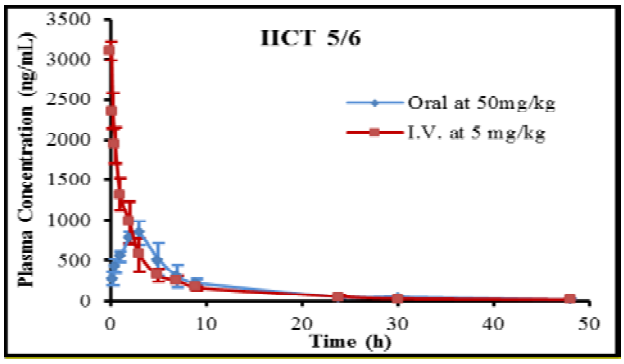
(~7.94 h) and kidney (~15.41 h) as compared with other tissues. The preclinical pharmacokinetics and tissue distribution data obtained using this LC-MS/MS method is expected to assist the future clinical investigations of S-007-867 as a promising anti-platelet agent. ***[Xenobiotica 2015; DOI: 10.3109/00498254.2014.994053]***

6.2.5 Metabolic stability, plasma protein binding and pharmacokinetic of *E*- and *Z*-guggulsterone in rats

In *in vitro* metabolic stability studies of guggulsterone, which is a racemic mixture of two stereoisomers (*E*- and *Z*-), *in vitro* intrinsic clearance (CL_{int}) was found to be 33.34 ± 0.51 and 39.23 ± 8.12 ì L/min/mg protein in rat liver microsomes for *E*- and *Z*- isomers, respectively. Plasma protein binding, as determined by equilibrium dialysis method, showed that both isomers were highly bound to rat plasma proteins (>95% bound). In *in vivo* pharmacokinetic studies in male *Sprague Dawley* rats, plasma concentration of *E*- and *Z*- isomers decreased rapidly following oral administration and were eliminated from systemic circulation with a terminal half-life of 0.63 ± 0.25 and 0.74 ± 0.35 h, respectively. The clearance (CL) was found for *E*- isomer 2.79 ± 0.73 compared to 3.01 ± 0.61 L/h/kg for *Z*- isomer indicating no significant difference (student *t* test; $p < 0.05$) in their elimination. The pharmacokinetics of both isomers was characterized by extensive hepatic metabolism as seen with rat liver microsomes with high clearance and low systemic availability in rats. In brief, first-pass metabolism seems to be responsible factor for low bioavailability of guggulsterone ***[Drug testing and analysis 2015; DOI:10.1002/dta.1885]***

6.2.6 Oral pharmacokinetic study of IICT 5/6

Intravenous and oral pharmacokinetic studies were performed at 5 and 50 mg/kg doses, respectively, in male *Sprague Dawley* rats. Mean plasma concentration-time profile upon intravenous and oral administration of IICT 5/6 is shown in the figure. The oral bioavailability (%F) was found to be 8.81%.



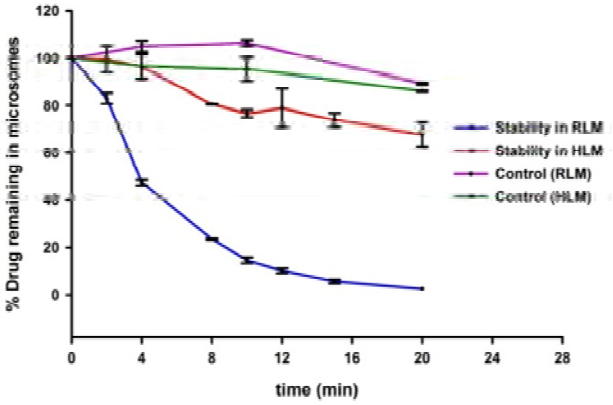
Intravenous and oral pharmacokinetic profiles of IICT 5/6 at 5 mg/kg and 50 mg/kg, respectively, in male *Sprague Dawley* rats (n=4, each)

6.2.7 PK studies of antithrombotic lead candidate S002-333 and isomers S004-1032 & S007-1558

S002-333 [(2-(40-methoxy-benzenesulfonyl)-2,3,4,9-tetrahydro-1H-pyrido (3,4-b) indole-3-carboxylic acid amide)] is a novel and potent antithrombotic active agent. The present work investigates the pharmacokinetics, bioavailability, dose proportionality and permeability of the racemate, S002-333 in male New Zealand White (NZW) rabbits. Rabbits were administered single intravenous (i.v.) (2 mg/kg) and three oral doses of 10, 20 and 40 mg/kg of S002-333, respectively, at different occasions to evaluate dose proportionality. Serial blood samples were collected and analyzed by a liquid chromatography tandem mass spectrometry (LC-MS/MS) method. Since S002-333 is a racemate consisting of S004-1032 (R) and S007-1558 (S), same samples were analyzed using a chiralcel column so as to evaluate the respective enantiomers. The peak plasma concentration, after oral administration, occurred at 10 h post-dose. The clearance (CL) and volume of distribution (V_d) after i.v. dose were found to be 3.05 ± 0.09 l/h/kg and 6.73 ± 1.16 l/kg, respectively. The absolute oral bioavailability of S002-333 was 16.32%, whereas it was 6.62 and 5.90% for R- and S-enantiomers, respectively. The absolute bioavailability of 10, 20 and 40 mg/kg doses were found to be 27.91, 14.39 and 16.91%, respectively. The PAMPA (parallel artificial membrane permeability assay) assay shows that S002-333 has low-passive permeability at gastric and intestinal environment. In conclusion, S002-333 has low-passive permeability, low CL and large V_d. The R-enantiomer has a ''slightly'' greater bioavailability than the S-enantiomer. ***[Xenobiotica 2015; 45(11):1016-23]***

6.2.8 Pharmacokinetics of anti-colon cancer compound S-007-1235

LC-MS/MS method (LLOQ, 0.25 ng/mL; linearity, 0.25-400 ng/mL and recovery >95%) for quantitative estimation of S-007-1235 was developed and applied for the *in vitro* and *in vivo* pharmacokinetic studies. It is slightly soluble in water and stable in simulated gastric fluid. With male *Sprague Dawley* rat's liver microsomes, it is rapidly metabolized (*in vitro* half-life, 3.5 ± 0.3 min) with intrinsic and hepatic clearance of 0.39 ± 0.02 mL/min*mg and 954.9 ± 72.2 mL/min*kg of protein, respectively. With human liver microsomes, it showed higher *in vitro* half-life, lower intrinsic and hepatic clearance. Following 10 mg/kg intravenous administration in female Balb/c mice, it showed low systemic availability (AUC, 2926 ng h/mL), large volume of distribution (41.2 L/kg) and high clearance (3.4 L/h/kg) after 10 mg/kg intravenous administration in female BALB/c mice. The *in vitro* and *in vivo* studies showed five putative metabolites.



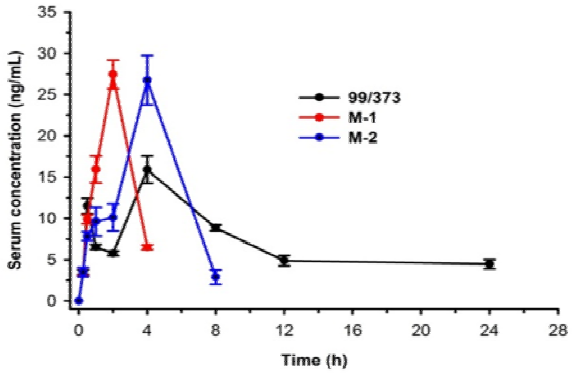
6.2.9 Pharmacokinetic study of anti-obesity compound S-013-1593

LC-MS/MS method (LLOQ, 0.1 ng/mL; linearity, 0.25-100 ng/mL and recovery, >50%) for quantitative estimation of S-013-1593 was developed and applied for the following *in vitro* studies. It is slightly soluble in simulated gastric and intestinal fluids and tris buffer and was found stable in simulated gastric and intestinal fluids and serum. S-013-1593 is rapidly metabolized (*in vitro*

half-life, 7.2 ± 1.1 min) with intrinsic and hepatic clearance of 0.10 ± 0.02 mL/min*mg and 238.0 ± 36.9 mL/min*kg of protein, respectively. It has moderate plasma protein binding. The *in vitro* metabolism study indicated demethylated metabolite of the compound.

6.2.10 Pharmacokinetics of 99/373 in ovarectimized rats

LC-MS/MS method (LLOQ, 2 ng/mL; linearity, 2-200 ng/mL and recovery, >90%) for quantitative estimation of 99/373 was developed and then applied for its pharmacokinetic study in ovarectimized female *Sprague Dawley* rats. Following 10 mg/kg oral dose, the compound and two of its metabolites were detected in ovarectimized rats, which were below the quantitation limit in normal female rats. The C_{max} of 99/373 averaged to 15.9 ng/mL, whereas the metabolites showed approx. 2-time higher C_{max} but were monitored for 4 (M-1) and 8 h (M-2) only. The compound exhibited low systemic availability (AUC_{0-t}, 170.3 ± 16.6 ng h/mL) and high clearance (59.2 ± 6.0 L/h/kg).



6.3 Regulatory Toxicology

6.3.1 Systemic Toxicity studies

6.3.1.1 S007-1500: 10Days Dose range finding study in SD rat by oral route

Doses of 6.25, 12.50, 25mg/kg of compound **S-007-1500** body weight tested in SD Rat and found safe.

6.3.1.2 S-002-333: 10 Days repeat dose range finding study in rat by oral route

Doses of 150,300,600mg/kg of compound **S-002-333** body weight tested in SD Rat and found safe.

6.3.2 Genotoxicity studies

6.3.2.1 S-002-333

Mutagenicity evaluation of **S-002-333** by *Salmonella* reverse mutation assay (Ames Assay) Doses of S002-333 (10µg, 33µg, 100µg, 333µg&1000µg/plate) were tested using *Salmonella* tester strains: TA-97a, TA-98, TA-100& TA-102 in spot assay and found non mutagenic. The same concentrations were again tested by Plate Incorporation Assay with and without S9 mix. The compound was found to be non-mutagenic.

6.3.2.2 S-011-1793 Salt

Mutagenicity evaluation of S-011-1793 salt by Salmonella reverse mutation assay (Ames Assay) Doses of S-011-1793 (10µg, 33µg, 100µg, 333µg&1000µg/plate) were tested using Salmonella tester strains: TA-97a, TA-98, TA-100& TA-102 in spot assay and found non mutagenic but cytotoxic. The same concentrations were again tested by Plate Incorporation Assay with and without S9 mix. The compound was found to be non-mutagenic.

6.3.3 Reproductive toxicity studies

6.3.1. S-007-867

Male fertility study has been completed in CF strain rats using 80,160, 640 mg/kg body wt. of compound **S-007-867**. The sample is considered safe.

6.4 Clinical & Experimental Medicine

6.4.1 Clinical Trial Studies

6.4.1.1 CDR-134-D123 (Anti-diabetic compound)

The fruit extract of plant *Xylocarpus granatum* were evaluated for antidiabetic activity. The clinical and preclinical information was compiled and sent to AYUSH for marketing approval. The information has been resubmitted for inclusion in Extra-Ayurvedic Pharmacopeia, Deptt. of AYUSH .

6.4.1.2 CDR-134-F194 (Anti-hyperglycaemic agent)

The preclinical studies were completed and the compound CDR134F194 was found to have good anti hyperglycemic activity. The Permission for Phase-I Clinical Trial studies of CDR134 F194 was accorded by Drugs Controller General of India. The formulation for clinical trial is under development under GMP certified conditions.

6.4.1.3 CDRI compound 97/78 (Anti-malarial agent)

The regulatory approval from DCGI for the phase I clinical trials consisting of single dose study and multiple dose study was obtained. The single dose trial was completed and formulation is under preparation for multiple dose studies under GMP conditions. The discussions for possible new industry partner and support of further clinical drug development are going on.

6.4.1.4 Compound 99/373 (Anti-osteoporotic agent)

The preclinical models of osteoporosis showed excellent activity for compound 99/373. The preclinical studies were completed and permission for phase I clinical trial was obtained. The discussions for possible industry partner and support of further clinical drug development are going on.

NOTES

TECHNICAL SERVICES AND FACILITIES

1. Business Development

The Institute sustained to explore the business development opportunities by establishing liaison with national and international organizations and industries in order to have more public–private partnership at early stage of the development and to have collaborations for new leads. The major new contracts/assignments signed/undertaken by the Institute during reporting period are as follows:

Details	Client/Collaborator	Signing Date
License Agreements		
CSIR-CDRI Plant Extract A-4744	Pharmanza Herbal Pvt. Ltd., Gujarat	10.04.2015
Sponsored Project Agreements		
Synthetic microbicidal vaginal spermicides: design, synthesis and biological evaluation	HLL Lifecare Limited Thiruvananthpuram	13.05.2015
In vitro studies of 10 leads of NIF for anti-malarial evaluation	National Innovation Foundation-India (NIF), Ahmedabad, Gujarat	04.06.2015
In vivo studies of 6 leads of NIF for anti-malarial evaluation	National Innovation Foundation-India (NIF), Ahmedabad, Gujarat	04.06.2015
Validation of two herbal leads from NIF for three doses each in SHR using Telemetric system	National Innovation Foundation-India (NIF), Ahmedabad, Gujarat	02.09.2015
Memorandum of Understanding signed for joint R&D		
Study of antioxidant and molecular mechanism for anti HIV activities of some plant products	University of Allahabad, Allahabad	04.02.2015
Dissecting role of critical miRNA in breast cancer in Indian subjects	King Georges Medical University, Lucknow	23.02.2015
IP Search and Analysis Services	CSIR-URDIP, Pune	19.03.2015
Habitat ecology and species diversity of Cordyceps in district Pithoragarh, Central Himalaya	Department of Zoology, LSM Government Postgraduate College, Pithoragarh	21.04.2015
Immunological characterization of recombinant culture filtrate proteins from ESAT-6 family of *Mycobacterium tuberculosis* H37Rv	King George Medical University, Lucknow	01.05.2015
Research & Co-development Agreement on MTB Diagnostic Kit	Nextec Lifesciences Pvt. Ltd., Gomti Nagar, Lucknow	28.05.2015
Evaluation of a carbazol alkaloid molecule 'Mahanine' isolated from natural sources against experimental visceral leishmaniasis	CSIR-IICB, Kolkata	01.09.2015
The effect of *Aloe Vera* on human gingival fibroblast (hGF) – an *in vitro* study	BBD College of Dental Sciences, BBD University, Lucknow	15.10.2015
Evaluation of morphological and biochemical changes in human gingival fibroblast (hGF) treated with *Acacia nilotica*	BBD College of Dental Sciences, BBD University, Lucknow	15.10.2015
Memorandum of Agreements		
Tissue specific transcripts and cardical glycoside profiling of calotropis plant after different biotic and abiotic elicitor treatment	DBT, New Delhi	30.04.2015
Identification and functional characterization of novel microRNA candidates altered by phytoestrogen medicarpin: Role in the pathogenesis of osteoporosis	DBT, New Delhi	06.07.2015
miRNA in the regulation of Scierostin, A therapeutic approach for osteoporosis	DBT, New Delhi	12.08.2015
Mechanistic studies on napthaquinone based anticancer agents in breast cancer	DBT, New Delhi	14.08.2015
Secrecy Agreements		
Standardized fraction of Plant 4655 (K09) as antidyslipidemic and antiobesity properties	Charak Pharma Pvt. Ltd. Mumbai	02.02.2015
Eutectic mixture of zolmitriptan	Dr. Reddy's Laboratories Ltd., Hyderabad	17.02.2015

Details	Client/Collaborator	Signing Date
Engaging CSIR-CDRI for scientific advice on a project related to bone health disorders including osteoporosis, covering the pathology, animal models, clinical and preclinical end points, translational aspects and treatments	Glenmark Pharmaceuticals Limited, Mumbai	20.07.2015
99/373 as anti-osteoporotic (antiresorptive) compound, Centchroman (INN: Ormeloxifene,) for Breast cancer, Kaempferol for enhancing osteogenic action.	Akums Drugs & Pharmaceuticals Limited, New Delhi	06.08.2015
Evaluation of data for the DRL samples	Dr. Reddy's Laboratories Ltd., Hyderabad	27.08.2015
Develop plant metabolite database for storing, searching, processing and retrieval of information in web application under the project metabolic profiling	Softgen Technologies (P) Ltd., Lucknow	16.10.2015
CSIR-CDRI Synthetic compound 80/574 as antidyslipidemic especially in dyslipidemia of diabetes.	USV Limited, Mumbai	15.10.2015
Evaluation of hit/lead/candidate drugs/molecules and utilizing the R&D facilities	Dr. Reddy's Institute of Life Sciences, Hyderabad	10.12.2015
Evaluation of data on CDRI candidates drugs S007-867, S002-333, S007-1235	Sun Pharma Advanced Research Company Ltd, Mumbai	15.12.2015
Ligand and structure-based virtual screening of designed and synthesized chemical library against DNMT1	TCG Life Sciences, West Bengal	18.01.2016
Consultancy Agreement		
Bone disorders and osteoporosis	Glenmark Pharmaceuticals Limited, Mumbai	04.12.2015
Material Transfer Agreement		
MLOY4 Cell line	The University of Missouri, Kansas City, Department of Oral Biology, Kansas, USA	16.01.2015
Transfected cell lines MDCK- ABCB1 (MDR1), MDCKABCG2 (BCRP), MDCK-ABCC2 (MRP2)	The Netherlands Cancer Institute, Amsterdam	12.02.2015
34686: wt dynamic 2 pEGFP,41392: pLEX_307, 16398: BJ5183 cells, 16399: AdEasier-1 cells (strains) 16400: pAdEasy-1, 16403:pShuttle-CMV 16405:pAdTrack-CMV	Addgene, USA	25.02.2015
Polyclonal antibodies developed against MAPK1 of *L. donovani* in rabbit	Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany	26.02.2015
Polyclonal antibodies developed against MAPK1 of *L. donovani* in rabbit	Institute of Tropical Medicine, Belgium	03.03.2015
Plasmids for Androgen Receptor GRE2/ARE2 elbLuc, pCR3.1AR, pCR3.1	Baylor College of Medicine, Houston, TX, USA	01.05.2015
Recombinant plasmids cloned with pGEX6P2-MDM2 (17-125) (Plasmid #62063), pcDNA3 MDM2 WT (Plasmid #16233), pGEX-EZH2 (Plasmid #28060), pSMP-EZH2_1 (Plasmid #36387), pCMVHA hEZH2 (Plasmid #24230), hE-cadherin-pcDNA3 (Plasmid #45769), pLKO.1 puro shRNA E-cadherin (Plasmid #18801), Bmi1-overexpression (Plasmid #21577), Bmi1 shRNA1 (Plasmid #21576), pcDNA3-HA-TRAIL-R1 (Plasmid #61382), pcDNA3-TRAIL-R2 (Plasmid #61383), pGL2-Full (Plasmid #16012)	Addgene, 1 Kendall Sq. Ste. B7102, Cambridge, MA 02139, US	25.06.2015
Recombinant plasmids cloned with pEGFP-Akt (Plasmid #39531), 1477 pcDNA3 flag HA Akt1 (Plasmid #9021), GSK3 beta pGEX (Plasmid #15898), HA GSK3 beta K85A pcDNA3 (Plasmid #14755), pcDNA3-Flag mTOR wt (Plasmid #26603), HA Raptor (Plasmid #8513), myc-Rictor corrected (Plasmid #11367), HA GST p85 S6K1 pRK5 (Plasmid #8466), pRK5 HA-GST-Presc-mAkt1 (wt), HA GST PreScission p70 S6K1 (Plasmid #15511)	Addgene, 1 Kendall Sq. Ste. B7102, Cambridge, MA 02139, US	25.06.2015

Details	Client/Collaborator	Signing Date
Recombinant plasmids cloned flag-SIRT1(Plasmid#1791), Flag-SIRT1 H363Y(Plasmid#1792), pGEX-Skp2 (Plasmid#19946), pcMV5-CBFbeta (Plasmid#12427), pHA-PUMA (Plasmid#16588), Flag p21 WT (Plasmid#16240), pMCSF-R-luc (Plasmid#12420), pGEX Stat3SH2 (Plasmid#46513) for expression in mammalian cells.	Addgene, USA	22.07.2015
Plasmids (57818, 57822, 57827, 50661, 8858, 11424, 24588)	Addgene, USA	13.08.2015
Plasmids (18015, 49531, 21737) from Addgene	Addgene, USA	01.09.2015
Microbes (group 2) for routine antimicrobial testing	BEI, ATCC, USA	09.09.2015
Brugia malayi trehalose-6-phosphate phosphatase clone (Bm-TPP) in expression vector pET-28a	Eskitis Institute, Griffith University, USA	20.10.2015
pST-K, pST-KT,pST-2K and pJAK2.D	Addgene, USA	10.12.2015
Adult Brugia malayi parasites(sub-periodic strain)	National Centre for Cell Science, Pune	01.12.2015
50470-pAAGFAP-HAhM3D(Gq)IRESmCitrine, 5047-pAAVGFAP-HAhM4D(Gi)IRESmCitrine, 50456-pAAVh-SynDIO-HArM3D(Gs) IRESmCitrine, 50457-pAAV-hSynDIO-EGFP, 50473-pAAV-GFAP-EGFP, 50479-pAAV-GFAP-hM4D(Gi)mcherry, 65418-pAAV-CaMKIIa-HAKORDIRESmCitrine, 66402-HRH3Tango, 45447-pCIEGFPNR2bwt, 66403-HRH4Tango	Addgene, USA	14.01.2016

2. S&T Management Activities

The S&T Management Unit is the nucleus of multifarious management and coordination activities at CSIR-CDRI including Project, IPR, HRD & HRM, Website & Intranet, ISTAG, RTI, Press & Media, Technical Information, Societal activities, Event Organizations, PRO and other miscellaneous activities. List of assignments undertaken during the reporting period are as follows:

PME Activities

- Preparation of Translational Research Plan Document
- Mapping and Monitoring outcome driven deliverables document on Dehradun Declaration
- Vetting of project proposals and processing for approval of the competent authorities
- Revised Estimates & Budget Estimates
- Monitoring of funds and day to day clearance of indent through the Real Time Budget Monitoring Tool raised by the scientists & other staff members in various projects.
- Incorporation of newly joined staff and new sanctioned projects in SnP software
- Co-ordination with Finance & Accounts and Stores & Purchase
- Coordination with Planning & Performance Division, CSIR
- Monitoring of R&D activities under the leadership of Director
- Maintenance of all kind of project folders and record keeping at central place
- Vetting of expenditure statements, utilization certificates and processing for approval of the competent authorities.
- R&D Highlights and Executive Summary for RC meeting
- Processing and obtaining, Security & Sensitivity clearance of the projects involving foreign agencies, from CSIR
- Digitized information management
- Information for ERPS
- Maintenance and updating the Real Time Budget Monitoring Tool in collaboration with Computer Centre to help the Project PI's and taskforce members in expenditure management.

IPR Management (Upto August 2015)

Implementation of Intellectual Property Management Policy to ensure timely completion of procedures for filing and grant of patents for the institute and their maintenance. The assignments undertaken during the reporting period are as follows:

- Protection of innovations arising from the institute's pursuits
- Coordination for filing and grant of Indian and foreign applications/patents with IPU, CSIR and IP Law attorneys
- Maintenance of Patents and Management of patent portfolio
- Recommendations for renewal of patents/ commercialization status
- Maintenance of information on IP system/surveillance
- Respond to queries on IP related issues

Human Resources Management & HRD Activities

As per the New Human Resources Management Policy which made a paradigm changes in human resource planning and its management, optimize the output and meet the current as well as future requirements of the Institute and ultimately enhance the productivity of individual.

- Execution of internal transfers of staff
- Background work for recruitment of Technical & Scientific Staff
- Nominations for training programs
- Processing of staff nominations for honours & awards and fellowships
- Processing of requests of staff and research fellows for participation in various fora (Conference/symposia/ seminar/workshop/training programmes)
- Advance Training Courses for Postgraduate Students and for the employees of R&D Institutions/ Pharmaceutical Industry/Government Laboratories, Academic Institutes etc.
- Faculty trainees from Industries and Academia
- IAS, INSA & NASI Summer Fellows

- Postgraduate Research Students training
- Training in Instrumentation (SAIF)
- Training in Laboratory Animal Science for Technical personnel
- Induction and motivation of post graduate students from across the country through arranging interactive lab visit programmes

Dissemination of Technical Information

- Maintaining and updating the CDRI Website and intranet
- Biological screening services for external users
- Respond to queries from various corners (Govt./non-Govt. agencies)
- Replies to Parliament and Audit queries
- Print and Electronic Media management
- Communication within and outside the institute
- Management of database on projects, patents, staff, research fellows, budget, ECF, awards, conferences / symposia /seminar / workshops etc.

Institutional Publications

- CSIR-CDRI Annual Report
- CSIR-CDRI Newsletters (two issues per year)
- CSIR-CDRI Monthly Reports
- CSIR-CDRI Advertisements
- Inputs for CSIR News and CSIR Annual Report

ISTAG

- Processing of foreign deputation proposals of scientists and other technical staff visiting abroad to attend Conferences, Meetings, Fellowships, Bilateral exchange programme and instruments trainings etc.
- Providing foreign deputation reports to the Head, ISTAD, CSIR of scientists visited abroad
- Arranging training programs for foreign candidates
- Coordination of distinguished foreign visitors/delegation at CSIR-CDRI
- International collaborative projects, Bilateral International cooperation programs

ERPS

- Co-ordinate and facilitated various groups for integration of the ERPS implementation at CSIR-CDRI

RTI

- Implementation of Right to Information Act-2005 in the institute for Scientific & Technical matters to promote transparency and accountability in the working of every public authority in India

Adoption of a Plant Scheme

- Continued Green CSIR-CDRI initiative by Plantation in the new premises

3. Sophisticated Analytical Instrument Facility

Sophisticated Analytical Instrument facility at CSIR-Central Drug Research Institute, Lucknow is more than 40 years old and is one of the first four such facilities set up by the Department of Science & Technology (DST), Government of India for fulfilling the following objectives:

- Provide facilities of sophisticated analytical instruments to CSIR-CDRI scientists and other users from academic institutes, R&D laboratories and industries to enable them to carry out measurements for R&D work.
- Acquire and develop capability for preventive maintenance and repair of sophisticated instruments and organize short term courses/workshops on the use and application of various instruments and analytical techniques.
- Development of new measurement/analytical techniques: Apart from providing routine analytical techniques/methods of analysis available on the instruments, efforts are made by the SAIF to develop new techniques/methods of analysis to put the instruments to their full use and offer them to the scientists for exploring new dimensions in research in various areas of science and technology.
- Train technicians for maintenance and operation of sophisticated instruments
- Apart from providing analytical services, SAIF is involved in R & D activity of the institute with several ongoing projects a large number of Ph.D. students.

Name of the facility	External Samples	Internal Samples	Total no of samples analyzed
Mass spectrometry	1151	33674	34825
NMR spectroscopy	1247	34012	35259
IR & UV-Vis spectroscopy	426	3785	4211
Flowcytometry	36	34501	34537
HPLC & OR	20	2558	2578
Micro Analysis	377	477	854
Electron Microscopy	165	2979	3144
Total	**3422**	**111986**	**115408**

4. Academic Affairs Unit

The unit serves as a centre for the management of research students (PAs/JRFs/SRFs/RAs) working in different departments of the institute. The activities carried out during the period include:

- Completion of pre-Ph.D. course work (Ist and IInd semester) under CSIR-CDRI Ph.D. program for JNU and AcSIR students (total 68) for the session Jan 2015
- Coordinated centralized admission of Junior Research fellows under JNU for CDRI-Ph.D. program through interview for the batch commencing January 2016
- Coordinated centralized admission of JRF/SRFs for registration under AcSIR for CDRI-PhD program through interview for the batches commencing August 2015
- Liaised with Jawaharlal Nehru University, New Delhi for timely registration, synopsis approval, panel of examiners approval, thesis submission, Ph.D. viva at CSIR-CDRI etc.
- Conducted viva voce exams of 59 students registered with JNU New Delhi and 14students registered with AcSIR at CSIR-CDRI (total-73)
- Coordinated with JNU, AcSIR and other universities for submission of ninety nine (99) Ph.D. thesis for the award of Ph.D. degree from respective universities
- Liaised with AcSIR-HQ for the registration of students working at CSIR-CDRI

- Comprehensive exams of two batches of year 2014 AcSIR students were held
- Screening and endorsement of post-doctoral application forms being submitted by Ph.D. students from outside CSIR-CDRI to Indian funding agencies
- Meeting of CSIR-CDRI-JNU academic council was organized at CSIR-CDRI
- Upgraded and Implemented new "Human Resource Management System" software dealing with the online registration of research students (JRFs/SRFs/PAs/RAs) with the help of Computer division
- Coordinated with AcSIR for submission of Ph.D. thesis and successful conduction of viva-voce examination of fourteen (14) student at CSIR-CDRI
- Formation and Implementation of DAC (Doctoral Advisory Committee) for JNU students of five academic years, 20010-2015
- Three meetings of CSIR-CDRI Academic Council were held to prepare guidelines for carrying out academic activities in the institute
- Coordinated centralized admission of Junior Research Fellows under JNU for Pre-Ph.D. program through interview for the batch commencing from spring 2016
- Formation of DAC (Doctoral Advisory Committee) for AcSIR students
- Formation of Comprehensive Examination Committee (CEC) for AcSIR students
- Coordinated AcSIR 800 course work of AcSIR students of 2013 batch
- Coordinated the nomination of annual day awards for students under five different categories of memorial awards for the year 2015 (Dr MM Dhar, Dr JM Khanna & Dr Swarn Nitya Anand Awards)
- Students were nominated for Eli-Lilly best thesis award for the year 2014-2015

5. National Laboratory Animal Facility

National Laboratory Animal Center (NLAC) of CSIR-CDRI being a national resource facility for supply of research animals breeds and maintains different species of laboratory animals required for use in approved biomedical research programs of the institute. During the reported period, this facility ensured supply of healthy and defined animals for in-house and extramural research projects. Besides, the center, within the regulatory provisions, also fulfilled the need of research animals and their tissues, organs, blood or sera samples demanded by other Government and corporate institutions for research purposes. The center maintained quarantined and tuberculin tested non-human primates (Rhesus monkeys) for experimental usage in CPCSEA approved research projects which were procured from Government recognized animal supplier. In the facility, stringent health monitoring procedures for experimental animals were conducted through employing various laboratory techniques including microbiological, parasitological (ecto- and endoparasites), pathological, radiological and tuberculin testing and post mortem investigations with a view to use healthy animals in research and generate reproducible and consistent research findings. Analysis of laboratory animal feed, animal feed trial studies, production of special research diets, like high fat diet, high sucrose diet, high cholesterol diet etc were also performed as and when required. Facility had also been involved in HRD programme in laboratory animal science and animal research through conducting hands-on training modules in animal ethics, care, breeding, management, health monitoring and quality control issues. Scientific and technical consultancy services were also extended to other institutions on contemporary issues of animal care and management including creation and developing Research Animal Facilities.

a) Population status of laboratory animals maintained at CDRI as on 23.1.2016

Animal Species	Strain(s)	Genotype(s)	Population status (Numbers available)
Mouse	Swiss	Out-bred	2656
	Park's strain (PS)	Out-bred	105
	BALB/C	Inbred	3121
	AKR	-do-	310
	NZB	-do-	46
	AJ	-do-	446
	C57BL/6	-do-	1505
	db/db	-do	2007
	DBA/1j	-do-	75
	C3H/Hej	-do-	376
	Modified / Transgenic animals: NCF-1, MK2, NOS-1Tg, Lepr(db)\J, NOS-2, APOE/NOS1	-do-	~500
Rat	Sprague Dowley (SD)	Out-bred	4177
	Druckrey(DR)	-do-	31
	Charles Foster (CF)	-do-	704
	Wistar	Inbred	759
	SHR	-do-	301
Hamster	Golden hamster (GH)	Out-bred	1882
	Golden Hamster	Inbred	435
	White hamster (Mutant of GH)	-do-	58
Gerbil	Mongolian strain	Out-bred	445
Mastomys	Coucha strain	Out-bred	771
Guinea Pig	English albino	Out-bred	757
Rabbit	New Zealand White	Out-bred	273
	Belgian	Out-bred	185
Sheep	Farm-bred	Random bred	1
Monkey	Rhesus	Wild caught	47

b) Supply of experimental animals for research purposes:

In total, 33,628 animals were supplied within and outside institute for research purposes, out of which more than 3,000 animals costing about Rs 33 lac were supplied to outside government institutions, industries and other research establishments. Information is summarized as below:

No.	Services Details	Total supplies (Numbers)
A.	Supply of research animals to CDRI in-house projects	24897
B.	Supply of animals to Extramural funded projects in CDRI	5677
C.	Supply of animals to CPCSEA registered institutions for research purposes. **1.** Govt. funded institutes **2.** Private sector organizations	2236 818
Total animal supplies for biomedical research and experimentation:		33,628

c) Other technical services rendered:(Between April' 15 to December'15)

Technical services	Details
• Screening of animals for Endo and Ecto-parasites	1090 nos.
• Pathological monitoring (gross and post mortem investigations), and Hematological and biochemical examinations conducted	145 cases/samples
• Number of nonhuman primates under rehabilitation	16 nos.
• Number of tuberculin/PPD testing conducted	30 nos.
• Proximate analysis of animal feed	15 samples
• In-house formulation and production of laboratory animal feed including research diets for experimental purposes	>450 Qts.
• Consultancy services rendered to other institutions	> 20 institutions
• Human resource development programmes including Training courses and Symposia organized in the area of lab animal science, animal care and management, animal techniques and experimentation	Four training courses/events were organized on different occasions to impart basic/ hands-on training t to about 70 research fellows/scientific and technical personnel engaged in area of animal care/ research

6. Tissue & Cell Culture Laboratory

The Tissue and Cell Culture laboratory has been established with an objective to develop & upkeep of Central Tissue Culture Facility including maintenance, propagation, cryopreservation & revival of Cell Lines. Conduct research on exploring the anti breast cancer profile of Centchroman & also initiate newer technologies such as Stem Cell Research.

Tasks carried out/services provided during reporting period:

- Provision of Cell Culture Flasks to user scientists.
- Incorporation of New Cell Lines.
- Provide training in Cell & Tissue Culture Techniques to people from within & outside the Institute.

List of cell lines under maintenance (Name of cell lines)

i)	MCF-7	Human Breast Cancer ER +ve
ii)	MDA MB 231	Human Breast Cancer ER -ve
iii)	L 929	Mouse Connective tissue fibroblasts
iv)	HEK 293	Human Embryo Kidney
v)	H9c2	Rat myoblasts
vi)	Hep G2	Human Liver carcinoma
vii)	Hep 3B	Human Liver carcinoma
viii)	3T3 L1	Mouse Embryo fibroblasts
ix)	J774 A.1	Mouse Macrophage
x)	Vero C 1008	African Green Monkey Kidney fibroblasts
xi)	C 6	Rat Glioma
xii)	L 6	Rat Muscle
xiii)	SHSY 5Y	Human Neuroblastoma
xiv)	hGF	Human Gingival fibroblast- Primary culture
xv)	Neuro-2A	Mouse Neuroblastoma
xvi)	BV-2	Mouse Microglia

7. S&T Knowledge Resource Centre

The S&T Knowledge Resource Centre (KRC) has been established with an objective to provide biomedical information services for the scientists in the era of information boom. The centre also caters to the need of the pharmaceutical industry, entrepreneurs, and researchers involved in biomedical research. The centre is computerized and conforms to the norms of e-governance. KRC continued to provide information services to its users and a total of 1255 outside users (Students of M. Pharm, Biotechnology, Biomedical Sciences) utilized these services during the year. Its present collection comprises of 22494 books and 73969 bound volumes of journals. Centre also provides access to various e-journals, open source resources and bibliographic databases viz- Scifinder, Web of Science, R&D Insight etc. The centre also manages, maintains and updates the institute website and institutional repository. The centre published a monthly periodical 'Drugs & Pharmaceuticals Industry Highlights' incorporating periodical 'Drugs & Pharmaceutical R&D Highlights'.

In addition centre provides services to the scientists of institute and other scientific organizations in photography, power point presentations, exhibitions, display panels, posters, designing of covers and layouts for institutional publications.

8. Information Technology Services

Infrastructure:

The salient IT infrastructure comprise of :

- LAN strength of 1500 wired nodes of 1G connectivity
- Single mode optical fiber backbone connectivity affording 10G connectivity
- NKN link of 1 Gbps bandwidth
- Campus-wide Wi-Fi
- Data center facility with provision for near DR site
- Videoconferencing facility
- Network Core Switch affording 8x10G and 2x48x1G Uplinks on fiber
- SAN storage of 20TB capacity
- Backup internet link(4Mbps) from STPI

Services:

The salient IT services offered are :

- Internet and email services (extended through NIC)
- Comprehensive IT Support to institute-wide users
- Operation and Maintenance of R&D & Business Applications & Databases
- Hosting & Maintenance of CDRI web applications

Software Development:

A) Software developed and Implemented:

1. Bill processing and tracking system-An addendum to SnP Software
2. CBRS - Compound submission and Bio-Assay Reporting System
3. Online application for Scientist Recruitment 2015 (incl. Online fee payment)
4. Up-gradation of Intranet website
5. Major Equipment online Booking facility
6. Biologist Request seeking compounds for bio-evaluation
7. Online system for PhD Applications
8. Website for online submission of applications for recruitment of Project Assistants
9. Up-gradation of HRMS for joining of trainees and regular staff
10. Websites for seminars like CTDDR, CLINRES, AICBC etc.

B) Software developed and under implementation:

1. TRT (a Knowledge repository for compounds under evaluation stage)
2. Project Management System
3. Hospital management System for CSIR Dispensary

C) Software under development

1. New CDRI website (cdriindia.org)
2. Visitor Management System
3. Digital Herbarium

9. Other Lab Services

Instrumentation Centre provided efficient and economical repair, maintenance and upkeep of different sophisticated analytical, biomedical, electronics and laboratory equipments in CSIR-CDRI and CDRI-SAIF. Due to non-availability of imported components/spares, equivalent indigenous substitute were used to ensure the smooth functioning of equipments. Tracing of part of circuit were carried out whenever circuit diagram/service manual was not available. Technical specification verification was carried out for the procurement of state of the art new equipments. Division helped the user Scientists to prepare broad based technical specification and to choose right equipment to suit their application. Laboratory equipments of different divisions of institute were calibrated as per GLP guidelines as per user requirement. Division reviewed the SOP (Instrument Maintenance) of different Instruments.

10. Laboratory Engineering Services

The Lab Engineering Services division continued to provide Engineering Services to the Institute to maintain the Infrastructure for R&D work. The major works carried out during reporting period are as follows:

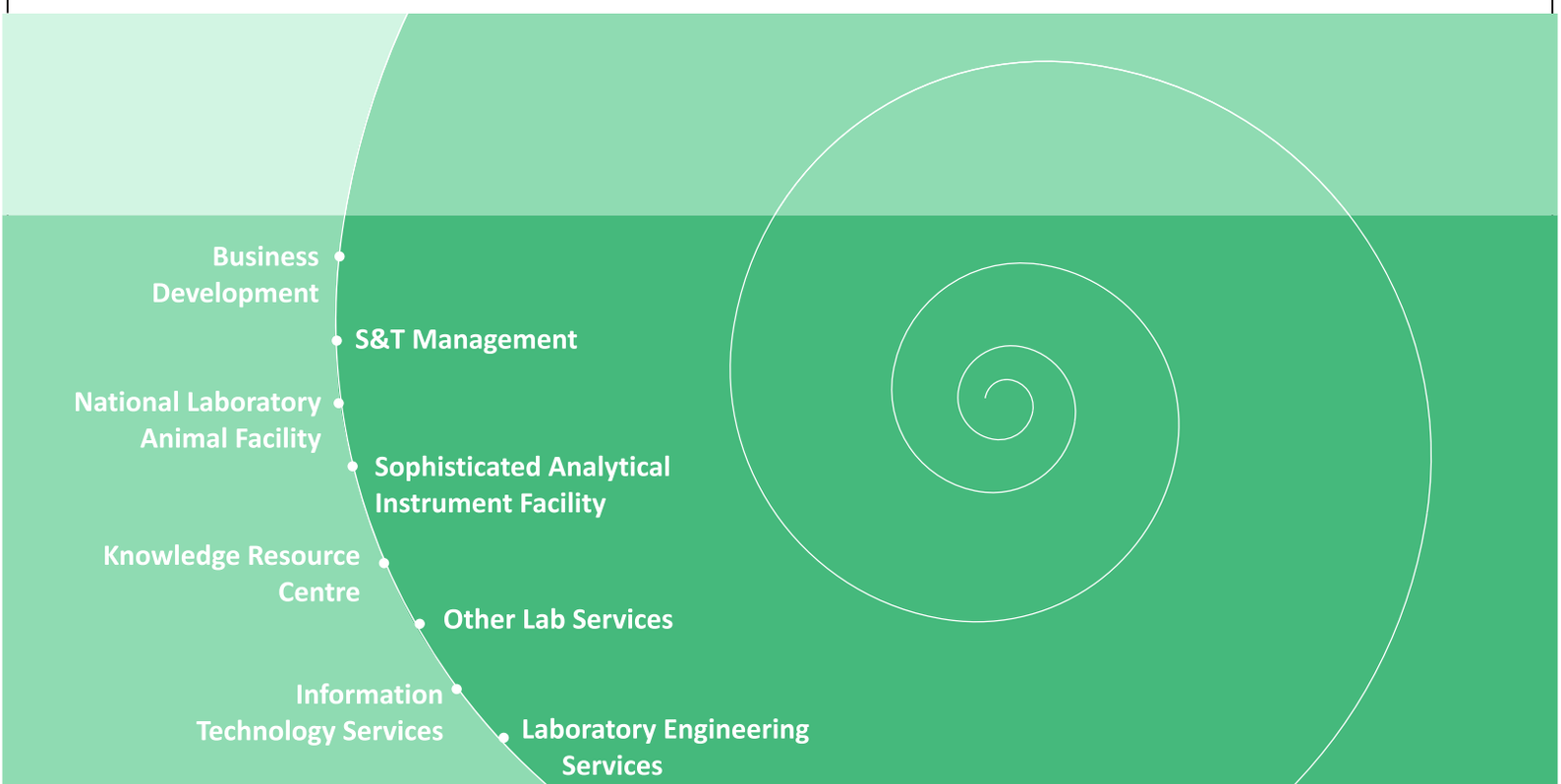
- New facilities of centralized compressed air, Nitrogen, LPG & Vacuum, distilled water supply at the user bench in laboratory has been provided.
- Most sophisticated laboratory set up i.e. reaction hoods, chemical storage cabinet and safety measures.
- Laboratory follows safety provision along with most sophisticated optical fume sensor, fire alarms and computer controlled fire alarm panels.
- CSIR-CDRI is committed to share environmental & social responsibility therefore, facility of Effluent treatment plant for treatment of laboratory waste and sewage treatment plant for treatment of domestic waste water has been created in Jankipuram campus.
- The laboratory compliances all the statuary norms from various state and central agencies and committed to follow the guidelines issued by various agencies time to time.
- Laboratory has integrated water lines to reuse of ETP/ STP treated water in Garden hydrant line to optimize water consumption.

NOTES

CSIR-Central Drug Research Institute, Lucknow

- Business Development
- S&T Management
- National Laboratory Animal Facility
- Sophisticated Analytical Instrument Facility
- Knowledge Resource Centre
- Other Lab Services
- Information Technology Services
- Laboratory Engineering Services

Technical Services & Facilities

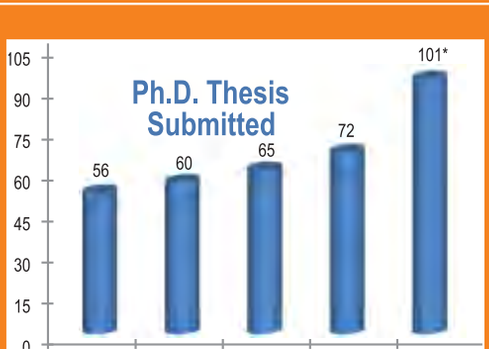


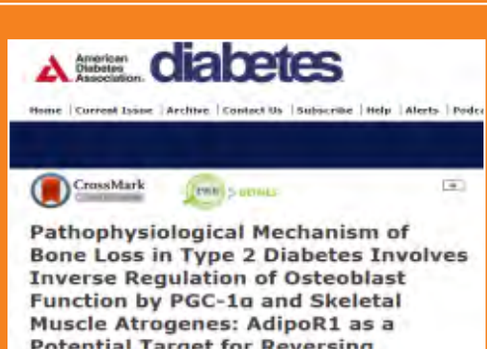
Technical Services & Facilities

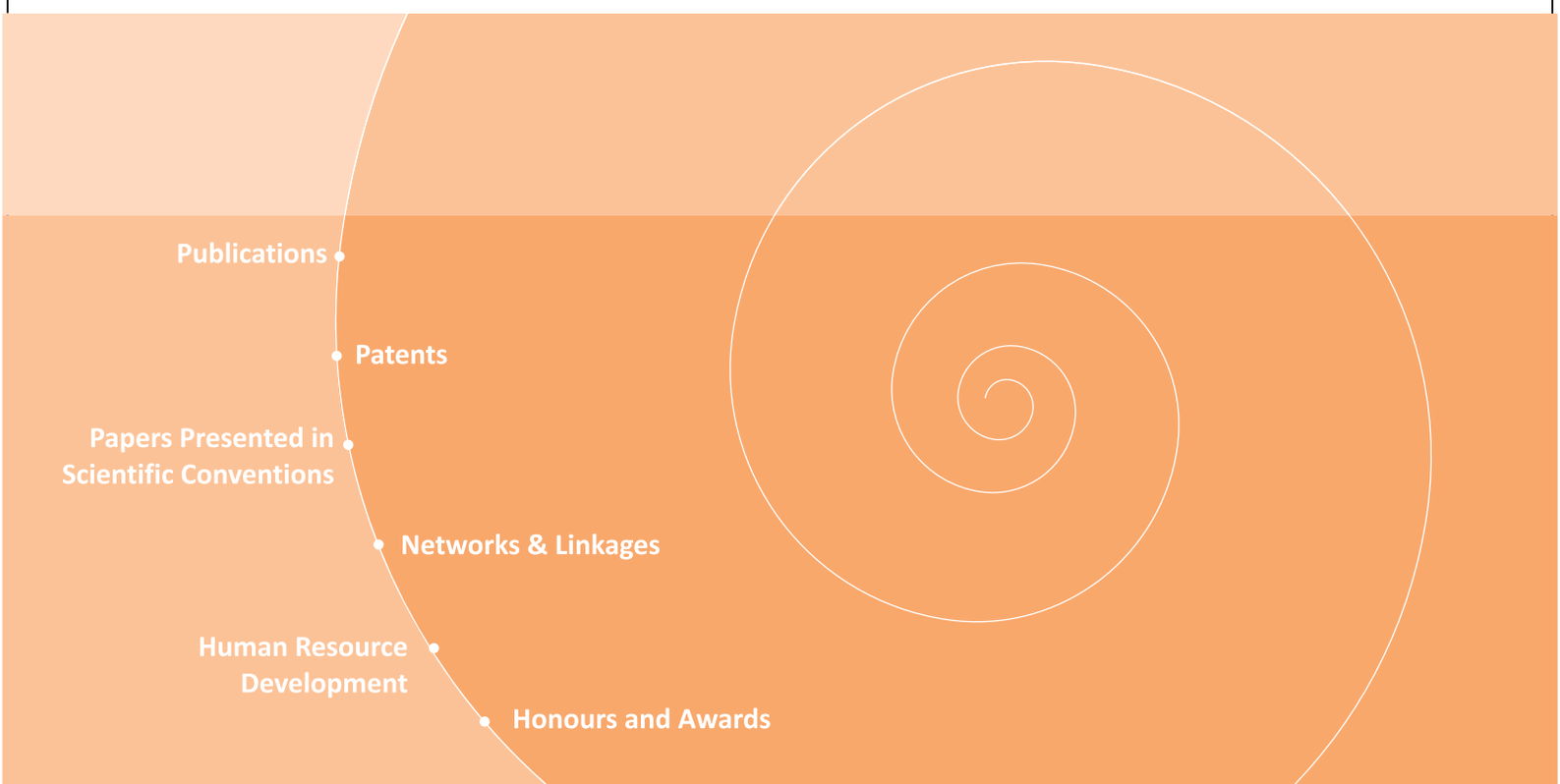
CSIR-Central Drug Research Institute, Lucknow

- Publications
- Patents
- Papers Presented in Scientific Conventions
- Networks & Linkages
- Human Resource Development
- Honours and Awards

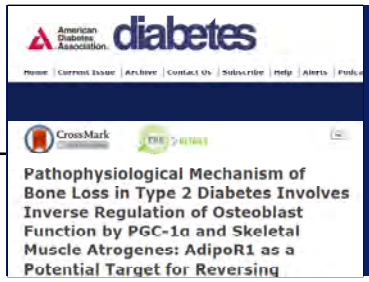
Research Output







Research Output



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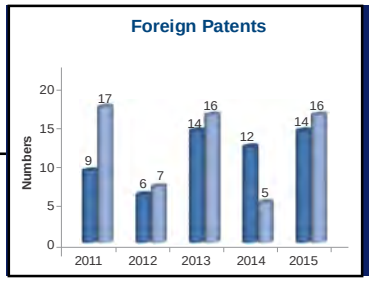


PATENTS

Patents Granted Abroad

1. **United States Patent No.:** 8946261 **Date of Grant:** 03.02.2015

   Title: Substituted 1, 2, 3, 4-tetrahydroquinolin-7-yl carbamates, their preparation, and use thereof as acetylcholinesterase (AchE) inhibitors for the treatment of Alzheimer's and other neurodegenerative diseases

   Inventors: Kuldeep Kumar Roy, Santoshkumar Tota, Chandishwar Nath, Rakesh Shukla & Anil Kumar Saxena

   Supporting Staff: Zahid Ali & Arimardan Singh Kushwaha

2. **United States Patent No.:** 8946682 **Date of Grant:** 03.02.2015

   Title: Novel donor-acceptor flurene scaffolds:a process and uses thereof

   Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & RS Anand

3. **JAPAN Patent No.:** 5719775 **Date of Grant:** 27.03.2015

   Title: Substituted benzfurochromenes and related compounds for the prevention and treatment of bone related disorders

   Inventors: Atul Goel, Amit Kumar, Sumit Chaurasia, Divya Singh, Abnish Kumar Gautam, Rashmi Pandey, Ritu Trivedi, Man Mohan Singh, Naibedya Chattopadhyay, Lakshmi Manickavasagam, Girish Kumar Jain & Anil Kumar Dwivedi

4. **Australian Patent No.:** 2009233324 **Date of Grant:** 07.05.2015

   Title: Novel donor-acceptor flurene scaffolds:a process and uses thereof

   Inventors: Atul Goel, Sumit Chaurasia, Vijay Kumar, Sundar Manoharan & RS Anand

5. **European Patent No. :** 2265595 **Date of Grant:** 22.07.2015

   Title: *Ulmus Wallichiana* PLANCHON derived extract,designated as "OSTEOANABOL" and its compounds employed in prevention or treatment of osteo-health related disorders

   Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya, Naibedya Chattopadhyay

6. **French Patent No. :** 2265595 (EP Desig.) **Date of Grant:** 22.07.2015

   Title: *Ulmus Wallichiana* PLANCHON derived extract,designated as "OSTEOANABOL" and its compounds employed in prevention or treatment of osteo-health related disorders

   Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya, Naibedya Chattopadhyay

7. **German Patent No.** 2265595 (EP Desig.) **Date of Grant:** 22.07.2015

   Title: *Ulmus Wallichiana* PLANCHON derived extract,designated as "OSTEOANABOL" and its compounds employed in prevention or treatment of osteo-health related disorders

   Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya, Naibedya Chattopadhyay

8. **Spanish Patent No. :** 2265595 (EP Desig.) **Date of Grant:** 22.07.2015

   Title: *Ulmus Wallichiana* PLANCHON derived extract,designated as "OSTEOANABOL" and its compounds employed in prevention or treatment of osteo-health related disorders

   Inventors: Rakesh Maurya, Preeti Rawat, Kunal Sharan, Jawed Akhtar Siddiqui, Gaurav Swarnkar, Geetanjali Mishra, Lakshmi Manickavasagam, Girish Kumar Jain, Kamal Ram Arya, Naibedya Chattopadhyay

9. **United States Patent No.:** 9096539 **Date of Grant:** 04.08.2015

   Title: Novel Substituted 2h-Benzo[E]Indazole-9-Carboxylates for the treatment of diabetes and related disorders

   Inventors: Goel Atul, Taneja Gaurav, Rahuja Neha, Rawat Arun Kumar, Jaiswal Natasha, Tamrakar Akhilesh Kumar, Srivastava Arvind Kumar

10. **European Patent No. :** 2705047 **Date of Grant:** 05.08.2015

    Title: *Dalbergia sissoo* derived extract and compounds for the prevention of osteo-health related disorders Designated as osteoNATURALcare

    Inventors: Maurya Rakesh, Dixit Preety, Trivedi Ritu, Khedgikar Vikram, Gautam Jyoti, Kumar Avinash, Singh Divya, Singh Sheelendra Pratap, Wahajuddin, Jain Girish Kumar, Chattopadhyay Naibedya

11. **French Patent No. :** 2705047 (EP Desig.) **Date of Grant:** 05.08.2015

    Title: *Dalbergia sissoo* derived extract and compounds for the prevention of osteo-health related disorders Designated as osteoNATURALcare

    Inventors: Maurya Rakesh, Dixit Preety, Trivedi Ritu, Khedgikar Vikram, Gautam Jyoti, Kumar Avinash, Singh Divya, Singh Sheelendra Pratap, Wahajuddin, Jain Girish Kumar, Chattopadhyay Naibedya

12. **German Patent No. :** 2705047 (EP Desig.) **Date of Grant:** 05.08.2015

    Title: *Dalbergia sissoo* derived extract and compounds for the prevention of osteo-health related disorders Designated as osteoNATURALcare

Inventors: Maurya Rakesh, Dixit Preety, Trivedi Ritu, Khedgikar Vikram, Gautam Jyoti, Kumar Avinash, Singh Divya, Singh Sheelendra Pratap, Wahajuddin, Jain Girish Kumar, Chattopadhyay Naibedya

13. **Great Britain Patent No. :** 2705047 (EP Desig.) **Date of Grant:** 05.08.2015

Title: *Dalbergia sissoo* derived extract and compounds for the prevention of osteo-health related disorders Designated as osteoNATURALcare

Inventors: Maurya Rakesh, Dixit Preety, Trivedi Ritu, Khedgikar Vikram, Gautam Jyoti, Kumar Avinash, Singh Divya, Singh Sheelendra Pratap, Wahajuddin, Jain Girish Kumar, Chattopadhyay Naibedya

14. **European Patent No. :** 2675790 **Date of Grant:** 18.11.2015

Title: Substituted 1, 2, 3, 4-tetrahydroquinolin-7-yl carbamates, their preparation, and use thereof as acetylcholinesterase (AchE) inhibitors for the treatment of Alzheimer's and other neurodegenerative disease

Inventors: Kuldeep Kumar Roy, Santoshkumar Tota, Chandishwar Nath, Rakesh Shukla, Anil Kumar Saxena

15. **United States Patent No.:** 9200034 **Date of Grant:** 01.12.2015

Title: Novel dolastatin mimics as anticancer agents

Inventors: Tushar Kanti Chakraborty, Gajula Praveen Kumar, Dulal Panda, Jayant Asthana

16. **United States Patent No.:** 9206155 **Date of Grant:** 08.12.2015

Title: Chiral 3-aminomethylpiperidine derivative as inhibitors of collagen induced platelet activation and adhesion

Inventors: Dinesh Kumar Dikshit, Madhu Dikshit, Tanveer Irshad Siddiqui, Anil Kumar, Rabi Sankar Bhatta, Girish Kumar Jain, Manoj Kumar Barthwal, Ankita Misra, Vivek Khanna, Prem Prakash, Manish Jain, Vishal Singh, Varsha Gupta, Anil Kumar Dwivedy

Patents Filed Abroad

1. **PCT Application No.:** PCT/IN2015/000076 **Date of Filing:** 09.02.2015

Title: Substituted Naphtho[2,1-b][1,10]phenanthroline based fluorescent dyes and application thereof

Inventors: Atul Goel, Shahida Umar, Pankaj Nag, Aamir Nazir, Lalit Kumar, Shamsuzzama, Jiaur Rahaman Gayen & Zakir Hossain

2. **PCT Application No. :** PCT/IN2015/000235 **Date of Filing:** 10.06.2015

Title: Cationic lipid cordiarimide hybrid compounds and a process for preparation thereof

Inventors: Bathula Surendar Reddy, VKK Durga Rao, Komal Sharma, M. Prathap Reddy, Dibyendu Banerjee & Deependra Kumar Singh

3. **Australian Application No. :** 2014208337 **Date of Filing:** 24.07.2015

Title: Antidiabetic and antidyslipidemic activities of pregnane-oximino-aminoalkylethers

Inventors: Verma Prem Chandra, Gupta Jyoti, Singh Dharmendra Pratap, Gupta Varsha, Kushwaha Hari Narayan, Misra Anamika, Rahuja Neha, Srivastava Rohit, Jaiswal Natasha, Khanna Ashok Kumar, Tamrakar Akhilesh Kumar, Singh Shio Kumar, Dwivedi Anil Kumar, Srivastava Arvind Kumar, Pratap Ram

4. **United States of America Application No. :** 14/763480 **Date of Filing:** 24.07.2015

Title: Antidiabetic and antidyslipidemic activities of pregnane-oximino-aminoalkylethers

Inventors: Verma Prem Chandra, Gupta Jyoti, Singh Dharmendra Pratap, Gupta Varsha, Kushwaha Hari Narayan, Misra Anamika, Rahuja Neha, Srivastava Rohit, Jaiswal Natasha, Khanna Ashok Kumar, Tamrakar Akhilesh Kumar, Singh Shio Kumar, Dwivedi Anil Kumar, Srivastava Arvind Kumar, Pratap Ram

5. **South African Application No. :** 2015/05621 **Date of Filing:** 04.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

6. **Iranian Application No. :** 39450140003005161 **Date of Filing:** 05.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

7. **Nigerian Application No. :** NG/PT/C/2015/1393 **Date of Filing:** 07.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

8. **Sri Lankan Application No. :** 18334 **Date of Filing:** 07.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

9. **Brazilian Application No. :** 1120150190979 **Date of Filing:** 10.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

10. **Indonesian Application No. :** P00201504895 **Date of Filing:** 11.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

11. **AP Application No. :** AP/P/2015/008642 **Date of Filing:** 17.08.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

12. **Great Britain Application No. :** 1514914.9 **Date of Filing:** 21.08.2015

Title: Antidiabetic and antidyslipidemic activities of pregnane-oximino-aminoalkylethers

Inventors: Verma Prem Chandra, Gupta Jyoti, Singh Dharmendra Pratap, Gupta Varsha, Kushwaha Hari Narayan, Misra Anamika, Rahuja Neha, Srivastava Rohit, Jaiswal Natasha, Khanna Ashok Kumar, Tamrakar Akhilesh Kumar, Singh Shio Kumar, Dwivedi Anil Kumar, Srivastava Arvind Kumar, Pratap Ram

13. **PCT Application No. :** PCT/IN2015/050124 **Date of Filing:** 29.09.2015

Title: A formulation useful for delivery of neuro protecting agent

Inventors: Anil Kumar Dwivedi, Hafsa Ahmad, Kiran Khandelwal, Rajender Singh Sangwan, Neelam Singh Sangwan, Jiaur Rahaman Gayen, Sarika, Smrati Bhaduaria, Sps Gaur, Vivek V Bhosale, Srikanta Kumar Rath, Sharad Sharma, Rakesh Shukla

14. **Chinese Application No. :** 2014800198858 **Date of Filing:** 30.09.2015

Title: Carbodithioates and process for preparation thereof

Inventors: Sharma Vishanu Lal, Lal Nand, Sarswat Amit, Jangir Santosh, Bala Veenu, Kumar Lalit, Rawat Tara, Jain Ashish, Kumar Lokesh, Maikhuri Jagdamba Prasad, Gupta Gopal

Patents Granted in India

1. **Patent No.:** 265054 **Date of Grant**: 04.02.2015

Title: Novel cyclopropa [a]naphthalenes and a process for the preparation their of

Inventors: Atul Goel, Fateh Veer Singh, Puja Garg, Preeti Dohare & Madhur Ray

2. **Patent No.:** 266250 **Date of Grant:** 20.04.2015

Title: An intra-vaginal abortifacient gel composition

Inventors: Satywan B Jadhav, Rabi Sankar Bhatta, Man Mohan Singh & Girish Kumar Jain

Patents Filed in India

1. **Patent Application No.:** 0125DEL2015 **Date of Filing:** 15.01.2015

Title: A Novel Antileishmanial Formulation

Inventors: Neena Goyal, Sonali Gangwar, Anil Kumar Kala Sadan, Subhasish Biswas, Anil Kumar Dwivedi, Hafsa Ahmad, Kailash Chand Gupta, Pradeep Kumar, Priyanka Bhatnagar & Sanjay Batra

Supporting Staff: Karthik Ramalingam & V Saravana Kumar

2. **Patent Application No. :** 1198DEL2015 **Date of Filing:** 30.04.2015

Title: Antibody useful for the detection of cancer

Inventors: Monika Sachdev, Parmita Kar, Saurabh Kumar, Deepshikha Tewari, Madan Lal Bhatt & Rekha Sachan

3. **Patent Application No:** 3891DEL2015 **Date of Filing:** 30.11.2015

Title: 6-Substituted-7-Hydroxy-4-(methylthio)-2-oxo-2H-chromene-3-carbonitriles as Vacuoles staining dyes and uses thereof;

Inventors : Atul Goel, Ashutosh Raghuvanshi, Ajay Kumar Jha, Manoj Kathuria, Kalyan Mitra

4. **Patent Application No:** 3988DEL2015 **Date of Filing:** 08.12.2015

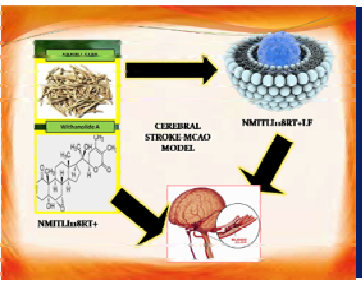
Title: Synthesis of 6/8((di(hetero-2-ylmethyl)amino)methyl)-7-hydroxyl-4-(methylthio)-2-oxo-2H-chromene-3-carbonitriles and uses thereof

Inventors : Atul Goel, Ajay Kumar Jha, Ashutosh Raghuvanshi, Rakesh Kumar Arya, Dipak Datta

5. **Patent Application No:** 4242DEL2015 **Date of Filing:** 23.12.2015

Title: Pyranone fused Aza-heterocyclic fluorescent dyes and uses thereof;

Inventors : Atul Goel, Ashutosh Raghuvanshi, Ajay Kumar Jha, Shalini Dogra, Prem Narayan Yadav



PAPER PRESENTED IN SCIENTIFIC CONVENTIONS

2015

Drug Discovery in India: "Past, Present and Future", CSIR-CDRI, Lucknow (1 January)

1. Iodine-mediated divergent synthesis of fused aza-heterocycles via allylamines derived from Morita-Baylis-Hillman chemistry, B Harikrishna and Sanjay Batra
2. Triple cooperative catalytic multi-cascade approach to enantioselective synthesis of Canthin-4-ones, SU Dighe and Sanjay Batra
3. Palladium-catalyzed chelation-assisted regioselective oxidative biaryl coupling or hydroxylation in N-phenylpyrazoles, S Bhattacharyya and Sanjay Batra
4. Identification of novel anticancer 1,4,5-trisubstituted 1,2,3-triazoles with β-amino alcohol scaffold as potent antimalarial agents, N Devender, Sarika gunjan, Kartikey Singh, Venkatareddy pasam, Hamidullah, SK Shukla, Renutripathi, Rituraj Konwar, AK Trivedi and Rama P Tripathi
5. Design and synthesis of novel fluorescent probes for selective imaging of biometals, Shahida Umar, Ashutosh Sharma and Atul Goel
6. Rapid profiling and structural characterization of *Berberis aristata* applying hyphenated mass spectrometric technique, Awantika Singh, Vikas Bajpai, Sunil Kumar, Brijesh Kumar
7. Drug repositioning approach as an effective strategy for targeting cancer, Ankur Omer, Poonam Singh

National Conference on Drug Carriers in Medicine and Biology, Erode (7-8 January)

8. Liposomal delivery of Antistroke agent NMITLI118RT+, Hafsa Ahmad, Kiran Khandelwal, Sheeba Sazi, Rakesh Shukla, Anil Kumar Dwivedi
9. Design, Synthesis and formulation development of 4-oxopentanoic acid derivative, Akansha Srivastava, Rishi Ranjan Pandey, Arshi Naqvi, Jagdamba Prasad Maikhuri, Gopal Gupta, Anil Kumar Dwivedi

International Conference on Nanoformulations and Translational Research: Small Getting Bigger, BBA University, Lucknow (2-3 February)

10. Bio-analytical method development and validation, stability, PAMPA permeability, and protein binding studies of Withanolide-A, Sandeep K Singh, Guru R Valicherla, Jiaur R Gayen
11. Implementation of Good Laboratory Practices in Academic Laboratories, Gauri Kannan, Anuradha Gupta, Amit Misra, Sudipta Saha
12. Preparation of chitosan coated liposomes of novel Antithrombotic S002-333 to improve oral bioavailability:A pharmacokinetic assessment, Kiran Khandelwal, Shakti Deep Pachauri, Abhishek Arya, Vivek K. Pawar, Trapti Joshi, Pankaj Dwivedi, Hafsa Ahmad, Bupendra Singh, Komal Sharma, Sanjeev Kanojiya, Manish K. Chourasia, Anil Kumar Saxena and Anil Kumar Dwivedi
13. Effect of citrus flavonoid hesperetin on in vitro efficacy of bicalutamide against prostate cancer, Abhishek Arya, Kiran Khandelwal, Hafsa Ahmad, Boda Rajkumar and Anil Kumar Dwivedi

29th ISMAS International Symposium on Mass Spectrometry, Jodhpur (2-6 February)

14. Simultaneous quantitative determination of multiple bioactive Phytoconstituents in *Ocimum* species using UPLC-ESI-MS/MS in multiple reaction monitoring mode, Renu Pandey and Brijesh Kumar

Indo-French Seminar on "Women in Science", IISc, Bangalore, (3-5 February)

15. Th1 stimulatory proteins as potential poly vaccine candidate against visceral Leishmaniasis, Keerti Rawat, Sumit Joshi, Narendra K Yadav and Anuradha Dube

17th CRSI National Symposium in Chemistry, Pune (6-8 February)

16. A strategy for the Synthesis of Anthraquinone based Aryl-C-Glycosides, Kapil Upadhyaya, Namrata Anand, Sanjeev K Shukla and Rama Pati Tripathi
17. Novel analogues of lupeol and their anti-diabetic activity, K Dev, CK Maurya, AK Tamrakar and Rakesh Maurya

7th International Symposium on Drug Metabolism & Pharmacokinetics (DMPK-2015), NIPER-Mohali (18-21 February)

18. Role of stabilizing agents on the development of trans-Resveratrol Nanocrystal, Vishal S Makadia, Sandeep K Singh, Guru R Valicherla and Jiaur R Gayen
19. Pharmacokinetics and bio-distribution of Rapamycin delivered as inhalable particles to mice, Anuradha Gupta, Madhur Sachan, Yeshwant Singh, Shio Kumar Singh and Amit Misra

34th Annual Convention of Indian Association for Cancer Research, Jaipur (19-21 February)

20. Alpha-solanine induces ROS mediated autophagy through activation of endoplasmic reticulum stress and inhibition of Akt/mTOR pathway, Mohammad Hasanain, Arindam Bhattacharjee, Praveen Pandey, Raghi Ashraf, Kalyan Mitra and Jayanta Sarkar

Recent Advances in Pharmaceutical Sciences for Drug Discovery & Development, NIPER- Raebareli (20 – 21 February)

21. Synthesis of novel pyrimidine nucleoside analogues owning multiple bases/sugars and their glycosidase inhibitory activity, Ravi Kumar Thakur, A Mishra, K K G Ramakrishna, R Mahar, S K Shukla, A K Srivastava and Rama P Tripathi
22. Identification of novel phenyl butenonyl C-glycosides with ureidyl and Sulfonamidyl moieties as antimalarial agents, KKG Ramakrishna, S Gunjan, AK Shukla, VR Pasam, VM Balaramnavar, A Sharma, S Jaiswal, J Lal, R Tripathi, Anubhooti, R Ramachandran and RP Tripathi
23. A sensitive and validated LC–MS/MS method for the

determination of Topiramate in rabbit plasma and its application to pharmacokinetic study, TulsankarSachinLaxman, Hitesh K Tirgar, Yarra Durga Prasad, Hardik Chandasana, SubrataKundu, Ganga Srinivasan and Rabi S Bhatta

24. Preliminary pharmacokinetic study of a novel S013-0305, antihyperlipidemic drug, Pakala Dora Babu, Santosh Kumar Puttrevu and Rabi S Bhatta
25. In-vitro pharmacokinetics studies of novel anti-diabetic cdri molecule S009-0629, Kishan S Italiya, Guru R Valicherla, Sandeep K Singh, Sudhir Shahi, Vishal S Makadia, Atul Goel, Jiaur R Gayen
26. Hypolipedemic activity of Gugulipid, comparison with standard hypolipedemic drugs, Surabhi Singh, Priti Sharma, Shail Singh, Vivek Bhosale and Ashim Ghatak
27. Pharmacovigilance in Anti-tubercular Drug Therapy: A Cohort Event Monitoring Study, Priti Sharma, Surabhi Singh, Shail Singh, Rajendra Prasad, SPS Gaur and Vivek Bhosale

Applied Analysis-2015, Pharmaceutical India, Mumbai (22-25 February)

28. Liquid chromatography mass method using electrospray ionization for quantification of Withanolide-A in rat plasma and tissues and its application to preclinical tissue distribution study, Guru R Valicherla, Sandeep K Singh, Sudhir Shahi, Jiaur R Gayen

National symposium on interfacing chemical biology and drug design (ICBDD), Amity university-Lucknow (24-25 February)

29. Identification of novel anticancer 1,4,5-trisubstituted 1,2,3-triazoles with β-amino alcohol scaffold as potent antimalarial agents, N Devender, Sarika Gunjan, Kartikey Singh, Venkatareddy Pasam, Hamidullah, S K Shukla, Renu Tripathi, Rituraj Konwar, AK Trivedi and Rama P Tripathi
30. A Strategy for the Synthesis of Anthraquinone based Aryl-C-Glycosides, Kartikey Singh, Namrata Anand, Sanjeev K Shukla and Rama Pati Tripathi

21st ISCB International Conference (ISCBC-2015)–Current trends in Drug Discovery and Development, CSIR-CDRI, Lucknow (25-28 February)

31. Rational-based design and synthesis of novel functionalized Pyranones and Biphenyls as potent anti-hyperglycemic agents, Shachi Mishra, Pankaj Nag and Atul Goel
32. Nature-inspired synthetic and natural pterocarpans and their therapeutic potential, Chandra Prakash Gupta, Ashutosh Raghuvanshi and Atul Goel
33. Donor-Acceptor based Arenes and Heteroarenes for Cell Imaging and Metal Sensing Applications, Dipak Purohit, Shahida Umar and Atul Goel
34. Synthesis of novel pyrimidine nucleoside analogues owning multiple bases/sugars and their glycosidase inhibitory activity, R Mahar, S K Shukla, AK Srivastava, Rama P Tripathi
35. Identification of novel phenyl butenonyl C-glycosides with ureidyl and sulfonamidyl moieties as antimalarial agents, KKG Ramakrishna, S Gunjan, AK Shukla, VR Pasam, VM Balaramnavar, A Sharma, S Jaiswal, J Lal, R Tripathi, Anubhooti, R Ramachandran, RP Tripathi
36. A reversed-phase liquid chromatography method development and validation for S007-1235, a potent anti-leukemic compound, in rat serum and application to serum protein binding studies, S Jaiswal, A Sharma, M Shukla, T Akhtar, A Kumar and J Lal
37. Pharmacokinetic studies of a novel anti-leishmanial compound, S013-0244, in rats, M Shukla, A Sharma, S Jaiswal, S Pandey, PMS Chauhan, N Rangraj, K Vaghasiya and J Lal
38. Recognition and evaluation of Mycobacterial Triacylglcerol Synthesis promoter activity under diverse environmental stress conditions using True-Red Reporter, Shivangi Rastogi, Amit Kumar Singh, Manju Y Krishnan
39. CaCO3 microspheres/Ciprofloxacin HCl Loaded Macroporus Scaffolds for Intervention of Osteomyelitis, Gitu Pandey, PR Mishra
40. A Validated HPLC method for estimation of chiral purity of a new antimalarial compound CDRI- S011-1793 and its isomer S012-0585, Hafsa Ahmad, Prachi Mall, D. Vasanth, SB Katti, Anil Kumar Dwivedi
41. Synthesis and biological evaluation of novel curcumin like compounds as spermicides, Swati Gupta, Akansha Srivastava, Anil Kumar Dwivedi
42. *Murraya koenigii* (L.) Spreng. Ameliorates insulin resistance in dexamethasone-treated mice by enhancing peripheral insulin sensitivity, J Pandey, R Maurya, R Raykhera, MN Srivastava, PP Yadav, AK. Tamrakar
43. Identification and characterization of flavon-3-ols, phenolic acids and triterpenoids in Terminalia arjuna using LC-QTOF-HRMS technique, Awantika Singh and Brijesh Kumar
44. Characterization of diterpeniods and flavonoids in herbal medicinal *Andrographis paniculata* by HPLC-ESI-QTOF-MSMS, Sunil Kumar and Brijesh Kumar
45. Chemical investigation of osteoporotic active plant *Ulmas wallichiana* and *Cissus quadrungularis* using DART MS and QToF LC MS analysis, Vikas Bajpai and Brijesh Kumar
46. Comprehensive quantitative analysis of multiple bioactive compounds in different plant parts of *Cassia auricular* and *Cassia fistula* by Ultra-High Performance Liquid Chromatography coupled to Triple Quadrupole Mass Spectrometry, Preeti Chandra and Brijesh Kumar

21st Conference of National Magnetic Resonance Society, India (NMRS-2015), Amritsar (6-9 March)

47. HR-MAS NMR metabolomics for teratogenicity: Evaluation in cyclophosphamide treated Rats, Rohit Mahar, Nikunj Sethi, Neeraj Sinha and Sanjeev K Shukla

International Conference/Congress on Embryo Implantation and Pregnancy: Intricacies and Strategies for Its Success, NII, New Delhi (9-11 March)

48. Endoglin is involved in the regulation of uterine receptivity for embryo implantation, Sangappa Chadchan, Sahil Mahfooz and Rajesh Kumar Jha
49. HIV-1 Nef Facilitates the Breach of Blood–Placental Barrier after Implantation, Saurabh K Agnihotri, Poonam Singh, Balwant Kuma, Reshu Saxena, Sadan Kuma, Mahesh Chandra Tiwari, Rekha Sachan, Raj Kamal Tripathi and Monika Sachdev

50. Functional validation of miRNA expressed during Oocyte maturation in mouse model, Bilal A Hakim, Amar Nath, Saurabh K Agnihotri, Ankit K Agrawal, Rituraj Konwar and Monika Sachdev

A National workshop cum Seminar on: Frontiers in Ethnomedicinal Research: Traditional to Translational (FER-15), Indira Gandhi National Tribal University, Amarkantak (9-11 March)

51. Immunoprophylactic Potential of N-methyl-6, 7-dimethoxyisoquinolone Isolated from Annona squamosa Against Filarial Parasite Brugia malayi, Vishal Kumar Soni, Prashant Kumar Singh, Mohd. Shahab and Shailja Misra-Bhattacharya
52. RNAi as A Tool to Validate Drug Targets In The Filarial Parasite Brugia malayi, Prashant Kumar Singh, Susheela Kushwaha, Shahab Mohd, Vishal Kumar Soni and Shailja Misra-Bhattacharya

Multifunctional, Hybrid and Nanomaterials (Hybrid Materials 2015), Sitges Spain (9-13 March)

53. Design and development of docetaxel nanocrystals for improved chemotherapy of breast cancer, Komal Sharma, Vivek Pawar and Manish K Chourasia
54. Enhancement of in vitro efficacy of bicalutamide by concomitant administration of naringenin against prostate cancer", Abhishek Arya, Kiran Khandelwal, Hafsa Ahmad, Komal Sharma, Satish Agrawal and Anil Kumar Dwivedi

National conference on "Reproductive Health Challenges: Issues & Remedies, Jaipur (11-13 March)

55. Expression of germ cell maturation marker in HPV positive cervical cancer, A Jain, SK Agnihotri, P Kar, B Hakim, M L B Bhatt, R Sachan and M Sachdev
56. Study for the effect of Chebulinic acid on male reproductive system, A K Agrawal, SK Agnihotri, M Aggrawal, M C Tiwari, R Sachan T Narender and M Sachdev

Animals in Research and Testing: A cross talk between relevance and ethics", CSIR-CDRI, Lucknow, (13-14 March)

57. Computational based virtual screening to explore potential drug candidate against phosphodiesterase δ-subunit (PDEδ) to treat cancer, Ankur Omer and Poonam Singh

National Conference on Biotechnological Developments and Societal Benefits: Present Status and Future Prospectus, Sky Institute Lucknow, (8-9 April)

58. Biotechnological tools as potent means for toxic assessment of chemicals, RK Singh

International conference on translational research in 21st Century."Stem Cell transplantation: Current status, Bhopal (11-14 April)

59. *In silico* approach in stem cell biology from basic to translational research, Abbas M, Vivek Bhosale, Ashim Ghatak, Mukesh Srivastava and Dipak Dutta
60. Recent Development in Toxicology of Nenomedicine RISUGadv, R. K. Singh

International Symposium "Bristol Synthesis Meeting", School of Chemistry, University of Bristol, UK (14 April)

61. Current trends in Organic Synthesis, Atul Goel

American Society of Andrology 40th Annual Conference "A Lifetime of Male Reproductive Health", Utah, USA (18 – 21 April)

62. Energy metabolism of quiescent sperm in cauda epididymis of rat, Lokesh Kumar, Santosh K. Yadav, VikasVerma, AasthaPandey, BhavanaKushwaha, Vikas Sharma, JP Maikhuri, Gopal Gupta

106th Annual Meeting of the American Association for Cancer Research, Philadelphia, (18-22 April)

63. Superoxide anion ($O_2^{\cdot-}$) mediated activation of mTORC2 by estrogen receptor in breast cancer cells: Role of acetylation dependent inhibition of MnSOD, Smrati Bhadauria

Asian Congress of Nutrition, Yokohama, Japan (14-18 May)

64. Anticancer effects of extract of the fruit of *Morinda citrifolia* (Noni) in breast cancer cell lines, Komal Sharma, Shakti Deep Pachauri, Kiran Khandelwal, Jitendra K Saxena, Anil K Dwivedi, and Manish K Chourasia

National Environmental Day Celebration, Bareilly, (5 June)

65. "An overview of natural resources & their conservation in India", RK Singh

Albany 2015, Conversation 19, Albany, New York,(9-13 June)

66. Exploring the possibilities for targeting the existing anti-viral molecules against cancer, Poonam Singh and Ankur Omer

Drug Discovery and Development Colloquium 2015, Mississippi, USA (22-24 June)

67. Comparative *in vitro* and *in vivo* pharmacokinetic evaluation of novel 4-aminoquinoline- tetrazole antimalarials, A Sharma, S Jaiswal, M Shukla, S Pandey, PMS Chauhan and J Lal

7th International Conference on Children's Bone Health(ICCBH), Salzburg, Austria(27- 30 June)

68. Medicarpin, a natural Pterocarpan, enhances bone regeneration in cortical bone defect model by activation of notch and Wnt canonical signalling pathway, Manisha Dixit, Ashutosh Raghuvanshi, AtulGoel and Divya Singh

8th IAS Conference on HIV Pathogenesis, Treatment and Prevention (IAS 2015), Vancouver Convention Centre, Vancouver, Canada (19-22 July)

69. HIV-1 Nef controls cellular invasion through differential modulation of host proteins", Reshu Saxena, Kavita Singh, Kalyan Mitra, Anil Kumar Tripathi, Amit Kumar Tripathi, Jimut Kanti Ghosh and Raj Kamal Tripathi

42nd CRS Annual Meeting & Exposition, -2015, Edinburgh, Scotland (26-29 July)

70. Inhalable particles containing Nitazoxanide alone and in combination with Isoniazid and Rifabutin for the treatment of Tuberculosis, Anuradha Gupta, Deepak Sharma, Pushpa Gupta, Umesh Dutta Gupta and Amit Misra

Uppsala Pharmacometric Summer School (UPSS 2015), Sweden (10-21 August)

71. PK-PD modeling of miltefosine in *Leishmania donovani* infected Golden Syrian Hamster using NONMEM, S Jaiswal, A Sharma, M Shukla, BJ, N Goyal and J Lal

72. PK-PD modeling of furosemide in spontaneously hypertensive rats using NONMEM, M Shukla, S Jaiswal, A Sharma, M Jain, K Hanif and J Lal

250th ACS National Meeting & Exposition, Boston, USA (16-20August)

73. Trifaceted gastric retention of capecitabine exploiting xanthan gum, Yuvraj Singh and Manish K Chourasia

63rd International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research, Budapest, Hungary (23-27August)

74. Osteoprotective activity from *Pholidota articulata* Lindley (Orchidaceae): A traditional plant used for healing fractures in Uttarakhand Himalaya, India, Chetan Sharma, KR Arya, D Singh and T Narender

23rd international conference on bio-encapsulation, Delft, Netherlands (2-4 September)

75. Galactosamine coated cationic NPs for improved targeting of Amphotericin B in VL, Priyanka Tripathi and PR Mishra

76. CD44 receptor targeted Paclitaxel nanocrystals for improved therapeutic efficacy, Shweta Sharma, A Verma, PR Mishra

77. $CaCO_3$ microspheres/Ciprofloxacin loaded gelatin cryogel for osteomyelitis, Gitu Pandey, A Pant, N Mittapelly, P Singh, PK, Shukla and PR Mishra

5th Euro-India International Conference on Holistic Medicine (ICHM-2015), Kottayam (Kerala), (September 11 – 13)

78. Simultaneous determination of eight bioactive alkaloids in the herbal medicine Daruharidra using ultra performance liquid chromatography with hybrid triple quadrupole linear ion trap mass spectrometer, Awantika Singh, Vikas Bajpai, Sunil Kumar, Brijesh Kumar and K. B. Rameshkumar

79. Study of geographical variation in *Phyllanthus amarus* using Direct Analysis in Real Time Mass spectrometry, Sunil Kumar, Vikas Bajpai, Awantika Singh, Mukesh Srivastava, and Brijesh Kumar

80. Development of rapid UPLC-ESI-MS/MS method for quantitative distribution of selected compounds in *Tinospora cordifolia* stem, Vikas Bajpai, Awantika Singh, MPS Negi, Sunil Kumar, Brijesh Kumar

9th International Conference on Researches in Engineering, Technology and Sciences, London, UK (17-18 September)

81. Design and synthesis of Curcumin derivatives as potential anticancer agents, A Srivastava, RR Pandey, A Naqvi, G Gupta and AK Dwivedi

23th International Conference on Bioencapsulation, Deft, Netherlands (30-6 September)

82. Methoxy PEG-g-linoleic acid based Micelles for synergistic activity of Curcumin, Pankaj Singh, Vivek K Pawar and Manish K Chourasia

6th International Conference on Stem Cell and Cancer, ICSCCB, Pune (2-5 October)

83. Mechanism of phenotype switching of macrophases in tumor microenvironment, Smrati Bhadauria

FENS-Featured Regional Meeting (FFRM 2015) at Thessaloniki, Greece,(7-10 October)

84. A novel chemically modified bioactive fraction from *Curcuma longa* [NCCL] for management of CVS and CNS disorders, Hafsa Ahmad, Manoj Barthwal, J Kumarvelu and Anil Kumar Dwivedi

85. Anti-stroke benefits of a solid dosage form of NMITLI118RT+ (a standardized extract of a new chemotype of *Withania somnifera* Dunal) in occlusion model in rats, Hafsa Ahmad, Kiran Khandelwal, Rakesh Shukla., S Samuel Saji and Anil Kumar Dwivedi

Immunocon 2015, RMRIMS, Patna, (9 -11 October)

86. Evaluation of cellular responses of MHC class II-restricted antigenic peptides of Th1 stimulatory proteins of *Leishmania donovani*, Sumit Joshi, Narendra K Yadav, Keerti Rawat and Anuradha Dube

3rd International TB-Meeting "Inhaled therapies for Tuberculosis and other infectious diseases"-2015, Parma, Italy (14-16 October)

87. Investigation of nuclear localizing proteins of *Mycobacterium tuberculosis* during infection, Atul Kumar Agarwal, Rajeev Ranjan, Madhur Sachan, Ashish Srivastava, Sanketkumar Pandya, AnuradhaGupta, T.J. Reddy and Amit Misra

88. Small molecules that nudge host response, Amit Misra, Madhur Sachan, Ashish Srivastava, Rajeev Ranjan, Sanket Pandya and Anuradha Gupta

International conference on Nascent Development in Chemical Sciences (NDCS-2015), Pilani (14-18 October)

89. Biocatalyzed waste free strategy for C-S and S-S bond formation in green solvent, Aditya G Lavekar, Saima,YogeshThopate and Arun K Sinha

90. Green Protocols for C-C and C-S Bond Formation in Neutral Ionic Liquid [hmim]Br, Yogesh Thopate, Nitin H Andhare, Richa Singh and Arun K Sinha

91. Environmentally benign strategies for S-S, C-S and C-N

bonds, Saima, Aditya G Lavekar, Danish Equbal and Arun K Sinha

20th North American ISSX Meeting, Orlando, USA (17-22 October)

92. Preclinical pharmacokinetics and species differences in the CYP-mediated metabolism of isoformononetin, a potential anti-osteoporotic flavonoid, K Siva Rama Raju, ITaneja, M Rashid, SP Singh and M Wahajuddin
93. Effect of polymorphism on the preclinical pharmacokinetics of Desbutyl-Lumefantrine, a potential anti-malarial agent, I Taneja, K S R Raju, S Arora, S Jain, S P Singh and M Wahajuddin
94. Development of novel antihyperlipidemic combination of Atorvastatin and BAR antagonist 16-dehydropregnenlone (80-574): Pharmacokinetic and pharmacodynamic drug-drug interaction, Rabi Sankar Bhatta, Anju Puri, Ashok K Khanna, Ram Pratap and GK Jain
95. LC-MS/MS determination of Aspirin and Clopidogrel along with their metabolites: Application to human pharmacokinetic study, Yarra Durga Prasad, Yashpal Singh Chhonker, CP Pandey, Hardik Chandasansa, Sachin LaxamnTulsankar, VS Narain, Madhu Dixit, Rabi Sankar Bhatta
96. Plasma protein binding, pharmacokinetics, tissue distribution, excretion, enzyme kinetics and CYP450 biotransformation studies of novel antiplatelet agent S007-867, Hardik Chandasana, Yashpal Singh Chhonker, Tulsankar Sachin, Yarra Durga Prasad, Anil Kumar KS, Dinesh Dikshit and Rabi Sankar Bhatta

2015 AAPS annual meeting and exposition, Florida, USA, (25-29 October)

97. Long circulating CD44 targeted Paclitaxel nanocrystals for improved therapeutic efficacy against Cancer, Shweta Sharma, A Verma and PR Mishra
98. Effect of Red clover extract pre-treatment on the pharmacokinetics of tamoxifen by the modulation of major drug metabolizing enzymes, K Siva Rama Raju, I Taneja, G R Valicherla, JR Gayen, SP Singh and M Wahajuddin
99. Modulation of immune response along with bax and bcl-2 mediated enhanced apoptosis in breast cancer cells via paclitaxel loaded vitamin E nanoemulsion, Vivek K Pawar, Manish K Chourasia
100. Targeting of nitric oxide donors to macrophages in a rodent model of visceral Leishmaniasis, Sanketkumar Pandya, Rahul Kumar Verma, Prashant Khare, Anuradha Dube and Amit Misra

26th All India congress of Zoology & International Symposium on Innovation in Animal Sciences for Food Security, Health Security and Livelihood, BBAU, Lucknow (29-31 October)

101. New vistas in laboratory animals for drug research to meet out the four “R” of the research, Vivek Bhosale, M. Abbas, Kavita Durgapal and Tirath Kumar

LUSCON 2015 Lucknow Science Congress 2015, Lucknow (29-31 October)

102. Friend or foe?- Changing paradigms in energy metabolism, AN Gaikwad

XXXIII Annual Conference of Indian Academy of Neurosciences (IAN-2015), Punjab University, Chandigarh (31 October–2 November)

103. Memantine attenuates streptozotocin-induced Alzheimer’s disease like pathology in astrocytes: The role of insulin receptors and neurotrophic factor, Rakesh Shukla
104. Histamine 3 Receptor antagonist ciproxifan reversed depression like symptoms through modulation of BDNF and NMDA receptor in hippocampus, Ajeet Kumar, Shalini Dogra and Prem N Yadav

NCRI Cancer Conference, Liverpool UK (1- 4 November)

105. Salinomycin Targets EZH2 Driven Epigenetic Repression of Death Receptors in Colon Cancer Stem Cells, Anup Kumar Singh, Shrankhla Maheshwari ,Rakesh K Arya, Akhilesh Singh and Dipak Datta

राष्ट्रीय विज्ञान संगोष्ठी कृषि, ऊर्जा एवं स्वास्थ्य के विकास में विज्ञान के आयाम, लखनऊ (4-6, नवंबर)

106. हर्बल उत्पादों की मानव जीवन में स्वास्थ्य के लिए अनिवार्यता, रामाकान्त सिंह

National Conference on "Reproductive health challenges : Issues & Remedies. ; Jaipur (1-13 November 2015)

107. Expression of germ cell maturation marker in HPV positive cervical cancer, A Jain, SK Agnihotri, P Kar, B Hakim, MLB Bhatt, R Sachan, M. Sachdev
108. Study for the effect of Chebulinic acid on male repoductive sysem, AK Agarwal, SK Agnihotri, M Agarwal, MC Tiwari, R Sachan, T Narendra, M. Sachdev

International Conference On Biotechnological Advancements in Free Radical Biology and Medicine ICBAFM–2015, Integral University, Lucknow (14-16 November)

109. Hypertension a risk factor for memory impairment: Role of central renin angiotensin system, Rakesh Shukla

International Conference on New Horizons in Biotechnology (NHBT-2015), organized by BRSI and NIIST, Thriuvananthapuran (22-25 November)

110. D-amino acid oxidase knockout leads to increase susceptibility of Mycobacterium tuberculosis H37Ra under stress, Kumar Sachin Singh, Rishabh Sharma, Deepa Keshari, Shailendra Yadav and Sudheer Kumar Singh
111. Wall integrity Phosphoserine aminotransferase of Mycobacterium smegmatis MC2 155 maintains cell and increases survival under stress, Deepa Keshari, Kumar Sachin Singh, Rishabh Sharma, Shalendra Yadav and Sudheer Kumar Singh
112. Down-regulation of threonine dehydratase leads to increased susceptibility of Mycobacterium tuberculosis H37Ra under stress, Rishabh Sharma, Deep Keshari, Kumar Sachin Singh, Shailendra Yadav and Sudheer Kumar Singh
113. Knockdown of 4’-Phosphopanteheinyl transferase affects

growth and increases sensitivity of Mycobacterium tuberculosis H37Ra to antimycobacterial agents Shailendra Yadav, Kumar Sachin Singh, Rishabh Sharma, Deepa Keshari, and Sudheer Kumar Singh

3rd International conference on Nanotechnology in Medicine (NanoMED 2015), Manchester, UK (23 - 25 November)

114. Ormeloxifene loaded polymeric nanoparticles for treatment of breast cancer, SG Agrawal, A Arya, H Ahmad, K Sharma and AK Dwivedi

CCDDR-2015 International Conference on "Current Challenges in Drug Discovery Research, Jaipur (23-25 November)

115. Obesity, Dyslipidemia and Diabetes: Indian scenario and Indigenous solution, AN Gaikwad
116. Cryogel as a drug delivery system for therapeutic intervention in osteomyelitis an associated osteoporosis, Gitu Pandey, G Pandey, A Pant, N Mittapelly, P Singh, PK Shukla and PR Mishra
117. Investigation of salt formation between memantine and pamoic acid: Its exploitation in nanocrystalline form as long acting injection, Naresh Mittapelly, Rachumallu, Gitu Pandey, Shweta Sharma, Abhishek Arya, Rabi Shankar Bhatta and Prabhat Ranjan Mishra

The XXXIX All India Cell Biology Conference on Cellular Organization and Dynamics, Trivendrum (6-8 December)

118. Identification of new substrates of PKnG and their involvement in growth and in intracellular survival of mycobacteria, Sameer Tiwari, Shivraj Yabaji, Richa Saxena, Pramod K Singh, Diwakar K Singh and Kishore K Srivastava
119. Mechanism of protein tyrosine kinase phosphorylation in mycobacteria and identification of the phosphorylation sites on the substrate by the use of inhibitor Swati Jaiswal, Aditi Chatterjee, Sapna Pandey and Kishore K Srivastava
120. Isolation and genetic characterization of non toxic Pseudomonas aeruginosa strains having inhibitory property against mycobacteria, Alok K Mishra, Rikesh K Dubey, Shivraj M Yabaji, Richa Saxena, Dinesh K Tripathi and Kishore K Srivastava
121. Murine lung eosinophils and macrophages exhibit functional impairment during Filarial manifestation of Tropical Pulmonary Eosinophilia, Pankaj Sharma, Aditi Sharma and Mrigank Srivastava
122. Functional modulation of host antigen-presenting cells during early stages of Brugia malayi infective larvae (L3) infection, Aditi Sharma, Pankaj Sharma and Mrigank Srivastava
123. Role of Circular RNA Molecule circRNA4 and its Synthesizing Gene zip-2 in Parkinson's Disease: Studies Employing Transgenic C. elegans Expressing Human alpha-Synuclein, Lalit Kumar, Shamsuzzama and Aamir Nazir
124. Regulation of Parkinson's Disease Specific Pathways by microRNA Let-7: Studies Employing Transgenic *C. elegans* Expressing Human alpha-Synuclein , Shamsuzzama, Lalit Kumar and Aamir Nazir

26th conference on drug delivery to the lungs (DDL26), Edinburgh, Scotland(9-11 December)

125. Inhalable Glucagon-like Peptide 1 porous particles prepared by spray freeze drying technique, Sanket kumar Pandya and Amit Misra

5th Ramalingaswami Conclave, Regional center for Biotechnology, Faridabad (18 – 20 December)

126. Damage Associated moleular patterns in the regulation of liver fibrosis, Kumaravelu Jagavelu

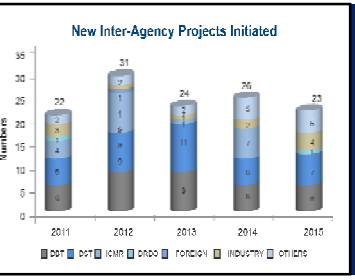
Ist International conference on Trends in Cell and Molecular Biology, organized by BITS Pilani K K Birla Goa Campus (19 -21 December)

127. Identification and characterization of HIV-1Nef interacting candidate protein of *C.elegans* and its human homolog, Raj Kamal Tripathi

2016

103rd Indian Science Congress-Women Science Congress, Mysuru (3-7 January)

1. Trehalose-6-phosphate-phosphatase of *Brugia malayi*: A promising antifilarial vaccine candidate, Shailja Misra-Bhattacharya
2. Cloning, Expression and Characterization of Rec A from *Wolbachia* Endosymbiont of Lymphatic Filarial Parasite *Brugia malayi,* Mamta Gangwar, Ruchi Jha and Shailja Misra-Bhattacharya
3. Immune responses of bancroftian patients to *Brugia malayi* trehalose-6-phosphate phosphatase and heavy chain myosin, Ruchi Jha, Mamta Gangwar, Dhanvantri Chahar, SB Anand and Shailja Misra- Bhattacharya



NETWORKS & LINKAGES

1. 12th Five Year Plan CSIR Network Projects (2012-2017)

S N	Code No.	Acronym	Project Title	Nodal Officer (CSIR-CDRI)
1	BSC0201	ASTHI	Anabolic Skeletal Targets in Health and Illness (CSIR-CDRI, Nodal lab)	Dr. Naibedya Chattopadhyay
2	BSC0101	PROGRAM	Factors Governing Competent Gamete Production and Reproductive Dysfunction (CSIR-CDRI, Nodal lab)	Dr. Rajender Singh
3	BSC0102	THUNDER	Towards Holistic Understanding of Complex Diseases: Unravelling the Threads of Complex Diseases (CSIR-CDRI, Nodal lab)	Dr. Manoj K Barthwal
4	BSC0103	UNDO	New Approaches Towards Understanding of Disease Dynamics and to Accelerate Drug Discovery (CSIR-CDRI, Nodal lab)	Dr. SK Rath
5	BSC0104	SplenDID	Emerging and Re-Emerging Challenges In Infectious Disease: System Based Drug Design for Infectious Diseases (CSIR-CDRI, Nodal lab)	Dr. R Ravishankar
6	BSC0106	BioprosPR	Bio-prospection of Plant Resources and other Natural Products (CSIR-NBRI, Nodal lab)	Dr. Dipak Dutta
7	BSC0108	MEDCHEM	Medicinal Chemistry for Stem Cell Biology and Regenerative Medicines (CSIR-IIIM, Nodal lab)	Dr. Atul Kumar
8	BSC0111	INDEPTH	Integrated NextGen Approaches in Health, Disease and Environmental Toxicity (CSIR-IITR, Nodal lab)	Dr. BN Singh
9	BSC0112	NanoSHE	Nano-materials: Applications and Impact on Safety, Health and Environment (CSIR-IITR, Nodal lab)	Dr. Amit Misra
10	BSC0113	UNSEEN	Understanding Supra Molecular Ensembles and Machines (CSIR-IICB, Nodal lab)	Dr. Ashish Arora
11	BSC0114	HOPE	Understanding the Role of Host molecules in Parasitic Infection (CSIR-IICB, Nodal lab)	Dr. Anuradha Dube / Dr. Neena Goyal
12	BSC0115	miND	Neurodegenerative Disease: Cause and Corrections (CSIR-IICB, Nodal lab)	Dr. Shubha Shukla
13	BSC0118	EpiHeD	Epigenetic in Health and Disease (CSIR-CCMB, Nodal lab)	Dr. Aamir Nazir
14	BSC0119	HUM	Understanding the Human Microbiome (CSIR-IMTECH, Nodal lab)	Dr. Arunava Dasgupta
15	BSC0120	Biodiscovery	Centre for Bio-therapeutic Molecule Discovery (CSIR-IMTECH, Nodal lab)	Dr. JK Ghosh
16	BSC0121	GENESIS	Genomics and Informatics Solutions for Integrating Biology (CSIR-IMTECH, Nodal lab)	Dr. MI Siddiqui
17	BSC0123	GenCODE	Genome Dynamics in Cellular Organization, Differentiation and Enantiostasis (CSIR-IGIB, Nodal lab)	Dr. W Haq
18	CSC0302	ADD	Advance Drug Delivery System (CSIR-IICT, Nodal lab)	Dr. Manish Kumar Chourasia
19	ESC0103	BIOCERAM	Development of Novel CSIR Technology for Manufacturing Tailored and Patient Specific Bio-ceramic Implants and Biomedical Devices at Affordable Cost (CSIR-CGCRI, Nodal lab)	Dr. PR Mishra
20	ISC0102	KNOWGATE	CSIR Knowledge Gateway and Open Source Private Cloud Infrastructure (CSIR-NISCAIR, Nodal lab)	Mr. Suman Mallik
21	PSC0111	MISTIQUE	Measurement for Innovation in Science and Technology for Improvement of Quality & Economy of Life (CSIR-NPL, Nodal lab)	Dr. AK Dwivedi

2. Grant in Aid Projects

Title	PI	Date of Start	Expected Date of Completion
Department of Biotechnology			
Study of brain Insulin / Insulin Receptor in glial cell during neuroinflammation (National Initiative on Glial Cell Research in Health and Disease)	Dr. Rakesh Shukla	25-04-2012	24-04-2015
To study the activation of Glial cell in chronic hypertension (National Initiative on Glial Cell Research in Health and Disease)	Dr. Kashif Hanif	25-04-2012	26-03-2016
Solution structure and dynamics of Unc-60 ADF/Cofilin proteins of *Caenorhadbitis elegans*	Dr. Ashish Arora	24-08-2012	28-05-2016
Drugs against central body fatness and insulin resistance (high peri/post-menopausal prevalence) RGYI	Dr. JR Gayen	12-09-2012	10-09-2016
Biotechnological intervention for pharmaceutically valuable compounds from forest resins	Dr. Rakesh Shukla	01-05-2013	30-04-2016
Molecular characterization and epidemiological modeling of antimicrobial resistance at the interface of Animal-Human-Plant pathogen Continuum	Dr. Rabi Shankar Bhatta	15-04-2013	14-04-2016
Role of miRNAs responsible for bone mass reversal at the time of weaning	Dr. Ritu Trivedi	20-05-2013	19-05-2016
Characterization of the role of Human DNA ligase I in Lagging strand DNA synthesis and DNA Replication (RGYI)	Dr. Dibyendu Banerjee	10-06-2013	09-06-2016
An approach towards identification and synthesis of antigenic epitopes of potential *L. donavani* Th1 stimulatory proteins for the development of synthetic vaccine against Visceral Leishmanisis	Dr. AA Sahasrabuddhe	20-06-2013	19-06-2016
Elucidating the role of P53 and DNA damage response pathway in anti-cancer activity of a novel coumarin-chalcone hybrid	Dr. Jayanta Sarkar	20-06-2013	19-06-2016
Studies on effect of different herbal preparation on wound healing and angiogenesis	Dr. Syed Musthapa M	15-07-2013	14-07-2016
Discovering antimalarials from marine organisms (Phase III): Bulk recollection of promising marine organisms – isolation, purification, characterization and chemical synthesis of marine derived antimalarial.	Dr. AK Sinha	01-04-2012	31-03-2015
Genetic manipulation and drug targeting approaches against *Plasmodium berghei* sporozoite proteins S14, Serine threonine protein Kinase -9 and Liver stage specific Acyl - CoA Synthase	Dr. Satish Mishra	10-10-2013	09-10-2018
Investigating the extra-ribosomal functions of ribosomal proteins during stress and infection	Dr. Niti Kumar	13-11-2013	12-11-2018
Assembly of Iron-Sulphur [Fe-S] Cluster on critical proteins of the plasmodium apicoplast	Dr. Saman Habib	11-10-2013	10-10-2018
Discovery and development of novel bone anabolic agents for accelerated fracture healing	Dr. Naibedya Chattopadhyay	21-02-2014	21-02-2016
Identification and functional characterization of novel microRNA Candidates altered by phytoestrogen medicarpin: Role in the pathogenesis of osteoporosis	Dr. Divya Singh	01-08-2014	31-07-2017
Studies on the interactions between mycobacteria and host defence peptides.	Dr. Mukesh Pasupuleti	01-10-2014	30-09-2017
miRNA in the regulation of sclerostin, a therapeutic approach for osteoporosis. (Women Scientist Scheme)	Dr. Sharmishtha Bhattacharya	26-09-2014	25-09-2017
Exploration of Interleukin 1 receptor associated kinase (IRAK) family of kinases during macrophage foam cell formation and inflammation.	Dr. Manoj Kumar Barthwal	22-10-2014	22-10-2017
Molecular and biochemical characterization of chaperonin class of heat shock proteins of *Leishmania donovani*, their exploration as drug target.	Dr. Neena Goyal	24-12-2014	23-12-2017
Quest for corannulene based polyfunctional molecules in nanobiotechnology and nanomedicine: Transporting and translocating properties of corannulene derived carrier systems.	Dr. Gautam Panda	24-03-2015	23-03-2018

Title	PI	Date of Start	Expected Date of Completion
Profiling and characterization of early phase differential-mi-RNA(s) responsible for downstream development of insulin resistance in Hmsc derived-adipocytes.	Dr. Anil N Gaikwad	28-04-2015	27-04-2018
Tissue specific transcripts and cardical glycoside profiling of calotropis plant after different biotic and abiotic elicitor.	Dr. Vineeta Tripathi	20-04-2015	19-04-2018
Mechanistic studies on napthaquinone based anticancer agents in breast cancer.	Dr. Durga Prasad Mishra	29-07-2015	28-07-2018
Understanding the role of Poly (ADP-ribose) polymerase on tight junctions functioning during carcinogenesis – (Bio-Care Fellow scheme)	Dr. Jyotika Rajawat Dr. DP Mishra	16-04-2015	25-09-2016
Department of Science & Technology			
Sophisticated Analytical Instrument Facility (SAIF)	Director	01-04-1975	Long term
Understanding the mechanism of anti-carcinogenic effect of alpha-solanine	Dr. Jayanta Sarkar	01-10-2012	30-09-2015
Exploration of potency, efficacy and mode of action of *Ulmus wallichiana* against hypertension	Dr. JR Gayen	01-10-2012	30-09-2015
Evaluation of weak dipole… dipole interactions in molecular solids by means of experimental charges density studies and computational methods	Dr. TS Thakur	07-11-2012	06-11-2015
Role of estrogen(s) induced redox alterations in breast carcinogenesis	Dr. Smrati Bhadauria	01-01-2013	31-12-2016
Role of integrin 8-FAS and FAK signaling in the endometrial epithelial cell physiology during uterine tissue remodeling process	Dr. Rajesh Kumar Jha	27-02-2013	26-02-2016
Functional characterization of fission yeast cleavage and polyadenylation factor subunit RNA 14 and its implication on cell cycle checkpoint pathway	Dr. Shakil Ahmed	15-03-2013	14-03-2016
Identification and characterization of small molecule inhibitors of human DNA ligases as potential anti-cancer agents	Dr. Dibyendu Banerjee	03-06-2013	02-06-2016
Molecular dissection of signal transduction events involved in host defence against experimental visceral leishmaniasis	Dr. Susanta Kar	20-06-2013	19-06-2016
Deciphering the role of CCR4-Not complex in human malaria parasite *Plasmodium falciparum. (*Inspire Fellow Scheme)	Dr. Manish Goyal	10-06-2013	09-06-2018
Therapeutic evaluation of fetal osteo-progenitor stem cell in rat model of osteoporosis. (SERB DST Fast Track Scheme)	Dr. Deepsikha Tewari	30-07-2013	29-07-2016
Deconstructing Corticostriatal Circuit : Implication in executive function	Dr. Prem N. Yadav	01-11-2013	31-10-2016
Tyrosine hydroylase as potential drug target in Parkinson's disease: studies with genetic knockdown model of *Caenorhabditis elegans*.	Dr. Aamir Nazir	01-11-2013	31-10-2016
Clonal multiplication of Indian traditional plant *ulmus wallichiana* Planchon: An endangered tree for healing fracture	Dr. KR Arya	17-10-2013	16-10-2015
Qualitative and Quantitative analysis of bioactive alkaloida in Berberis and Mahonia species and use of PCA for marker identification	Dr. Brijesh Kumar	17-10-2013	16-10-2015
Probing electrophilic cyclization of alkynols and alkylamines for the synthesis of various heterocyclic compounds	Dr. Maddi Sridhar Reddy	02-12-2013	01-12-2016
Identification of drug targets in *Helicobacter pylori* using dual-tagged carbohydrates	Dr. Pintu Kumar Mandal	01-03-2014	28-02-2017
Target oriented delivery of chemotherapeutiv agent in leishmanisasis via macrophage scavenger receptors	Dr. Manish K Chourasia	01-06-2014	31-05-2017
Exploring the potential of heterodienophile in Hauser-kraus annulations.	Dr. Namrata Rastogi	01-06-2014	31-05-2017
Investigations on the immunomodulatory properties of cyclic and linear host defence peptides.	Dr. Mukesh Pasupuleti	10-07-2014	09-07-2017
Development of catalytic asymmetric fluorination and fluorocyclization reactions.	Dr. Kishore Mohanan	01-08-2014	31-07-2017

Title	PI	Date of Start	Expected Date of Completion
Development of novel strategies towards the synthesis of N-Heterocycles using isocyanide based multicomponents reaction	Dr. PMS Chauhan	15-05-2014	14-05-2017
Molecular and functional characterization of MAP Kinase1 homologue of *Leishmania donovani*.	Dr. Neena Goyal	01-01-2015	31-12-2017
RNAi mediated functional analysis of biomarkers for endometrial receptivity. (*Young Scientist Scheme)*	Dr. Rohit Kumar	06-04-2015	05-04-2018
Development of sugar amino acid derived peptides self assembling selectively on bacterial membranes, forming ion pores and killing bacteria including MTB.	Dr. RS Ampapathi & Dr. Vinita Chaturvedi	20-05-2015	19-05-2018
Skeletal effect of stimulation of receptor activator of NF-κB ligand (RANKL) from osteoblast by theophylline and the mechanism of action of the drug.	Dr. Naibedya Chattopadhyay	03-06-2015	02-06-2018
E3 ubiquitin ligases in breast cancer: Identification of novel interacting proteins of E3 ubiquitin ligase E6AP from breast cancer cells	Dr. Arun Kumar Trivedi	03-06-2015	02-06-2018
Design and development of plants secondary metabolite LC-MS/MS library to explore the chemistry of medicine plants	Dr. Sanjeev Kanojiya	01-10-2015	30-09-2018
Original biocompatible phosphorus dendrimers as a new strategy to tackle pulmonary tuberculosis.	Dr. KK Srivastava	16-11-2015	15-11-2018
In vivo studies of GIT enzyme resistance insulin compound.	Dr. JR Gayen	04-01-2016	04-01-2018
Indian Council of Medical Research			
Designed synthesis and biological evaluation of novel agents for managements design prostatic hyperplasia	Dr. VL Sharma	01-12-2012	30-11-2015
Evaluation of Ply - ADP - Ribose polymerase -2 (PARP-2) and Caspase - 8 signalling mechanism role during uterine tissue remodeling	Dr. Rajesh Kumar Jha	01-12-2012	30-11-2015
Evaluation of rescue treatment for cerebral malaria *in vitro / in vivo* model	Dr. Renu Tripathi	21-11-2013	20-11-2016
Design synthesis, evaluation and identification of novel dually effective spermicidal agents with-trichominal activity for prophylactic contraception	Dr. Gopal Gupta	01-04-2014	31-03-2017
Validation of WNT pathway modulation and efficacy study in primary osteoporosis, fracture healing and secondary osteoporosis for repositioning of clofazimine	Dr. Naibedya Chattopadhyay	01-04-2014	31-03-2017
Studies on the effects of obesogens in male germ cells an exploratory study.	Dr. DP Mishra	01-04-2014	31-03-2017
Preclinical development of Kaempferol with enhanced drug delivery for superior osteogenic activity.	Dr. Ritu Trivedi	01-04-2014	31-03-2017
Lead identification of non steroidal molecule with anti-proliferative activity for management of endometrial hyperplasia.	Dr. Anila Dwivedi	01-04-2014	31-03-2017
Preclinical development of orally active, rapid fracture healing agent	Dr. Divya Singh	15-06-2014	14-06-2017
Studying mechanism of pro-fertility activity of *Mucuna pruriens*, *Withania somnifera* and *Asparagus racemosus* in spermatogenically compromised rat model and identification of active phyto-constituents	Dr. Rajender Singh	15-06-2014	14-06-2017
Indian National Science Academy			
Holistic epigenome analysis to identify differentially methylated regions (DMRs) that affect male fertility	Dr. Rajender Singh	01-04-2014	31-03-2017
Attenuation of GCSFr signaling by ubiquitination: Implications of E3 ubiquitin Ligases in GCSFr signaling mediated myeloid leukemia Pathogenesis	Dr. Arun Kumar Trivedi	01-07-2014	30-06-2017
Understanding the role of heat shock proteins (HSPs) in *Plasmodium falciparum* survival in stress conditions	Dr. Niti Kumar	01-01-2015	31-12-2017
Ministry of Earth Sciences			
Design and synthesis of novel Dolastatins, Azumamides and Microsporin A analogs: A quest for anticancer drugs	Dr. Dipankar Koley	01-11-2012	31-03-2015
Biological evaluation, discovery of novel bioactive compounds & coordination of the MOES project Drug from Sea	Dr. Madhu Dikshit	01-11-2012	31-03-2017
Development of antimicrobial, anti-inflammatory and anticancer agents from the marine-organisms and micro-organisms	Dr. T Narender	01-08-2013	31-07-2016

Title	PI	Date of Start	Expected Date of Completion
Search for novel antimicrobial and anticancer metabolites from marine bacteria	Dr. Prem Prakash Yadav	01-08-2013	31-07-2016
Synthesis and bioevaluation of chemical libraries of B- carboline based mimics of marine natural products.	Dr. Sanjay Batra	20-04-2015	19-04-2018
Synthesis of Fascaplysin analogues as possible anticancer agents.	Dr. Maddi Sridhar Reddy	20-04-2015	19-04-2018
Collection and fractionation of the identified leads such as NIO-905-A002(F003,4) and NIO-968 (CNS) NIO-970	Director	20-08-2015	19-08-2017
Third party verification and out sourcing of some of the activities related to development of drugs from ocean.	Director	08-12-2015	07-12-2017
AYUSH			
Exploration, identification and isolation of bone fracture healing agents from Indian folk traditional plants *Pholidota articulate* and *Coelogyn cristata* (Orchidaceae)	Dr. KR Arya	31-12-2014	31-12-2017
Department of Atomic Energy			
Design and synthesis of donor-acceptor based new organic fluorescent dyes and their applications.	Dr. Atul Goel	06-01-2016	05-01-2021
Defence Research and Development Organisation			
Pharmacokinetic studies of radioprotective formulation prepared from active principles isolated from *Podophyllum hexandrum*.	Dr. RS Bhatta	07-05-2015	06-05-2016
Emeritus Scientist			
Integrated 3D molecular modeling, design and synthesis of novel chemical entities (NCEs) as potential agents for the treatment of Alzheimer disease.	Dr. AK. Saxena	01-05-2014	30-04-2017

3. Sponsored Projects

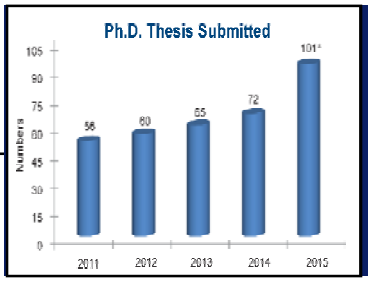
Code No.	Project Title	Funding Agency	Principal Investigator	Duration
SSP0210	Genotoxicity & Molecular mechanism of RISUGadv	IIT, Kharagpur	Dr. R.K. Singh	2014-16
SSP0211	*In vitro* testing of GSKCH formulation for osteogenic effect	GSKCH, Gurgaon	Dr. N. Chattopadhyay	2014-15 (12 month)
SSP0213	Synthetic microbicidal vaginal spermicides: Design, synthesis and biological evaluation.	HLL, Thiruvanantpuram	Dr. Gopal Gupta	2015-18
SSP0214	*In vivo* studies of 6 leads and *In vitro* of 10 leads of National Innovation Foundation-India (NIF) for antimalarial evaluation.	NIF, Ahmedabad, Gujarat	Dr. Renu Tripathi	2015-16
SSP0215	Validation of two herbal leads from NIF for three doses each in SHR using Telemetric system	NIF, Ahmedabad, Gujarat	Dr. Rakesh Shukla	2015-16 (4 months)

4. CSIR Young Scientist Award Projects

Code No.	Project Title	Principal Investigator	Duration
YSA0001	Identification of Kinase and phosphatase specific to CTD serine7 of RNA Polymerase II	Dr. Sohail Akhtar	2011-16
YSA0002	Elucidation of functional inactivation of cdx2 expression in colon cancer cells: Possible role of E3 ubiquitin ligases in regulating steady state levels of cdx2 protein expression via ubiquitination	Dr. A.K. Trivedi	2014-19

5. CSIR Extra Mural Research Project

Code No.	Project Title	Principal Investigator	Duration
EMR0001	Understanding the role of bone in metabolic diseases and evaluation of therapeutic potential of osteoanabolic compounds. (CSIR Nehru Science Post-Doctoral Research Fellowship)	Dr. Sapna	2014-16



HUMAN RESOURCE DEVELOPMENT

1. Ph. D. thesis submitted

S. No.	Name of Student	Title	Name of Supervisor
		Jawaharlal Nehru University, New Delhi	
1.	Shashi Gandhi	Molecular cloning, overexpression, purification and characterization of cytosolic serine hydrooxymethytransferase of *Leishmania donovani*	Dr JK Saxena
2.	Ankita Singh	Elucidation of novel protein kinase signaling involved in monocyte inflammatory response and cytokine production	Dr Manoj K Barthwal
3.	Karri Bhaskara Rao	Design and synthesis of novel heterocyclic compounds as potential pharmaceutical agents	Dr KV Sashidhara
4.	Neha Gaur	Molecular studies of recombinant arginase of *Leishmania donovani*	Dr JK Saxena
5.	Vaibhav Kumar Shukla	Structural and biophysical characterization of ADF/cofilins	Dr Ashish Arora
6.	Kuldeep Singh	Functional characterization of Actin-like protein(s) in *Leishmania*	Dr AA Sahasrabuddhe
7.	SunitaYadav	Molecular and biochemical characterization of chemotherapeutic protein of filarial parasite	Dr JK Saxena
8.	Harish Shukla	Biophysical aggregational studies on recombinant Isocitrate and Hyaluronatelyases	Dr Md. Sohail Akhtar
9.	Manisha	Cloning and characterization of surface protein of endosymbiotic bacteria *Wolbachia*(WSP) of filarial parasite *Brugia malayi*	Dr Shailja Bhattachrya
10.	Yeshwant Singh	Drug-drug interaction studies of novel trioxane antimalarial molecule with antitubercular drug	Dr SK Singh
11.	Smita Gupta	Cloning and characterization of guanylate kinase, a nucleoside monophosphate kinase of filarial parasite	Dr JK Saxena
12.	Ashutosh Raguvanshi	Diversity oriented synthesis of arenes and heteroarenes and their applications	Dr Atul Goel
13.	Kumari Rashmi	Investigating into the role of active CDRI osteogenic compound in metabolic diseases and elucidation of its mechanism of action	Dr Sabyasachi Sanyal
14.	Vasantha Rao Dola	Design and synthesis of 4-aminoquinoline derivatives as novel antimalarial agents	Dr SB Katti
15.	Gunaganti Naresh	Synthesis and chemical transformation of natural product inspired synthons of biological importance	Dr T Narender
16.	Ranga Prasad Doda	Design and synthesis of novel imidazole derivatives as potential anticancer agents	Dr KV Sashidhara
17.	M Prathap Reddy	Development of potentially bioactive delivery vectors possessing intrinsic therapeutic activity as siRNA carries	Dr Manish Chourasia
18.	Kirtika Prakash	Studies with antioxidant system enzymes to explore the molecular mechanism of arteether resistance in *Plasmodium vinckei*	Dr SK Puri
19.	Inderpreet Arora	Chiron approach synthesis of stereo-chemically pure nitrogen containing cyclic and acyclic compounds	Dr Arun K Shaw
20.	Munna Prasad Gupt	Synthetic studies towards heterocyclic scaffolds: Development of new chemotherapeutic agents	Dr RP Tripathi
21.	Nisha Yadav	Studies and synthesis of novel bioactive oxazepine derivatives as potential DNA ligase inhibitors	Dr Kanchan Hajela
22.	Smriti Pandey	Proteome analysis of induced drug resistant strain of *Candida ablicans* and identification of potential target(s)	Dr PK Shukla
23.	Jyoti	To study an inverse relationship underlying the effect of isoflavones on adipogenesis and osteogenesis	Dr Ritu Trivedi
24.	Rajesh Kumar Arigela	Synthesis of 1,2,3 triazole annulated polyheterocyclic compound of biological interest	Dr Bijoy Kundu

S. No.	Name of Student	Title	Name of Supervisor
25.	Hari Shyam	Molecular basis of action of a novel SERM, Ormeloxifene in human endometrial cancer cells	Dr Anil K Balapure
26.	Amit Kumar	Design of novel peptides or novel analogs of naturally occurring antimicrobial peptides and evaluation of their biological activity	Dr Jimut Kanti Ghosh
27.	Anand Kumar Pandey	Synthesis of novel fused hybrid of nitrogen heterocyclic and their bioevaluation as anti-infective agents	Dr PMS Chauhan
28.	Jyoti	A microRNA signature for medicarpin-induced osteoblast differentiation	Dr Divya Singh
29.	Atul Kumar Agrawal	Investigation of putative binding of *Mycobacterium tuberculosis* proteins with host DNA	Dr Amit Misra
30.	Pooja Agarwal	Studies on interactions of pathogenic mycobacteria adipocytes during persistence in the host	Dr YK Manju
31.	Vishal Singh	Management of Prostate cancer by selective estrogen receptor modulators-role of proteasome	Dr Gopal Gupta
32.	Rahul Shukla	Development & evaluation of novel drug delivery system for chemotherapeutic agents	Dr Prabhat Ranjan Mishra
33.	Abhishek Kumar Singh	Nitric oxide synthase activity, expression and its regulation in neutrophil maturation	Dr Madhu Dikshit
34.	Makthala Ravi	Synthesis of potential antimalarial agents	Dr PP Yadav
35.	Pintu Das	Chiron approach to the synthesis of biologically important compounds	Dr Arun K Shaw
36.	Yashoda Krishna Sunkari	Studies directed towards the development of amide-linked RNA and sugar amino acid based glycopeptide mimics	Dr Dipankar Koley
37.	Sankalan Mondal	Design, synthesis, molecular modeling studies and bioevaluation of trisubstitutedmethanes and amino acids derived heterocycles	Dr Gautam Panda
38.	Kainat Khan	Identification of bone modulatory phytochemicals and elucidation of their modes of action	Dr Naibedya Chattopadhyay
39.	S Srinvas	Design of one-pot strategies for the synthesis of indole-based polyheterocycles of biological interest	Dr Bijoy Kundu
40.	Srinivasarao Kondaparla	Synthetic studies of 4-aminoquinoline analogues as potential antimalarial agents	Dr SB Katti
41.	Aparna Agarwal	Structural and functional characterization of gntR transcription regulatory protein(s) from *Mycobacterium tuberculosis* and BmTPP	Dr R Ravishankar
42.	Padam Kumar	Phytochemical investigation of Indian medicinal plants and chemical transformation of bioactive molecules	Dr Rakesh Maurya
43.	Ashok Kumar Maurya	Design and synthesis of flexible polymethylene linker compounds based on nitrogenous heterocycles for structural and biological studies	Dr Arun K Shaw
44.	Yarkali Krishna	Design, synthesis and biological evaluation of peptides and peptidomimetics and total synthesis of bioactive alkaloids	Dr Dipankar Koley
45.	Somi Reddy Kundooru	Chiron approach to the synthesis of biologically active molecules from commercially available monosaccharides	Dr Arun K Shaw
46.	Mohd. Parvez Khan	Determination of efficacy and mode of action osteogenic agents from Indian medicinal plants	Dr Naibedya Chattopadhyay
47.	Khemraj Singh Baghel	Role of Macrophages in breast cancer metastasis: Delineating the involvement of cytokine signaling networks	Dr Smrati Bhadauria
48.	Isha Kapoor	Proteomic-based identification of E3 ubiquitin ligase interacting proteins in myeloid leukemia	Dr Arun K Trivedi
49.	Shashi Kant Kumar	Study of the influence of phagosome maturation process on the outcome of latent tuberculosis infection	Dr Sudhir K Sinha
50.	Navneet Kumar Yadav	Evaluation of anticancer activity and toxic effects of certain medicinal plants	Dr RK Singh

S. No.	Name of Student	Title	Name of Supervisor
51.	Vijay Kumar	Role of Integrin β8-and focal adhesion kinase (FAK) signaling in the uterine tissue remodeling process	Dr Rajesh Kumar Jha
52.	Garima Pandey	Syntheses of possible antimalarial agents and novel AZA polycycles	Dr Sanjay Batra
53.	Hamidullah	Investigation into the role of IL-10 in breast cancer progression	Dr Rituraj Konwar
54.	Suniti Vaishya	Analysis of polypeptide chain release factors involved in translation termination in *Plasmodium falciparum* organelles	Dr Saman Habib
55.	Akhilendra Pratap Bharati	Identification and characterization of stress induced gene regulatory proteins of *Saccharomyces cerevisiae*	Dr Sohail Akhtar
56.	Manish Charan	Investigation of proteins predicted to be involved in the [Fe-S] complexation pathway in organelles of *Plasmodium falciparum*	Dr Saman Habib
57.	Chetan Sharma	Bio-prospection and *in vitro* biosynthesis of bioactive secondary metabolites from Indian traditional plants used for bone healing	Dr KR Arya
58.	B Hari Krishna	Development of novel strategies for the synthesis of fused heterocycles of biological interest	Dr Sanjay Batra
59.	PraveshVerma	Molecular and biochemical characterization of protein disulphide isomerase of filarial parasite	Dr JK Saxena
60.	Piyush Dravid	Molecular characterization of malate dehydrogenase and chitinase from filarial parasites	Dr JK Saxena
61.	Vineet Kumar Maurya	Deciphering “Transforming Growth Factor β-activation signaling” during uterine tissue remodeling process	Dr Rajesh Kumar Jha
62.	Ashutosh Sharma	Synthesis of Pyranone-derivative donor-acceptor organic fluorescent dyes for cell-imaging and organic electronic devices	Dr Atul Goel
63.	Anuradha Gupta	Induction of macrophage autophagy using inhalable microparticles as a treatment strategy for tuberculosis	Dr Amit Misra
64.	Meenakshi Rana	Elucidation of novel lipid and inflammatory signaling pathway involved in monocyte/macrophage activation from cell formation and apoptosis	Dr Manoj K Barthwal
65.	Sunil Kumar Singh	The role of neurotransmitters/receptors and hypoxic factors in cerebral malaria model and their therapeutic reversal	Dr Renu Tripathi
66.	Chennam Setty Subbaiah	Peptide and Peptidomimetics as potential anti-infective agents	Dr W haq
67.	Mohammad Kashif	Functional and structural characterization of the Largest Subunit of RNA Polymerase II	Dr Md. Sohail Akhtar
68.	Megha Dubey	Study of post-translational modifications induced by oxidative/nitrosative stress in neutrophils	Dr Madhu Dikshit
69.	Subash Chand Verma	Investigation on the long term persistence of *Mycobacterium tuberculosis* in the host despite a functional immune system	Dr YK Manju
		AcSIR PhD Program	
70.	Abhisheak Sharma	Interaction studies of concurrently co-administered clinically important drugs on the pharmacokinetic Pharmacodynamic profile of Centchroman and pre-clinical pharmacokinetic studies of novel anti-parasitic compounds	Dr Jawahar Lal
71.	Chakrapani Tripathi	Initiation and progression of angiogenesis: Deciphering the role of Chemo-attractant networks between tumor cells macrophages	Dr Smrati Bhadauria
72.	Shubhra Srivastava	Characterization of Molybdenum Cofactor biosynthesis pathway proteins(s) from *M. tuberculosis* H37Rv	Dr Ashish Arora
73.	Ajay Kumar	Design and synthesis of 1,3 diza heterocyclic based privileged structure as potential anticancer agents	Dr Atul Kumar
74.	Mahendra Kumar Hidau	Pharmacokinetics, metabolite profiling and drug-drug interaction studies of novel anti-tubercular and anti-malarial molecules	Dr SK Singh
75.	Poonam Goswami	A study to evaluate the involvement of endoplasmic reticulum stress and biochemical alterations in rotenone induced neurotoxicity	Dr Sarika Singh

S. No.	Name of Student	Title	Name of Supervisor
76.	Hardik Jamnadas Chandasana	Evaluation of preclinical ADME properties and prediction of human pharmacokinetics of S007-867, a novel potent antiplatelet agent	Dr Rabi S Bhatta
77.	Akanksha Srivastava	Production, purification and characterization of microbial cholesterol oxidase	Dr PK Shukla
78.	Sonali Ganwar	Characterization of dipeptidylcarboxypeptidase of *Leishmaniadonovani* and identification of potential inhibitors as antileishmanial agents	Dr NeenaGoyal
79.	Sameer Tiwari	Studies on the roles of PknG phosphorylated substrates in growth and in survival of *Mycobacterium bovis* BCG.	Dr Kishore K Srivastava
80.	AwakashSoni	Studies on HEME Detoxification protein (HDP) and its resistance to arteether in *Plasmodium vinckei*	Dr SK Puri
81.	Arif Jamal Siddiqui	Studies on immunological responses elicited during pre-erythrocytic stage infection withrodent malaria parasite *Plasmodium yoelii*	Dr SK Puri
82.	Shivika Rai	A study on neuro-inflammation and its influence on NMDA receptor and synaptic function in STZ (ICV) induced memory impaired rat	Dr Rakesh Shukla
83.	Akansha Mishra	Exploration of antihyperglycemic activity and molecular mechanism(s) of action of selected nature identicals	Dr Arvind K Srivastava
84.	Jyoti Bhardwaj	Studies on some aspects of anti-malarial immunity against sporozoite and blood induced infection in rodent malaria models	Dr SK Puri
85.	Supinder Kaur	Role of HMG-CoA reductase inhibitors and endoplasmic reticulum associated genetic interventions in Parkinson's disease: Studies employing transgenic *Caenorhabditis elegans* model	Dr Aamir Nazir
86.	Pooja Agarwal	*In vitro* selection of an Arteether tolerant phenotype and chemo-sensitivity studies with Indian field isolates of *Plasmodium falciparum*	Dr Kumkum Srivastva
87.	Pooja Shukla	Drug Induced hematotoxicity and it's amelioration by plant products	Dr RK Singh
88.	Preeti Vishwakarma	Modulation of immune system using STAT3 inhibitors in Visceral leishmaniasis (Kala Azar)	Dr Susanta Kar
89.	Akhilesh Kumar	A study on antiteratogenic potential of Curcumin against teratogenic activity of valproic acid	Dr Neeraj Sinha
90.	Komal Sharma	Synthesis and biological evaluation of prostate specific membrane antigen (PSMA) targeting cationic amphiphiles and anticancer evaluation of CDRI compounds	Dr Manish K Chourasia
91.	Sonal Gupta	Design, synthesis and biological evaluation of novel agents for management of Benign Prostatic Hyperplasia	Dr VL Sharma
92.	Richa Dwivedi	Development of an *in vitro* model using *M. tuberculosis* grown in mouse bone marrow macrophages to select new molecules active against latent TB	Dr Vinita Chaturvedi
		Banaras Hindu University, Varanasi	
93.	Vaibhav Mishra	Evaluation of Gastro-protective effect of natural product and elucidation of its molecular mechanism	Dr Manoj K Barthwal
94.	Vandana Singh	Cloning expression and characterization of lactate dehydrogenase from *Plasmodium vivax* and *Plasmodium knowlesi*, the human malaria parasites	Dr NA Kaushal
		Integral University, Lucknow	
95.	Utsav Debnath	Design, synthesis, biological evaluation & molecular modeling studies ofthiazolidine& related analogues as anti HIV-1agents	Dr SB Katti
96.	Sunil Kumar Mishra	Evaluation of anti-carcinogenic potential of bioactive compounds derivative from Indian Medicinal plants	Dr AK Saxena
97.	Gurpreet Kaur	A study on the involvement of poly (ADP-ribose) polymerase-1 (PARP-1) in pulmonary hypertension	Dr Kashif Hanif
98.	Vikas Kushwaha	Studies on cloning, expression and purification of disorganized muscle protein 1 of filarial parasite *Brugia malayi* and its responses in rodent hosts	Dr P K Murthy

S. No.	Name of Student	Title	Name of Supervisor
		KGMU, Lucknow	
99.	Chandra Prakash Pandey	Identification and characterization of aspirin and clopidogrel resistance in patients of cardiovascular disease	Dr Madhu Dikshit
		Jamia Hamdard University, New Delhi	
100.	Atul Kumar Verma	Molecular characterization of immunomodulatory protein(s) of human filarial parasite *Brugia malayi*	Dr PK Murthy
		Banasthali University, Rajasthan	
101.	Renuka Khatik	Development of bioconjugate polysaccharides nanoparticles for effective management of colorectal cancer	Dr Amit Misra

2.1 Training to Post Graduate Students

During the calendar year, a total of 105 Post-graduate students from 43 Colleges/Universities and their affiliated colleges from all over the country were selected on merit basis and were imparted training in various disciplines of drugs and pharmaceutical research for 2-12 months duration.

2.2 Training to Post Graduate Students

CSIR-CDRI being a mentor institute for the NIPER Raebareli, imparted one year project training in biomedical research to 30 M.S. (Pharm) Pharmaceutics & Medicinal Chemistry specialization students.

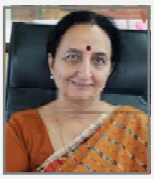
2.3 Training under cooperation with INSA & NASI

Under the programme, 08 INSA & NASI fellows from different institutes were provided training in different aspects of biomedical research.

HONOURS AND AWARDS

Dr Madhu Dikshit

- JC Bose National Fellowship



Dr Brijesh Kumar

- 10th Dr. P.D. Sethi's Annual Award for Best Paper in Pharma Analysis 2014

Dr Anuradha Dube

- JC Bose National Fellowship

Dr Atul Kumar

- Penta Star awards by SciFinder–Chemical Abstracts Services (CAS) American Chemical Society (ACS) Columbus, OH-USA.

Dr Saman Habib

- Fellow of Academy of Sciences, Bengaluru

Dr Sanjay Batra

- Associate Editor, RSC Advances, Royal Society of Chemistry, UK

Dr Neena Goyal

- Dr. B.N.Singh Memorial Oration Award, 26th National Congress of Parasitology, BHU, Varanasi (21-23rd Jan 2016).

Dr M. Sridhar Reddy

- Thieme Chemistry Journal Awardee – 2015

Dr Aamir Nazir

- Raman Research Fellowship 2015-16.

Gunaganti Naresh (Student of Dr. T Narender)

- Eli Lilly Outstanding Thesis Award for 2014

Dr Atul Goel

- DAE-SRC Outstanding Investigator's Award 2014-15 by DAE, SRC, Mumbai
- CRSI Bronze Medal 2015, Chemical Research Society of India
- Honorary Diploma in Chemical Sciences 2015, ISPF, Russia

Dr. Veenu Bala (Student of Dr. VL Sharma)

- Dr. MM Dhar Memorial Distinguished Career Achievement Award-2015 (Chemical Sciences)

Dr Neeloo Singh

- Professor. B.K. Aikat Oration Award – 2012, Indian Council of Medical Research India
- Bharat Gaurav Award 2015, India International Friendship Society

Dr. Avinash Kumar (Student of Dr. Ritu Trivedi)

- Dr. MM Dhar Memorial Distinguished Career Achievement Award-2015 (Biological Sciences)

Dr Mukesh Pasupuleti

- Recognition as 'Outstanding Performer' in the book "PURSUIT OF BIOTECHNOLOGY Opportunities & Options" published by DBT, India

Dr. Yashpal Singh Chhonker (Student of Dr. RS Bhatta)

- Dr. JM Khanna Memorial Distinguished Career AchievementAward-2015 (Pre-clinical & Clinical Sciences)

Mr. Vivek Kumar Pawar (Student of Dr. Manish Kumar Chourasia)

- Dr. JM Khanna Memorial Early Career Achievement Award 2015

Ms Swati Jaiswal (Student of Dr. JawaharLal)

- Selected for Uppsala Pharmacometrics Summer School (UPSS) 2015 By Novartis and Uppsala Biomedical Centre, Uppsala University, Sweden

Ms. Samriddhi Shukla (Student of Dr. Syed Musthapa Meeran)

- Dr. Swarn Nitya Anand Memorial Early Career Achievement Award 2015 for Women Research Scholars

Mr Mahendra Shukla (Student of Dr. JawaharLal)

- Selected for Uppsala Pharmacometrics Summer School (UPSS) 2015 By Dept. Science and Technology, India

Mr. Sharanbasappa S. Karade (Student of Dr. J.V. Pratap)

- Selected for Advance research at European Synchrotron Radiation Facility, Grenoble, France by Regional Centre for Biotechnology, Dept. of Biotechnology, Govt. of India

Ms Shivangi Rastogi, (Student of Dr. Manju Y.K.)

- Best Poster award in Life Sciences, 21st ISCB International Conference-ISCBC- 2015

Anup Kumar Singh (Student of Dr. J.V. Pratap)

- NCRI Prize Award for best poster by NCRI Cancer Conference

Mr Alok K Mishra (Student of Dr K.K. Srivastava)

- Selected for a bilateral (UK-India) AMR DxC Autumn School-2015 on Molecular diagnostics for Antimicrobial Resistance By University of Edinburgh, Scotland, United Kingdom.

Mr. Dipak Purohit (Student of Dr. Atul Goel)

- Best Poster Award, Indian Society of Chemists and Biologists

Ms Gitu Pandey (Student of Dr. PR Mishra)

- Best poster prize in Life Sciences category, 21st ISCB International Conference, 2015, CDRI, Lucknow
- Best poster award by International Conference on Current Challenges in Drug Discovery Research, 2015, MNIT, Jaipur

Mr Sangappa Basanna Chadchan (Student of Dr. Rajesh Kumar Jha)

- Best poster at an international congress on "Embryo implantation and pregnancy: Intricacies and strategies for success", NII, New Delhi, India

Ms Manisha Dixit (Student of Dr Ritu Trivedi)

- New Investigator Award by ICCBH

Mr Vijay Kumar (Student of Dr. Rajesh Kumar Jha)

- Best Poster Award by International Symposium on Reproductive Biology And Comparative Endocrinology (ISRBCE-2015) held at BHU, Varanasi
- Young Scientist Award at National Seminar on "Translational Research in Biotechnology for improving Animal Health and Production and 3rd Annual Meeting of Society for Veterinary Science and Biotechnology held at RAJUVAS Bikaner India

Mr Abhishek Arya (Student of Dr. A.K. Dwivedi)

- First prize for poster presentation, International Pharmaceutical Conference-2015, BBA University, Lucknow

Ms Richa Shrivastava (Student of Dr. Smrati Bhadauria)

- Best oral presentation, International conference on stem cell and cancer, Pune

NOTES

CSIR-Central Drug Research Institute, Lucknow

- Major Events Organized
- Distinguished Visitors
- Invited Lectures Delivered by Institute Scientists
- Visits and Deputation Abroad
- *Members of Distinguished Committees*

Other Activities

Other Activities

MAJOR EVENTS ORGANIZED

64th Annual Day of CSIR- Central Drug Research Institute and 40th Sir Edward Mellanby Memorial Oration

CSIR-CDRI celebrated its 64th Annual Day on the 17th February, 2015. The Annual day's main programme was organized in afternoon with the graceful presence of Prof. Gautam R. Desiraju, as the Chief Guest and Dr BN. Dhawan, Former Director, CSIR-CDRI president of function. Dr Ram A Vishwakarma, Director CSIR-CDRI formally welcomed the Chief Guest, other dignitaries and presented a detailed account of the achievements made by CSIR-CDRI during the reporting period. The event started off with the 40th Sir Edward Mellanby Memorial Oration by Prof. Gautam R Desiraju, Indian Institute of Science, Bengaluru in the memory of Institute's Founder Director Sir Edward Mellanby. The topic of the oration was "Crystal Engineering: Enhancement of Pharmaceutical Physicochemical properties". In his oration, Prof. Desiraju expressed his concern about the reasons of failure in the developmental phase of drugs and possibilities of taking to the next stage with subtle improvements saving time and money. He also emphasized the importance of Crystal Engineering vis-à-vis drug development program with special reference to techniques relevant to polymorphs, co crystal and salts.

Later, the Annual Report, 2014-15 was released by the distinguished guests on the dais, followed by distribution of Annual Awards for the best performing employees and students. On this occasion the prestigious CDRI Awards-2015 for Excellence in Drug Research was also announced. In Life Sciences category CDRI Award-2015 has been awarded to Prof. Rinti Banerjee, IIT Bombay for her work on "Trigger Responsive Nanoparticles for Drug Delivery". In the Chemical Sciences category, the award has gone to Dr Ramakoteswara Rao Jetti, Mylan Laboratories, Medak, Telangana for his work on "Novel Solid Forms of Active Pharmaceutical Ingredients". Dr MM Dhar Memorial Distinguished Career Achievement Award-2014 for Chemical Sciences was awarded to Dr Veenu Bala and for Biological Sciences to Dr Avinash Kumar. Dr JM Khanna Memorial Distinguished Career Achievement Award-2014 for Pre-clinical & Clinical Sciences was awarded to Dr Yashpal Singh Chhonker. Dr JM Khanna Memorial Early Career Achievement Award 2014 was awarded to Mr Vivek Kumar Pawar and Dr Swarn Nitya Anand Memorial Early Career Achievement Award 2014 for Women Research Scholars was awarded to Ms. Samriddhi Shukla. Further, Excellence awards to the publications with impact factor greater than 10 in category I and greater than 6 in category II, patents that were granted abroad and best technology award were also awarded. Furthermore, the institute felicitated its employees completing 25 years of service. Dr BN Dhawan, in his presidential remarks praised the efforts made by the institute. He was delighted with the performance of the younger scientists to carry on tone and rhythm of the able leadership from its former directors and stalwarts, as this institute is modernized beyond imaginations and everyone has greater expectations from the future research. Mr Vinay Tripathi proposed vote of thanks and concluded the programme

21st ISCB International Conference (ISCBC-2015) on Current Trends in Drug Discovery and Developments

Central Drug Research Institute, Lucknow & Indian Society of Chemists & Biologists, Lucknow, India jointly organized, 21st ISCB International Conference from February, 25-28, 2015. The conference was inaugurated with welcome address by Director, CSIR-CDRI Dr Ram Vishwakarma and presidential address by Prof. Anamik Shah, President of ISCB. About 40 invited speakers

from all around the country delivered their lectures during 12 sessions of the conference. More than two hundred participants attended the conference. ISCB Award for Excellence and ISCB Young Scientist Awards was also conferred. Organizing Secretary, Dr PMS Chauhan, proposed the vote of thanks for all the participants and organizing teams along with media persons for grand success of the event.

National Symposium on "Animals in Research and Testing: A Cross-Talk between Relevance and Ethics" (NSART 2015)

CSIR-CDRI In collaboration with Laboratory Animal Science Association of India (LASAI) organized a National Symposium on "Animals in Research and Testing: A CrossTalk between Relevance and Ethics" (NSART 2015) from March 13-14, 2015, which was inaugurated by Dr RK Singh, Director, IVRI, Izatnagar as Chief Guest. In his inaugural speech Dr Singh emphasized on ensure of Animal Welfare during the course of research and

experimentation on them. Prof. BN Dhawan, Former Director, CSIR-CDRI, Lucknow graced the function as Guest of Honour. He briefed the uses of Animals in biomedical research that is very minimal (app 8%) but without which it is impossible to develop any new therapeutic agent meant for mankind. He also mentioned that unless until we ensure the welfare and Humane use of these research animals one cannot produce valid and reliable experimental outcomes. Dr Shailja Bhattacharya, Chairperson, NSART 2015, presided over the function and welcomed all guests, delegated and dignitaries attending the same. Dr Rishendra Verma, President, LASAI, put the special remarks on the current scenario of Laboratory Animal Science in our Country. In his speech he raised the issue about control and governing of animal research and experimentation by Ministry of Environments & Forests, while it seems that they are no way related to this area and recommended to bring it under suitable agency. Dr DS Upadhyay Organizing Secretary, NSART 2015 introduced about the significance and genesis of this symposium. Around 150 participants and more than 25 invited eminent speakers will deliver their talks during different scientific session related to Science, Welfare and Ethics.

One Day Workshop on Patinformatics

CSIR-CDRI In collaboration with CSIR-URDIP, Pune organized a One Day Workshop on Patinformatics on March 19, 2015. Director Dr Ram Vishwakarma welcomed the participants

and emphasized on the need of Patinformatics in current R&D scenario. Participants from all four Lucknow based CSIR laboratories participated in this workshop. Dr Raj Hirwani, Head CSIR-URDIP, Pune delivered a talk on, Patinformatics: Basics and Applications. Participants learned about Reading a patent / Patent Classifications, Patent Database searching along with various Case Studies on Patent Landscape Analysis, Freedom to operate Analysis and Patentability Study during the workshop.

Visit of Honorable Minister for Science & Technology Dr Harsh Vardhan at CSIR-CDRI

Dr Harsh Vardhan, Union Minister for Science & Technology, visited CSIR-CDRI, Lucknow on 11th April 2015. On this occasion, he announced that the Indian pharmaceuticals sector would soon be showcasing 'candidate drugs' for malaria, osteoporosis and diabetes. The "candidate drugs" are currently undergoing clinical trials. He further announced that simultaneously, CSIR-CDRI is carrying out Investigational New Drug (IND) studies on lead molecules for fracture-healing, cancers, thrombosis, malaria and hyperglycemia.

The Minister said, "I am confident that the drug laboratories under CSIR are capable of backing up the Swasth Bharat Mission. Our scientists are focusing on both infectious and life-style diseases. We are developing next generation drugs, biologics, biosimilars, gene therapeutics, stem cell therapeutics, personalized medicine and multifunctional nanomedicine.

Honorable Minister said, "I am certain that India has the potential of becoming a global pharmaceutical powerhouse and in the process of putting some key enablers in place. These include giving the right incentives for R&D, forging alliances with the private sector and keeping an open mind on suggestions for fiscal relief to the private sector so that its role in R&D is enhanced. He said that in recent months he has visited a number of CSIR laboratories and is convinced that they have the competencies for new drug discovery and development including clinical trials, and has played a major role over the last six decades in the growth of pharmaceutical industry and education in India.

Earlier, addressing scientists at the CSIR-CDRI auditorium here, he made it clear that the Prime Minister is committed to making India one of the world's leading destinations for end-to-end drug discovery and innovation by 2020. "Strengthening of

the R&D ecosystem is the priority". He also emphasized that the people of India are expecting that CSIR laboratories would be able to produce therapeutic and preventive measures for reemerged infectious diseases like Dengue, Chikunguniya, Encephalitis, Swine Flu as well as conditions like Cancer, Diabetes, Osteoporosis, Hypertension, Depression and Ulcers. The Minister thanked representatives of the pharmaceutical private sector who were present on the occasion for supporting CSIR labs in bringing the products from the laboratory to the market.

Today, India ranks third in terms of volume of production with 10 percent share of the global market by volume and 14th largest by value. India is often dubbed the "Pharmacy of Developing World". Dr Harsh Vardhan however pointed out that India still has a long way to go in Pharma R&D. Moreover, India pharma needs to move from a phase of manufacturing to innovation. He expressed concern over the fact that currently, new drug R&D in India is mostly an affair of government organizations. "I request industry representatives to collaborate with CSIR laboratories in new drug R&D. The Prime Minister has given a call for Make in India. We need to generate millions of jobs in a couple of years because this country has a youth bulge. Seamless partnership will help develop products and technologies for the benefit of the common man," he pointed out. In this context licensing of a new botanical product CDR4744F004 for osteoporosis and Centbucridine (Local anaesthetic), IND Package for a new antithrombotic compound S007-867 and anti-stroke chemotype of Ashwagandha (NMITLI118RT+) are steps in right direction.

He announced that Government would soon set up the Biopharma Industry Incubator (BII) under the umbrella of CSIR-CDRI, Lucknow. It would strive to build a new generation of enterprises in the health care sector. The S&T Ministry is also considering setting up Government Laboratory Practices (GLP)-certified labs in CSIR-CDRI for complete range of Investigational New Drug (IND) studies. He said the step would foster new drug development as well as shore up the financial bottom line of the laboratory. Further, the Minister announced the formation of a National Centre for Laboratory Animals in the CSIR-CDRI new campus conforming to national and international guidelines. The new institution would serve as a referral centre for lab animal breeding and experimentation for new drug development.

Workshop on *in vivo* Imaging and Analysis

Under the CSIR-NWP Project "UNDO" (BSC0103) a 3 day workshop cum training program on *in vivo* Imaging and Analysis was conducted from 8-10 April, 2015 at the CSIR-Central Drug Research Institute. PhD scholars from various Divisions were participated in this training program and learned basic and practical applications of this advance technique.

CSIR-CDRI-BC Centre of Excellence in Flow Cytometry: Workshop on Flow Cytometry based Multicolour Immunophenotyping, Cell Cycle analysis and Apoptosis Assays

Under the aegis of CSIR-CDRI-Beckman Coulter Centre of Excellence in Flow Cytometry, a workshop cum hands on training experience was organized in the Division of Parasitology from 21st -23rd April, 2015 in the Division of Parasitology. The workshop modules were divided into lectures and hands on practical sessions over a three day period on Beckman Coulter Flow Cytometer FC 500. The three day workshop covered topics related to apoptosis and cell cycle analysis using Flow Cytometry. 12 students from various divisions of CSIR-CDRI learnt the basics of flow cytometry like instrument set-up, calibration, sample preparation, data analysis etc. The workshop was jointly conducted by Dr Ritesh Kumar- Application Specialist and Mrs Sakshi PaulProduct and Application Manager (both BC India Pvt. Ltd) and Dr Madhu Dikshit, Dr Shailja Bhattacharya, Dr Anuradha Dube, Dr Anil Gaikwad and Dr Mrigank Srivastava (all CSIR-CDRI). On the last day of the workshop, certificates for successful completion of the training were distributed to all the participants by Dr Madhu Dikshit (Director, CSIR-CDRI). Amit Rai (student of Dr Akhilesh Tamrakar) and Madhur Sachan (student of Dr Amit Misra) jointly received the first prize in Flow Cytometry quiz competition.

Swachchhta Abhiyan and Shramdaan Program

CSIR-CDRI is promoting Swachchhta Abhiyan among the staff, for this CDRI Staff Club organized a “Shramdaan” program on 15th May 2015. Director Dr Ram Vishwakarma, motivated the Scientist and research scholars of Institute and briefed about the necessity and importance of cleanliness of campus. During the program all scientist and students in the leadership of Director participated enthusiastically for the Shramdaan in campus.

Dr Madhu Dikshit takes over the charge as Director

After 36 years of devoted research at CSIR-Central Drug Research Institute, Dr Madhu Dikshit has taken over the charge as the Director, CSIRCDRI, Lucknow on 8th June 2015. She is the first woman Director in 64 years of glorious history of CDRI. Dr Dikshit has been conferred with several honours and accolades including elected fellowships (FNASc, FASc & FNA). She had contributed to more than 160 research publications of international repute. Dr Madhu Dikshit while addressing the scientists, administrative staff and students of the Institute assured to work collectively keeping the legacy to serve the nation. She mentioned about earlier achievements made by previous Directors and urged the staff to maintain same decorum in future also. Dr Dikshit emphasized on working proactively towards the mandate

and invited optimum contribution from the existing good pool of scientists and infra-structure towards impact oriented applied and basic sciences. All scientists, administrative staff and students extended their best wishes to Dr Madhu Dikshit for her able leadership and assured all possible cooperation.

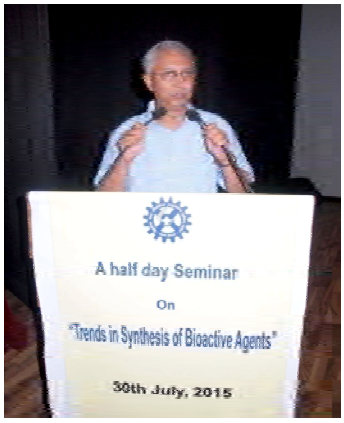
International Yoga Day Celebration

June 21 is the longest day of the year in the Northern Hemisphere and has special significance in many parts of the world and considered as most energetic day of the year so, United Nations General Assembly (UNGA) on December 11, 2014 declared this day as the International Yoga Day to honor the centuries old contribution of India to developing Yoga as a physical, mental, and spiritual practice or discipline. CSIR-CDRI club also organized a Yoga Camp for all staff club members to celebrate the occasion. Institute's Controller of Administration, Mr Bijay Kumar Kar was the Yoga Guru on the occasion and many scientists and research scholars participated in it.

Half day Seminar on "Trends in Synthesis of Bioactive Agents"

To commemorate the superannuation of Dr Bijoy Kundu, HOD, Medicinal and Process Chemistry Division, a half day Seminar was organized by the MPC division in the CDRI auditorium on 30th July, 2015. The conference started by the inaugural function wherein Dr Madhu Dikshit welcomed the guest and speakers and detailed out the significant contributions made by Dr Kundu and Dr Shaw. The chief guest Dr Nautiyal recalled the interactions he and Dr Kundu had since early days of their respective research careers. Prof. Tandon delivered the presidential address highlighting some of the contributions of Dr Kundu.

The technical session was commenced with the talk by Prof K N Singh, BHU, Varanasi, Dr Ramesh Ram Panicker, of IIT, Kanpur. Besides this, three short talks were presented by Dr Jimut Ghosh, CDRI, Lucknow, Dr Namrata Rastogi, CDRI, Lucknow and Dr Devesh Sawant, Central Univ. of Rajasthan, Ajmer. Followed this, in the felicitation ceremony, Dr Kundu's students Manisha, Arunendra and Devesh recalled their experiences. Namrata and Dipankar from CDRI and Dr Bhaduri and Dr Saxena as past HODs shared their reminiscence.Then Dr Rakesh Mauraya felicitated Dr Kundu by presenting a shawl and Dr Sanjay Batra presented a memoralia to him. There after Dr Kundu thanked all the members of Medicinal and Chemistry Division and spoke a few words of motivation. The program concluded by vote of thanks by Dr Sanjay Batra.



Communal Harmony Day (Sadbhawana Diwas) Celebration

"Sadbhawana Diwas" was celebrated in the institute on August 20, 2014 with a theme to promote national integration and communal harmony among people of all religions, languages and regions. The idea behind observance of Sadbhawana Diwas is to avoid violence and to promote goodwill among the people. All the employees of CSIR-CDRI participated in this occasion and took the "Pledge of Sadbhawana" that they will work for the emotional oneness and harmony of all the people of India regardless of caste, region, religion or language.

The 54th Meeting of the CSIR-CDRI Research Council

The 54th Meeting of the CSIR-CDRI Research Council was held on August 24-25, 2015. A large number of Scientists and Research Students of the Institute actively participated in the meeting. Dr Madhu Dikshit, Director, CSIR-CDRI formally welcomed the Chairman and Members of the Research Council to the 54th Meeting. She added that it is the first meeting being convened after taking over as Director of this premier Institute. She will focus on the Institute's mandate of drug discovery and development. Prof. NK Ganguly in his opening remarks congratulated Dr Madhu Dikshit and hoped that Institute will do well in all fronts of new drug discovery and development. He added that approach for new drug discovery and development has changed a lot in recent years. After that approval of the Minutes of the 53rd Research Council Meeting was done. Followed by this, presentation of Executive Summary of R & D activities by the Director and discussion on this presentation

was done. Area Coordinators and Nodal Officers presented their work and Research Council members provided their feedback on the presentations. Research Council unanimously approved all the proposals and recommended for speedy implementation. Finally, Director CDRI thanked the Chairman and Members of the Council for their valuable inputs. She assured the members that appropriate action will be initiated based on their suggestions.

CSIR-CDRI-BC Centre of Excellence in Flow Cytometry: Workshop on Flow Cytometry based Multicolour Immunophenotyping, Cell Cycle analysis and Apoptosis Assays

Under the aegis of CSIRCDRI-Beckman Coulter Centre of Excellence in Flow cytometry, a workshop cum hands on training experience was organized in the Division of Parasitology from 2nd- 4th Sept, 2015. The workshop modules were divided into lectures and hands on practical sessions over a four day period on Beckman Coulter Flow cytometer FC 500. A total of 12 students were shortlisted for the three day workshop which focused on the theoretical and practical aspects of instrument set up and QC, including designing of compensation controls, multi-colour immunophenotyping, cell cycle analysis and Annexin V-PI assays for assessment of apoptosis/ necrosis

by Flow cytometry. The workshop was jointly conducted by Dr Amitav Mohanty – Manager Marketing, Mr Chandra JuvvaApplication Specialist, Mr Chandra Mohan Gupta and Dayanand Tiwari- Area Sales Manager (all BC India Pvt. Ltd) and Dr Madhu Dikshit, Dr Shailja Bhattacharya, Dr Anuradha Dube, Dr Anil Gaikwad and Dr Mrigank Srivastava (all CSIR-CDRI). On the last day of the workshop, certificates for successful completion of the training were distributed to all participants by Dr Shailja Bhattacharya (Chief Scientist and HOD Parasitology Division) and Dr Anuradha Dube (Chief Scientist Parasitology Division). Sneha Ratnapriya (student of Dr Anuradha Dube) and Alok Mishra (student of Dr K K Srivastava) jointly received the first prize in Flow cytometry quiz competition.

Study tour of Medical Officers

A group of six MD (Community Health Administration) students along with two faculties from National Institute of Health and Family Welfare, New Delhi which is an autonomous institute under the Ministry of Health and Family Welfare, Govt. of India has visited the Institute on 7th September, 2015. The major objective of the study tour was, to understand the functioning of the organization and role of CDRI in Health and family welfare. The delegates interacted with scientists of various divisions and visited major facilities of Institute.

Hands on Training Workshop in NMR for small molecules: Theory & Practice

SAIF, CSIR-CDRI organized two-day Hands on training workshop in NMR for small molecules on 10th 11th September, 2015. The goal of the workshop was to train the attendees about the fundamentals of NMR instrumentation and thorough knowledge of its applications. Scholars were armed with valuable skills and experience to take them back to their lab. The workshop was limited for 16 research scholars who are involved in Organic Synthesis. Participants learned the deep intricacies of the techniques.

CSIR Foundation Day Celebrations

Team CSIR Lucknow (CDRI, CIMAP, IITR, and NBRI) celebrated its 73rd CSIR Foundation Day on September 26, 2015 at CSIR-Central Drug Research Institute, Jankipuram Extension Lucknow. Director, CSIR-CDRI, Dr Madhu Dikshit welcomed the guests. Director, CSIR-NBRI, Dr C. S. Nautiyal presented the brief introduction of Chief Guest.

Prof. Akhilesh K Tyagi, Director, National Institute of Plant Genome Research (NIPGR), New Delhi graced the occasion as Chief Guest and delivered CSIR Foundation Day lecture on, "*Rice Genome: Origin, Domestication and functions*". During his lecture he emphasized on the significance of rice genome in future. Prof. B.N. Dhawan, Ex-Director, CSIR-CDRI felicitated the chief guest and gave his presidential remarks on this occasion. Morning session of the celebrations was summed up with vote of thanks to the dignitaries, guests and media persons by Professor Alok Dhawan, Director, CSIR-IITR.

During the second session of celebrations in after noon, CSIR-CDRI Awards-2015 for excellence in Drug Research was bestowed to the selected winners after their award oration. Under Biological Sciences the award was conferred to Dr Rinti Banrejee IIT, Mumbai. Dr Banerjee delivered award oration entitled "*Trigger Responsive Nanoparticles for Drug Delivery*". For Chemical Sciences the award was conferred to Dr Ramkoteshwara Rao Jetti, Mylan Laboratory, Medak. Dr Jetti delivered award oration entitled "*Novel Solid Forms of Active Pharmaceutical Ingredients*".

Further mementoes were given away to colleagues completing 25 years of service in CSIR and to colleagues superannuated during Sep 2014 Aug 2015. Prizes were awarded to the children of CSIR employees who have secured more than 90% marks in Science subjects during intermediate board exams. The prizes were also given away to the winners of drawing, essay writing and quiz competitions organized on the sidelines of the foundation day celebrations.

Thereafter Prof. Akhilesh K Tyagi along with other dignitaries on dais released CSIR-CDRI Newsletter (Vol.7 No.1, April to September, 2015). The Foundation Day Celebration function ended with the vote of thanks proposed by Mr. Vinay Tripathi

Skill Development Program

CSIR-CDRI organized a four days Skill Development Program for the administrative staff in collaboration with CSIR-HRDC, Ghaziabad from 5th-9th October, 2015. Many participants from Institute participated in this program and get acquainted with the methodologies for improving performance and skills at work place.

Hindi Pakhwara

CSIR-CDRI celebrated Hindi fortnight from 14th-28th September, 2015. The objective of fifteen days long celebration was to create awareness in the use of Hindi for official work. Dr Madhu Dikshit Director, CSIR-CDRI and Prof. Surya Prasad Dikshit addressed the staff members during inaugural function. During the fortnight long celebrations various competitions viz. Essay writing, Hindi translation, Debate in Hindi, Hindi writing and Hindi stenography, Rajbhasha quiz and Hindi Kavya Path competition were also organized at CDRI for all staff members including the students. On the concluding day of Hindi Pakhwara, Shri Vinod

Rashtriya Ekta Diwas

Dr Madhu Dikshit, Director, CSIR-CDRI administered the Rashtriya Ekta Diwas pledge to the CDRI staff at a function, on the birth anniversary of Sardar Vallabhbhai Patel on 30th October 2015. After the pledge she urged to all the staff to promote the unity among society and work as a team without any discrimination.

Vigilance Week Celebrations

CSIR-CDRI has celebrated Vigilance week from 26th-31st October, 2015. Celebrations were started with oath taking ceremony. Various events viz. essay competition, debate competition were organized for the staff during the week long program. On the concluding day, Mr S K Raghuvanshi, IAS, Secretary (Home, Vigilance, Civil Aviation and Director General, Jail) Govt. of Uttar Pradesh was the Chief Guest of the program. He distributed the cash award and certificates to the winners of competitions and delivered a talk on "Preventive Vigilance as a tool of Good Governance". On this occasion Director, Dr Madhu Dikshit emphasized on honesty and loyalty in personal life and professional duties. Controller of Administration, Mr. B.K. Kar proposed the vote of thanks for successful organization of event.

Chandra Pandey, addressed the audience and distributed the prize for winners of various competitions.

Half Day Seminar by Indian Pharmacological Society (IPS), Lucknow branch

Indian Pharmacological Society (IPS), Lucknow branch organized a Guest Lecture and Felicitation function at CSIR-Central Drug Research Institute on 7th October, 2015. Dr Rakesh Shukla President of IPS (Lucknow Branch) and Head Division of Pharmacology CSIR-CDRI welcomed all the participants and introduced guest speaker Prof. Anil Gulati, a renowned pharmacologist and Associate Dean, Midwestern University, Chicago (USA) to the audience. Prof Gulati explained role of endothelin B receptor in neurogenesis following cerebral stroke and Alzheimer diseases in rats by use of endothelin B receptor agonist IRL-1620 in his lecture "Understanding Neurogenesis in Adult Brain". Prof. Ravi Kant, Honourable Vice chancellor of KGMU, Lucknow presided over the function.

IPS Lucknow Branch felicitated Prof. Alok Dhawan Life member of IPS for assuming charge of Director CSIR-IITR. Students, Scientists and faculties of various renowned institutes attended the program. Dr Anil Gaikwad, Secretary, IPS (Lucknow branch) proposed vote of thanks.

National Workshop on Small molecule analysis by API Mass Spectrometry & NMR Spectroscopy

SAIF, CSIR-CDRI organized a National Workshop on Small molecule analysis by API Mass Spectrometry & NMR Spectroscopy

from 2-3rd November, 2015.The workshop has provided an opportunity to experience the state-of-the-art LC-MS, LC-MS/MS and NMR techniques and initiate lively discussion among veteran research scientists, academicians and budding researchers to share their knowledge in the frontier areas of chemical sciences. The beginners have got a chance to familiarize themselves with LC-MS and NMR techniques. As well as, gain confidence by observing their applications and data interpretation. This Workshop was focused on the structure characterization of small molecules using LC-MS, HRMS, MS/MS and NMR techniques. Total 31 participants from different parts of country have attended the workshop.

14th Dr B. Mukerji Memorial Lecture

CSIR-CDRI, Lucknow organized 14th Dr B. Mukerji Memorial Lecture sponsored by Sachin & Sikta Pradhan Foundation, Bethesda, USA in the memory of Dr Bishnupada Mukerji, first Indian director of CSIR-CDRI and an eminent Pharmacologist of the country, on 27th November 2015. The program was initiated with the floral tribute to Dr B. Mukerji. Director, Dr Madhu Dikshit welcomed the guest. On this occasion, Prof. Santanu Bhattacharya, Director, Indian Association for the Cultivation of Science, Kolkata, delivered the memorial lecture on "Functional Gene Delivery: Challenges and Promises". A memento was presented to the guest and the program was concluded with the vote of thanks by Shri Vinay Tripathi.

Laboratory Animal Technician Training Course

Laboratory Animal Technician Training Course was organized by CSIR-CDRI in collaboration with National Institute of Animal Welfare (Ministry of Environment, Forests & Climate Change, Govt. of India) during 7th -18th December, 2015. The hands on training was imparted to the laboratory animal professionals/technicians/attendants on humane care, breeding, scientific husbandry and management of experimental animals and basic animal techniques in accordance with the guidelines of the CPCSEA. During the valedictory function, the certificates were also given by the Chief Guest in presence of Director, CSIR-CDRI.

3rd Convocation of NIPER, Raebareli

The Third Convocation of NIPER Raebareli was held on 11th December, 2015. Padma Bhushan, Padama Vibhushan Prof. MM Sharma, Former Director Institute of Chemical Technology Mumbai was the Chief Guest and the function was presided over by Dr VK Subburaj, IAS, Secretary, Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers, Govt. of India. Other guests and participants at the event included, Dr Madhu Dikshit, Director, CSIR-CDRI, Lucknow & the Mentor Institute of NIPER-Raebareli, Dr PK Shukla, Project Director, NIPER-Raebareli, Dr RP Tripathi, Dean, NIPER-Raebareli, Dr Shaija Bhattacharya, Registrar, NIPER- Raebareli, Faculty of NIPER- Raebareli, Academia, Scientists from mentor institute CSIR-CDRI and other research institutes. Prof. MM Sharma presented gold and silver medals to department toppers and the M.S. Degrees were conferred by the chairman steering committee, Dr VK Subburaj. The convocation address was delivered by the Chief Guest Padma Vibhushan Prof. MM Sharma. The function concluded with National Anthem.

CSIR-CDRI participated in the 103rd session of Indian Science Congress as a part of CSIR team.

The 103rd session of the Indian Science Congress (ISC) was held from 03-07 January, 2016 with its focal theme "Science and Technology for Indigenous Development in India" at University of Mysore, Mysuru. As per the tradition, the Hon'ble Prime Minister of India, Shri Narendra Modi inaugurated the 103rd session of Indian Science Congress on Jan 3rd 2016. Thousand of national/ international delegates including Nobel Laureates, Eminent Scientists, Industry Leaders, Policy Makers, Innovators and Academicians participated in Indian Science Congress, 2016.

As a part of Pride of India Expo, CSIR showcased various technologies. CSIR-CDRI drugs (Saheli-Contraceptive pill, Keenmind-Memory Enhancer, E-Mal and Larither- Antimalarial) and other potential lead molecules from the institute were highlighted along with other ongoing Research and Development activities under the *Swasth Bharat* Mission of Govt. of India. A large number of students and other visitors from all walks of life visited the CSIR pavilion & interacted with the scientists.

The 55th Meeting of the CSIR-CDRI Research Council

The 55th Meeting of the CSIR-CDRI Research Council was held on 4-5th January, 2016. A large number of Scientists of the Institute actively participated in the meeting. Dr Madhu Dikshit, Director, CSIR-CDRI formally welcomed the Chairman and Members of the Research Council to the 55th Meeting. Prof. NK Ganguly in his opening remarks added that approach for new drug discovery and development has changed a lot in recent years so we have to keep ourselves updated. After that approval of the Minutes of the 54th Research Council Meeting was done. Followed by this, presentation of Executive Summary of R & D activities by the Director and discussion on this presentation was done. Area Coordinators and Nodal Officers presented their work and Research Council members provided their feedback on the presentations. Research Council unanimously approved all the proposals and recommended for speedy implementation. Finally, Director CDRI thanked the Chairman and Members of the Council for their valuable inputs. She assured the members that appropriate action will be initiated based on their suggestions.

Brain-Storming meeting on "Renewing the tradition of natural product research in India"

CSIR-CDRI, Lucknow organized a Brain-Storming meet entitled "Renewing the tradition of natural product research in India" supported by Department of Science & Technology with past stalwarts and current researchers from 21-23 Jan 2016.

On the inaugural day Director CDRI, Dr Madhu Dikshit, welcomed the guests and said I am optimistic that this Three days meet will leave a historical mark and provide a new impetus to the Natural Product Research in India for the well-being of mankind. She mentioned further, India had long been aware of the therapeutic potential of natural resources and use of botanicals in treating human population has been the mainstay of Ayurveda. In the inaugural session Dr T.K Chandrashekhar, former Secretary SERB remarked about the need of renewing the tradition of natural product research in India and its scope in present scenario.

In his inaugural speech on "Natural products, organic synthesis and drug discovery symbiosis for better human well-being," Padmashri Prof. Goverdhan Mehta said that "For well-being of mankind if we want to go forward we have to go back to nature first." In his oration he mentioned how the natural products can be used for therapeutically useful entities. How tools of organic synthesis are fully geared to manipulate, amplify and harness their therapeutical potential. How we can use the synergy between organic synthesis and natural products with great potential for future drug development. After that, Dr K

Nagrajan, a renowned Medicinal chemist, during his lecture on "New drug discovery and natural products", discussed the new drug development path from natural source.

In further sessions in consecutive two days many participants from length and breadth of country sit together for brain-storming meeting for guidance and to discuss the strategies for natural products research. During the three days long brain storming meeting the experts come up with the need of rethinking and rejuvenating the Natural Products research.

Workshop on "Protein identification by Mass spectrometry"

Sophisticated Analytical Instrument Facility (SAIF) CSIR-Central Drug Research Institute Lucknow organized a workshop on "Protein identification by Mass Spectrometry" from 19-21th January, 2016. The objective of the workshop is to provide hands on experience in sample preparation for MS analysis and MS data processing. The training was imparted to the students who were in the early stage of their Ph.D. course. About twenty participants participated in this specialized training.

Next Generation Sequencing (NGS) workshop

The next generation sequencing workshop was organized by Dr Rajender Singh at CSIR-Central Drug Research Institute, Lucknow from January 27-30, 2016. The main objective of the workshop was to get acquaint the people with modern DNA and RNA sequencing methods. The field of DNA sequencing has seen revolutionary changes in the recent years, brining several new possibilities for more investigative research. CDRI has

introduced state of the art DNA sequencing facility with IlluminaMiseq at its heart. More than 25 students/scientists from all over India participated in the workshop.

67th Republic Day Celebrations

The 67th republic day was celebrated with full enthusiasm at CSIR-CDRI. On this occasion Director Dr Madhu Dikshit greeted all the Scientist, Research students and staff and said, our republic has made great progress in scientific, economic and social sectors but the need to remodel our efforts in tune with changing aspirations and needs always remains. We are all aware of the expectations of the nation from scientific institution that were created just after independence. Science is the engine of economic growth and Nation wants us to introspect the direction of our research and make necessary amends for making effective contributions to our society.

Societal Activities

CSIR-CDRI is determined to be a catalytic agent to evolve India into "*Samarth Bharat-Sashakt Bharat*" through its contribution to Science and Society. To connect the science with society we are working on human resource development, skill development among researchers and spreading the awareness among youth about science and health issues.

"Students are the future of the nation" keeping it in mind we are targeting the young minds for bringing the change in society by the means of educating them towards health and cleanliness so that they can play a key role in the mission of "Swachchh Bharat-Swasth Bharat". To achieve this various programs were organized for the students and faculty during the reporting period to connect the science with society such as CSIR-800 exploratory societal projects at rural areas under AcSIR program, Popular lecture by CDRI Scientist at Navodaya vidyalaya and other Schools and Colleges, Health awareness programs at rural areas, Outreach programs for rural schools, Programs for Motivation of Students and Faculty and Open-Days for public to connect common man with Institute. Besides this, some specialized scientific programs for promotion of Science and Technology at various Academic Institutions and Universities such as Training and skill development programs and Technical Support in biological activity screening to beneficiaries from all the corners of country. This helps those researchers who do not have such facility and finally helps improving the scientific scenario of country.

The Institute's visit and one-to-one interaction with Scientists helps the young minds to set their goals high. The achievements and environment of the Institute inspire them to pursue the science education. It provides a future vision to young minds to select science as a career as another option besides medical and engineering stream.

DISTINGUISHED VISITOR

Padma Bhushan Prof. M M Sharma, FRS,
Academy Professor, AcSIR,
Emeritus Professor of Eminence,
Institute of Chemical Technology, Mumbai

Delivered a Lecture on Process Chemistry PC (R&D) on 10.12.2015

Others Visitors

	Speaker & Address	Title of Lecture	Date
	Dr Nitish Gupta Department of Molecular Parasitology, Humboldt University,Berlin	A Lethal intimacy- Metabolic basis of parasite-host interplay and infidelity	18.02.2015
	Dr Vivek Rangnekar Professor of Radiation Medicine Associate Director, Markey Cancer Center University of Kentucky,USA	Special Cancer Biology Seminar "Empowering Normal Cells Against Cancer"	02.03.2015
	Mr. Amitabh Shrivastava, CEO, CSIR-Tech Pvt. Ltd. (CTPL)	Interactive session on "Catalyzing Lab to Market Journeys"	15.04. 2014
	Prof. G.N. Pandey, Director MDSR, Department of Psychiatry University of Illiniois,Chicago	Immunity Depression And Suicide: A Search For Biomearkers	01.05.2015
	Dr Sita Naik Rtd. Professor and Ex-Head Department of Immunology,SGPGI, Lucknow	Science Education: Realities and challenges	01.05.2015
	Prof. Nadesh Palaniyar Professor, Deprtment of Laboratory Medicine and Pathobiology, University of Toranto,Canada	Missing links in Neutrophil Extracellular Trap Formation (NETosis) Pathways: Identifying Drug Targets	06.05.2015

	Speaker & Address	Title of Lecture	Date
	Dr Farid Ahmed Ludwing Maximilians University Munich, Germany	Rational Combination of Experimental Drugs for the Treatment of Acute Myeloid Leukemia: In vitro Studies	23.07.2015
	Dr Sanjay V Malhotra Associate Professor, Stanford School of Medicine, Stanford University, USA	Designing Drugs against Proteins-proteins interactions and Drug Resistance	27.07.2015
	Prof Virinder S Parmar Professor of organic Chemistry & Head, University of Delhi (India)	Biocatalytic Synthesis of Novel Polymeric Advanced Materials for Applications in Health and Industrial Sectors.	03.08.2015
	Dr Prakash Chand Ex-Scientist, NISCAIR, New Delhi	Indian Citation Index, ICI	07.08.2015
	Dr Rajeev K Tyagi Biomedical Parasitology Unit, Institute Pasteur, Paris, France	Plasmodium falciparum infected mouse-human chimera(s): more than a tour de force	09.09.2015
	Dr Sushil Kumar Dean & Professor, Centre for Business Sustainability, Indian Institute of Management, Lucknow	Leadership in large Scientific Organizations	16.09.2015
	Prof. Anil Gulati Associate Dean Midwestern University Chicago,USA	Understanding Neurogenesis in the Adult Brain	07.10.2015
	Dr Dieter Bromme Professor and Canada Research Chair, The University of British Columbia, Canada	Ectosteric inhibitors of cathepsin K as anti-resorptive drugs	23.10.2015
	Dr Sridhar Sivasubbu CSIR-IGIB, New Delhi	Non-Coding RNA Based Regulation of Vascular Development in Zebrafish	05.11.2015

	Prof. Sabyasachi Sinha, Indian Institute of Management, Lucknow	Developing Scientist Entrepreneur	20.11.2015
	Dr Pratima Srivastava, Associate Director, Biology Discovery and Services, GVK BIO, Hyderabad,	Roadmaps of Success in Novel Drug Discovery and Development	24.11.2015
	Dr J.S. Yadav J C Bose Fellow (Former Director,CSIR-IICT) Indian Institute of Technology	Novel Synthetic Routes to Natural Products	26.11.2015
	Dr Suresh Verma, Assistant Professor, Centre of Translational Research, Temple University, USA	Anti-inflammatory approach for treatment of Cardiac hypertrophy and heart failure	07.12.2015
	Prof. Raj Chhabra, Department of Chemical Engineering, Indian Institute of Technology, Kanpur	Nature of Research and skills required	17.12.2015
	Dr S.P.S.Khanuja Ex. Director, CSIR-CIMAP,Lucknow	Bio entrepreneurship Opportunities through Natural Products-R&D Leads	19.01.2016
	Dr Sukant Khurana IISER Kolkata	Drug Discovery for neuronal disorders, using natural products as a starting point	04.02.2016

Student delegation's visit under Outreach Program

S.No.	Students Delegations	No. of Members	Date
1.	St. John's College, Agra	48	19.02.2015
2.	Pranveer Singh Institute of Technology Kanpur	40	16.04.2015
3.	Awadh International School, Faizabad	45	21.08.2015
4.	National Institute of Health and Family Welfare, New Delhi	07	07.09.2015
5.	Colvin Taluqdars' College, Lucknow	25	29.09.2015
6.	Air Force School, Bamrauli, Allahabad	25	09.11.2015
7.	Rama Hospital, College and Research Centre, Kanpur	40	19.11.2015
8.	Jawahar Navodaya Vidyalayas (20 JNVs) of Uttar Pradesh and Uttarakhand	120	24.11.2015
9.	Jagannath Kishore College, Purulia, West Bengal, India	20	23.12.2015
10.	Govt. Digvijaya Autonomus College Rajnandgaon, C.G. on 7th January	40	07.01.2016

INVITED LECTURES DELIVERED BY INSTITUTE SCIENTISTS

Dr Shailja Bhattacharya

- Trehalose-6-phosphate-phosphatase of *Brugia malayi:* A promising antifilarial vaccine candidate, At Indian Science Congress- Women Science Congress at University of Mysuru, 5 January,2016
- Experimental models in filarial research, Annual Convention of Laboratory Animal Science Association of India (LASAI) National Symposium on "Animals in Research and Testing: A Cross-Talk between Relevance and Ethics" (NSART 2015) at CDRI, Lucknow, 13-14 March, 2015

Dr Rakesh Maurya

- Application of Natural Resources and Traditional Knowledge in Search of Potential Leads for the Development of Herbal Medicine for the Treatment of Osteoporosis, Netaji Subhas Mahavidyalaya, Udaipur, Gomati Tripura, 28-29 November, 2015

Dr Rakesh Shukla

- The role of insulin receptors and neurotrophic factor in Dementia, Punjab University, Chandigarh, 2 November,2015
- Hypertension a risk factor for memory impairment, Integral University, Lucknow, 15 November,2015

Dr Anuradha Dube

- Search for a vaccine against Kala-azar: Classical and molecular approaches, IMMUNOCON-2015; 42nd Annual Conference of Indian Immunology Society, Organised by Rajendra Memorial Research Institute of Medical Sciences (Indian Council of Medical Sciences) Patna, India 11 October, 2015
- Advancing Th1 stimulatory proteins towards development of polypeptide vaccine against Kala-Azar, 8th Indo Global summit & Expo on Vaccines, Therapeutics & Healthcare (VTH-2015) hosted by OMICS International November 2-4, 2015 Hyderabad, 2 November, 2015

Dr AK Dwivedi

- Spermicides as active ingredients in barrier contraceptives, Amity University, Lucknow, 22February, 2015

Dr Arun K Sinha

- Step-economic Approaches Towards Synthesis of some Natural and Non-natural Bioactive Compounds, BITS Pilani, 14 October, 2015

Dr RP Tripathi

- Monosaccharides in search of new chemotherapeutics, Pondicherry University, 29 December,2015
- Application of Sugars in Development of New Chemotherapeutic Agents, Center of Innovative and Applied Bioprocessing (CIAB), Mohali, Punjab, 29 December,2014

Dr Jawahar Lal

- Pharmacokinetic modeling: classical and population approach, Department of Pharmaceutics, IIT, BHU, Varanasi; SPIRIT 15: A National Seminar on Frontiers of Pharmaceutical Sciences & Technology, 21 March, 2015

Dr Amit Misra

- Targeting lung macrophages with inhaled particles: Eliciting 'appropriate' host responses to infection with *Mycobacterium tuberculosis* in addition to drug delivery, Faculty of Mathematics and Natural Sciences; University of Oslo, Oslo, Norway, 7January,2015
- Inhalable Particles Targeting Drugs Affecting Host Responses to Tuberculosis, Department of Molecular Biosciences, University of Oslo, Oslo, Norway, 8January,2015
- Small molecules that nudge host responses, Third International TB Meeting Inhaled Therapies for Tuberculosis and Other Infectious Diseases, Parma, Italy, 14 October,2015
- Pincer Attack on Macrophage-Resident *M. tuberculosis:* Killing the Bug and Healing the Host, National Jalma Institute of Leprosy & Other Mycobacterial Diseases, Agra, India, 7 November,2015
- Innate Immune Responses In Lung Macrophages Harbouring *M. tuberculosis*, National Institute of Immunology, New Delhi, India, 21 December,2015

Dr PMS Chauhan

- Perspectives and challenges in drug research: design and synthesis of nitrogen heterocyclic as novel therapeutic agents, Med chem. India, September 10, 2015 at Hotel Radisson HITEC City, Hyderabad, India, 10 November,2015
- Synthesis of Biologically Active Scaffolds via Isocyanide Based Multicomponent Reactions and using other methodology, International conference on ""Nascent Developments in Chemical Sciences: Opportunity for Academia-Industry Collaboration (NDCS-2015) ,October 16-18,2015,BITS,PILANI, 17 November, 2015
- perspectives and challenges in drug research: design and synthesis of nitrogen heterocycles as novel therapeutic agents , Current Challenges in Drug Discovery Research at MNIT Jaipur from 23rd-25th November, 2015, 24 November, 2015

Dr Brijesh Kumar

- Evidence based research for quality control of Indian Medicinal Plants usin MS, HRMS and LC-MS/MS instruments, Seminar at Isabella Thoburn College, Lucknow, 14 November, 2015

Dr Sanjay Batra

- Adventures with Iodine-mediated Cascade Reactions, RSC workshop on Chemistry for Tomorrow's world, New Delhi, 3 December, 2015
- Iodine-Mediated Heterocyclizations of Morita-Baylis-Hillman Derivatives via Domino Approach, XVII NOST Conference, LeMeridien, Jaipur, 28 October, 2015
- A domino approach to the synthesis of 3,4,5-trisubstituted isoxazoles, Nascent Developments in Chemical Sciences: Opportunities for Academia-Industry Collaboration (NDCS-2015), BITS Pilani, 17 October, 2015

- 1-Formyl-9H-β-carboline: Advanced intermediate for syntheses of natural products and condensed heterocycles, 22nd Grasmere Meeting on Heterocyclic Chemistry, Grasmere UK, 10 May, 2015
- Drug Repositioning as an innovative strategy to boost drug discovery efforts, Institute for Intensive Research In Basic Sciences, MG University, Kottayam, 15 January, 2015
- A Roadmap to Drug Discovery and Development, Institute for Intensive Research In Basic Sciences, MG University, Kottayam, 15 January, 2015

Dr SK Rath

- Genome Variation in Indians, TERI University, New Delhi, 18 January, 2015
- Alternative Toxicity Models (Panel Discussion), IITR, Lucknow, 5 November, 2015

Dr BN Singh

- Harvesting *M.tuberculosis* genome: Identification of genetic regulatory elements and decoding their role(s) in mycobacteria" in UP. Microcon 2015, XI Annual Conference of Association of Medical Microbiologist. IMS, BHU, Varanasi, 6 February 2015
- Decoding transcriptional regulatory circuits of FASII elongation pathway in mycobacteria, National Conference on Biotechnology and Human Welfare. New Vistas Department of Biotechnology VBS Purvanchal University, Jaunpur, 22 March,2015
- Drug Resistance in tuberculosis and anti-tuberculosis drug development, NIPER Raebareili, September, 2015

Dr PR Mishra

- Application of nano-Carriers for the treatment of Leishmaniasis, National Conference on "NanoSciences, NanoToxicology and NanoInformatics-Present and Future Perspectives" Integral University, Lucknow, 14 March,2015
- Novel Strategies for Drug Delivery, United Institute of Pharmacy, Allahabad, 21 March 2015
- Nanocarriers as Nanomedicines: lessons to be learnt from Leishmania studies, Recent Advances in Pharmaceutical Sciences for Drug Discovery and Development NIPER Rae Bareli, 20 February, 2015

Dr Atul Goel

- Pyranone-derived Fluorescent Molecules and their Applications in Organic Electronics and in Live Cell Imaging, Cardiff University, Cardiff, UK, 15 June,2015

Dr T Narender

- Development of New Methods for the Synthesis of Privileged Structures of Biological Importance, International Conference on "Current Challenges in Drug Discovery Research (CCDDR 2015), MNIT, Jaipur, 24 November, 2015
- Targeting Metabolic Diseases by Natural Products, BITS Pilani, 6 October, 2015
- Application of Natural Products and Biotechnology in Drug Discovery, Amity University, Lucknow, 15 January, 2015

Dr KR Arya

- Osteogenic properties from traditional bone healing plants of Uttarakhand Himalaya, India, International conference on medicinal plants: Resource for affordable new generation healthcare, Lucknow, India, 20 March, 2015

Dr Kishor Mohanan

- Novel Strategies for the Synthesis of Drug-like Heterocycles, St. Albert's College, Ernakulam, 8 October, 2015

Dr M Sridhar Reddy

- Taming Alkyne for New and Atom Economical C-Pd Avenues, CSIR-IICT, Hyderabad. Dr J. S. Yadav's foundation half a day symposium, 4 August,2015
- Azides as Interesting Surrogates for Nitrogen Embedded Organic Scaffolds, Half Day Seminar and Felicitation Function in honour of Dr AR Prasad, Chief Scientist & Head of Centre for Semiochemicals Division, CSIR-IICT, 30 November, 2015

Dr Divya Singh

- Osteoimmunology: New Perspectives, 2nd Annual Conference UP chapter of Indian Society of Bone and Mineral Research organized by Department of Endocrinology and Metabolism, Institute of Medical Sciences, BHU, Varanasi, 1 March, 2015

Dr Kumaravelu J

- Role of MAPKAPK2 in inflammation, Anna University, Chennai, 12 November, 2015
- Damage Associated moleular patterns in the regulation of liver fibrosis, Regional center for Biotechnology, Faridabad, 18 December, 2015

Dr Prem N Yadav

- Targeting orphan G Protein Coupled Receptors GPR40 for the treatment of diabesity: A proof of concept study, IIT-Madras, Chennai, 29-30 October, 2015

Dr Manish K Chourasia

- Validating biological implications of nano therapeutics: in vivo execution and result denomination, National Workshop on "Advancements in Pharmacological Studies for Evaluating Targeted Drug Delivery Systems", Shri Rawatpura Sarkar Institute of Pharmacy, Raipur, CG, January, 2015
- Potential of nano range formulations in altering natural course of drugs, Sriram College of Pharmacy, Jabalpur, MP, 12 October, 2015

Dr Satish Mishra

- The role of Cysteine Protease Bergpain-1 in Plasmodium, Lonza knowledge center, Hyderabad, 17 July, 2015

Dr Sanjeev K Shukla

- Spectroscopic tools for Structural Characterization, National Seminar at D.B.S. (P.G.) College, Kanpur University, Kanpur, 10 January, 2015
- NMR Spectroscopy: Basic Principles, Concepts and Applications in Chemistry, Regional Institute of Paramedical and Nursing Sciences, Zemabawk, Aizawl, Mizoram, 3 March, 2015
- Two Dimensional NMR Spectroscopy, Seminar at Isabella Thoburn College, Lucknow, 14 November, 2015

Dr Rajender Singh

- Treatment of male sub/in-fertility: classical methods pay off better, Annual meeting of the Indian Society for Study of Reproduction and Fertility (ISSRF) at National Institute for Research in Reproductive Health (NIRRH), Mumbai, 17 February, 2015

Dr Namrata Rastogi

- DAMP Anion Substitution/Addition-Elimination Reactions, XVII NOST Organic Chemistry Conference, Le Meridian Hotel, Jaipur, 27 October,2015

Dr Rajesh Kumar Jha

- Beyond DNA guardian signaling of PARP during receptive endometrium, National Institute for Research in Reproductive Health (NIRRH) in Mumbai, India. (International Conference on Reproductive Health and 25th Annual Meeting of the Indian Society for the Study of Reproduction & Fertility (RH/ISSRF-2015), 16 February, 2015
- Implications of RhoGTPase signaling in the ovarian pathophysiology, Department of Zoology, BHU, Varanasi (International Symposium on Reproductive Biology and Comparative Endocrinology during), 27 February, 2015

Dr Vivek V Bhosale

- Clinical trials of new drugs and drug dossier preparation, 9thUttarakhand State Science & Technology congress (USSTC), session blending Ayurveda with modern science and reverse pharmacology at Dehradun , 28 February, 2015
- Phase 0 clinical trials, ICMR Sponsored National Conference on “Innovation In Alternative To Animal Experimentation—From Drug Discovery To Drug Delivery”, AKS University, Satana 22 August, 2015
- Ethics in human research: Case studies, Workshop on “Current Regulatory Requirements for Members of Institutional Ethics Committees”, B.B.D. University Lucknow organized by CDSA Department of Biotechnology, Ministry of Science & Technology, 16 September, 2015

Dr Sripathi Rao Kulkarni

- IPRs as tools to protect innovations, Shri Ramswaroop Memorial University, Lucknow, 25 November, 2015
- IP issues in academics and research, Amity Institute of Biotechnology, Lucknow, 29 October,2015
- Patents, Copyrights and Related Rights, Workshop on Intellectual Property Rights: Issues & Challenges, jointly organized by IGNOU, Lucknow and Lucknow University, at Lucknow University, Lucknow, 21 July, 2015
- WIPO-IP Day Lecture: Latest Developments in Intellectual Property Rights, CST-UP, Lucknow, 26 April, 2015
- An Overview and Latest Developments in Intellectual Property Rights, Deen Dayal Upadhyay University, Gorakhpur, organized jointly by CST-UP, 15 March,2015

Dr Prem Prakash Yadav

- Mother Nature: An Inspiration to Drug Discovery Research, Jawahar Navodaya Vidyalaya, Piparsand, Lucknow/ Regional Science Congress-2015, 21 November, 2015
- Late Stage Radical C-H Functionalizations of Heteroarenes in Medicinal Chemistry, MNIT, Jaipur/ International Conference on “Current Challenges in Drug Discovery Research (CCDDR 2015), 24 November, 2015

VISITS AND DEPUTATIONS ABROAD

Name of Scientist	Country of Visit	Purpose of Visit (Period of Deputation)
Dr A K Dwivedi	Greece	Invited in Federation of European Neurosciences-Featered Regional Meeting (05 to 09 October 2015)
Dr Amit Misra	Italy	Invited in 3rd International TB Meeting on Inhaled Therapies for Tuberculosis and other Infectious Diseases (14 to16 October 2015)
Dr Neena Goyal	Germany	Invited in mid-term meeting of European Research consortium NMTryp (New Medicines for Trypanosomatidic infections) (9 to 11 September 2015)
Dr Sanjay Batra	UK	To attend the 22nd Grasmere Heterocyclic Symposium 2015 (07 to 11 May 2015)
Dr Mohd. Imran Siddiqi	Italy	To attend the Workshop on water at the interface between Biology, Chemistry, Physics and Material Science (05 to 09 October 2015)
Dr Jiaur R Gayen	Germany	Invited to conduct his research project with Prof. Dr. Michael Roden, Director German Diabetes Centre (01 November 2014 to 30 April 2015)

MEMBERSHIP OF DISTINGUISHED COMMITTEES/ BOARDS

Dr. Madhu Dikshit

Committees

Member, (1) Council of Indian Academy of Sciences; (2) Sectional Committee (Health Sciences), Indian National Science Academy; (3) Academic Council, Jawaharlal Nehru University, New Delhi, (4) Core Member, Programme Advisory Committee on Health Sciences, SERB, DST; (5) Scientific Advisory Committee (SAC), DBT-IISc Partnership Programme; (6) National Research Advisory Committee Meeting of National Innovation Foundation- India, Ahmedabad; (7) Steering Committee of NIPERs, Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers, GoI; (8) Indian Council of Medical Research (Medical Sciences) PAC; (9) Council of Scientific Industrial Research (Organic & Medicinal Chemistry and Chemical Technology Res Committee); (10) Drug Technical Advisory Board, Directorate General of Health Services, DCGI, India; (11) Institute Body of Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow 2015-2019; (12) Expert Committee on Malaria Diagnostic and Chemotherapy and Prospects of Malaria Elimination in the Country; (13) Advisory-cum-Monitoring Committee of Biotech Park, Lucknow 2015-17; (14) Organic Chemicals, Alcohols & Allied Products Sectional Committee, PCD 09, Bureau of Indian Standards, New Delhi; (15) Advisory-cum-Monitoring Committee of Biotech Park, Lucknow; (16) Academic Standards Committee, NIPER; (17) Lucknow Management Association

Societies

Member, (1) Indian Society of Free Radical Research; (2) International Society of Heart Research (Indian section); (3) Indian Pharmacological Society; (4) Society of Biological Chemists; (5) Indian Academy of Neurosciences, India; (6) UP association of Science and Technology; (7) National Academy of Medical Sciences, India; (8) The Cytometry Society of India; (9) Indian Society for Atherosclerosis Research; (10) Pulmonary Vascular Research Institute, India

Dr. AK Dwivedi

Member, (1) Drugs Panel for New Drug Manufacturing Licenses, Directorate of Medical & Health Services, Uttar Pradesh (2) Expert Sub-Committee for product development of drug from Natural Sources, Indian Council of Medical Research

Joint Secretary, Indian Society of Chemists and Biologists. Lucknow

Dr. Ashim Ghatak

Member, (1) American College of Clinical Pharmacology, USA; (2) National Academy of Medical Sciences, India Fellow, (1) Indian College of Physicians

Elected Councilor, Executive Committee of South Asian Chapter of American College of Clinical Pharmacology, Mumbai, India

Dr. Naibedya Chattopadhyay

Editorial Advisory Board Member, (1) Biochemical Pharmacology (2) American Journal of Physiology Endocrinology and Metabolism (3) American Journal of Physiology Cell Physiology

Dr. Arun K Sinha

Member, (1) Scientific Advisory Committee (SAC); (2) Centre of Innovative & Applied Bioprocessing (CIAB), Mohali, Punjab

Dr. RP Tripathi

Member, (1) Joint Working Group (JWG) on Fragrance and Flavor (Ministry MSME Govt. of India) (2) Lab Research Council, DRDE (DRDO) Gwalior

Editorial Board Member, (1) ARKIVOC; (2) Journal of Organic Biological Chemistry

Dr. DS Upadhyay

Member, (1) Live Stock Feed, Equipments and System, Sectional Committee, FAD, Bureau of Indian standard, New Delhi; (2) Veterinary Council India; (3) U.P. State Veterinary Council; (4) CPCSEA SubCommittee for Rehabilitation of Laboratory Animals; (5) Management Committee of the National Institute of Animal Welfare, Ministry of Environment & Forests, Govt. of India; (6) Institutional Animal Ethics Committees of CIMAP, IITR, Integral University, AH Dept., Saraswati Dental College & University, Amity University, Lucknow

Dr. MN Srivastava

Member, Board of panel for PSC on R&D of Central Sector Scheme for Conservation Development and Sustainable Management of Medicinal plants, National Medicinal Plants Board, (AYUSH), Ministry of Health & Family Welfare, Govt. of India

Dr. PMS Chauhan

General Secretary, ISCB

Member, Advisory Board Central University Gujarat

Dr. VL Sharma

Member, Research & Development Committee, Department of Pharmacy, Integral University, Lucknow

Dr. Atul Kumar

Member, Global Advisory Board member of SciFinder, Chemical Abstracts Service (CAS), American Chemical Society (ACS), Columbus , USA, Technical Evaluation Panel (TEP), BIRAC , New delhi

Dr. Saman Habib

Member, (1) Animal Sciences Review Committee, CSIR, New Delhi; (2) Selection Committee for CSIR Nehru Post-doctoral Fellows (Life Sciences)

Dr. Jawahar Lal

Editorial Board Member, American Journal of Modern Chromatography, USA

Executive Member, Indian Society of Chemists and Biologists, Lucknow, India

Editorial Advisory Board Member, Chemistry & Biology Interface

Dr. R Ravishankar

Member, Working group on new TB drugs (WGND),

Dr. Srikanta Kumar Rath

Member, (1) Review committee on Genetic manipulation, DBT, India (2) Sub-Committee on formulating biosafety guidelines to conduct and monitor Confined Research Trials (CRTs) on genetically engineered (GE) (SPT) Rice, DBT, India (3) Committee for Safety and Tolerability of excipients used in parental formulation in Subsequent New Drug , DCG (I), FDA, New Delhi (4) Committee for use of PET in packaging of drug formulations for pediatric use, geriatric use and for use in case of women and women of reproductive age group, The Ministry of Health and Family Welfare (5) Academic council, JNU, New Delhi

Member, Editorial Board, Toxicology International

Dr. Amit Misra

Member, (1) Expert Committee on Tuberculosis, Department of Biotechnology (2) UNDP Consultative Group on Biologicals and Biosimilars (3) Indian Pharmaceutical Association

Vice-President, Asian Federation for Pharmaceutical Sciences

Member, Organizing Committee, (1) Third International TB Meeting Inhaled Therapies for Tuberculosis and Other Infectious Diseases, Parma, Italy (2) 4th Global Forum on TB Vaccines, Shanghai, China.

Dr. Sanjay Batra

Member, (1) Royal Society of Chemistry, UK (2) NOST, India (3) Governing Council, Chemical Research Society of India, Bengaluru; (3) Project Advisory Committee for Chemical Sciences committee Fast Track, SERB-DST

Dr. Kumkum Srivastava

Executive Committee Member, Indian Society for Parasitology, India

Dr. Gautam Panda

Member, (1) National Academy of Sciences, Allahabad, India (2) Chemical Research Society of India

Dr. KR Arya

Joint Secretary, Society of Ethnobotanists (2014-2017), National Botanical Research Institute (NBRI), Lucknow

Dr. PR Mishra

Member Editorial Board, (1) Recent Patents in drug delivery and Formulations (Bentham Sciences) (2) Journal of Pharmaceutical and Biomedical Sciences

Founder Member, Indian Nanoscience Society.

Dr. Manish K. Chourasia

Member, BIRAC Expert Committee for CRS and BIG grants

Dr. Mohd. Imran Siddiqi

Member, Advisory Committee for Biotechnology, (2012-2015) Council of Science and Technology, UP

Dr D Hansda

Member, (1) West Bengal Veterinary Council, Constitute under Veterinary Council India, (2) Live stock feed, equipments and system, sectional committee, FAD, BIS, New Delhi

Dr. Rajender Singh

Member, Senate of Academy of Scientific & Innovative Research

Dr. Monika Sachdev

Member,(1) Society for Frontiers in Reproduction, USA (2) Society for study of Reproduction, USA (3) International Society of Transgenic Technology

Dr. Jiaur R Gayen

Member, Laboratory Animal Science Association of India

Dr. Rabi Sankar Bhatta

Editorial Board Member, Journal of Drug Formulation and Production

Member, International Society for Study of Xenobiotics (ISSX), USA

Dr Mrigank Srivastava

Member, Society for Leukocyte Biology

Dr. Wahajuddin

Member, Editorial Board, (1) Journal of Bioequivalence & Bioavailability; (2) Analytica Pharmaceutica Acta; (3) Pharmaceutical Regulatory Affairs

Life Member, National Academy of Sciences (India)

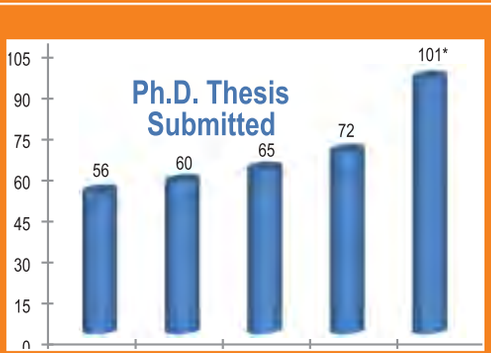
Dr. HK Bora

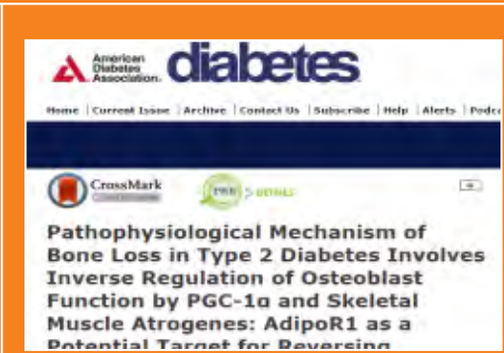
Member, Assam Veterinary Council, Constitute under Veterinary Council India

CSIR-Central Drug Research Institute, Lucknow

- पेटेण्ट्स
- वैज्ञानिक सम्मेलनों में प्रस्तुत शोध पत्र
- नेटवर्क्स एवं लिंकेजस
- मानव संसाधन विकास
- पुरस्कार एवं सम्मान

अनुसंधान उपलब्धियाँ





पेटेण्ट्स

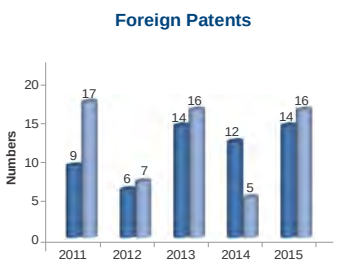
वैज्ञानिक सम्मेलनों में प्रस्तुत शोध पत्र

नेटवर्क्स एवं लिंकेजस

मानव संसाधन विकास

पुरस्कार एवं सम्मान

अनुसंधान उपलब्धियाँ



पेटेण्ट्स

विदेशों में स्वीकृत पेटेण्ट

1. **यूनाइटेड स्टेट्स पेटेण्ट सं.:** 8946261 **आबंटन की तारीख** : 03.02.2015

   शीर्षक : सब्सटीट्यूटेड 1,2,3,4-टेट्राहाइड्रोक्विनोलिन-7-लस कार्बामेट्स, प्रिपरेशन, एण्ड यूज़ देयर ऑफ़ ऐज़ ऐसिटिलकोलिनेस्ट्रेज़ (AchE) फॉर द ट्रीटमेन्ट ऑफ़ अल्ज़ाइमर एण्ड अदर न्यूरोडिजेनरेटिव डिसिजस

   अन्वेषक : कुलदीप कुमार रॉय, संतोष कुमार टोटा, चण्डीश्वरनाथ शुक्ला और अनिल कुमार सक्सेना

   सहायक सदस्य : ज़ाहिद अली और अरिमर्दन सिंह कुशवाहा

2. **यूनाइटेड स्टेट्स पेटेण्ट सं.** 8946682 **आबंटन की तिथि** : 03.02.2015

   शीर्षक : नॉवेल डौनर-ऐक्सेप्टर फ्लुरीन स्कफ़ॅल्ड्स : ए प्रॉसेस ए देयर ऑफ़

   अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनोहरन तथा आर एस आनन्द

3. **जापान पेटेण्ट सं.** : 5719775 **आबंटन की तिथि** : 27.03.2015

   शीर्षक : सब्स्टीट्यूटेड बेन्जफ्यूरोक्रोमीन्स एण्ड रिलेटेड कंपाउंड द प्रिवेन्शन एण्ड ट्रीटमेन्ट ऑफ़ बोन रिलेटेड डिसआर्डर्स

   अन्वेषक : अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या अबनीश कुमार गौतम, रश्मि पांडे, ऋतु त्रिवेदी, मनमोहन सिंह नैबेद्य चट्टोपाध्याय, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन, अनिल कुमार द्विवेदी

4. **ऑस्ट्रेलियन पेटेण्ट सं.** : 2009233324 **आबंटन की तारीख** : 07.05.2015

   शीर्षक : नॉवेल डौनर ऐक्सेप्टर फ्लुरीन स्कफ़ल्ड्स : ए प्रॉसेस एण्ड यूज़ेज़ देयर ऑफ़

   अन्वेषक : अतुल गोयल, सुमित चौरसिया, विजय कुमार, सुन्दर मनमोहरन तथा आर एस आनन्द

5. **यूरोपियन पेटेण्ट सं.** : 2265595 **आबंटन की तिथि** : 22.07.2015

   शीर्षक : *अल्मस वॉलिचियाना* प्लैनचॉन डिराइण्ड एक्सट्रैक्ट, डेज़िग्नेटेड ऐज़ ''ओस्टियोऐनाबोल'' एण्ड इट्स कंपाउंड्स एक्लॉएड इन प्रिवेन्शन और ट्रीटमेन्ट ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स

   अन्वेषक : राकेश मौया, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मनिक्कबसगम, गिरीश कुमार जैन, कमल राम आर्या, नैबेद्य चट्टोपाध्याय

6. **फ्रेंच पेटेण्ट सं.** 2265595 (EP Desig) **आबंटन की तिथि** : 22.07.2015

   शीर्षक : *अल्मस वॉलिचियाना* प्लैनचॉन डिराइण्ड एक्सट्रेक्ट, डिज़िग्नेटेड ऐज़ ओस्टियो ऐनाबोल एण्ड इट्स कंपाउंड्स एम्लॉएड इन प्रिवेन्शन ऑर ट्रीटमेन्ट ऑफ़ ओस्टियो हेल्थ रिलेटेड डिस्आर्डर्स

   अन्वेषक : राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी, गोरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन, कमल राम आर्या, नैबैद्य चट्टोपाध्याय

7. **पेटेण्ट सं. :** 2265595 (EP Desig) **आबंटन की तिथि** : 22.07.2015

   शीर्षक : *अल्मस वॉलिथियान* प्लैनचॉन डिराइण्ड एक्सट्रैक्ट डेज़िग्नेटेड ऐज़ ''ओस्टियोऐनाबोल'' एण्ड इट्स कंपाउंड्स एम्लाएड इन प्रिवेन्शन और ट्रीटमेन्ट ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स

   अन्वेषक : राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन, कमल राम आर्या, नैबैद्य चट्टोपाध्याय

8. **स्पैनिश पेटेण्ट सं.** : 2265595 (EP Desig) **आबंटन की तिथि** : 22.07.2015

   शीर्षक : *अल्मस वॉलिथियान* प्लैनचॉन डिराइण्ड एक्सट्रैक्ट डेज़िग्नेटेड ऐज़ ''ओस्टियोऐनाबोल'' एण्ड इट्स कंपाउंड्स एम्लाएड इन प्रिवेन्शन और ट्रीटमेन्ट ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स

   अन्वेषक : राकेश मौर्या, प्रीति रावत, कुनाल शरन, जावेद अख्तर सिद्दीकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मनिक्कवसगम, गिरीश कुमार जैन, कमल राम आर्या, नैबैद्य चट्टोपाध्याय

9. **यूनाइटेड स्टेट्स पेटेण्ट सं.** : 9096539 **आबंटन की तिथि** : 04.08.2015

   शीर्षक : नॉवेल सब्सटीट्यूटेड 2h-बेंज़ो [E] इंडैज़ोल-9-कार्बोज़ाइलेट्स फ़ॉर द ट्रीटमेन्ट ऑफ़ डॉयबिटीज़ एण्ड रिलेटेड डिसआर्डर्स

   अन्वेषक : गोयल अतुल, तनेजा गौरव, राहुजा नेहा, रावत अरूण कुमार, जैसवाल नताशा, ताम्रकार अखिलेश कुमार, श्रीवास्तव अरविन्द कुमार

10. **यूरोपियन पेटेण्ट सं.** : 2705047 **आबंटन की तिथि** : 05.08.2015

शीर्षक : *डैलबर्जिया सिसू* डिराइण्ड एक्सट्रेक्ट एण्ड कंपाउंड्स फ़ॉर द प्रिवेन्शन ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स डेज़िगनेटेड ऐज़ ओस्टियो नैचरलकेयर

अन्वेषक : मौर्य राकेश, दीक्षित प्रीति, त्रिवेदी ऋतु, खेडगिकर विक्रम, गौतम ज्योति, कुमार अविनाश, सिंह दिव्या, सिंह शीलेन्द्र प्रताप, वहाजुद्दीन, जैन गिरीश कुमार, चट्टोपाध्याय नैबेद्य

11. **फ्रेन्च पेटेण्ट सं.** : 2705047 [EP Desig] **आबंटन की तिथि** : 05.08.2015

शीर्षक : *डैलबर्जिया सिसू* डिराइण्ड एक्सट्रेक्ट एण्ड कंपाउंड्स फ़ॉर द प्रिवेन्शन ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स डेज़िगनेटेड ऐज़ ओस्टियो नैचरलकेयर

अन्वेषक : मौर्य राकेश, दीक्षित प्रीति, त्रिवेदी ऋतु, खेडगिकर विक्रम, गौतम ज्योति, कुमार अविनाश, सिंह दिव्या, सिंह शीलेन्द्र प्रताप, वहाजुद्दीन, जैन गिरीश कुमार, चट्टोपाध्याय नैबेद्य

12. **जर्मन पेटेण्ट सं.** : 2705047 [EP Desig] **आबंटन की तिथि** : 05.08.2015

शीर्षक : *डैलबर्जिया सिसू* डिराइण्ड एक्सट्रेक्ट एण्ड कंपाउंड्स फ़ॉर द प्रिवेन्शन ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स डेज़िगनेटेड ऐज़ ओस्टियो नैचरलकेयर

अन्वेषक : मौर्य राकेश, दीक्षित प्रीति, त्रिवेदी ऋतु, खेडगिकर विक्रम, गौतम ज्योति, कुमार अविनाश, सिंह दिव्या, सिंह शीलेन्द्र प्रताप, वहाजुद्दीन, जैन गिरीश कुमार, चट्टोपाध्याय नैबेद्य

13. **ग्रेट ब्रिटेन पेटेण्ट सं.** : 2705047 [EP Desig] **आबंटन की तिथि** : 05.08.2015

शीर्षक : *डैलबर्जिया सिसू* डिराइण्ड एक्सट्रेक्ट एण्ड कंपाउंड्स फ़ॉर द प्रिवेन्शन ऑफ़ ओस्टियो हेल्थ रिलेटेड डिसआर्डर्स डेज़िगनेटेड ऐज़ ओस्टियो नैचरलकेयर

अन्वेषक : मौर्य राकेश, दीक्षित प्रीति, त्रिवेदी ऋतु, खेडगिकर विक्रम, गौतम ज्योति, कुमार अविनाश, सिंह दिव्या, सिंह शीलेन्द्र प्रताप, वहाजुद्दीन, जैन गिरीश कुमार, चट्टोपाध्याय नैबेद्य

14. **यूरोपियन पेटेण्ट सं.** : 2675790 **आबंटन की तिथि** : 18.11.2015

शीर्षक : सब्स्टीट्यूटेड, 1,2,3,4-टेट्राहाइड्रोक्विनोलिन 7-पिन कार्बामेट्स, देयर प्रिपरेशन, एण्ड यूज़ देयर ऑफ़ ऐज़ ऐसिटाइलकोलिनेस्ट्रेज़ (AchE) इनहिविटर्स फ़ॉर द ट्रीटमेन्ट ऑफ़ अल्जाइमर्स एण्ड अदर न्यूरो डिजेनरेटिव डिज़ीज़

अन्वेषक : कुलदीप कुमार रॉय, संतोष कुमार टोटा, चण्डीश्वरनाथ, राकेश शुक्ला, अनिल कुमार सक्सेना

15. **यूनाइटेड स्टेट्स पेटेण्ट सं.** : 9200034 **आबंटन की तिथि** : 01.12.2015

शीर्षक : नॉवेल डौलैस्टैटिन मिमिक्स ऐज ऐण्टी कैन्सर एजेण्ट्स

अन्वेषक : तुषार कान्ति चक्रवर्ती, गजुला प्रवीन कुमार, दुलाल पाँडॉ, जयन्त अस्थाना

16. **युनाइटेड स्टेट्स पेटेण्ट सं.** : 9206155 **आबंटन की तिथि** : 08.12.2016

शीर्षक : काइरल 3-ऐमिनोमिथाइलपिपराडीन डेरीवटिव ऐज़ इन हिबिटर्स ऑफ़ कोलैजन इन्डॅयूज़्ड प्लेटलेट ऐक्टिवेशन एण्ड ऐडहीशन

अन्वेषक : दिनेश कुमार दीक्षित, मधु दीक्षित, तनवीर इरशाद सिद्दीकी, अनिल कुमार, रबी शंकर भट्टा, गिरीश कुमार जैन, मनोज कुमार बर्थवाल, अंकिता मिश्रा, विवेक खन्ना, प्रेम प्रकाश, मनीष जैन, विशाल सिंह, वर्षा गुप्ता, अनिल कुमार द्विवेदी

विदेशों में आवेदित पेटेण्ट

1. **पीसीटी ऐप्लिकेशन नं.** : PCT/IN2015/000076 **आवेदन की तिथि** : 09.02.2015

शीर्षक : सब्सटीट्यूटेड नैफ़थो [2,1-b] [1,10] फ़ेनैन्थ्रोलिन बेस्ड फ्लोरेसेन्ट डॉइज़ एण्ड ऐप्लिकेशन देयर ऑफ़

अन्वेषक : अतुल गोयल, शाहिदा उमर, पंकज नाग, आमिर नाज़िर, ललित कुमार, शम्सुज़्ज़मा, जियाउर रहमान गाइन और ज़ाकिर हुसैन

2. **पीसीटी ऐप्लिकेशन सं.** : PCT/IN2015/000235 **आवेदन की तिथि** : 10.06.2015

शीर्षक : कटायनिक लिपिड कॉर्डिपारिमाइड हाइब्रिड कंपाउंड्स एण्ड ए प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : बथुला सुरेन्दर रेड्डी, वी के के दुर्गा राव, कोमल शर्मा, एम प्रताप रेड्डी, दिव्येन्दु बैनर्जी और दीपेन्द्र कुमार सिंह

3. **ऑस्ट्रेलियन ऐप्लिकेशन नं.** : 2014208337 **आवेदन की तिथि** : 24.07.2015

शीर्षक : ऐण्टीडायबेटिक ऐण्टीडिस्लिपिडेमिक ऐक्टिविटीज़ ऑफ़ प्रैगनेन-ऑक्ज़ीमिनो-ऐमिनो अल्काइलियर्स

अन्वेषक : वर्मा प्रेमचन्द्र, गुप्ता ज्योति, सिंह धमेन्द्र प्रताप, गुप्ता वर्षा, कुशवाहा हरि नारायण, मिश्रा अनामिका, राहुजा नेहा, श्रीवास्तव रोहित, जैसवाल नताशा, खन्ना अशोक कुमार, ताम्रकार अखिलेश कुमार, सिंह शिव कुमार, द्विवेदी अनिल कुमार, श्रीवास्तव अरविन्द कुमार, प्रताप राम

4. **युनाइटेड स्टेट्स ऑफ़ अमेरिका ऐप्लिकेशन नं.** : 14/763480 **आवेदन की तिथि** : 24.07.2015

शीर्षक : ऐण्टीडायबेटिक ऐण्टीडिस्लिपिडेमिक ऐक्टिविटीज़ ऑफ़ प्रैगनेन-ऑक्ज़ीमिनो-ऐमिनो अल्काइलियर्स

अन्वेषक : वर्मा प्रेमचन्द्र, गुप्ता ज्योति, सिंह धमेन्द्र प्रताप, गुप्ता वर्षा, कुशवाहा हरि नारायण, मिश्रा अनामिका, राहुजा नेहा, श्रीवास्तव रोहित, जेसवाल नताशा, खन्ना अशोक कुमार, ताम्रकार अखिलेश कुमार, सिंह शिव कुमार, द्विवेदी अनिल कुमार, श्रीवास्तव अरविन्द कुमार, प्रताप राम

5. **साउथ अफ़्रीकन ऐप्लिकेशन नं.** : 2015/05621 **आवेदन की तिथि** : 04.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

6. **ईरानियन ऐप्लिकेशन नं.**: 39450140003005161 **आवेदन की तिथि** : 05.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

7. **नाइजीरियन ऐप्लिकेशन नं.** : NG/PT/C/2015/1393 **आवेदन की तिथि** : 07.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

8. **श्रीलंकन ऐप्लिकेशन नं.** : 18334 **आवेदन की तिथि** : 07.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

9. **ब्राज़ीलियन ऐप्लिकेशन नं.** : 1120150190979 **आवेदन की तिथि** : 10.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

10. **इण्डोनेशियन ऐप्लिकेशन नं.** : P00201504895 **आवेदन की तिथि** : 11.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

11. **एपी ऐप्लिकेशन नं.** : AP/P/2015/008642 **आवेदन की तिथि** : 17.08.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

12. **ग्रेट ब्रिटेन ऐप्लिकेशन नं.** : 1514914.9 **आवेदन की तिथि** : 21.08.2015

शीर्षक : ऐण्टीडॉयबिटिक एण्ड ऐण्टी डिस्लिपिडेमिक ऐक्टिबिटीज़ ऑफ़ प्रेग्नेन-ऑक्जीमिनो-ऐमिनोअल्काइलेदर्स

अन्वेषक : वर्मा प्रेम चन्द्र, गुप्ता ज्योति, सिंह धर्मेन्द्र प्रताप, गुप्ता वर्षा, कुशवाहा हरी नारायण, मिश्रा अनामिका, राहुजा नेहा, श्रीवास्तव रोहित, जैसवाल नताशा, खन्ना अशोक कुमार, ताम्रकार अखिलेश कुमार, सिंह शिव कुमार, द्विवेदी अनिल कुमार, श्रीवास्तव अरविन्द कुमार, प्रताप राम

13. **पीसीटी ऐप्लिकेशन नं.** : PCT/IN/2015/050124 **आवेदन की तिथि** : 29.09.2015

शीर्षक : ए फॉर्मेशन यूज़फुल फ़ॉर डिलीवरी ऑफ़ न्यूरो प्रोटेक्टिंग एजेण्ट

अन्वेषक : अनिल कुमार द्विवेदी, हज़ा अहमद, किरन खंडेलवाल, राजेन्दर सिंह सांगवान, नीलम सिंह संगवान, जियाडर रहमान गाइन, सारिका, स्मृति भदौरिया, एसपीएस गौड़, विवेक वी भोंसले, श्रीकान्ता कुमार रथ, शरद शर्मा, राकेश शुक्ला

14. **चाइनीज़ ऐप्लिकेशन नं.** : 2014800198858 **आवेदन की तिथि** : 30.09.2015

शीर्षक : कार्बोडॉइथायोएट्स एण्ड प्रॉसेस फ़ॉर प्रिपरेशन देयर ऑफ़

अन्वेषक : शर्मा विष्णु लाल, लाल नन्द, सारस्वत अमित, जांगीर संतोष, बाला वीनू, कुमार ललित, रावत तारा, जैन आशीष, कुमार लोकेश, मैखुरी जगदंबा प्रसाद, गुप्ता गोपाल

भारत में स्वीकृत पेटेण्ट

1. **पेटेण्ट सं.** : 265054 **आबंटन की तिथि** : 04.02.2015

शीर्षक : नॉवेल साइक्लोप्रोपा [a] नैथलीन्स एण्ड ए प्रॉसेस फ़ॉर द प्रिपरेशन देयरऑफ़

अन्वेषक : अतुल गोयल, फ़तेह वीर सिंह, पूजा गर्ग, प्रीति दोहरे और मधुर रे

2. पेटेण्ट ऐप्लिकेशन नं.: 266250 **आबंटन की तिथि** : 20.04.2015

शीर्षक : ऐन इन्ट्रा-वेजाइनल एबॉर्टीफ़ेशिएन्ट जेल कॉम्पोज़ीशन

अन्वेषक : सत्यभान बी. जाधव, रबी शंकर भट्टा, मनमोहन सिंह एवं गिरीश कुमार जैन

भारत में आवेदित पेटेण्ट्स

1. **पेटेण्ट ऐप्लिकेशन नं.**: 0125DEL2015 **आवेदन की तिथि** : 05.01.2015

शीर्षक : ए नॉवेल ऐण्टीलीशमैनियल फ़ॉर्मुलेशन

अन्वेषक : नीना गोयल, सोनाली गंगबार, अनिल कुमार कला सदन, सुभाशीष बिस्वास, अनिल कुमार द्विवेदी, हफ़्ज़ा अहमद, कैलाश चन्द गुप्ता, प्रदीप कुमार, प्रियंका भटनागर एवं संजय बत्रा

सहायक सदस्य : कार्तिक रामालिंगम एवं वी सरवन कुमार

2. **पेटेण्ट ऐप्लिकेशन नं.** : 1198DEL2015 **आवेदन की तिथि** : 30.04.2015

शीर्षक : ऐण्टीबॉडी यूज़फुल फ़ॉर द डिटेक्शन ऑफ़ कैन्सर

अन्वेषक : मोनिका सचदेव, परमिता कार, सौरभ कुमार, दीपशिखा तिवारी, मदन लाल भट्ट एवं रेखा सचान

3. **पेटेण्ट ऐप्लिकेशन नं.**: 3891DEL2015 **आवेदन की तिथि** : 30.11.2015

शीर्षक : 6-सब्सटीट्यूटेड-7 हाइड्रॉक्जी-4 (मिथाइलथापो)-2 OXO-2H क्रोमीन-3 कार्बोनाइट्रिल्स ऐज़ वैक्युलोल्स स्टेनिंग डॉइज़ एण्ड यूज़ेज़ देयर ऑफ़

अन्वेषक : अतुल गोयल, आशुतोष रघुवंशी, अजय कुमार झा, मनोज कथूरिया, कल्याण मित्रा

4. **पेटेण्ट ऐप्लिकेशन नं.** : 3988DEL2015 **आवेदन की तिथि** : 08.12.2015

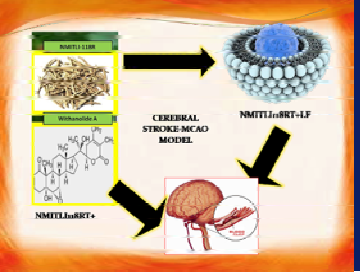
शीर्षक : सिंथिसिज़ ऑफ़ 6/8 (di (हेट्रो-2 मिथाइल) ऐमिनो) मिथाइल)-7-हाइड्रोक्ज़िल-4 (मेथिलाथियो)-2 ऑक्ज़ो 2H-क्रोमीन-2-कार्बोनाइट्रिल्स एण्ड यूज़ेज़ देयर ऑफ़

अन्वेषक : अतुल गोयल, अजय कुमार झा, आशुतोष रघुवंशी, राकेश कुमार आर्य, दीपक दत्ता

5. पेटेण्ट ऐप्लिकेशन नं. : 4242DEL2015 आवेदन की तिथ : 23.12.2015

शीर्षक : पाइरैनेन फ्यूज़ड ऐज़ा-हेट्रोसाइक्लिक फ्लोरेसेन्ट डॉइज़ एण्ड यूज़ेज़ देयर ऑफ़

अन्वेषक : अतुल गोयल, आशुतोष रघुवंशी, अजय कुमार झा, शालिनी डौंगरा, प्रेम नारायण यादव



वैज्ञानिक सम्मेलनों में प्रस्तुत किये गये शोध पत्र

2015

भारत में औषधि खोज पर संगोष्ठीः भूत, भविष्य और वर्तमान, सीएसआईआर-सीडीआरआई, लखनऊ (01 जनवरी 2015)

1. आयोडीन-मीडिएटेड डॉइवर्जेन्ट सिन्थिसिज़ ऑफ़ फ्यूज़्ड ऐज़ा-हेट्रासाइकिल्स वाया ऐलिलामाइन्स डिराइव्ड फ्रॉम मोरिटा-बेलिस-हिलमैन केमिस्ट्री; बी. हरीकृष्णा और संजय बत्रा
2. ट्रिपल कोऑपरेटिव कैटालिटिक मल्टी-कैस्केड ऐप्रोच टु इनैनशियोसेलेक्टिव सिन्थिजिस ऑफ़ कैनथिन-4-ओन्स; एसयू दिघे और संजय बत्रा
3. पैलेडियम-कैटलाइज़्ड चीलेशन-असिस्टैड रेज़ियोसेलेक्टिव ऑक्सीडेटिव बायरिल कपलिंग ऑर हाइड्रोक्सीलेशन इन एन-फ़ेनिलपाइराज़ोल्स,; एस. भट्टाचार्या और संजय बत्रा
4. आइडेण्टीफ़िकेशन ऑफ़ नॉवेल ऐण्टी कैंसर 1,4.5 ट्राइसब्स्टीट्यूटेड 1,2,3 ट्राईज़ोल्स विद β–ऐमिनो अल्कोहल स्कफ़ल्ड एज़ पोटेन्ट एण्टीमलेरियल एजेण्ट्स; एन. देवेन्द्र, सारिका गुंजन, कार्तिकेय सिंह, वेंकट रेड्डी पासम, हमीदुल्ला, एसके शुक्ला, रेनू त्रिपाठी, रितुराज कोनवर, एके त्रिवेदी और रामा पी त्रिपाठी
5. डिज़ाइन एण्ड सिंथिसिज़ ऑफ़ नॉवेल फ्लोरेसेन्ट प्रोब्स फ़ॉर सेलेक्टिव इमेजिंग ऑफ़ बायोमेटल्स; शाहिदा उमर, आशुतोष शर्मा और अतुल गोयल
6. रैपिड प्रोफ़ाइलिंग एण्ड स्ट्रक्चरल कैरेक्टराइज़ेशन ऑफ़ *बर्बेरिस ऐरिस्टेटा* अल्काइंग हाइफेनेटेड मॉस स्पेक्ट्रोमीट्रिक टेक्नीक; अवंतिका सिंह, विकास बाजपेई, सुनील कुमार बृजेश कुमार
7. ड्रग रिपोज़िशनिंग ऐप्रोच एज़ एन इफ़ेक्टिव स्ट्रैटजी फ़ॉर टार्गेटिंग कैंसर, अंकुर ओमर, पूनम सिंह

नेशनल कांफ्रेंस ऑन ड्रग कैरियर्स इन मेडिसिन एण्ड बायोलॉजी, इरोड तमिलनाडु (7-8 जनवरी)

8. लिपोज़ोमल डिलीवरी ऑफ़ एण्टीस्ट्रोक एजेण्ट एनएमआईटीएलआई118RT+, हफ़ज़ा अहमद, किरन खण्डेलवाल, शीबा साज़ी, राकेश शुक्ला, अनिल कुमार द्विवेदी
9. डिज़ाइन सिंथिसिज़ एण्ड फॉर्मुलेशन डिवेलपमेन्ट ऑफ़ 4-ऑक्ज़ोपेन्टानोइक ऐसिड डेरीवेटिव; आकांक्षा श्रीवास्तव, ऋषि रंजन पाण्डे, अर्शी नकवी, जगंदबा प्रसाद मैखुरी, गोपाल गुप्ता, अनिल कुमार द्विवेदी

इण्टरनेशनल कांफ्रेंस ऑन नैनो फ़ार्मुलेशन्स एण्ड ट्रांसलेशनल रिसर्चः स्मॉल गेटिंग विगर, बीबीए विश्वविद्यालय, लखनऊ (2-3 फरवरी)

10. बायो एनालिटिकल मेथड डिवेलपमेन्ट एण्ड वैलिडेशन, स्टैबिलिटी PAMPA पर्मिएबिलिटी एण्ड प्रोटीन बाइन्डिंग स्टड्डीज़ ऑफ़ विदैनोलाइड-ए; संदीप के सिंह, गुरू आर वलिचेरला, जियाउर आर गाइन
11. इम्प्लिमेन्टेशन ऑफ़ गुड लेबोरेट्री प्रैक्टिस इन एकैडमिक लेबोरेट्रीज़; गौरी कन्नन, अनुराधा गुप्ता, अमित मिश्रा, सुदीप्त साहा
12. प्रिपरेशन ऑफ़ चिटोसन कोटेड लिपोज़ोम्स ऑफ़ नॉवेल एण्टीथ्रॉम्बोटिक S002-333 टू इम्प्रूव ओरल बायोअवेलेबिलिटीः ए फ़ार्माकोकाइनेटिक असेसमेन्ट; किरन खण्डेलवाल, शक्ति दीप पचौरी, अभिषेक आर्या, विवेक के. पवार, तृप्ति जोशी, पंकज द्विवेदी, हफ़ज़ा अहमद, भूपेन्द्र सिंह, कोमल शर्मा, संजीव कनौजिया, मनीष के चौरसिया, अनिल कुमार सक्सेना, और अनिल कुमार द्विवेदी
13. इफेक्ट ऑफ़ साइट्रस फ्लेवोनाइड हेस्पेरेटिन ऑन *इन विट्रो* ऐफ़िकेसी ऑफ़ बाइकैलुटैमाइड अगेन्स्ट प्रॉस्टेट कैंसर; अभिषेक आर्या, किरन खण्डेलवाल, हफ़ज़ा अहमद, बोडॉ राजकुमार, अनिल कुमार द्विवेदी

मॉस स्पेक्ट्रोमीट्री पर 29वीं आईएसएमएएस अन्तर्राष्ट्रीय संगोष्ठी, जोधपुर, भारत (2-6 फरवरी)

14. साइमलटेनियस क्वांटिटेटिव डिटर्मिनेशन ऑफ़ मल्टीपल बायोऐक्टिव फ़ाइटोकॉन्स्टीट्युएंट्स इन ओसिमम स्पिशीज़ यूजिंग UPLC-ESI-MS/MS इन मल्टीपल रिऐक्शन मॉनीटरिंग मोड; रेनू पांडे, बृजेश कुमार

इण्डौ-फ्रेंच सेमिनार- विमेन इन साइंस, इण्डियन इंस्टीट्यूट ऑफ़ साइंस, बंगलौर, भारत (2-5 फरवरी)

15. Th1 स्टिम्युलेटरी प्रोटीन्स ऐज़ पोटेन्शियल पॉली वैक्सीन कैण्डीडेट अगेन्स्ट बिसरल लीशमेनियासिस; कीर्ति रावत, सुमित जोशी, नरेन्द्र के यादव, अनुराधा दुबे

17वीं सीआरएसआई राष्ट्रीय रसायन विज्ञान संगोष्ठी, पुणे, महाराष्ट्र (6-8 फरवरी)

16. ए स्ट्रैटजी फॉर द सिन्थिसिज़ ऑफ़ ऐन्थ्राक्विनोन बेस्ड ऐरिल-सी ग्लाइकोसाइड्स; कपिल उपाध्याय, नम्रता आनंद, संजीव के शुक्ला और रमापति त्रिपाठी
17. नॉवेल ऐनालोग्स ऑफ़ ल्युपिओल एण्ड देयर एण्टी डॉयबिटिक एक्टिविटी; के देव, सीके मौर्या, एके ताम्रकर, आर मौर्या

औषधि चयापचय और औषधि प्रभाव गति पर 7वीं अन्तर्राष्ट्रीय संगोष्ठी (डीएमपीके-2015), नाइपर, मोहाली, (18-21 फरवरी)

18. रोल ऑफ़ स्टैबिलाइजिंग एजेण्ट्स ऑन द डिवेलपमेण्ट ऑफ़ ट्रांस-रिज़वरेट्रॉल नैनोक्रिस्टल; विशाल एस. मैकेडिया, संदीप के. सिंह, गुरू आर बेलिचेरला, जियाउर आर. गाइन
19. फ़ार्माकोकाइनेटिक्स एण्ड बायो-डिस्ट्रीव्यूशन ऑफ़ रेपामाइसिन डिलीवर्ड एज़ इन्हेलेबल पार्टिकल्स टु माइस; अनुराधा गुप्ता, मधुर साचान, यशवंत सिंह, शिव कुमार सिंह, अमित मिश्रा

इण्डियन एसोसिएशन फ़ॉर कैन्सर रिसर्च का 34वां वार्षिक सम्मेलन, जयपुर (19-21 फरवरी)

20. अल्फा-सोलेनिन इन्ड्यूसेज़ ROS मीडिएटेड ऑटोफ़ैगी थ्रू ऐक्टीवेशन ऑफ़ ऐन्डौप्ज़ामिक रेटीकुलम स्ट्रेस एण्ड इन्हिबिशन ऑफ़ एकेटी/एमटीओआर पाथवे; मोहम्मद हसनैन, अरिन्दम भट्टाचार्यजी, प्रवीन पाण्डे, रागी अशरफ़, कल्याण मित्रा, जयन्त सरकार

रीसेण्ट एडवांसेज़ इन फार्मास्युटिकल साइन्सेज़ फॉर ड्रग डिस्कवरी एण्ड डिवेलपमेन्ट, नाइपर, रायबरेली (20-21 फरवरी)

21. सिन्थिसिज ऑफ़ नॉवेल पिरीमिडीन न्यूक्लिओसाइड ऐनालॉग्स ओविंग मल्टीपल बेसेज़/शुगर्स एण्ड देयर ग्लाइकोसाइडेज़ इनहिबिटरी एक्टिविटी; रबी कुमार ठाकुर, ए मिश्रा, केकेजी रामकृष्ण, आर महर, एसके शुक्ला, एके श्रीवास्तव, आरपी त्रिपाठी
22. आइडेण्टीफ़िकेशन ऑफ़ नॉवेल फ़ेनिल ब्यूटेनॉनिल सी-ग्लाइकोसाइड्स विद यूरिआइडिल एण्ड सल्फ़ोनैमाइडिल मॉयटीज़ एज़ एण्टीमलेरियल

एजेण्ट्स; केकेजी रामकृष्ण, एस गुंजन, एके शुक्ला, वीआर पासम, वीएम बालारामनवर, ए शर्मा, एस जैसवाल, जे लाल, आर त्रिपाठी, अनुभूति, आर रामचन्द्रन, आरपी त्रिपाठी

23. ए सेन्सिटिव एण्ड वैलिडेटेड एलसी-एमएस/एमएस मेथड फ़ॉर द डिटरमिनेशन ऑफ़ टॉपिरैमेट इन रैबिट प्लाज़्मा एण्ड इट्स एप्लिकेशन टु फ़ार्माकोकाइनेटिक स्ट्डी; तुलसंकर सचिन लक्ष्मन, हितेश के टिरगर, यश दुर्गा प्रसाद, हार्दिक चन्दासन, सुब्रता कुण्डू, गंगा श्री निवासन, रबी एस भट्टा
24. प्रिलीमिनरी फ़ार्माकोकायनेटिक स्ट्डी ऑफ़ ए नॉवेल एस013-0305, एण्टी हायपरलिपिडेमिक ड्रग; पाकला डौंरा बाबू, संतोष कुमार पुट्टरेवु, रबी एस भट्टा
25. इन विट्रो फ़ार्माकोकायनेटिक्स स्ट्डीज़ ऑफ़ नॉवेल एण्टीडॉयबिटिक सीडीआरआई मॉलिक्यूल एस009-0629, किशन एस इटालिया, गुरू आर वेलीचेरला, संदीप के सिंह, सुधीर शाही, विशाल एस मैकेडिया, अतुल गोयल, जियाउर आर गाइन
26. हाइपोलिपिडेमिक ऐक्टिविटी ऑफ़ गुग्गुपिपिड कम्पैरिज़न विद स्टैण्डर्ड हाइपोलिपिडेमिक ड्रग्स; सुरभि सिंह, प्रीति शर्मा, शैल सिंह, विवेक भोंसले, अशीम घटक
27. फ़ार्माकोविजिलेन्स इन एण्टी ट्युबरकुलर ड्रग थेरेपीः ए को हॉर्ट इवेन्ट मॉनीटरिंग स्ट्डी; प्रीति शर्मा, सुरभि सिंह, शैल सिंह, राजेन्द्र प्रसाद, एसपीएस गौड़ और विवेक भौंसले

अप्लाइड एनालिसिज़-2015 फ़ार्मास्युटिकल इण्डिया, मुंबई, (22-25 फरवरी)

28. लिक्विड क्रोमैटोग्राफ़ी मास मेथड यूज़िंग इलेक्ट्रोस्प्रे आयनाइज़ेशन फ़ॉर क्वान्टीफ़िकेशन ऑफ़ विदैनोलाइड-ए इन रैट प्लाज़्मा एण्ड टिश्यूज़ एण्ड इट्स एप्लिकेशन टु प्री-क्लीनिकल टिश्यू डिस्ट्रीब्यूशन स्ट्डी; गुरू आर वेलिचेरला, संदीप के सिंह, सुधीर शाही, जियाउर आर गाइन

नेशनल सिम्पोज़ियम ऑन इण्टरफ़ेसिग केमिकल बायोलॉजी एण्ड ड्रग डिज़ाइन (ICBDD), एमिटी विश्वविद्यालय, लखनऊ कैम्पस, (24-25 फरवरी)

29. आइडेण्टीफ़िकेशन आफ़ नॉवेल एण्टीकैंसर 1,4,5-टाइसब्स्टीट्यूटेड 1,2,3, ट्रायजोल्स विद β-ऐमिनो अल्कोहल स्कफ़ल्ड एज पोटेण्ट एण्टी मलेरियल एजेण्ट्स; एन. देवेन्द्र, सारिका गुंजन, कार्तिकेय सिंह, वेंकटरेड्डी पासम, हमीदुल्ला, एसके शुक्ला, रेनु त्रिपाठी, रितुराज कोनवर, एके त्रिवेदी और आरपी त्रिपाठी
30. ए स्ट्रेटजी फ़ॉर द सिंथेसिस ऑफ एन्थ्राक्विनोन बेस्ड ऐरिल-सी ग्लाइकोसाइड्स; कार्तिकेय सिंह, नम्रता आनंद, संजीव के शुक्ला और आरपी त्रिपाठी

21वीं आईएससीबी इण्टरनेशनल कांफ्रेंस (आईएससीबीसी-2015) करेण्ट ट्रेन्ड्स इन ड्रग डिस्कवरी एण्ड डिवेलपमेन्ट, सीडीआरआई, लखनऊ (25-28 फरवरी)

31. रैशनल-बेस्ड डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ नॉवेल फ़ंक्शनलाइज्ड पाइरैनोन्स एण्ड बाइफ़ेनिल्स एज़ पोटेण्ड एण्टी हाइपरग्लाइसेमिक एज़ेण्ट्स; शची मिश्रा, पंकज नाग और अतुल गोयल
32. नेचर-इन्स्पायर्ड सिन्थेटिक एण्ड नैचरल टेरोकार्पन्स एण्ड देयर थेराप्यूटिक पोटेन्शियल; चन्द्र प्रकाश गुप्ता, आशुतोष रघुवंशी और अतुल गोयल
33. डौंनर-एक्सेप्टर बेस्ड ऐरीन्स एण्ड हेट्रोएटीन्स फ़ॉर सेल इमेजिंग एण्ड मेटल सेन्सिंग एप्लिकेशन्स, दीपक पुरोहित, शाहिदा उमर और अतुल गोयल
34. सिन्थिसिज़ ऑफ़ नॉवेल पिरीमिडीन न्यूक्लिओसाइड एनालोग्स ओविंग मल्टीपल बेसेज़/शुगर्स एण्ड देयर ग्लाइकोसाइडेज़ इनहिबिटरी एक्टिविटी; आर महर, एसके शुक्ला, एके श्रीवास्तव, आरपी त्रिपाठी
35. आइडेण्टीफ़िकेशन ऑफ़ नॉवेल फ़ेनिल ब्यूटेनॉनिल सी-ग्लाइकोसाइड्स विद यूरिआइडिल एण्ड सल्फ़ोनैमिडिल मॉयटीज़ एज एण्टीमलेरियल एजेण्ट्स, केकेजी रामकृष्ण, एस गुंजन, एके शुक्ला, बीआर पासम, वीएम बालारामनवर, ए शर्मा, ए जैसवाल, जे लाल, आर त्रिपाठी
36. ए रिवर्स-फ़ेस्ड लिक्विड क्रोमैटोग्राफी मेथड डिवेलपमेंट एण्ड वैलिडेशन फ़ॉर एस007-1235, ए पोटेण्ट एण्टी-ल्यूकीमिक कम्पाउण्ड्, इन रैट सीरम एण्ड एप्लिकेशन टु सीरम प्रोटीन बाइन्डिंग स्ट्डीज़; एम शुक्ला, टी अख्तर, ए कुमार और जे लाल
37. फ़ार्माकोकायनेटिक स्ट्डीज ऑफ़ ए नॉवेल एण्टी-लीशमैनियल कम्पाउण्ड, एस013-0244, इन रैट्स; एम शुक्ला, ए शर्मा, एस जैसवाल, एस पाण्डे, पीएमएस चौहान, एन रंगराज, के वागसिया और जे लाल
38. रिकग्निशन एण्ड इवैल्युएशन ऑफ़ माइकोबैक्टीरियल ट्रायसिलग्लिसरॉल सिन्थिसिज़ प्रमोटर एक्टिविटी अण्डर इाइवर्स एनवायरनमेन्टल स्ट्रेस कण्डीशन्स यूजिंग ट्यू-रेड रिपोर्टर; शिवांगी रस्तोगी, अमित कुमार सिंह, मन्जू वाइ कृष्णन
39. CaCO3 माइक्रोस्पयर्स/सिप्रोलॉक्ज़ैसिन HCl लोडेड मैक्रोपोरस स्कफ़ल्ड्स फ़ॉर इण्टरवेंशन ऑफ़ ओस्टियोमाइलिटिस; गीतू पाण्डे, पीआर मिश्रा
40. ए वैलिडेटेड HPLC मेथड फ़ॉर एस्टिमेशन ऑफ़ काइरल प्योरिटी ऑफ़ ए न्यू एण्टीमलेरियल कम्पाउण्ड सीडीआरआई-एस011-1793 एण्ड इट्स आइज़ोमर एस012-0585; हफ़सा अहमद, प्राची मल्ल, डी वासनाथ, एसबी कट्टी, अनिल कुमार द्विवेदी
41. सिन्थिसिज़ एण्ड बायोलॉजिकल इवैल्युएशन ऑफ़ नॉवेल करक्यूमिन लाइक कम्पाउण्ड्स एज़ स्पर्मिसाइड्स; स्वाति गुप्ता, आकांक्षा श्रीवास्तव, अनिल कुमार द्विवेदी
42. मुराया कोएनेगी (एल) स्प्रेंग अमेलियोरेट्स इन्स्युलिन रेज़िस्टेन्स इन डेक्सामिथाज़ोन ट्रीटेड माइस बाइ एनहैन्सिंग पेरीफेरल इन्स्युलिन सेन्स्टिविटी; जे पाण्डे, आर मौर्या, आर रायखेरा, एमएन श्रीवास्तव, पीपी यादव, एके ताम्रकर
43. आइडेण्टीफ़िकेशन एण्ड कैरेक्टराइजेशन ऑफ़ लेवॉन-3 ओल्स,फ़ेनोलिक ऐसिड्स एण्ड ट्राइटरपेनॉइड्स इन टर्मिनोलिया अर्जुना यूजिंग LC-QTOF-HRMS टेक्नीक; अवंतिका सिंह और बृजेश कुमार
44. कैरेक्टराइज़ेशन ऑफ़ डॉयटरपेनाएड्स एण्ड लेवोनॉएड्स इन हर्बल मेडिसिनल एण्ड्रोग्राफ़ीज़ पेनीक्युलेटा बाई HPLC-ESI-QTOF-MSMS, सुनील कुमार और बृजेश कुमार
45. केमिकल इन्वेस्टीगेशन ऑफ़ ओस्टियोपोरोटिक एक्टिव प्लाण्ट अल्मस वॉलिचीनिया एण्ड साइसस क्वांड्रगुलरिस यूजिंग DARTMS एण्ड QTOF LC MS ऐनालिसिस, विकास बाजपेई और बृजेश कुमार
46. कॉम्प्रेहेन्सिव क्वान्टिटेटिव एनासिसिज़ ऑफ़ मल्टीपल बायोऐक्टिव कम्पाउण्ड्स इन डिपरेन्ट प्लांट पार्ट्स ऑफ़ कैसिया ऑरिक्युलर एण्ड कैसिया फ़िस्टुला बाई अल्ट्रा हाई फ़ॉर्मेन्स लिक्विड क्रोमैटोग्राफी कपल्ड टु ट्रिपल क्वाड्रपोल मॉस स्पेक्ट्रोमीट्री, प्रीति चन्द्रा, बृजेश कुमार

नेशनल मैग्नेटिक रेज़ोनेन्स सोसाइटी, भारत का 21वाँ सम्मेलन (एमएमआरएस-2015), अमृतसर, भारत (6-9 मार्च)

47. HR-MAS NMR मेटाबोलोमिक्स फ़ॉर टेराटोजेनिसिटी: इवैल्युएशन इन साइक्लोफॉस फ्रैमाइड ट्रीटेड रैट्स; रोहित महर, निकुंज सेठी, नीरज सिन्हा, संजीव के शुक्ला

इण्टरनेशनल कांफ्रेंस/कांग्रेस ऑन एम्ब्रयो इम्प्लांटेशन एण्ड प्रेगनेन्सी: इन्ट्रीकेसीज़ एण्ड स्ट्रैटजीज़ फ़ॉर इट्स सक्सेस, एनआईआई, नई दिल्ली (9-11 मार्च)

48. एन्डौग्लिन इज़ इनवॉल्व्ड इन द रेगुलेशन ऑफ़ यूटरिन रिसेप्टिविटी फ़ॉर एम्ब्रयो इम्प्लांटेशन; सैनगप्पा, चैडचन, साहिल महफूज़ और राजेश कुमार झा
49. एचआईवी-1 नेफ़ फैसिलिटेट्स द ब्रीच ऑफ़ ब्लड-प्लेसेन्टल बैरियर आ़टर इम्प्लांटेशन; सौरभ के अग्निहोत्री, पूनम सिंह, बलवंत कुमार, रेशू सक्सेना, सदन कुमार, महेश चन्द्र तिवारी, रेखा सचान, राज कुमार त्रिपाठी, मोनिका सचदेव
50. फ़ंक्शनल वैलिडेशन ऑफ़ miRNA एक्सप्रेस्ड ड्यूरिंग ऊसाइट मैच्योरेशन इन माउस मॉडल; बिलाल ए. हाकिम, अमर नाथ, सौरभ के अग्निहोत्री, अंकित के अग्रवाल, रितुराज कोनवर, मोनिका सचदेव

फ्रंटियर्स इन एथनोमेडिसिनल रिसर्च: ट्रेडीशनल टु ट्रांसलेशनल पर राष्ट्रीय कार्यशाला सह सेमिनार इंदिरा गांधी नेशनल ट्राइबल यूनिवर्सिटी, अमरकंटक (9-11 मार्च)

51. इम्यूनोप्रोफाइलैक्टिक पोटेन्शियल ऑफ़ एन मिथाइल-6, 7-डॉइमेथॉक्ज़ीआईसोक्विनोलीन आइसोलेटेड फ्रॉम एनोना स्क्वामोसा अगेन्स्ट फ़ाइलेरियल पैरासाइट *ब्रूज़िया मलाय*; विशाल कुमार सोनी, प्रशांत कुमार सिंह, मो शहाब और शैलेजा मिश्रा भट्टाचार्या
52. ल्छंप एज़ ए टूल टु वैलिडेट ड्रग टार्गेट्स इन द फाइलेरियल पैरासाइट, ब्रूज़िया मलाय; प्रशांत कुमार सिंह, सुशील कुशवाहा, मोहम्मद शहाब, विशाल कुमार सैनी, और शैलेजा भट्टाचार्य

मल्टीफ़ंक्शनल हाइब्रिड एण्ड नैनोमैटीरियल्स (हाइब्रिड मैटीरियल्स 2015) स्पेन (9-13 मार्च)

53. डिज़ाइन एण्ड डिवेलपमेन्ट ऑफ़ डॉसिटैक्सल नैनोक्रिस्टल्स फ़ॉर इम्यूव्ड केमोथेरेपी ऑफ़ ब्रेस्ट कैंसर; कोमल शर्मा, विवेक पवार, मनीष के चौरसिया
54. एन्हैन्समेन्ट ऑफ़ *इन विट्रो* एफ़ीकेसी ऑफ़ बाइकैल्युटैमाइड बाई कनकमिटेन्ट एडमिनिस्ट्रेशन ऑफ़ नैरिनजेनिन अगेन्स्ट प्रॉस्टेट कैंसर, अभिषेक आर्या, किरन खण्डेलवाल, हफ़सा अहमद, कोमल शर्मा, सतीश अग्रवाल, अनिल कुमार द्विवेदी

रिप्रोडक्टिव हेल्थ चैलेन्जेज: इश्यूज़ एण्ड रेमेडीज़ पर राष्ट्रीय सम्मेलन, जयपुर (11-13 मार्च)

55. एक्सप्रेशन ऑफ़ जर्म सेल मैच्योरेशन मॉर्कर इन एचपीवी पॉज़िटिव सर्विकल कैंसर; ए जैन, एसके अग्निहोत्री, पी कार, बी हाकिम, एमएलबी. भट्ट, आर सचान, एम सचदेव
56. स्टडी फ़ॉर द इफ़ेक्ट ऑफ़ चेबुलिनिक ऐसिड ऑन मेल रिप्रोडक्टिव सिस्टम; एके अग्रवाल, एसके अग्निहोत्री, एम अग्रवाल, एमसी तिवारी, आर सचान, टी नरेन्द्र, एम सचदेव

ऐनिमल्स इन रिसर्च एण्ड टेस्टिंग: ए क्रॉस टॉक बिटवीन रेलेवैन्स एण्ड एथिक्स'' सीएसआईआर-सीडीआरआई, लखनऊ (13-14 मार्च)

57. कम्प्यूटेशनल बेस्ड वर्चुअल स्क्रीनिंग टु एक्सप्लोर पोटेन्शियल ड्रग कैन्डीडेट अगेन्स्ट फ़ॉस्फोडॉयस्ट्रेज़ δ-सबयूनिट (PDEδ) टु ट्रीट कैन्सर; अंकुर ओमर, पूनम सिंह

नेशनल कांफ्रेंस ऑन बायोटेक्नोलॉजिकल डिवेलपमेन्ट्स एण्ड सोसायटल बेनिफ़िट्स: प्रेजेण्ट स्टेटस एण्ड फ्यूचर प्रॉस्पेक्ट्स, स्काई इन्स्टीट्यूट लखनऊ (8-9 अप्रैल)

58. बायोटेक्नोलॉजिकल टूल्स एज़ पोटेन्ट मीन्स फ़ॉर टॉक्सिक असेसमेन्ट ऑफ़ केमिकल्स, आरके सिंह

21वीं शताब्दी में ट्रांसलेशनल रिसर्च पर अन्तर्राष्ट्रीय सम्मेलन स्टेम सेल ट्रांसप्लाण्टेशन: करेण्ट स्टेट्स, भोपाल (11-14 अप्रैल)

59. *इन सिलिको* ऐप्रोच इन स्टेम सेल बायोलॉजी फ्रॉम बेसिक टु ट्रांसलेशनल रिसर्च; अब्बास एम., विवके भोंसले, अशिम घटक, मुकेश श्रीवास्तव, दीपक दत्ता
60. रीसेण्ट डिवेलपमेन्ट इन टॉक्सीकोलॉजी ऑफ़ नैनोमेडिसिन RISUGadv, आरके सिंह

अंतर्राष्ट्रीय संगोष्ठी ''ब्रिस्टल सिन्थिसिज़ मीटिंग'' स्कूल ऑफ़ केमिस्ट्री, बिस्टल विश्वविद्यालय, यूके (14 अप्रैल, 2015)

61. करेण्ट ट्रेण्ड्स इन ऑर्गेनिक सिंन्थिसिज़; अतुल गोयल

अमेरिकन सोसाइटी ऑफ़ एण्ड्रालॉजी 40वाँ वार्षिक सम्मेलन ''ए लाइफ़टाइम ऑफ़ मेल रिप्रोडेक्टिव हेल्थ'', ऊटाह, यूएसए (18-21 अप्रैल)

62. एनर्जी मेटाबोलिज़्म ऑफ़ क्वायसेन्ट स्पर्म इन कॉडॉ एपिडिडीमिस ऑफ़ रैट; लोकेश कुमार, संतोष के यादव, विकास वर्मा, आस्था पाण्डे, भावना कुशवाहा, विकास शर्मा, जेपी मैखुरी, गोपाल गुप्ता

106वीं वार्षिक बैठक - अमेरिकन एसोसिएशन फ़ॉर कैंसर रिसर्च, फ़िलाडौल्फ़िया (18-22 अप्रैल)

63. सुपरऑक्साइड एनायन (O2.-) मीडिएटेड एक्टिवेशन ऑफ़ mTORC2 बाइ एस्ट्रोजन रिसेप्टर इन ब्रेस्ट कैंसर सेल्स: रोल ऑफ़ ऐसिटिलेशन डिपेन्डेन्ट इनहिबिशन ऑफ़ MnSOD, स्मृति भदौरिया

एशियन कांग्रेस ऑफ़ न्यूट्रीशन, योकोहामा, जापान, (14-18 मई)

64. एण्टी कैंसर इफ़ेक्ट्स ऑफ़ एक्सट्रेक्ट ऑफ़ द फ्रूट ऑफ़ मॉरिन्डॉ सिट्रीफोलिया (Noni) इन ब्रेस्ट कैंसर सेल लाइन्स; कोमल शर्मा, शक्ति दीप पचौरी, किरन खण्डेलवाल, जितेन्द्र के सक्सेना, अनिल के द्विवेदी, मनीष के चौरसिया

राष्ट्रीय पर्यावरण दिवस समारोह, बरेली (5 जून)

65. एन ओवरव्यू ऑफ़ नैचरल रिसोर्सेज़ एण्ड देयर कंज़रवेशन इन इण्डिया, आरके सिंह

ऐलबैनी 2015 कनवर्सेशन 19, अलबैनी, न्यूयार्क (9-13 जून)

66. एक्सप्लोरिंग द पॉसिविलिटिज़ ट्रीटमेन्ट फ़ॉर टार्गेटिंग द एक्ज़िस्टिंग एण्टी वायरल मॉलीक्यूल्स अगेन्स्ट कैंसर; पूनम सिंह, अंकुर ओमर

ड्रग डिस्कवरी एण्ड डिवेलपमेन्ट कोलोक्विम 2015, मिसीसिपी, यूएसए (22-24 जून)

67. कम्पैरेटिव *इन विट्रो* एण्ड *इन वीवो* फ़ार्माकोकाइनेटिक इवैल्युएशन

ऑफ़ नॉवेल 4-एमिनोक्विनोलिन-टेट्राज़ोल एण्टी मलेरियल्स; ए. शर्मा, एस जैसवाल, एम शुक्ला, एस पाण्डे, पीएमएस चौहान, और जे लाल

बच्चों के अस्थि स्वास्थ्य पर 7वां अन्तर्राष्ट्रीय सम्मेलन, आस्ट्रिया (27-30 जून)

68. मेडीकार्पिन, ए नैचरल टेरोकार्पन, एनहैन्सेज़ बोन रिजनरेशन इन कॉर्टिकल बोन डिफेक्ट मॉडल बाई ऐक्टिवेशन ऑफ़ नॉच एण्ड डब्ल्यूएनटी कैनॉनिकल सिग्नलिंग पॉथवे; मनीषा दीक्षित, आशुतोष रघुवंशी, अतुल गोयल और दिव्या सिंह

एचआईबी पैथॉजेनेसिस, ट्रीटमेन्ट और प्रिवेन्शन पर 8वां आईएएस सम्मेलन आईएएस-2015, वैंकूवर, कनाडा (19-22 जुलाई)

69. HIV-1 Nef कंट्रोल्स सेल्युल इनवेज़न थ्रू डिफेरेन्शियल मॉड्यूलेशन ऑफ़ होस्ट प्रोटीन्स; रेशु सक्सेना, कविता सिंह, कल्यान मित्रा, अनिल कुमार त्रिपाठी, अमित कुमार त्रिपाठी, जीमुत कांति घोष और राजकमल त्रिपाठी

42वीं सीआरएस वार्षिक बैठक और एक्सपोज़ीशन-2015, एडिनवर्ग, स्कॉटलैण्ड (26-29 जुलाई)

70. इन्हेलेबल पार्टिकल्स कन्टेनिंग निटाजॉक्ज़ेनाइड एलोन एण्ड इन कॉम्बिनेशन विद आइसोनायज़िड एण्ड रिफ़ाब्युटिन फ़ॉर द ट्रीटमेन्ट ऑफ़ ट्युबरकुलोसिस; अनुराधा गुप्ता, दीपक शर्मा, पुष्पा गुप्ता, उमेश दत्त, अमित मिश्रा

उपसला फ़ार्माकोकायनेटिक समर स्कूल (यूपीएसएस-2015), उपसला यूनिवर्सिटी, स्वीडन (10-21 अगस्ता)

71. पीके-पीडी मॉडलिंग ऑफ़ मिल्टफ़ोज़िन इन *लीशमैनिया डोनोवनी* इनफेक्टेड गोल्डेन सीरियन हैम्स्टर यूजिंग नॉनमेन; एस जैसवाल, ए शर्मा, एम शुक्ला, वीजे, एन गोयल और जे लाल

72. पीके-पीडी मॉडलिंग ऑफ़ फ्यूरोसेमाइड इन स्पॉनटेनियसली हाइपरटेन्सिव रैट्स यूजिंग नॉनमेम; एम. शुक्ला, एस जैसवाल, ए. शर्मा, एम जैन, के हनीफ़ और जे लाल

250वीं एसीएस नेशनल मीटिंग एण्ड एक्सपोज़ीशन बोस्टन, यूएसए (16-20 अगस्त)

73. ट्राइफेसेटेड गौस्ट्रिक रिटेन्शन ऑफ़ केपसिटाबाइन एक्सप्लाइटिंग जैनथन गम; युवराज सिंह और मनीष के चौरसिया

सोसाइटी फ़ॉर मेडिसिनल प्लाण्ट एण्ड नैचरल प्रॉडक्ट रिसर्च की 63वीं अन्तर्राष्ट्रीय कांग्रेस और वार्षिक बैठक, बुडॉपोस्ट, हंगरी (23-27 अगस्त, 2015)

74. ओस्टियोप्रोटेक्टिव ऐक्टिविटी फ्रॉम *फ़ोलिज़ेटा आर्टिकुलेटा* लिडले (ऑर्चिडेसी): ए ट्रेडीशनल प्लाण्ड यूज़्ड फ़ॉर हीलिंग फ्रैक्चर्स इन उत्तराखण्ड, हिमालय, चेतन शर्मा, केआर आर्या, डी सिंह, टी नरेन्द्र

बायो एन्कैप्सुलेशन पर 23वीं इण्टरनेशनल कांफ्रेंस, नीदरलैण्ड (2-4 सितम्बर)

75. गैलेक्टोसैमाइन कोटेड कटायनिक NPs फ़ॉर इम्प्रूव्ड टार्गेटिंग ऑफ़ ऐम्फोटेरिसिन बी इन वीएल; प्रियंका त्रिपाठी और पीआर मिश्रा

76. CD44 रिसेप्टर टार्गेटेड पैक्लीटैक्सेल नैनोक्रिस्टल्स फ़ॉर इम्प्रूव्ड थेराप्यूटिक एफ़ीकेसी; श्वेता शर्मा, वी वर्मा, पीआर मिश्रा

77. CaCO3 माइक्रोस्फ़ेयर्स/सिप्रॉलोक्ज़ैसिन लोडेड जिलेटिन क्रियोजेल फ़ॉर ओस्टियो माइलिटिस; गीतू पाण्डे, ए पंत, एन भिट्टापेल्ली, पी सिंह, पीके शुक्ला, पीआर मिश्रा

होलिस्टिक मेडिसिन पर पांचवां यूरो-इण्डिया अन्तर्राष्ट्रीय सम्मेलन (आईसीएचएम-2015), कोट्टयम, केरल (11-13 सितम्बर)

78. साइमल्टेनियस डिटर्मिनेशन ऑफ़ ऐट बायोऐक्टिव अल्कालॉइड्स इन द हर्बल मेडिसिन दारूहरिद्रा यूजिंग अल्ट्रा पर्मफ़ॉर्मेन्स लिक्विड क्रोमैटोग्राफी विद हाइब्रिड ट्रिपल क्वाड्रपोल लीनियर आयन ट्रैन मॉस स्पेक्ट्रोमीटर; अवंतिका सिंह, विकास वाजपेई, सुनील कुमार, बृजेश कुमार और केबी रमेश कुमार

79. स्ट्डी ऑफ़ जॉग्रफ़िकल वैरिएशन 1 फ़ाइलैन्थस एमैरस यूजिंग डॉयरेक्ट एनालिसिज़ इन रियल टाइम मॉस स्पेक्ट्रोमीट्री; सुनील कुमार, विकास बाजपेई, अवंतिका सिंह, मुकेश श्रीवास्तव, बृजेश कुमार।

80. डिवेलपमेन्ट ऑफ़ रैपिड UPLC-ESI-MS/MS मेथड फ़ॉर क्वान्टिटेटिव डिस्ट्रीब्यूशन ऑफ़ सेलेक्टेड कम्पाउण्ड्स इन टिनोस्पोरा कॉर्डिफ़ोलिया स्टेम; विकास बाजपेई, अवंतिका सिंह, एमपीएस नेगी, सुनील कुमार, बृजेश कुमार

बायोएन्कैप्सुलेशन पर अन्तर्राष्ट्रीय सम्मेलन, डेट, नीदरलैण्ड (3-6 सितम्बर)

81. मेथॉक्ज़ी लिनोलीक ऐसिड बेस्ड मिसलीज़ फ़ॉर सिनरजिस्टिक ऐक्टिविटी ऑफ़ करक्यूमिन; पंकज सिंह, विवके के पवार, मनीष के चौरसिया

स्टेम सेल और कैंसर पर छठा अंतर्राष्ट्रीय सम्मेलन आईसीएससीबी, पुणे (2-5 अक्टूबर)

82. मैकेनिज़्म ऑफ़ फ़ेनोटाइप स्विचिंग ऑफ़ मैक्रोफ़ेज़ेज इन ट्यूमर माइक्रोएनवायरमेन्ट, स्मृति भदौरिया

फ़ेन्स फ़ीचर्ड रीजनल मीटिंग (FERM-2015), ग्रीस (7-10 अक्टूबर)

83. ए नॉवेल केमिकली मॉडीफ़ाइड बायोऐक्टिव फ्रैक्शन फ्रॉम *करक्यूमा लॉन्गा* (NCCL) फ़ॉर मैनेजमेन्ट ऑफ़ सीवीसी एण्ड सीएमएस डिस्ऑर्डर्स; हफ़्ज़ा अहमद, मनोज बर्थवाल, जे कुमारवेलु और अनिल कुमार द्विवेदी

84. एण्टी स्ट्रोक बेनिफ़िटिस ऑफ़ ए सॉलिड डौंसेज़ फ़ॉर्म ऑफ NMITLI 118RT+ (ए स्टैंटडर्डाइज़्ड एक्सट्रैक्ट ऑफ़ ए न्यू केमोटाइप ऑफ़ *विदैनिया सोम्नीफ़ेरा*) इन ऑक्लूज़न मॉडल इन रैट्स; हफ़्ज़ा अहमद, किरन खण्डेलवाल, राकेश शुक्ला, एस. सैमुअल साजी, अनिल कुमार द्विवेदी

इम्यूनोकॉन 2015, आरएमआरआईएमएस, पटना भारत (9-11 अक्टूबर)

85. इवैल्युएशन ऑफ़ सेल्युलर रिस्पॉन्सेज़ ऑफ़ MHC क्लास।।-रिस्ट्रिक्टेड ऐण्टीजेनिक पेप्टाइड्स Th1 और स्टिम्युलेटरी प्रोटीन्स ऑफ़ *लीशमैनिया डौनोवनी*; सुमित जोशी, नरेन्द्र के यादव, कीर्ति रावत, अनुराधा दुबे

तीसरी अन्तर्राष्ट्रीय टीबी-मीटिंग ''इनहेल्ड थेरपीज़ फ़ॉर ट्युबरकुलोसिस एण्ड अदर इन्फ़ेक्शस डिजीज़ेज''-2015, इटली (14-16 अक्टूबर)

86. इन्वेस्टीगेशन ऑफ़ न्यूक्लियर लोकलाइज़िंग प्रोटीन्स ऑफ़ *माइकोबैक्टीरियम ट्युबरकुलोसिस* ड्यूरिंग इन्फ़ेक्शन; अतुल कुमार अग्रवाल, राजीव रंजन, मधुर सचान, आशीष श्रीवास्तव, संकेत कुमार पांड्या, अनुराधा गुप्ता, टीजे रेड्डी और अमित मिश्रा

87. स्मॉल मॉलिक्युल्स दैट नज होस्ट रिस्पॉन्स; अमित मिश्रा, मधुर

सचान, आशीष श्रीवास्तव, राजीव रंजन, संकेत पांड्या, अनुराधा गुप्ता।

नेसेण्ट डिवेलपमेन्ट इन केमिकल साइंसेज़ (एनडीसीएस-2015) पर अन्तर्राष्ट्रीय कांफ्रेंस, बिट्स, पिलानी, राजस्थान (14-18 अक्टूबर)

88. बायो कैटलाइज़्ड वेस्ट फ्री स्ट्रैट्जी फ़ॉर सी-एस एण्ड एस-एस बॉण्ड, फ़ॉर्मेशन इन ग्रीन सॉल्वेन्ट; आदित्य जी. लवेकर, साइमा योगेश थोपटे, अरून के सिन्हा
89. ग्रीन प्रोटोकॉल्स फ़ॉर सी-सी एण्ड सी-एस बॉण्ड फ़ॉर्मेशन इन न्यूट्रल आयनिक लिक्विड; योगेश थोपटे, नितिन एच अंधारे, ऋचा सिंह और अरुण के सिन्हा
90. एनवायरमेंटली बिनाइन स्ट्रेटजीज फ़ॉर एस-एस, सी-एस एण्ड सी-एन बॉण्ड्स, सायमा, आदित्य जी लवेकर, दानिश इकबाल और अरुण के सिन्हा

20वीं नॉर्थ अमेरिकन ISSX मीटिंग, ऑरलैण्डौं,यूएसए (17-22 अक्टूबर)

91. प्री क्लीनिकल फ़ार्माकोकाइनेटिकस एण्ड स्पेशीज़ डिफ़रेन्सेज़ इन द सीवाईपी-मीडिएटेड मेटाबोलिज़्म ऑफ़ आइसोफ़ॉर्मोनोनेटिन, ए पोटेन्शियल एण्टी ओस्टियोपोरोटिक लोवोनॉइड; के शिवा रामाराजू, आई तनेजा, एम राशिद, एसपी सिंह, एम वहाजुद्दीन
92. इफ़ेक्ट ऑफ़ पॉलीमॉर्फ़िज़्म ऑन द प्री-क्लीनिकल फ़ार्माकोकाइनेटिक्स ऑफ़ डिस्ब्यूटिल ल्यूमिफैन्ट्रिन, ए पोटेन्शियल एण्टी मलेरियल एजेण्ट, आई तनेजा, केएसआर राजू, एस आरोड़ा, एस जैन, एसपी सिंह, एम वहाजुद्दीन
93. डिवेलपमेन्ट ऑफ ऑफ़ नॉवेल एण्टी हाइपरलिपिडैमिक कॉम्बिनेशन ऑफ़ एटॉरवैस्टैटिन एण्ड एन्टागोनिस्ट 16-डिहाइड्रोप्रेग्नेन्लोन (80-574): फ़ार्माकोकायनेटिक एण्ड फ़ार्माकोडॉयनमिक ड्रग-ड्रग इन्टरैक्शन; रबी शंकर भट्टा, अंजु पुरी, अशोक के खन्ना, राम प्रताप, जीके जैन
94. एलसी-एमस/एमएस डिटर्मिनेशन ऑफ़ ऐस्प्रिन एण्ड क्लोपिडॉग्रेल एलॉन्ग विद देयर मेटाबोलाइट्सः ऐप्लिकेशन टु ह्यूमन फ़ार्माकोकाइनेटिक स्टडी; यश दुर्गा प्रसाद, यशपाल सिंह छोंकर, सी. पी. पाण्डे, हार्दिक चन्दासना, सचिन लक्ष्मण तुलसंकर, वीएस नारायण, मधु दीक्षित, रबी शंकर भट्टा
95. प्लाज़्मा प्रोटीन बाइन्डिंग, फार्माकोकाइनेटिकस, टिश्यू डिस्ट्रीब्यूशन, एक्सक्रीशन, एन्ज़ाइम काइनेटिक्स और CYP450 बायोट्रांसफ़ार्मेशन स्ट्डीज ऑफ़ नॉवेल एण्टी प्लेटलेट एजेण्ट एस007-867; हार्दिक चन्दासना, यशपाल सिंह छोंकर, तुलसंकर सचिन, यश दुर्गाप्रसाद, अनिल कुमार केएस, दिनेश दीक्षित रबी शंकर भट्टा

एएपीएस की वार्षिक बैठक और एक्सपोज़ीशन, यूएसए (25-29 अक्टूबर)

96. लांग सर्कुलेटिंग सीडी44 टार्गेटेड पैक्लीटैक्सेल नैनोक्रिस्टल्स फ़ॉर इम्प्रूव्ड थेराप्यूटिक एफ़ीकेसी अगेन्स्ट कैंसर; श्वेता शर्मा, ए वर्मा, पीआर मिश्रा
97. इफ़ेक्ट ऑफ़ रेड क्लोवर एक्सट्रैक्ट प्री-ट्रीटमेन्ट ऑन द फ़ार्माकोकाइनेटिक्स ऑफ़ टैमोक्ज़ीफ़ेन वाइ द मॉड्युलेशन ऑफ़ मेजर ड्रग मेटाबोलाइजिंग एन्जाइम्स; के शिवा रामा राजू, आई तनेजा, जीआर वेलीचेरला, जीआर गाइन, एसपी सिंह, एम वहाजुद्दीन
98. मॉड्युलेशन ऑफ़ इम्यून रिस्पॉन्स एलॉन्ग विद बैक्स एण्ड बीसीएल-2 मीडिएटेड एनहैन्स्ड एपॉप्टॉसिस इन ब्रेस्ट कैंसर सेल्स वाया पैक्लीटैक्सेल लोडेड विटामिन ई नैनो इमल्ज़न; विवेक के पवार, मनीष के चौरसिया
99. टार्गेटिंग ऑफ़ नाइट्रिक ऑक्साइड डौनर्स टु मैक्रोफेज़ इन ए रोडेन्ट मॉडल ऑफ़ विसरल लीशमैनिएसिस; संकेत कुमार पांड्या, राहुल कुमार वर्मा, प्रशांत खरे, अनुराधा दुबे, अमित मिश्रा

इनोवेशन इन ऐनिमल साइंसेज़ फ़ॉर फूड सिक्योरिटी हेल्थ सिक्योरिटी एण्ड लाइवलिहुड पर 26वीं अखिल भारतीय जुऑलॉजी कांग्रेस और अंतर्राष्ट्रीय संगोष्ठी, लखनऊ (29-31 अक्टूबर)

100. न्यू बिस्टाज़ इन लेबोरेट्री ऐनिमल्स फ़ॉर ड्रग रिसर्च टु मीट आउट द फ़ोर ऑफ़ द रिसर्च; विवेक भोंसले, एम अब्बास, कविता दुर्गापाल, तीरथ कुमार

लसकॉन-2015 लखनऊ साइंस कांग्रेस 2015, लखनऊ (29-31 अक्टूबर)

101. फ्रेन्ड और फ़ो?-चेन्जिंग पैराडॉइम्स इन एनर्जी मेटाबोलिज़्म; एएन गायकवाड़

इण्डियन एकैडमी ऑफ़ न्यूरासाइंसेज़ का XXXIIIवां वार्षिक सम्मेलन पंजाब विश्वविद्यालय, चण्डीगढ़ (31 अक्टूबर-2 नवम्बर)

102. मेमनटाइन एटीन्युएट्स स्ट्रेप्टोज़ॉटोसिन-इन्ड्यूज्ड अल्ज़ाइमर्स डिज़ीज़ लाइक पैथोलॉजी इन ऐस्ट्रोसाइट्सः द रोल ऑफ़ इन्स्युलिन रिसेप्टर्स एण्ड न्यूरोट्रॉफ़िक फ़ैक्टर; राकेश शुक्ला
103. हिस्टैमिन 3 रिसेप्टर एण्टागोनिस्ट सिप्रॉक्ज़ीफैन रिवर्स्ड डिप्रेशन लाइक सिम्पटम्स थ्रु माड्युलेशन ऑफ़ बीडीएनएफ एण्ड एनएमडीए रिसेप्टर इन हिपोकैम्पस; अजित कुमार शालिनी डौंगरा और प्रेम एन यादव

एनसीआरआई कैंसर सम्मेलन, लिवरपूल, यूके (01-04 नवम्बर, 2015)

104. सैलिनोमाइसिन टार्गेट्स EZH2 ड्रिवेन एपिजेनेटिक रिप्रेशन ऑफ़ डेथ रिसेप्टर्स इन कोलन कैंसर स्टेम सेल्स; अनूप कुमार सिंह, श्रृंखला महेश्वरी, राकेश के. आर्या, अखिलेश सिंह, दीपक दत्ता एनसीआरआई कैंसर कान्फ्रेन्स लीवरपूल, यूके, 104 नवम्बर

राष्ट्रीय विज्ञान संगोष्ठी, कृषि मृदा एवं स्वास्थ्य के विकास में विज्ञान के आयाम, लखनऊ; 4-6 नवम्बर 4

105. हर्बल उत्पादों की मानव जीवन में स्वास्थ्य के लिए अनिवार्यता, रामाकान्त सिंह

नेशनल कॉन्फ्रेन्स ऑन रिप्रोडक्टिव हेल्थ चेलेन्जेजः इश्यूज एण्ड रेमेडीज, जयपुर (1-13 नवंबर)

106. एक्सप्रेशन ऑफ जर्म सेल मेचुरेशन मार्कर इन एचपीवी पॉजिटिव सर्वाइकल कैन्सर, ए जैन, एसके अग्निहोत्री, पी कार, बी हाकिम, एमएलबी भट्ट, आर सचान, एम सचदेव
107. स्टडी फॉर द इफेक्ट ऑफ चेबुलिनिक एसिड ऑन मेल रिप्रोडक्टिव सिस्टम, एके अग्रवाल, एसके अग्निहोत्री, एम अग्रवाल, एमसी तिवारी, आर सचान, टी नरेन्द्र, एम सचदेव

इण्टरनेशनल कांफ्रेंस ऑन बायोटेक्नोलॉजिकल एडवांसमेन्ट्स इन फ्री रैडिकल बायोलॉजी एण्ड मेडिसिन (ICBAFM-2015)] इन्टिग्रल यूनिवर्सिटी, लखनऊ, (14-16 नवम्बर)

108. हाइपरटेन्शन ए रिस्क फ़ैक्टर फ़ॉर मेमारी इम्पेयरमेन्टः रोल ऑफ़ सेन्ट्रल रेनिन एन्ज्योटेन्ज़िन सिस्टम, राकेश शुक्ला

इण्टरनेशनल कांफ्रेंस ऑन न्यू होराइज़न्स इन बायोटेक्नोलॉजी (NHBT-2015)] BRSI और NIIST, तिरुअनंतपुरम द्वारा आयोजित (22–25 नवम्बर)

109. डी-ऐमिनो एसिड ऑक्सीडेज़ नॉकआउट लीड्स टु इनक्रीज़ सस्केप्टिबिलिटी ऑफ़ *मायोबैक्टीरियम ट्युबरकुलोसिस* H37Ra अण्डर स्ट्रेस; कुमार सचिन सिंह, ऋषभ शर्मा, दीपा केशरी, शैलेन्द्र यादव, सुधीर कुमार सिंह
110. वॉल इन्टेग्रिट्री फ़ॉस्फ़ेसिरिन एमिनोट्रांसफ़रेज़ ऑफ़ *मायकोबैक्टीरियम स्मेगमैटिस* Mc2 155, मेनटेन्स सेल एण्ड इन्क्रीज़ सर्वाइवल अण्डर स्ट्रेस, दीपा केशरी, कुमार सचिन सिंह, ऋषभ शर्मा, शैलेन्द्र यादव और सुधीर कुमार सिंह
111. डॉउन रेगुलेशन ऑफ़ थ्रेयोनिन डिहाइड्रेटेज़ लीड्स टु इनक्रीज्ड ससेप्टिबिलिटी ऑफ़ *मायकोबैक्टीरियम ट्युबरकुलोसिस* अण्डर स्ट्रेस; दीपा केशरी, कुमार सचिन सिंह, ऋषभ शर्मा, शैलेन्द्र यादव और सुधीर कुमार सिंह
112. नॉकडॉउन ऑफ़ 4-फ़ॉस्फ़ोपैन्टिहाइनिल ट्रांसरफ़रेज़ अफेक्ट्स ग्रोथ एण्ड इन्क्रीजेज़ सेन्सिटीविटी ऑफ़ *मायकोबैक्टीरियल ट्युबरकुलोसिस* टु एण्टीबायोबैक्टीरियल एजेण्ट्स; शैलेन्द्र यादव, कुमार सचिन सिंह, दीपा केशरी, ऋषभ शर्मा, और सुधीर कुमार सिंह

नैनोटेक्नोलॉजी इन मेडिसिन पर तृतीय अंतर्राष्ट्रीय सम्मेलन (Nano-MED 2015) मैनचेस्टर, यूके (23–25 नवम्बर)

113. ऑर्मेलोक्ज़ीफ़ीन लोडेड पॉलीमरिक नैनोपार्टिकल्स फ़ॉर ट्रीटमेन्ट ऑफ़ ब्रेस्ट कैंसर; एसजी अग्रवाल, ए आर्या, एच अहमद, के शर्मा, एके द्विवेदी

सीसीडीडीआर-2015, इण्टरनेशनल कांफ्रेंस ''करेण्ट चैलेन्जेज़ इन ड्रग डिस्कवरी रिसर्च'' जयपुर (23–25 नवम्बर)

114. ओबीसटी डिस्लिपिडेमिया एण्ड डॉयबिटीज़: इण्डियन सिनैरियो एण्ड इन्डिजेनस सोल्यूशन; एएन गायकवाड़
115. क्रायोज़ेल एज़ ए ड्रग डिलीवरी सिस्टम फ़ॉर थेराप्यूटिक इण्टरवेंशन इन ओस्टियोमायलिटिस एण्ड एसोसिएटेड ओस्टियोपोरोसिस; गीतू पाण्डे, जी पाण्डे, ए पंत, एन मिट्टापेल्ली, पी सिंह, पीके शुक्ला, पीआर मिश्रा
116. इन्वेस्टीगेशन ऑफ़ सॉल्ट फॉर्मेशन बिटवीन मेमैनटाइन एण्ड पैमोइक ऐसिडः इट्स एक्सप्लाइटेंशन इन नैनोक्रिस्टलिन फ़ॉर्म एज़ लॉन्ग एक्टिंग इन्जेक्शन; नरेश मिट्टापेल्ली रचुमल्लु, गीता पाण्डे, श्वेता शर्मा, अभिषेक आर्या, रबी शंकर भट्टा, प्रभात रंजन मिश्रा

सेल्युलर ऑर्गनाइज़ेशन एण्ड डॉयनमिक्स पर XXXIX अखिल भारतीय सेल बायोलॉजी कांफ्रेंस, त्रिवेन्द्रम (6–8 दिसम्बर)

117. आइडेण्टीफ़िकेशन ऑफ़ न्यू सब्सट्रेट्स ऑफ़ च्चादळ एण्ड देयर इनवॉल्वमेन्ट इन ग्रोथ एण्ड इन इन्ट्रासेल्युलर सर्वाइवल ऑफ़ मायोबैक्टीरियम; समीर तिवारी, शिवराज याबाजी, रिचा सक्सेना, प्रमोद के सिंह, दिवाकर के सिंह और किशोर के श्रीवास्तव
118. मेकैनिज़्म ऑफ़ प्रोटीन टाइरोज़िन काइनेज़ फ़ासफ़ोरिलेशन इन माइकोबैक्टीरियम एण्ड आइडेण्टीफ़िकेशन ऑफ़ द फ़ास्फ़ोरिलेशन साइट्स ऑन द सब्सट्रेट बाइ द यूज़ ऑफ़ इनहिबिटर; स्वाति जैसवाल, अदिति चटर्जी, सपना पाण्डे और किशोर के श्रीवास्तव
119. आइसोलेशन एण्ड जेनेटिक कैरेकटराइजेशन ऑफ नॉन टॉक्सिक स्यूडौमोनाज़ एरुजिनोसा स्ट्रेन्स हैविंग इन्हिबिटिरी प्रॉपर्टी अगेन्स्ट माइकोबैक्टीरिया; आलोक के मिश्रा, रिकेश के दुबे, शिवराज एम याबाजी, रिया सक्सेना, दिनेश के त्रिपाठी और किशोर के त्रिपाठी
120. म्यूरिन लंग इऑसिनोफ़िल्स एण्ड मैक्रोफ़ेजेज़ एक्ज़िबिट फ़ंक्शनल इम्पेयरमेन्ट ड्यूरिंग फ़ाइलेरियल मैनिफ़ेस्टेशन ऑफ़ ट्रॉपिकल पल्मोनरी इऑसाइनोफ़ीलिया; पंकज शर्मा, अदिति शर्मा और मृगांक श्रीवास्तव
121. फंक्शनल मॉड्युलेशन ऑफ़ होस्ट एण्टिजेन प्रेज़ेन्टिंग सेल्स ड्यूरिंग अर्ली स्टेजेज़ ऑफ़ *ब्रूज़िया मलाय* इन्फेक्टिव लार्वा (L3) इन्फ़ेक्शन; अदिति शर्मा, पंकज शर्मा और मृगांक श्रीवास्तव
122. रोल ऑफ़ सर्लक्युलर RNA मॉलिक्यूल circRNA4 एण्ड इट्स सिन्थिसाइज़िंग जीन ip-2 इन पार्किंसन्स डिज़ीजः स्टडीज एम्प्लाइंड ट्रांसजेनिक सी एलेगैन्स एक्सप्रेसिंग ह्यूमन अल्फ़ा-साइनुक्लीन, ललित कुमार, शम्सुज़्ज़मा और आमिर नाज़िर
123. रेगुलेशन ऑफ़ पार्किन्सन्स डिज़ीज़ स्पेसिफ़िक पॉथवे बाई माइक्रो RNA Let-7: स्टडीज एम्प्लाइंग ट्रांसजेनिक *सी एलेगैन्स* एक्सप्रेसिंग ह्यूमन अल्फ़ा साइनुक्लीन, शम्सुज़्ज़मा, ललित कुमार और आमिर नाज़िर

ड्रग डिलीवरी टु द लंग्स पर 26वीं सम्मेलन, एडिनबर्ग, स्कॉटलैंण्ड (09–11 दिसम्बर)

124. इनहेलेबल ग्लूकागॉन लाइक पेप्टाइड 1 पोरस पार्टिकल्स प्रिपेयर्ड बाई स्प्रे फ्रीज़ ड्राइंग टेक्नीक; संकेत कुमार पांड्या, अमित मिश्रा

9वीं इण्टरनेशनल कांफ्रेंस-रिसर्चेज़ इन इंजीनियरिंग, टेक्नोलॉजी एण्ड साइंसेज़, लन्दन, यूके (17–18 दिसम्बर)

125. डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ करक्यूमिन डेरीवेटिव्स ऐज़ पोटेन्शियल ऐण्टी कैंसर एजेण्ट्स; ए श्रीवास्तव, आरआर पाण्डे, ए नकवी, जी गुप्ता, एके द्विवेदी

पाँचवी रामालिंगस्वामी कॉन्क्लेव, रीजनल सेण्टर फ़ॉर बायोटेक्नोलॉजी, फ़रीदाबाद (18–20 दिसम्बर)

126. डैमेज ऐसोसिएटेड मॉलीक्युलर पैटर्न्स इन द रेगुलेशन ऑफ़ लिवर फ़ाइब्रोसिस; कुमार वेलु जगवेलु

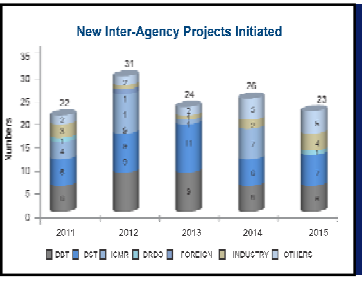
ट्रेन्ड्स इन सेल एण्ड मॉलिक्युलर बायोलॉजी पर प्रथम अन्तर्राष्ट्रीय सम्मेलन, बिट्ज़, पिलानी, केके बिरला गोवा परिसर (19–21 दिसम्बर)

127. आइडेण्टीफ़िकेशन एण्ड कैरेक्टराइज़ेशन ऑफ़ HIV-1 Nef इन्टरैक्टिंग कैण्डीडेट प्रोटीन ऑफ *सी एलेगैन्स* एण्ड इट्स ह्यूमन होमोलॉग, राजकमल त्रिपाठी

2016

103वीं इण्डियन साइंस कांग्रेस -विमेन साइंस कांग्रेस, मैसूर (3–7 जरवरी)

1. ट्रेहैलोज़-6-फ़ॉस्फ़ैट-फ़ॉसफटेज़ ऑफ़ ब्रूज़िया मलायः ए प्रॉमिसिंग एण्टी फ़ाइलेरियल वैक्सीन कैण्डीडेट; शैलेजा मिश्रा भट्टाचार्या
2. क्लोनिग, एक्सप्रेशन एण्ड कैरेक्टराइज़ेशन ऑफ़ Rec A फ़्रॉम वॉलबेशिया इण्डौसिमबॉएन्ट ऑफ़ लिम्फ़ैटिक फ़ाइलेरियल पैरासाइट *ब्रूज़िया मलाय*, ममता गंगवार, रूचि झा और शैलेजा मिश्रा भट्टाचार्या
3. इम्यून रिस्पॉन्सेज़ ऑफ़ बैंक्रॉटियन पेशेण्ट्स टु ब्रूज़िया मलाय ट्रेहलोज-6-फ़ॉस्फ़ेट फॉसफ्रटेज़ एण्ड हेवी चेन मायोसिन; रूचि झा, ममता गंगवार, धनवन्तरि चहार, एसबी आनन्द और शैलेजा मिश्रा भट्टाचार्या



नेटवर्क्स एवं लिंकेजेज

1. 12वीं पंचवर्षीय योजना की सीएसआईआर नेटवर्क परियोजनाएं (2012-2017)

	कोड सं.	ऐक्रॉनिम	परियोजना शीर्षक	नोडल ऑफिसर सीएसआईआर-सीडीआरआई
1	बीएससी0201	अस्थि	ऐनाबोलिक स्केलेटल टार्गेट्स इन हेल्थ एण्ड इलनेस (सीएसआईआर-सीडीआरआई, नोडल लैब)	डॉ नैबेद्य चट्टोपाध्याय
2	बीएससी0101	प्रोग्राम	फ़ैक्टर्स गवर्निंग कॉम्पीटेन्ट गेमीट प्रोडक्शन एण्ड रिप्रोडक्टिव डिस्फ़ंक्शन (सीएसआईआर-सीडीआरआई, नोडल लैब)	डॉ राजेन्द्र सिंह
3	बीएससी0102	थन्डर	टुवर्ड्स होलिस्टिक अण्डरस्टैन्डिंग ऑफ़ कॉम्प्लेक्स डिज़ीज़ेज़: अनरैवलिंग द थ्रेडस ऑफ़ कॉम्प्लेक्स डिज़ीज़ेज़ (सीएसआईआर-सीडीआरआई, नोडल लैब)	डॉ मनोज बर्थवाल
4	बीएससी0103	अनडू	न्यू ऐप्रोचेज़ टुवर्ड्स अण्डरस्टैन्डिंग ऑफ़ डिज़ीज़ डायनमिक्स एण्ड टु ऐक्सेलरेट ड्रग डिस्कवरी (सीएसआईआर-सीडीआरआई, नोडल लैब)	डॉ एसके रथ
5	बीएससी0104	स्प्लेन्डिड	इमर्जिंग एण्ड री-इमर्जिंग चैलेन्ज़ेज इन इनफ़ेक्ि ायस डिज़ीज़: सिस्टम बेस्ड ड्रग डिजाइन फ़ॉर इन्फ़ेक्शियस डिज़ीज़ेज़ (सीएसआईआर- सीडीआरआई, नोडल लैब)	डॉ आर रविशंकर
6	बीएससी0106	बायोप्रॉस्पर	बायो प्रॉस्पेक्शन ऑफ़ प्लाण्ट रिसोर्सेज़ एण्ड अदर नैचुरल प्रॉडक्ट्स (सीएसआईआर-एनबीआरआई, नोडल लैब)	डॉ दीपक दत्ता
7	बीएससी0108	मेडकेम	मेडिसिनल केमिस्ट्री फ़ॉर स्टेम सेल बायोलॉजी एण्ड रिजेनरेटिव मेडिसिन्स (सीएसआईआर-आईआईआईएम, नोडल लैब)	डॉ अतुल कुमार
8	बीएससी0111	इनडेथ	इन्टीग्रेटेड नेक्स्टजेन ऐप्रोचेज़ इन हेल्थ, डिज़ीज़ एन एनवायरमेन्टल टॉक्सिसिटी (सीएसआईआर-आईआईटीआर, नोडल लैब)	डॉ बीएन सिंह
9	बीएससी0112	नैनोशी	नैनो-मटीरियल्सः ऐप्लिकेशन्स एण्ड इम्पैक्ट ऑन सेफ़्टी हेल्थ एण्ड एनवॉयरमेन्ट (सीएसआईआर-आईआईटीआर, नोडल लैब)	डॉ अमित मिश्रा
10	बीएससी0113	अन्सीन	अण्डरस्टैण्डिंग सुप्रा-मॉलीक्युलर एनसेम्बल्स एण्ड मशीन्स (सीएसआईआर-आईआईसीबी, नोडल लैब)	डॉ आशीष अरोड़ा
11	बीएससी00114	होप	अण्डरस्टैण्डिंग द रोल ऑफ़ होस्ट मॉलीक्यूल्स इन पैरासिटिक इन्फ़ेक्शन्स (सीएसआईआर-आईआईसीबी, नोडल लैब)	डॉ अनुराधा दुबे
12	बीएससी0115	माइन्ड	न्यूरोडिजेनरेटिव डिज़ीज़ : कॉज़ एण्ड करेक्शन्स (सीएसआईआर-आईआईसीबी, नोडल लैब)	डॉ शुभा शुक्ला
13	बीएससी0118	एपिहेड	एपिजेनेटिक इन हेल्थ एण्ड डिज़ीज़ (सीएसआईआर-सीसीएमबी, नोडल लैब)	डॉ आमिर नाज़िर
14	बीएससी0119	हम	अण्डरस्टैण्डिंग द ह्यूमन माइक्रोबायोम (सीएसआईआर-इमटेक, नोडल लैब)	डॉ अरुणव दासगुप्ता
15	बीएससी0120	बायोडिस्कवरी	सेन्टर फ़ॉर बायोथेराप्यूटिक मॉलीक्यूल डिस्कवरी (सीएसआईआर-इमटैक, नोडल लैब)	डॉ जेके घोष
16	बीएससी0121	जेनेसिस	जेनॉमिक्स एण्ड इन्फ़ॉर्मेटिक्स सोल्यूशन्स फ़ॉर इन्टीग्रेटिंग बायोलॉजी (सीएसआईआर-इमटेक नोडल लैब)	डॉ एमआई सिद्दीकी

	कोड सं.	ऐक्रॉनिम	परियोजना शीर्षक	नोडल ऑफिसर सीएसआईआर-सीडीआरआई
17	बीएससी0123	जीनकोड	जीनोम डायनमिक्स इन सेल्युलर ऑर्गनाइज़ेशन, डिफ़रेन्सिएशन एण्ड इनैन्शियोस्टैट्टिस (सीएसआईआर-आईजीआईबी, नोडल लैब)	डॉ डब्ल्यू हक
18	सीएससी0302	एड	एडवांस ड्रग डिलीवरी सिस्टम (सीएसआईआर-आईआईसीटी नोडल लैब)	डॉ मनीष कुमार चौरसिया
19	इएससी0103	बायोसेरैम	डिवेल्पमेन्ट ऑफ़ नॉवेल सीएसआईआर टेक्नोलॉजी फ़ॉर मैन्युफ़ैक्चरिंग टेलर्ड एण्ड पेशेण्ट स्पेसिफ़िक बायो-सेरेमिक इम्प्लाण्ट्स बायोमेडिकल डिवाइसेज़ ऐट एफ़ोर्डेबल कॉस्ट (सीएसआईआर-सीजीसीआरआई, नोडल लैब)	डॉ पीआर मिश्रा
20	आइएससी0102	नोगेट	सीएसआई नॉलेज़ गेटवे ओपन सोर्स प्राइवेट क्लाउड इन्फ़्रास्ट्रक्चर, निस्केयर, नोडल लैब	श्री सुमन मलिक
21	पीएससी0111	मिस्टीक	मेज़रमेन्ट फ़ॉर इनोवेशन इन साइंस एण्ड टेक्नोलॉजी फ़ॉर इम्प्रूवमेन्ट ऑफ़ क्वालिटी एण्ड इकोनॉमी ऑफ़ लाइफ़ (सीएसआईआर-एनपीएल, नोडल लैब)	डॉ एके द्विवेदी

2. अनुदान परियोजनाएँ

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
जैव प्रौद्योगिकी प्रभाग			
स्ट्डी ऑफ़ ब्रेन इन्स्युलिन/इन्स्युलिन रिसेप्टर इन ग्लायल सेल ड्युरिंग न्यूरोइनफ़्लमेशन (नैशनल इनीशिएटिव ऑन ग्लायल सेल रिसर्च इन हेल्थ एण्ड डिज़ीज़)	डॉ राकेश शुक्ला	25.04.2012	24.04.2015
टु स्ट्डी द एक्टिवेशन ऑफ़ ग्लायल सेल इन क्रोनिक हाइपरटेंशन (नैशनल इनीशिएटिव ऑन ग्लायल सेल रिसर्च इन हेल्थ एण्ड डिज़ीज़)	डॉ काशिफ़ हनीफ़	25.04.2012	24.04.2015
सोल्यूशन स्ट्रक्चर एण्ड डायनमिक्स ऑफ़ Unc-60 एडीएफ/कॉफ़िलिन प्रोटीन्स ऑफ़ *सीनॉरैब्डाइटिस एलेगैन्स*	डॉ आशीष अरोड़ा	24.08.2012	23.08.2016
ड्रग अगेन्स्ट सेन्ट्रल बॉडी फ़ैटनेस एण्ड इन्स्युलिन रेज़िस्टेन्स (हाईजलपेरी/पोस्ट मेनोपॉलत प्रिवैलेन्स) RGYI	डॉ जेआर गाइन	12.09.2012	11.09.2016
बायोटेक्नोलॉजीकल इन्टरवेन्शन फॉर फार्मास्यूटिकली वेल्युएबल कंपाउन्ड्स फ्रॉम फॉरेस्ट रेजिन्स	डॉ राकेश शुक्ला	01.05.2013	30.04.2016
मॉलीक्युलर कैरेटराइज़ेशन एण्ड ऐपिडेमिऑलोज़िकल मॉडलिंग ऑफ़ एण्टी माइक्रोबियल रेस्टिन्स एट द इण्टर फेस ऑफ़ एनिमल ह्यूमन प्लाण्ट पैथॉजन कन्टीन्युअम	डॉ रबी शंकर भट्टा	15.04.2013	14.04.2016
रोल ऑफ़ miRNAs रिस्पॉन्सिबल फॉर बोन मास रिवर्सल एट द टाइम ऑफ़ वीनिंग	डॉ रितु त्रिवेदी	20.05.2013	19.05.2016
कैरेक्टराइज़ेशन ऑफ़ द रोल ऑफ़ ह्यूमन डीएनए लाइगेज। इन लैगिंग स्ट्रैन्ड डीएनए सिन्थिसिज़ एण्ड डीएनए रिप्लिकेशन (RGYI)	डॉ दिब्येन्दु बेनर्जी	10.06.2013	09.06.2016
एन एप्रोच टुवार्ड्स आइडेण्टिफिकेशन एण्ड सिंथेसिस ऑफ एण्टिजेनिक एपिटोप्स ऑफ पोटेन्शियल *एल. डोनोवनी* टीएच1 स्टीमुलेटरी प्रोटीन्स फॉर द डेवलपमेंट ऑफ सिंथेटिक वेक्सीन अगेंस्ट विसरल लिश्मेनिएसिस	डॉ एए सहस्रबुध्दे	20.06.2013	19.06.2016
इल्यूसिडेटिंग द रोल ऑफ़ पी53 एण्ड डीएनए डैमेज रिस्पॉन्स पॉथवे इन एण्टी कैंन्सर एक्टिविटी ऑफ़ ए नॉवेल कूमारिन चाल्कोन हाइब्रिड	डॉ जयन्त सरकार	20.06.2013	19.12.2013
स्ट्डीज ऑन इफ़ेक्ट ऑफ़ डिफ़रेन्ट हर्बल प्रिपरेशन ऑन वून्ड हीलिंग एण्ड एन्ज़ियोजेनेसिस	डॉ सैयद मुस्तफ़ा	15.07.2013	14.07.2016

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
डिस्कवरिंग एण्टिमलेरियल फ्रॉम मेरीन ऑर्गेनिज्म्स (फेज-III) बल्क रिकलेक्शन ऑफ प्रोमिसिंग मेरीन ऑर्गेनिज्म्स-आइसोलेशन, प्यूरिफिकेशन, केरेक्टराइजेशन एण्ड केमिकल सिंथेसिस ऑफ मेरीन डिराइव्ड एण्टिमलेरियल	डॉ एके सिन्हा	01.04.2012	31.03.2015
जेनेटिक मैनीपुलेशन एण्ड ड्रग टार्गेटिंग एप्रोचेज़ अगेन्स्ट *प्लाज़मोडियम बर्गी* स्पॉरोजोइट प्रोटीन्स S14, सिरीन थ्रिंयोनाइन प्रोटीन, काइनेज़-9 एण्ड लिवर स्टेज, स्पेसिफ़िक ऐसिल-CoA सिन्थेज़	डॉ सतीश मिश्रा	10.10.2013	09.10.2018
इन्वेस्टीगेटिंग द एक्स्ट्रा-रिबोज़ोमल फ़ंक्शन्स ऑफ़ रिबोज़ोमल प्रोटीन्स ड्यूरिंग स्ट्रेस एण्ड इन्फेक्शन	डॉ नीति कुमार	13.11.2013	12.11.2018
असेम्बली ऑफ़ आयरन सल्फ़र [Fe-S] क्लस्टर्स ऑन क्रिटिकल प्रोटीन्स ऑफ़ द प्लाज़मोडियम एपिकोप्लास्ट	डॉ समन हबीब	11.10.2013	10.10.2018
डिस्कवरी एण्ड डिवेलपमेन्ट ऑफ़ नॉवेल बोन एनाबोलिक एजेण्ट्स फॉर एक्सीलेरेटेड फ्रैक्चर हीलिंग	डॉ नैबेद्य चट्टोपाध्याय	21.02.2014	21.02.2016
आइडेण्टीफ़िकशन एण्ड फ़ंक्शनल कैरेक्टराइज़ेशन ऑफ़ नॉवेल माइक्रो RNA कैण्डीडेट्स आल्टर्ड बाई फ़ाईटोएस्ट्रोजेनः रोल इन द पेथोजेनेसिस ऑफ ऑस्टियोपोरोसिस	डॉ दिव्या सिंह	01.08.2014	31.01.2017
स्ट्डीज़ ऑन द इन्टरैक्शन्स बिटवीन माइक्रोबैक्टीरिया एण्ड होस्ट डिफेन्स पेप्टाइड्स	डॉ मुकेश पसुपुलेती	01.10.2014	30.09.2017
miRNA इन द रेगुलेशन ऑफ़ स्क्लेरोस्टिन ए थेराप्यूटिक एप्रोच फ़ॉर ओस्टियोपोरोसिस (वीमेन साइंटिस्ट स्कीम)	डॉ शर्मिष्ठा भट्टाचार्य और डॉ एन चट्टोपाध्याय	26.09.2014	25.09.2014
एक्सप्लोरेशन ऑफ़ इण्टरल्यूकिन 1 रिसेप्टर एसोसिएटेड काइनेज (IRAK) फैमिली ऑफ़ काइनेज़ ड्यूरिंग मैक्रोफेज़ फ़ोम सेल फॉर्मेशन एण्ड इनफ्लमेशन	डॉ मनोज कुमार बर्थवाल	22.10.2014	22.10.2017
मॉलीक्यूलर एण्ड बायोकेमिकल कैरेक्टराइजेशन ऑफ़ चेपरॉनिन क्लास ऑफ़ हीट शॉक प्रोटीन्स ऑफ़ *लीश्मैनिया डोनोवनी,* देयर एक्सप्लोरेशन ऐज़ ड्रग टार्गेट	डॉ नीना गोयल	24.12.2014	23.12.2017
क्वेस्ट फॉर कोरन्यूलिन बेस्ड पॉलिफंक्शनल मोलिक्यूल्स इन नेनोबायोटेक्नोलॉजी एण्ड नेनोमेडिसिनः ट्रांसपोर्टिंग एण्ड ट्रांसलोकेटिंग प्रोपर्टीज ऑफ कोरन्यूलिन डिराइव्ड कैरियर सिस्टम्स	डॉ गौतम पाण्डा	24.03.2015	23.03.2018
प्रोफाइलिंग एण्ड कैरेक्टराइजेशन ऑफ अर्ली फेज डिफरेन्शियल-एमआई-आरएनए(ज) रिस्पान्सिबल फॉर डाउनस्ट्रीम डेवलपमेन्ट ऑफ इन्सुलिन रेजिस्टेन्स इन Hmsc डिराइव्ड-एडिपोसाइट्स	डॉ अनिल एन गायकवाड	24.12.2014	23.12.2017
टिश्यू स्पेसिफिक ट्रांसक्रिप्ट्स एण्ड कार्डिकल ग्लाइकोसाइड प्रोफाइलिंग ऑफ केलोट्रॉपिस प्लाण्ट आफ्टर डिफरेण्ट बायोटिक एण्ड एबायोटिक एलिसिटर	डॉ विनीता त्रिपाठी	20.04.2015	19.04.2018
मेकेनिस्टिक सटडीज ऑन नेफ्थाक्विनोन बेस्ड एण्टिकेन्सर एजेन्ट्स इन ब्रीस्ट कैंसर	डॉ डीपी मिश्रा	29.07.2015	28.07.2018
अन्डरस्टेंडिंग द रोल ऑफ पॉली (एडीपी-राइबोज) पॉलीमरेज ऑन टाइट जंक्शन्स फंक्शनिंग ड्यूरिंग कार्सिनोजेनेसिस-(बायो-केयर फेलो स्कीम)	डॉ ज्योतिका राजावत एवं डॉ डीपी मिश्रा	16.04.2015	25.09.2016
विज्ञान एवं प्रौद्योगिक प्रभाग			
सोफ़िस्टिकेटेड एनालिटिकल इन्स्ट्रूमेन्ट फ़ैसिलिटी (सैफ)	निदेशक	01.04.1975	दीर्घ अवधि
अण्डरस्टैन्डिंग द मेकैनिज़म ऑफ़ एण्टी-कॉर्सिनोजेनिक इफ़ेक्ट ऑफ अल्फ़ा-सोलोनिन	डॉ जयन्त सरकार	01.10.2012	30.09.2015
एक्सप्लोरशन ऑफ़ पोटेन्सी, एफ़ीकेसी एण्ड मोड ऑफ़ एक्शन ऑफ़ *अल्मस वॉलिचियाना* अगेन्स्ट हाइपरटेन्शन	डॉ जेआर गाइन	01.10.2012	30.09.2015
इवैल्युएशन ऑफ़ वीक डाइपोल-डाइपोल इन्टरैक्शन्स इन मॉलीक्युलर सॉलिड्स बाइ मीन्स ऑफ़ एक्सपेरीमेन्टल चार्जेज़ डेन्सिटी स्ट्डीज़ एण्ड कम्प्यूटेशनल मेथड्स	डॉ टीएस ठाकुर	07.11.2012	06.11.2015

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
सेल ऑफ एस्ट्रोजन(स) इन्ड्यूज्ड रीडॉक्स अल्टरेशन्स इन ब्रीस्ट कार्सिनोजेनेसिस	डॉ स्मृति भदौरिया	01.01.2013	31.12.2016
रोल ऑफ़ इन्टेग्रिन 8-Fas एण्ड FAK सिग्नलिंग इन द एन्डोमीट्रियल एपिथेलियल सेल फ़िज़ियोलॉजी ड्यूरिंग यूटराइन टिश्यू रीमॉडलिंग प्रोसेस	डॉ राजेश कुमार झा	27.02.2013	26.02.2016
फ़ंक्शनल कैरेक्टराइज़ेशन ऑफ़ फिजन यीस्ट क्लीवेज एण्ड पॉलीऐडिनाइलेशन फ़ैक्टर सब यूनिट RNA14 एण्ड इट्स इम्प्लिकेशन ऑन सेल साइकिल चेक पाइण्ट पाथवे	डॉ शकील अहमद	15.03.2013	14.03.2016
आइडेन्टीफ़िकेशन एण्ड कैरेक्टराइजेशन ऑफ़ स्मॉल मॉलीक्यूल इनहिबिटर्स ऑफ़ ह्यूमन डीएनए लाइगेज़ेज पोटेन्शियल एण्टी कैंसर एजेण्ट्स	डॉ दिब्येन्दु बेनर्जी	03.06.2013	02.06.2016
मॉलीक्युलर डिसेक्शन ऑफ़ सिग्नल ट्रांसडक्शन ईवेन्ट्स इन्वॉल्व्ड इन होस्ट डिफ़ेन्स अगेन्स्ट एक्सपेरीमेन्टल विसरल लीशमैनियासिस	डॉ सुशांत कार	20.06.2013	19.06.2016
डेसिफरिंग द रोल ऑफ Ccr4-Not कॉम्पलेक्स इन ह्यूमन मलेरिया पेरासाइट *प्लाज्मोडियम फेल्सिपैरम* (इन्सपायर स्कीम)	डॉ मनीष गोयल	10.06.2013	09.06.2018
थेरेप्यूटिक इवेल्यूशन ऑफ फेटल ओस्टियो-प्रोजेनिटर स्टेम सेल इन रैट मॉडल ऑफ ओस्टियोपोरोसिस (SERB DST फास्ट ट्रेक स्कीम)	डॉ दीपशिखा तिवारी	30.07.2013	29.07.2016
डिकंस्ट्रक्टिंग कॉर्टिकोस्ट्राइटल सर्किटः इम्पलिकेशन इन एक्जिक्यूटिव फंक्शन	डॉ प्रेम एन यादव	01.11.2013	31.10.2016
टायरोसीन हायड्रोलेज एज पोटेन्शियल ड्रग टार्गेट इन पर्किन्सन्स डिजीजः स्टडीज विथ जेनेटिक नॉकडाउन मॉडल ऑफ सी	डॉ आमिर नाजिर	01.11.2013	31.10.2016
क्लोनल मल्टीप्लिकेशन ऑफ़ इण्डियन ट्रेडीशनल प्लाण्ट *अल्मस वालिचियाना* प्लैनकॉनः एन इन्डेन्जर्ड ट्री फॉर हीलिंग फ्रैक्चर	डॉ केआर आर्या	17.10.2013	16.10.2015
क्वालिटेटिव एण्ड क्वान्टिटेटिव एनालिसिस ऑफ़ बायोऐक्टिव अल्कलॉइड्स इन *बर्बेरिस* एण्ड *महोनिया* स्पेशीज़ एण्ड यूज़ ऑफ़ पीसीए फ़ॉर मार्कर आइडेन्टीफिकेशन	डॉ बृजेश कुमार	17.10.2013	16.10.2015
प्रोबिंग इलेक्ट्रोफ़िलिक साइक्लाइज़ेशन ऑफ़ एल्किनॉल्स एण्ड ऐल्किलएमीन्स फ़ॉर द सिन्थिसिज़ ऑफ़ वेरिअस हेट्रोसाइक्लिक कम्पाउण्ड्स	डॉ मड्डी श्रीधर रेड्डी	02.12.2013	01.12.2016
आइडेण्टीफ़िकशन ऑफ़ ड्रग टार्गेट्स इन *हेलिकोबैक्टर पाइलोरी* यूज़िंग डुएल-टैग्ड काबोहाइड्रेट्स	डॉ पिन्टू कुमार मण्डल	01.03.2014	28.02.2017
टार्गेट ओरिएन्टेड डिलीवरी ऑफ़ केमोथेराप्यूटिक एजेण्ट इन लीशमैनियासिस वाया मैक्रोफ़ेज स्केवेन्ज़र रिसेप्टर्स	डॉ मनीष के. चौरसिया	01.06.2014	31.05.2017
एक्सप्लोरिंग द पोटेन्शियल ऑफ हेट्रोडायइनोफाइल इन हॉसर-क्राउस एन्युलेशन	डॉ नम्रता रस्तोगी	01.09.2011	31.08.2014
इन्वेस्टिगेशन्स ऑन द इम्यूनोमाडुलेटरी प्रॉपर्टीज़ ऑफ़ साइक्लिक एण्ड लीनिअर होस्ट डिफ़ेप्स पेप्टाइड्स	डॉ मुकेश पसुपुलेती	10.07.2014	09.07.2017
डिवेलपमेन्ट ऑफ़ कैटलिटिक एसिमीट्रिक फ्लोरिनेशन एण्ड फ़्लोरोसाइक्लाइजेशन रिएक्शन्स	डॉ किशोर मोहनन	01.08.2014	31.07.2017
डिवलपमेन्ट ऑफ़ नॉवेल स्ट्रैटजीज़ टुवर्ड्स द सिन्थिसिज़ ऑफ़ एन-हेट्रोसाइक्ल्स यूजिंग आइसोसायनाइड बेस्ड मल्टीकॉम्पोनेन्ट रिऐक्शन्स	डॉ पी.एम.एस. चौहान	15.05.2014	14.05.2017
मॉलीक्युलर एण्ड फ़ंक्शनल कैरेक्टराइज़ेशन ऑफ MAP काइनेज़1 होमोलॉग ऑफ़ *लीशमैनिया डोनोवनी*	डॉ नीना गोयल	01.01.2015	31.12.2017
RNAi मीडिएटेड फंक्शनल एनालिसिस ऑफ बायोमार्कर फॉर एण्डोमीट्रियल रिसेप्टिविटी (यंग साइंटिस्ट स्कीम)	डॉ रोहित कुमार	06.04.2015	05.04.2018
डेवलपमेंट ऑफ शुगर अमीनो एसिड डिराइव्ड पेप्टाइड्स सेल्फ असेम्बलिंग सिलेक्टिवली ऑन बेक्टीरियल मेम्ब्रेन्स, फार्मिंग आयन पोर्स एण्ड किलिंग बेक्टीरिया इन्क्लुडिंग एमटीबी	डॉ आरएस अम्पापथी एवं डॉ विनीता चतुर्वेदी	20.05.2015	19.05.2018

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
स्केलेटल इफेक्ट ऑफ स्टीमुलेशन ऑफ रिसेप्टर एक्टिवेटर ऑफ NF-Kb लिगेंड (RANKL) फ्रॉम ओस्टियोब्लस्ट बाय थियोफिलिन एण्ड द मेकेनिज्म ऑफ द ड्रग	डॉ नैबेद्य चट्टोपाध्याय	03.06.2015	02.06.2018
E3 युबिक्यूटिन लाइगेजेज इन ब्रीस्ट कैंसरः आइडेंटिफिकेशन ऑफ नॉवेल इन्टरेक्टिंग प्रोटीन्स ऑफ E3 युबिक्यूटिन लाइगेज E6AP फ्रॉम ब्रीस्ट कैंसर सेल्स	डॉ अरूण कुमार त्रिवेदी	03.06.2015	02.06.2018
डिजाइन एण्ड डेवलपमेंट ऑफ प्लांट्स सेकेन्डरी मेटाबोलाइट LC-MS/MS लाइब्रेरी टू एक्स्प्लोर द केमेस्ट्री ऑफ मेडिकसनल प्लांटस	डॉ संजीव कनौजिया	01.10.2015	30.09.2018
ओरिजनल बायोकॉम्पेटिबल फास्फोरस डेन्ड्रीमर्स एज ए न्यू स्ट्रेटजी टू टेकल पल्मोनरी ट्यूबरक्लोसिस	डॉ केके श्रीवास्तव	16.11.2015	15.11.2018
इन वीवो स्टडीज ऑफ जीआईटी एन्जाइम रेजिस्टेन्स इन्सुलिन कंपाउण्ड	डॉ जेआर गाईन	04.01.2016	04.01.2018
इण्डियन कांउसिल ऑफ़ मेडिकल रिसर्च			
डिज़ाइन सिंथिसिज़ एण्ड बायोलॉजिकल इवैल्युएशन ऑफ़ नॉवेल एजेण्ट्स फ़ॉर मैनेजमेण्ट्स डिज़ाइन प्रॉस्टैटिक हाइपरप्लेज़िया	डॉ वीएल शर्मा	01.12.2012	30.11.2015
इवैल्युएशन ऑफ़ प्लाइ-एडीपी-रिबोज़ पॉजीमरेज़-2(PARP-2) एण्ड कैसपेस-8 सिग्नलिंग मैकेनिज़म रोल ड्यूरिंग यूटरिन टिश्यू रिमॉडलिंग	डॉ राजेश कुमार झा	01.12.2012	30.11.2015
इवैल्यूएशन ऑफ़ रेस्क्यू ट्रीटमेन्ट फ़ॉर सेरेब्रल मलेरिया *इन विट्रो/इन वीवो* मॉडल	डॉ रेणु त्रिपाठी	21.11.2013	20.11.2016
डिज़ाइन सिन्थिसिज़, इवैल्युएशन एण्ड आइडेण्टीफ़िकेशन ऑफ़ नॉवेल ड्यूअली इफ़ेक्टिव स्पर्मिसाइडल एजेण्ट्स विद एण्टी ट्राइकोमोनल एक्टिविटी फ़ॉर प्रोफ़ाइलैक्टिक कॉन्ट्रासेप्शन	डॉ गोपाल गुप्ता	01.04.2014	31.03.2017
वैलिडेशन ऑफ़ डब्ल्यूएनटी पॉथवे माडुलेशन एण्ड एफ़िकेसी स्टडी इन प्राइमरी ओस्टियोपोरोसिस, फ्रैक्चर हीलिंग एण्ड सेकेण्डरी ओस्टियोपोरोसिस मॉडल्स फ़ॉर रिपोजिशनिंग ऑफ़ क्लोफ़ैज़िमिन	डॉ एन चट्टोपाध्याय	10.04.2014	31.03.2017
स्ट्डीज़ ऑन द इफ़ेक्ट्स ऑफ़ ओबिसोजन्स इन मेल जर्म सेल्स एन एक्सप्लोरेटरी स्ट्डी	डॉ डीपी मिश्रा	01.04.2014	31.03.2017
प्री-क्लीनिकल डिवेलपमेन्ट ऑफ़ केम्फ़ेरॉल विद इनहान्स्ड ड्रग डिलीवरी फ़ॉर सुपीरियर ओस्टियोजोनिक ऐक्टिविटी	डॉ रितु त्रिवेदी	01.04.2014	31.03.2017
लीड आइडेण्टीफ़िकेशन ऑफ़ नॉन स्टेरॉयडल मॉलीक्यूल विद ऐण्टी-प्रॉलीफ़रेटिव ऐक्टिविटी फ़ॉर मैनेजमेन्ट ऑफ़ इन्डोमीट्रियल हाइपरप्लेज़िया	डॉ अनिला द्विवेदी	01.04.2014	31.03.2017
प्री-क्लीनिकल डिवेलपमेन्ट ऑफ़ ओरली ऐक्टिव, रैपिड फ्रैक्चर हीलिंग एजेण्ट	डॉ दिव्या सिंह	15.06.2014	14.06.2017
स्टडीइंग मेकैनिज़म ऑफ़ प्रो-फ़र्टिलिटी एक्टिविटी ऑफ़ म्युकुमा प्युरिन्स, *विथेनिया सोमनीफ़ेरा* एण्ड *ऐस्पेरेगस रेसिमोसस* इन स्पर्मेटॉजेनिकली कॉम्प्रोमाइज़्ड रैट मॉडल एण्ड आइडेण्टीफ़िकेशन ऑफ़ एक्टिव फ़ाइटो-कॉन्स्टीट्युएन्ट्स	डॉ राजेन्दर सिंह	15.06.2014	14.06.2017

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
इण्डियन नैशनल साइंस एकैडमी			
होलिस्टिक एपिजिनोम एनालिसिज़ टु आइडेण्टीफ़ाइ डिफ़रेन्शियली मिथाइलेटेड रीजन्स (DMRs) दैट अफ़ेक्ट मेल फ़र्टिलिटी	डॉ राजेन्दर सिंह	01.04.2014	31.03.2017
एटिन्युएशन ऑफ़ जीसीएसएफआर सिग्नलिंग बाइ यूबिक्विटिनेशनः इम्प्लिकेशन्स ऑफ़ E3 यूबिक्विटिन लाइगेसेज इन जीसीएसएफ़आर सिग्नलिंग मीडिएटेड माइलॉइड ल्यूकीमिया पैथॉजेनेसिस	डॉ अरुण कुमार त्रिवेदी	01.07.2014	30.06.2017
अण्डरस्टैडिंग द रोल ऑफ़ हीट शॉक प्रोटीन्स (HSP3) इन *प्लाज़मोडियम फैल्सीपैरम* सर्वाइवल इन स्ट्रैस कण्डीशन्स	डॉ नीति कुमार	01.01.2015	31.12.2017
पृथ्वी विज्ञान मंत्रालय			
डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ नॉवेल डोलैस्टैटिन्स, एज़्यूमैमाइड्स एण्ड माइक्रोस्पोरिन ए एनालॉग्स : ए क्वेस्ट फ़ॉर एण्टी कैन्सर ड्रग्स	डॉ दीपांकर कोली	01.11.2012	31.03.2015
बायोलॉजिकल इवैल्युशन, डिस्कवरी, ऑफ़ नॉवेल बायोऐक्टिव कम्पाउण्ड्स एण्ड कोआर्डिनेशन ऑफ़ द MoES प्रोजेक्ट ड्रग फ्रॉम सी	डॉ मधु दीक्षित	01.11.2012	31.03.2017
डिवेलपमेन्ट ऑफ़ एण्टीमाइक्रोबियल, एण्टीइन्फ्लमेटरी एण्ड एण्टीकैंसर एजेण्ट्स फ्रॉम द मैरिन ऑर्गैनिज़्म्स एण्ड माइक्रो ऑर्गैनिज़्म्स	डॉ टी नरेन्दर	01.08.2013	31.07.2016
सर्च फ़ॉर नॉवेल एण्टीमाइक्रोबियल एण्ड एण्टीकैन्सर मेटाबोलाइट्स फ्रॉम मैरिन बैक्टीरिया	डॉ प्रेम प्रकाश यादव	01.08.2013	31.12.2016
सिंथेसिस एण्ड बायोइवेल्युएशन ऑफ केमिकल लाईबेरी बी-कार्बोलेन बेस्ड मिमिक्स ऑफ मेरीन नेचुरल प्रोडक्ट्स	डॉ संजय बत्रा	20.04.2015	19.04.2018
सिंथेसिस ऑफ फासकेप्लाइसिन एनालॉग्स एज पॉसिबल एन्टी कैंसर एजेन्टस	डॉ एम एस रेड्डी	20.04.2015	19.04.2018
कलेक्शन एण्ड फ्रेक्शनेशन ऑफ द आईडेन्टिफाइड लीड्स सच एस NIO-905-8002(F003,4) एण्ड NIO-968 (CNS) NIO-970	निदेशक	20.08.2015	19.08.2017
थर्ड पार्टी वेरिफिकेशन एण्ड आउटसोर्सिंग ऑफ सम आफ द एक्टीविटीज़ रिलेटड टू डेवलपर्मेन्ट ऑफ ड्रग्स फ्राम ओशिएन	निदेशक	08.12.2015	07.12.2017
आयुष			
एक्सप्लोरेशन, आइडेण्टीफ़िकेशन एण्ड आइसोलेशन ऑफ़ बोन फ्रैक्चर हीलिंग एजेण्ट्स फ्रॉम इण्डियन ट्रेडीशनल प्लाण्ट्स *फोलिडोटा आर्टीकुलेट* एण्ड *सोलोज़िन क्रिस्टेटा* (ऑर्किडेसी)	डॉ केआर आर्या	31.1.22014	31.12.2017
डिपार्टमेन्ट ऑफ एटॉमिक एनर्जी			
डिजाइन एण्ड सिंथेसिस ऑफ डोनर-एक्सेप्टर बेस्ड न्यू आर्गेनिक फ्लोरेसेंट डाइज एण्ड देयर एप्लीकेशन्स	डॉ अतुल गोयल	06.01.2016	05.01.2021
डिफेन्स रिसर्च एण्ड डेवलपमेन्ट आर्गेनाइजेशन			
फार्मेकोकायनेटिक स्टडीज़ ऑफ रेडियोप्रोटेक्टिव फार्मुलेशन्स प्रिपेयर्ड फ्राम एक्टिव प्रिंसिपल आइसोलेट्स फ्राम *पोडोफाइलम हैक्जेन्ड्रम*	डॉ आरएस भट्टा	07.05.2015	06.05.2016
प्रतिष्ठित वैज्ञानिक			
इन्टीग्रेटेड 3डी मॉलीक्युलर मॉडलिंग, डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ नॉवेल केमिकल एन्टिटीज़ (NCEs) एज़ पोटेन्शियल एजेण्ट्स फ़ॉर द ट्रीटमेन्ट ऑफ़ अल्ज़ाइमर डिज़ीज़	डॉ एके सक्सेना	01.05.2014	30.04.2017

3. प्रायोजित परियोजनाएं

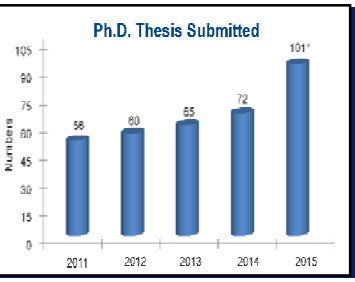
कोड नं.	परियोजना शीर्षक	फण्डिंग एजेन्सी	प्रधान अन्वेषक	अवधि
एसएसपी0210	जीनोटॉक्सिसिटी एण्ड मॉलीक्युलर मेकैनिज़्म ऑफ़ RISUGadv	आईआईटी, खड़गपुर	डॉ आरके सिंह	2014-2016
एसएसपी0211	*इन विट्रो* टेस्टिंग ऑफ़ GSKCH फ़ार्मुलेशन फ़ॉर ओस्टियोजेनिक इफ़ेक्ट	GSKCH गुड़गांव	डॉ एन चट्टोपाध्याय	2014-15 (12 महीने)
एसएसपी0213	सिंथेटिक माइक्रोबिसाइडल वैजायनल स्पर्मिसाइडसः डिजाइन सिंथेसिस एण्ड बायलोजिकल इवेल्युऐशन	एचएलएल त्रिवेन्द्रम	डॉ गोपाल गुप्ता	2015-18
एसएसपी0214	*इन वीवो* स्टडीज ऑफ 7 लीड्स एण्ड इन विट्रो 10 लीड्स ऑफ नेशनल इन्वोवेशन फाउण्डेशन इंडिया फॉर एंटिमलेरियल इवेल्युऐशन	एनआईएफ अहमदाबाद	डॉ रेणु त्रिपाठी	2015-16
एसएसपी0125	वेलिडेशन ऑफ 2 हर्बल लीड्स फ्रॉम एनआईएफ फॉर थ्री डोजेस ईच इन एसएचआर यूजिंग टेलिमेट्रिक सिस्टम	एमआईएफ अहमदाबाद	डॉ राकेश शुक्ला	2015-16 (4 महीने)

4. सीएसआईआर युवा वैज्ञानिक परियोजनाए

कोड नं.	परियोजना शीर्षक	प्रधान अन्वेषक	अवधि
वायएसए0001	आइडेण्टीफ़िकेशन ऑफ़ काइनेज़ एण्ड फ़ॉस्फ़ेट स्पेसिफ़िक टु CTD सिरीन 7 ऑफ़ RNA पॉलीमरेज़ III	डॉ सोहेल अख्तर	2011-16
वायएसए0002	इल्यूसिडेशन ऑफ़ फ़ंक्शनल इनऐक्टिवेशन ऑफ़ cdx2 एक्सप्रेशन इन कोलोन कैंसर सेल्सः पॉसिबल रोल ऑफ़ E3 यूबीक्विटिन लाइगेजेज इन रेगुलेटिंग स्टीडि स्टेट लेविल्स ऑफ़ cdx2 प्रोटीन एक्सप्रेशन वाया यूबिक्विटीनेशन	डॉ एके त्रिवेदी	2014-19

5. सीएसआईआर एक्ट्राम्युरल रिसर्च प्रोजेक्ट

कोड सं.	परियोजना शीर्षक	प्रधान अन्वेषक	अवधि
ईएमआर 0001	अंडरस्टेण्डिंग द रोज ऑफ बोन इन मेटाबोलिक डिजीजि एण्ड इवेल्युऐशन ऑफ थेरेप्यूटिक पोटेंशियल ऑफ ऑस्टियोबोलिक कम्पाउण्डस (सीएसआईआर नेहरू साइंस पोस्ट-डॉक्टोरल फैलोशिप)	डॉ सपना	2014-16



मानव संसाधन विकास

1. प्रस्तुत शोध प्रबन्ध (पीएचडी)

क्र.सं.	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक	सुपरवाइजर
		जवाहरलाल नेहरू विश्वविद्यालय, नई दिल्ली	
1.	शशि गांधी	मॉलिक्यूलर क्लोनिंग, ओवरएक्सप्रेशन, प्यूरिफिकेशन एण्ड कैरेक्टराइजेशन ऑफ साइटोसोलिक सीरिन हाइड्रॉक्सीमिथाइल ट्रोसफरेज ऑफ *लिश्मानिया डोनोवनी*	डॉ जेके सक्सेना
2.	अंकिता सिंह	एल्यूसिडेशन ऑफ नोवेल प्रोटीन काईनेस सिग्नलिंग इन्वॉल्वड इन मोनोसाईट इनफ्लामेटरी रेस्पांस एण्ड साईटोकाईन प्रोडक्शन	डॉ मनोज कुमार बर्थवाल
3.	कर्री भास्कर रॉव	डिजाईन एण्ड सिंथेसिस ऑफ नोवेल हेटरोसाइक्लिक कम्पाउण्ड्स ऐज पोटेन्शियल फार्मास्यूटिकल एजेंट्स	डॉ केवी शशीधरा
4.	नेहा गौर	मॉलिक्यूलर स्टडीज ऑफ रिकॉम्बिनैन्ट आरगिनेस ऑफ *लिश्मानिया डोनोवनी*	डॉ जेके सक्सेना
5.	वैभव कुमार शुक्ला	स्ट्रक्चरल एण्ड बायोफिजिकल कैरैक्टराईजेशन ऑफ एडीएफ/कोफिलिन्स	डॉ आशीष अरोड़ा
6.	कुलदीप सिंह	फंक्शनल कैरैक्टराईजेशन ऑफ ऐक्टिन–लाईक प्रोटीन्स इन लिश्मानिया	डॉ एए सहस्त्रबुद्धे
7.	सुनीता यादव	मॉलिक्यूलर एण्ड बॉयोकेमिकल कैरेक्टराईजेशन ऑफ कीमोथेराप्यूटिक प्रोटीन ऑफ फाईलेरियल पैरासाईट	डॉ जेके सक्सेना
8.	हरीश शुक्ला	बॉयोफिसिकल एग्रीगेशनल स्टडीज ऑन रिकॉम्बिनेन्ट आईसोसिट्रेट एण्ड हायाल्यूरोनेटलाईसेस	डॉ मोहम्मद सोहेल अख्तर
9.	मनीषा	क्लोनिंग एण्ड कैरेक्टराईजेशन ऑफ सर्फेस प्रोटीन ऑफ एन्डोसिम्बायोटिक बैक्टीरिया *वोल्बाचिया* (डब्लूएसपी) ऑफ फाईलेरियल पैरासाईट *ब्रुजिआ मलाई*	डॉ शैलजा भट्टाचार्या
10.	यशवंत सिंह	ड्रग–ड्रग इंटरैक्शन स्टडीज ऑफ नोवेल ट्राईऑक्सेन एन्टीमलेरियल मॉलीक्यूल विद एण्टी–ट्यूबरकुलर ड्रग	डॉ एसके सिंह
11.	स्मिता गुप्ता	क्लोनिंग एण्ड कैरेक्टराईजेशन ऑफ ग्वानिलेट काईनेज, ए न्यूक्लियोसाईट मोनोफास्फेट काईनेज ऑफ फाईलेरियल पैरासाईट	डॉ जेके सक्सेना
12.	आशुतोष रघुवंशी	डाईवर्सिटी ओरिएंटेड सिन्थेसिस ऑफ एरीन्स एण्ड हैट्रोऐरिनेस एण्ड देयर एप्लीकेशंस	डॉ अतुल गोयल
13.	कुमारी रश्मि	इन्वेस्टिगेटिंग इन टू द रोल ऑफ एक्टिव सीडीआरआई ऑस्टियोजेनिक कम्पाउंड इन मेटाबोलिक डिसीसेस एण्ड एल्यूसिडेशन ऑफ इट्स मकैनिज्म ऑफ एक्शन	डॉ सब्यसाची सान्याल
14.	वसंता राव डोला	डिजाईन एण्ड सिन्थेसिस ऑफ 4–अमीनोक्विनोलिन डेरिवेटिव्स ऐस नोवेल एंटी–मलेरियल एजेंट्स	डॉ एसबी कट्टी
15.	गुनागंटी नरेश	सिन्थेसिस एण्ड केमिकल ट्रांसफार्मेशन ऑफ नैचुरल प्रोडक्ट इंस्पायर्ड सिंथन्स ऑफ बायोलॉजिकल इम्पॉर्टेन्स	डॉ टी नरेन्द्र
16.	रंगा प्रसाद डोडा	डिजाईन एण्ड सिंथेसिस ऑफ नोवेल इमिडेजोल डेरिवेटिव्स ऐज पोटेन्शियल एंटी–कैंसर एजेंट्स	डॉ केवी शशीधरा
17.	एम प्रताप रेड्डी	डेवलपमेंट ऑफ पोटेन्शियली बायोएक्टिव डिलीवरी वेक्टर्स पोसेसिंग इंट्रिंसिक थिराप्यूटिक एक्टिविटी ऐज एसआई–आरएनए कैरीस	डॉ मनीष चौरसिया
18.	कीर्तिका प्रकाश	स्टडीज विद एंटीऑक्सीडैंट सिस्टम एंजाईम्स टू एक्सप्लोर द मॉलीक्यूलर मैकेनिज्म ऑफ आर्टईथर रसिस्टेंस इन *प्लासमोडियम विंकेई*	डॉ एसके पुरी
19.	इंदरप्रीत अरोड़ा	काइरॉन एप्रोच सिंथेसिस ऑफ स्टीरियो–केमिकली प्योर नाईट्रोजन कंटेनिंग साईक्लिक एण्ड एसाईक्लिक कम्पाउण्ड्स	डॉ अरूण के शॉ
20.	मुन्ना प्रसाद गुप्त	सिंथेटिक स्टडीज टुवर्डस हेट्रोसाइक्लिक स्कैफोल्ड्सः डेवलपमेंट ऑफ न्यू कीमोथिराप्यूटिक एजेंट्स	डॉ आरपी त्रिपाठी

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21.	निशा यादव	स्टडीज एण्ड सिंथेसिस ऑफ नोवेल बॉयोएक्टिव ऑक्साजिपाईन डेरिवेटिव्स एज पोटेन्शियल डीएनए लाईगेज इनहिबिटर्स	डॉ कंचन हजेला
22.	स्मृति पांडे	प्रोटियोम एनालिसिस ऑफ इंड्यूस्ड ड्रग रसिस्टेंट स्ट्रेन ऑफ *कैन्डीडा एल्बीकांस* एण्ड आईडेन्टिफिकेशन ऑफ पोटेन्शियल टार्गेट्स	डॉ पीके शुक्ला
23.	ज्योति	टू स्टडी एन इनवर्स रिलेशनशिप अन्डरलाईंग द इफेक्ट ऑफ आईसोफ्लेवॉन्स ऑन एडीपोजेनेसिस एण्ड ऑस्टियोजेसिस	डॉ रितु त्रिवेदी
24.	राजेश कुमार अरिगेला	सिन्थेसिस ऑफ 1,2,3 ट्राईआजोल एन्यूलेटेड पॉलीहेटरोसाईक्लिक कम्पाउण्ड ऑफ बायोलाजिकल इंटरेस्ट	डॉ बिजॉय कुण्डु
25.	हरि श्याम	मॉलिक्यूलर बेसिस ऑफ एक्शन ऑफ ए नोवेल एसईआरएम, ऑरमेल–ऑक्सीफेन इन ह्यूमन एण्डोमेट्रियल कैंसर सेल्स	डॉ अनिल के बालापुरे
26.	अमित कुमार	डिजाईन ऑफ नोवेल पेप्टाईड्स ऑर नोवेल एनालॉग्स ऑफ नेचुरली ऑक्रिंग एंटी–माईक्रोबियल पेप्टाईड्स एण्ड इवैलुएशन ऑफ देयर बायोलाजिकल एक्टिविटी	डॉ जिमुत कांति घोष
27.	आनंद कुमार पांडे	सिंथेसिस ऑफ नोवेल फ्यूस्ड हाईब्रिड ऑफ नाईट्रोजन हेट्रोसाईक्लिक एण्ड देयर बायो–इवेलुएशन ऐस एंटी–इंफेक्टिव एजेंट्स	डॉ पीएमएस चौहान
28.	ज्योति	ए माईक्रो–आरएनए सिग्नेचर फॉर मेडिकार्पिन–इंड्यूस्ड ऑस्टियोब्लास्ट डिफ्रेन्सिएशन	डॉ दिव्या सिंह
29.	अतुल कुमार अग्रवाल	इन्वेस्टिगेशन ऑफ प्यूटेटिव बाइंडिंग ऑफ *माईकोबैक्टीरिअम ट्यूबरकुलेसिस* प्रोटीन्स विद होस्ट डीएनए	डॉ अमित मिश्रा
30.	पूजा अग्रवाल	स्टडीज ऑन इंटरैक्शन्स ऑफ पैथोजेनिक माईकोबैक्टीरिया एडिपोसाईट्स ड्यूरिंग पर्सिस्टेंस इन द होस्ट	डॉ वाईके मंजू
31.	विशाल सिंह	मैनेजमेंट ऑफ प्रोस्टेट कैंसर बाई सेलेक्टिव इस्ट्रोजेन रिसेप्टर मॉड्यूलेटर्स रोल ऑफ प्रोटियासम	डॉ गोपाल गुप्ता
32.	राहुल शुक्ला	डेवलपमेंट एण्ड इवैलुएशन ऑफ नोवेल ड्रग डिलीवरी सिस्टम फॉर कीमोथिराप्यूटिक एजेंट्स	डॉ प्रभात रंजन मिश्रा
33.	अभिषेक कुमार सिंह	नाईट्रिक ऑक्साईड सिन्थेस एक्टिविटी, एक्सप्रेशन एण्ड इट्स रेगुलेशन इन न्यूट्रोफिल मैच्यूरेशन	डॉ मधु दीक्षित
34.	मक्थाला रवि	सिंथेसिस ऑफ पोटेन्शियल एंटी–मलेरियल एजेंट्स	डॉ पीपी यादव
35.	पिंटू दास	काईरॉन एप्रोच टू द सिंथेसिस ऑफ बायोलाजिकली इम्पार्टेन्ट कम्पाउण्ड्स	डॉ अरूण कुमार शॉ
36.	यशोदा कृष्णा सुंकारी	स्टडीज डायरेक्टेड टुवर्डस द डेवलपमेंट ऑफ एमाईड–लिंक्ड आरएनए एण्ड शुगर अमीनो एसिड बेस्ड ग्लाईकोपेप्टाईड मिमिक्स	डॉ दीपांकर कोले
37.	संकलन मण्डल	डिजाईन, सिंथेसिस, मॉलीक्यूलर मॉडलिंग स्टडीज एण्ड बायोइवैलुएशन ऑफ ट्राई–सब्सटीट्यूटेड मीथेन्स एण्ड अमीनो एसिड्स डिराईव्ड हेटरोसाईकिल्स	डॉ गौतम पाण्डा
38.	काईनात खान	आईडेन्टिफिकेशन ऑफ बोन मॉड्यूलेटरी फाईटो केमिकल्स एण्ड एल्यूसिडेशन ऑफ देयर मोड्स ऑफ ऐक्शन	डॉ नैवेद्य चटोपाध्याय
39.	एस श्रीनिवास	डिजाईन ऑफ वन–पॉट स्ट्रैटेजीस फार द सिंथेसिस ऑफ इंडोल बेस्ड पॉलीहेटरोसाईकिल्स ऑफ बायोलाजिकल इंटरेस्ट	डॉ बिजॉय कुण्डु
40.	श्रीनिवास रॉव कोण्डापार्ला	सिंथेटिक स्टडीज ऑफ 4–अमीनोक्विनोलिन एनालॉगस ऐस पोटेन्शियल एंटी–मलेरियल एजेंट्स	डॉ एसबी कट्टी
41.	अपर्णा अग्रवाल	स्ट्रकचरल एण्ड फंक्शनल कैरेक्टराईजेशन ऑफ जीएनटीआर ट्रांस्क्रिप्शन रेगुलेटरी प्रोटीन्स फ्राम *माईकोबैक्टीरिअम ट्यूबरकुलेसिस* एण्ड बीएमटीपीपी	डॉ आर रविशंकर
42.	पदम कुमार	फाईटोकेमिकल इन्वेस्टिगेशन ऑफ इण्डियन मेडिसिनल प्लांट्स एण्ड केमिकल ट्रांसफार्मेशन ऑफ बायोएक्टिव मॉलीक्यूल्स	डॉ राकेश मौर्या

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43.	अशोक कुमार मौर्या	डिजाईन एण्ड सिंथेसिस ऑफ फ्लेक्सिबल पॉलीमिथाईलीन लिंकर कम्पाउण्ड्स बेस्ट ऑन नाईट्रोजीनस हेट्रोसाईकिल्स फार स्ट्रक्चरल एण्ड बायोलॉजिकल स्टडीज	डॉ अरूण कुमार शॉ
44.	यार्कली कृष्णा	डिजाईन, सिंथेसिस एण्ड बायोलॉजिकल इवैलुएशन ऑफ पेप्टाईड्स एण्ड पेप्टीडॉमिमेटिक्स एण्ड टोटल सिंथेसिस ऑफ बायोएक्टिव एल्कालॉयड्स	डॉ दीपांकर कोले
45.	सोमी रेड्डी कुंडरू	काईरॉन एप्रोच टू द सिंथेसिस ऑफ बायोलाजिकली एक्टिव मॉलीक्यूल्स फ्राम कामर्शियली अवेलेबल मोनोसैकेराईड्स	डॉ अरूण कुमार शॉ
46.	मो परवेज खान	डिटरमिनेशन ऑफ इफिकेसी एण्ड मोड ऑफ एक्शन ऑस्टियोजेनिक एजेंट्स फ्राम इण्डियन मेडिसिनल प्लांट्स	डॉ नैवेद्य चट्टोपाध्याय
47.	खेमराज सिंह बघेल	रोल ऑफ मैक्रोफेजेस इन ब्रेस्ट कैंसर मेटोस्टैटिसः डेलिनिएटिंग द इन्वॉल्वमेंट ऑफ साईटोकाईन सिग्नलिंग नेटवर्कस	डॉ स्मृति भदौरिया
48.	ईशा कपूर	प्रोटियोमिक–बेस्ड आईडेन्टिफिकेशन ऑफ ई3 यूबिक्विटिन लाईगेस इंटरैक्टिंग प्रोटीन्स इन माईलॉयड ल्यूकीमिया	डॉ अरूण कुमार त्रिवेदी
49.	शशीकांत कुमार	स्टडी ऑफ द इंफ्ल्यूंस ऑफ फैगोसम मैचुरेशन प्रोसेस ऑन द आऊटकम ऑफ लेटेन्ट ट्यूबरकुलेसिस इंफेक्शन	डॉ सुधीर कुमार सिन्हा
50.	नवनीत कुमार यादव	इवैलुएशन ऑफ एंटी–कैंसर एक्टीविटी एण्ड टॉक्सिक इफेक्ट्स ऑफ सर्टेन मेडिसिनल प्लांट्स	डॉ आरके सिंह
51.	विजय कुमार	रोल ऑफ इंटेग्रिन β8–एण्ड फोकल एडहेसन काईनेस (एफएके) सिग्नलिंग इन द यूटेराईन टिश्यू रिमॉड्यूलिंग प्रोसेस	डॉ राजेश कुमार झा
52.	गरिमा पाण्डेय	सिंथेसिस ऑफ पासिबल एंटी–मलेरियल एजेंट्स एण्ड नोवेल एजेडए पॉलीसाईकिल्स	डॉ संजय बत्रा
53.	हमीदुल्लाह	इन्वेस्टिगेशन इन टू द रोल ऑफ आईएल–10 इन ब्रेस्ट कैंसर प्रोगरेशन	डॉ रितुराज कोनवार
54.	सुनीति वैश्य	एनालिसिस ऑफ पॉलीपेप्टाईड चेन रिलीस फैक्टर्स इन्वाल्वड इन ट्रांस्लेशन टर्मिनेशन इन प्लाजमोडियम फैल्सीपेरम ऑर्गेनल्स	डॉ समन हबीब
55.	अखिलेन्द्र प्रताप भारती	आईडेन्टिफिकेशन एण्ड कैरेक्टराईजेशन ऑफ स्ट्रेस इन्ड्यूस्ड जीन रेगुलेटरी प्रोटीन्स आफ सैक्करोमाईसेज सेरेविसेई	डॉ सोहेल अख्तर
56.	मनीष चरन	इन्वेस्टिगेशन ऑफ प्रोटीन्स प्रेडिक्टेड टू बी इन्वॉल्वड इन द (एफई–एस) कॉम्पलेक्शन पाथवे इन आर्गेनल्स ऑफ प्लाज्मोडियम फैल्सीपेरम	डॉ समन हबीब
57.	चेतन शर्मा	बायो–प्रॉस्पेक्शन एण्ड *इनविट्रो* बायोसिंथेसिस ऑफ बायोएक्टिव सेकेण्डरी मेटाबॉलिटीस फ्राम इण्डियन ट्रैडिशनल प्लांट्स यूस्ड फार बोन हीलिंग	डॉ केआर आर्या
58.	बी हरि कृष्ण	डेवलपमेंट ऑफ नोवेल स्ट्रैटेजीस फॉर द सिंथेसिस ऑफ फ्यूस्ड हेटरोसाईकिल्स ऑफ बायोलॉजिकल इंटरेस्ट	डॉ संजय बत्रा
59.	प्रवेश वर्मा	मॉलीक्यूलर एण्ड बायोकेमिकल कैरेक्टराईजेशन ऑफ प्रोटीन डाई सल्फाईड आईसोमिरेस ऑफ फाईलेरियल पैरासाईट	डॉ जेके सक्सेना
60.	पियूष द्रविड़	मॉलीक्यूलर कैरेक्टराईजेशन ऑफ मैलेट डिहाईड्रोगिनेस एण्ड काइटिनेज फ्राम फाईलेरियल पैरासाईट्स	डॉ जेके सक्सेना
61.	विनीत कुमार मौर्या	डेसीफेरिंग ट्रांस्फार्मिंग ग्रोथ फैक्टर β–एक्टिवेशन सिग्नलिंग ड्यूरिंग यूटेराईन टिश्यू रिमॉड्लिंग प्रोसेस	डॉ राजेश कुमार झा
62.	आशुतोष शर्मा	सिंथेसिस ऑफ पाईरानन–डेरिवेटिव्स डोनर–ऐक्सेप्टर आर्गेनिक फ्लुओरिसेन्ट डाईस फॉर सेल इमेजिंग एण्ड ऑरगेनिक इलेक्ट्रानिक डिवाईसेस	डॉ अतुल गोयल
63.	अनुराधा गुप्ता	इंडक्शन ऑफ मैकरोफेज आटोफेजी यूसिंग इन्हेलेबल माईक्रोपार्टिकल्स एज ए ट्रीटमेंट स्ट्रैटजी फार ट्यूबरक्यूलोसिस	डॉ अमित मिश्रा

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64.	मीनाक्षी राणा	एल्युसिडेशन ऑफ नोवेल लिपिड एण्ड इन्फ्लामेटरी सिग्नलिंग पाथवे इन्वाल्वड इन मोनोसाईट/मैकरोफेज एक्टीवेशन फ्राम सेल फार्मेशन एण्ड एपॉपटासिस	डॉ मनोज कुमार बर्थवाल
65.	सुनील कुमार सिंह	द रोल ऑफ न्यूरो–ट्रांसमिटर्स/रिसेप्टर्स एण्ड हाईपॉक्सिक फैक्टर्स इन सेरेब्रल मलेरिया मॉडल एण्ड देयर थिराप्यूटिक रिवर्सल	डॉ रेनु त्रिपाठी
66.	चेन्नम शेट्टी सुब्बैया	पेप्टाईड एण्ड पेप्टीडोमिमेटिक्स ऐस पोटेन्शियल एंटी–इंफेक्टिव एजेंट्स	डॉ डब्लू हक
67.	मोहम्मद काशिफ	फंक्शनल एण्ड स्ट्रक्चरल कैरेक्टराईजेशन ऑफ द लार्जेस्ट सबयूनिट ऑफ आरएनए पॉलीमिरेज–2	डॉ मो सोहेल अख्तर
68.	मेघा दुबे	स्टडी ऑफ पोस्ट–ट्रांस्लेशनल मॉडिफिकेशन्स इंड्यूस्ड बाई आक्सीडेटिव/नाईट्रोसेटिव स्ट्रेस इन न्यूट्रोफिल्स	डॉ मधु दीक्षित
69.	सुभाष चन्द वर्मा	इन्वेस्टिगेशन ऑन द लांग टर्म पर्सिसटेन्स ऑफ *माईकोबैक्टीरिअम ट्यूबरकुलोसिस* इन द होस्ट डेस्पाईट अ फंक्शनल इम्यून सिस्टम	डॉ वाईके मंजू
		वैज्ञानिक एवं अभिवन अनुसंधान अकादमी (एसीएसआईआर)	
70.	अभिषेक शर्मा	इंटरैक्शन स्टडीज ऑफ कन्करेंटली को–एडमिनिस्टर्ड क्लीनिकली इम्पार्टेन्ट ड्रग्स ऑन द फार्माकोकाईनेटिक्स फार्माकोडाईनेमिक प्रोफाईल ऑफ सेन्टक्रोमान एण्ड प्री–क्लीनिकल फार्माकोकाईनेटिक्स स्टडीज ऑफ नोवेल एंटी–पैरासाईट कम्पाउण्ड्स	डॉ जवाहर लाल
71.	चक्रपाणि त्रिपाठी	इनिशिएशन एण्ड प्रोगरेशन ऑफ एन्जियोजेनेसिसः डेसिफेरिंग द रोल ऑफ कीमो–अट्रैक्ट नेटवर्कस बिटवीन ट्यूमर सेल्स मैकरोफेजेस	डॉ स्मृति भदौरिया
72.	शुभ्रा श्रीवास्तव	कैरेक्टराईजेशन ऑफ मॉलीबडेनम कोफैक्टर बायोसिंथेसिस पाथवे प्रोटीन्स फ्राम *एम. ट्यूबरकुलोसिस* एच37आरवी	डॉ आशीष अरोड़ा
73.	अजय कुमार	डिजाईन एण्ड सिंथेसिस ऑफ 1,3 डिजा हेटरोसाईक्लिक बेस्ड प्रिविलेज्ड स्ट्रक्चर एज पोटेन्शियल एंटीकैंसर एजेंट्स	डॉ अतुल कुमार
74.	महेन्द्र कुमार हिडाउ	फार्माकोकाईनेटिक्स, मेटाबोलाईट प्रोफाईलिंग एण्ड ड्रग–ड्रग इंटरैक्शन स्टडीज ऑफ नोवेल एंटी–टयूबरकुलर एण्ड एंटी–मलेरियल मॉलीक्यूल्स	डॉ एसके सिंह
75.	पूनम गोस्वामी	अ स्टडी टू इवेलुएट द इन्वाल्वमेंट ऑफ एंडोप्लास्मिक रेटिकुलम स्ट्रेस एण्ड बायोकेमिकल आल्टरेशन्स इन रोटेनॉन इन्ड्यूस्ट न्यूरोटाक्सिसिटी	डॉ सारिका सिंह
76.	हार्दिक जमुनादास चंदासना	इवेलुएशन ऑफ प्रीक्लिनिकल एडीएमई प्रौपर्टीज एण्ड प्रेडिक्शन ऑफ हयूमन फार्माकोकाईनेटिक्स ऑफ S007-867 अ नोवेल पोटेन्ट एंटी–प्लेटलेट एजेंट	डॉ रवि एस भट्टा
77.	आकांक्षा श्रीवास्तव	प्रोडक्शन, प्यूरिफिकेशन एण्ड कैरेक्टराईजेशन ऑफ माईक्रोबियल कोलेस्ट्राल ऑक्सीडेज	डॉ पीके शुक्ला
78.	सोनाली गंगवार	कैरेक्टराईजेशन ऑफ डाईपेप्टाईडिल कार्बाक्सी पेप्टाईडेज ऑफ लिशमानिया डोनोवनाई एण्ड आईडेन्टिफिकेशन ऑफ पोटेन्शियल इन्हिबिटर्स एज एंटी–लिशमानियल एजेंट्स	डॉ नीना गोयल
79.	समीर तिवारी	स्टडीज ऑन द रोल ऑफ पीकेएनजी फास्फोराईलेटेड सब्सट्रेट्स इन ग्रोथ एण्ड इन सरवाईवल ऑफ *माईकोबैक्टीरिअम बोविस* बीसीजी	डॉ किशोर के श्रीवास्तव
80.	अवकाश सोनी	स्टडीज ऑन द एचईएमई डीटॉक्सीफिकेशन प्रोटीन (एचडीपी) एण्ड इट्स रेसिसटैन्स टू आर्टईथर इन *प्लाज्मोडियम विन्केई*	डॉ एसके पुरी
81.	आरिफ जमाल सिद्दीकी	स्टडीज ऑन इम्यूनोलॉजिकल रेस्पांसेस एलीसिटेड ड्यूरिंग प्री–एरिथ्रोसाईट्स स्टेज इन्फेक्शन विद रोडेन्ट मलेरिया पैरासाईट *प्लाज्मोडियम योली*	डॉ एसके पुरी

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82.	शिविका राय	ए स्टडीज ऑन न्यूरो–इन्फ्लेमेशन एण्ड इट्स इन्फ्लुएंस ऑन एनएमडीए रिसेप्टर एण्ड सिनैप्टिक फंक्शन इन एसटीजेड(आईसीवी) इन्ड्यूस्ड मेमोरी इम्पेअर्ड रैट	डॉ राकेश शुक्ला
83.	आकांक्षा मिश्रा	एक्सप्लोरेशन ऑफ एंटीहाईपरग्लाईसीमिक एक्टीविटी एण्ड मॉलीक्यूलर मिकैनिज्म ऑफ ऐक्शन ऑफ सलेक्टेड नेचर आईडेन्टिकल्स	डॉ अरविंद कुमार श्रीवास्तव
84.	ज्योति भरद्वाज	स्टडीज ऑन सम आस्पेक्ट्स ऑफ एंटी–मलेरियल इम्यूनिटी अगेन्सट स्पोरोज्वाईट एण्ड ब्लड इन्ड्यूस्ड इन्फेक्शन इन रोडेन्ट मलेरिया मॉडल्स	डॉ एसके पुरी
85.	सुपिन्दर कौर	रोल ऑफ एचएमजी–सीओए रिडक्टेस इन्हिबिटर्स एण्ड एण्डोप्लाज्मिक रेटिकुलम एसोसिएटेड जेनेटिक इंटरवेन्शन्स इन पार्किन्सन्स डिसीसः स्टडीज एम्पलॉयिंग ट्रांसजेनिक *सी एलिगेन्स* मॉडल	डॉ आमिर नाजिर
86.	पूजा अग्रवाल	इन विट्रो सेलेक्शन ऑफ एन आर्टईथर टालरेंट फीनोटाईप एण्ड कीमो–सेंसिटिविटी स्टडीज विद इण्डियन फील्ड आईसोलेट्स आफ प्लाज्मोडियम फैल्सीपेरम	डॉ कुमकुम श्रीवास्तव
87.	पूजा शुक्ला	ड्रग इन्ड्यूस्ड हीमैटोटॉक्सिटी एण्ड इट्स अमीलियोरेशन बाई प्लांट प्रोडक्टस	डॉ आरके सिंह
88.	प्रीती विश्वकर्मा	मॉडयूरेशन ऑफ इम्यून सिस्टम यूसिंग एसटीएटी3 इन्हिबिटर्स इन विसरल लिशमानियासिस (कालाजार)	डॉ सुशांत कार
89.	अखिलेश कुमार	ए स्टडी ऑन एंटीटेरैटोजीनिक पोटेन्शियल ऑफ करक्यूमिन अगेन्स्ट टेराटोजेनिक एक्टिविटी ऑफ वैल्पोरिक एसिड	डॉ नीरज सिन्हा
90.	कोमल शर्मा	सिंथेसिस एण्ड बायोलॉजिकल इवैलुएशन ऑफ प्रोस्टेट स्पेसिफिक मेम्बरेन एंटीजेन (पीएसएमए) टार्गेटिंग कैटिऑनिक एम्फीफाईल्स एण्ड एंटीकैंसर इवैलुएशन ऑफ सीडीआरआई कम्पाउंड्स	डॉ मनीष के चौरसिया
91.	सोनल गुप्ता	डिजाईन, सिंथेसिस एण्ड बायोलाजिकल इवैलुएशन ऑफ नोवेल एजेंटस फार मैनेजमेंट ऑफ बिनाईन प्रोस्टैटिक हाईपरलेशिया	डॉ वीएलशर्मा
92.	रिचा द्विवेदी	डेवलपमेन्ट ऑफ ऐन विट्रो मॉडल यूसिंग एम ट्यूबरकुलोसिस ग्रोन इन माउस बोन मैरो मैकरोफेजेस टू सेलेक्ट न्यू मॉलीक्यूल्स एक्टिव अगेन्स्ट लेटेन्ट टीबी	डॉ विनीता चतुर्वेदी
		बनारस हिंदु विश्वविद्यालय, वाराणसी	
93.	वैभव मिश्रा	इवैलुएशन ऑफ गैस्ट्रो–प्रोटेक्टिव इफेक्ट ऑफ नैचुरल प्रोडक्ट एण्ड एल्युसिडेशन ऑफ इट्स मॉलीक्यूलर मकैनिज्म	डॉ मनोज कुमार बर्थवाल
94.	वंदना सिंह	क्लोनिंग एक्सप्रेसन एण्ड कैरेक्टराईजेशन ऑफ लैक्टेट डिहाईड्रोजिनेस फ्राम *प्लाज्मोडियम वाईवाक्स* एण्ड *प्लाज्मोडियम नोलेसी*, द ह्यूमन मलेरिया पैरासाईट्स	डॉ एनए कौशल
		इंटीग्रल विश्वविद्यालय, लखनऊ	
95.	उत्सव देवनाथ	डिजाईन, सिंथेसिस, बायोलॉजिकल इवैलुएशन एण्ड मॉलीक्यूलर मॉडलिंग स्टडीज ऑफिथआजोलाईडिन एण्ड रिलेटेड एनालॉगस एस एंटी एचआईवी – 1 एजेंट्स	डॉ एसबी कट्टी
96.	सुनील कुमार मिश्रा	इवैलुएशन ऑफ एंटी–कार्सिनोजेनिक पोटेन्शियल ऑफ बायोएक्टिव कम्पाउंड्स डेरिवेटिव फ्राम इण्डियन मेडिसिनल प्लांट्स	डॉ एके सक्सेना
97.	गुरप्रीत कौर	ए स्टडी आफन द इन्वाल्वमेंट ऑफ पॉली (एडीपी–राईबोस) पॉलीमिरेस–1(पीएआरपी–1) इन पल्मोनरी हाईपरटेन्शन	डॉ काशिफ हनीफ

क्र.सं.	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक	सुपरवाइजर
98.	विकास कुशवाहा	स्टीडीज ऑन क्लोनिंग, एक्सप्रेशन एंड प्यूरिफिकेशन ऑफ डिस्आर्गेनाईज्ड मसल प्रोटीन ऑफ फाइलेरियल पैरासाइट *ब्रुजिया मैलाई* एण्ड इट्स रिस्पॉन्स इन रोडेन्ट होस्ट्स	डॉ पीके मूर्ति
		जामिया हमदर्द विश्वविद्यालय, नई दिल्ली	
99.	अतुल कुमार वर्मा	मॉलीक्यूलर कैरेक्टराईजेशन ऑफ इम्यूनो–मॉड्यूलेटरी प्रोटीन्स ऑफ ह्यूमन फाईलेरियल पैरासाईट ब्रुजिया मलाई	डॉ पीके मूर्ति
		किंग जार्ज मेडिकल युनिवर्सिटी, लखनऊ	
100.	चन्द्र प्रकाश पाण्डेय	आइडेन्टिफिकेशन एण्ड कैरेक्टराइजेशन आफ एस्प्रिन एण्ड क्लोपीडिजिरोल रजिस्टेन्स इन पेशेन्ट आफ कार्डिवैस्कुलर डिजिज	डॉ मधु दीक्षित
		वनस्थली विश्वविद्यालय, राजस्थान	
101.	रेणुका खटिक	डेवलपमेंट ऑफ बायोकांजुगेट पॉलीसैक्राईड्स नैनो–पार्टिकल्स फॉर इफेक्टिव मैनेजमेंट ऑफ कोलोरेक्टल कैंसर	डॉ अमित मिश्रा

2. वाह्य अभ्यर्थियों को प्रदान किया गया प्रायोजित प्रशिक्षण

उपर्युक्त कार्यक्रम के अन्तर्गत औषधि एवं औषधि निर्माण अनुसंधान प्रयोगशाला, जन्तु तकनीक, टिश्यू एवं सेल कल्चर, इन्स्ट्रूमेन्टेशन, परिष्कृत विश्लेषणात्मक उपकरणों एवं अन्य प्रयोगशाला तकनीकी के क्षेत्र में संस्थान द्वारा स्नातकोत्तर छात्रों, विदेश के शोध छात्रों तथा सम्पूर्ण देश के शैक्षिक तथा उद्योग जगत के प्रतिभागियों को प्रशिक्षण प्रदान किया गया।

2.1 स्नातकोत्तर छात्रों का प्रशिक्षण के

केलैण्डर वर्ष के दौरान देश भर के 43 कॉलेजो विश्वविद्यालयों और संबद्ध कॉलेजों के कुल 105 स्नातकोत्तर छात्र-छात्राओं को योग्यता के आधार पर चयन किया गया और औषधि तथा औषधि निर्माण अनुसंधान के विभिन्न विषयों में 2-12 महीनों का प्रशिक्षण दिया गया।

2.2 एम.एस. (फार्मा) छात्रों को प्रशिक्षण

सीएसआईआर-सीडीआरआई, नाइपर रायबरेली का संरक्षक संस्थान होने के कारण यहां के एमएस (फार्मा) के छात्रों को प्रति वर्ष बायोमेडिकल रिसर्च में एक वर्ष को प्रशिक्षण प्रदान करता है। इस वर्ष भी 30 छात्रों नें फार्मास्यूटिक्स एवं मेडिसिनल केमिस्ट्री में प्रशिक्षण प्राप्त किया।

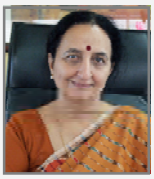
2.3 इन्सा और नासी के साथ सहयोग के अंतर्गत प्रशिक्षण

इस कार्यक्रम के अन्तर्गत इन्सा और नासी के 08 फेलोज़ को बायोमेडिकल रिसर्च के विभिन्न पहलुओं पर प्रशिक्षण दिया गया।

सम्मान एवं पुरस्कार

डॉ मधु दीक्षित

- जे सी बोस नेशनल फेलोशिप



डॉ बृजेश कुमार

- 10वां डॉ पीडी सेठी एनुअल अवार्ड फॉर बेस्ट पेपर इन फार्मा एनालिसिस-2014

डॉ अनुराधा दुबे

- जे सी बोस नेशनल फेलोशिप

डॉ अतुल कुमार

- साईफाइंडर-केमिकल एब्स्ट्रैक्ट्स सर्विसेज (सीएएस) ए डिवीजन ऑफ द अमेरिकन केमिकल सोसाइटी (एसीएस) कोलंबस, यूएसए द्वारा पेंटा स्टार अवार्ड्स

डॉ समन हबीब

- फेलो ऑफ अकादमी ऑफ साइंसेज, बेंगलुरु

डॉ संजय बत्रा

- आरएससी एडवांसेज, रॉयल सोसाइटी ऑफ केमिस्ट्री, यूके द्वारा एसोसिएट एडिटर मनोनीत

डॉ नीना गोयल

- डॉ बीएन सिंह मेमोरियल ओरेशन अवार्ड, 26वीं नेशनल कांग्रेस ऑफ परसिटोलॉजी, बीएचयू, वाराणसी

डॉ एम श्रीधर रेड्डी

- थीइम केमिस्ट्री जर्नल अवार्डी -2015

डॉ आमिर नाज़िर

- सीवी रमन रिसर्च फेलोशिप 2015-16

श्री गुनागन्ती नरेश (डॉ टी नरेन्द्र के छात्र)

- एली लिली आउटस्टेण्डिंग थीसिस अवार्ड-2014

डॉ अतुल गोयल

- डीएई-एसआरसी, गवर्नमेंट ऑफ इंडिया द्वारा आउटस्टैंडिंग इन्वेस्टिगेटर्स अवार्ड 2014-15
- केमिकल रिसर्च सोसाइटी ऑफ इंडिया द्वारा सीआरएसआई ब्रोंज मेडल 2015
- आईएसपीएफ, रूस द्वारा आनरेरी डिप्लोमा इन केमिकल साइंसेज 2015,

डॉ वीनू बाला (डॉ वीएल शर्मा की छात्रा)

- डॉ एमएम धर मेमोरियल डिस्टिंगुइश्ड कैरियर अचीवमेंट अवार्ड-2015 (केमिकल साइंसेज)

डॉ नीलू सिंह

- इंडियन कौंसिल ऑफ मेडिकल रिसर्च इंडिया का प्रोफेसर बीके ऐकत ओरेशन अवार्ड-2012,
- इंडिया इंटरनेशनल फ्रेंडशिप सोसाइटी द्वारा भारत गौरव अवाड-2015,

डॉ अविनाश कुमार (डॉ रितु त्रिवेदी के छात्र)

- डॉ एमएम धर मेमोरियल डिस्टिंगुइश्ड कैरियर अचीवमेंट अवार्ड -2015 (बायोलॉजिकल साइंसेज)

डॉ मुकेश पसुपुलेटी

- डीबीटी, गवर्नमेंट ऑफ इंडिया द्वारा प्रकाशित बुक "परस्यूट ऑफ बायोटेक्नोलॉजी ओप्पोर्चुनिटीज़ एण्ड ऑप्शंस" द्वारा 'आउटस्टैंडिंग परफॉर्मर' के रुप में सम्मानित

डॉ यशपाल सिंह छोंकर (डॉ आरएस भट्टा के छात्र)

- डॉ जेएम खन्ना मेमोरियल डिस्टिंगुइश्ड कैरियर अचीवमेंट अवार्ड-2015 (प्रीक्लीनिकल एण्ड क्लीनिकल साइंसेज)

श्री विवेक कुमार पवार (डॉ मनीष कुमार चौरसिया के छात्र)

- डॉ जेएम खन्ना मेमोरियल अर्ली करियर अचीवमेंट अवार्ड-2015

सुश्री स्वाति जैसवाल (डॉ जवाहर लाल की छात्रा)

- नोवार्टिस एण्ड उप्पसला बायोमेडिकल सेंटर, उप्पसला यूनिवर्सिटी, स्वीडन द्वारा उप्पसला फर्माकोमेट्रिक्स समर स्कूल-2015 हेतु चयनित

कु समृद्धि शुक्ल (डॉ सईद मुस्थपा मीरन की छात्रा)

- डॉ स्वर्ण नित्य आनंद मेमोरियल अर्ली करियर अचीवमेंट अवार्ड 2015 फॉर वीमेन रिसर्च स्कालर्स

श्री महेंद्र शुक्ला (डॉ जवाहर लाल के छात्र)

- डिपार्टमेंट ऑफ साइंस एण्ड टेक्नोलॉजी, इंडिया }kjkmil ykQekZdkesfVªDl lej Ldwy 2015 हेतु चयनित

श्री शरनबासप्पा एस कराड़े (डॉ जेवी प्रताप के छात्र)

- रीजनल सेंटर फॉर बायोटेक्नोलॉजी, डीबीटी बायोटेक्नोलॉजी, गवर्मेंट ऑफ इंडिया द्वारा यूरोपियन सिंक्रोट्रॉन रेडिएशन फैसिलिटी, ग्रेनोबल, फ्रांस में एडवांस रिसर्च हेतु चयनित

सुश्री शिवांगी रस्तोगी (डॉ मंजू वायके की छात्रा)

- 21वीं आईएससीबीसी इंटरनेशनल कांफ्रेंस-2015 में बेस्ट पोस्टर अवार्ड इन लाइफ साइंसेज

श्री अनूप कुमार सिंह (डॉ जेवी प्रताप के छात्र)

- एनसीआरआई कैंसर कांफ्रेंस में बेस्ट पोस्टर के लिए एनसीआरआई प्राइज अवार्ड

श्री अलोक के मिश्रा (डॉ केके श्रीवास्तव के छात्र)

- यूनिवर्सिटी ऑफ एडिनबर्ग, यूके द्वारा बायलेटरल (यूके-इंडिया) एएमआर डीएक्ससी ऑटम स्कूल-2015 ऑन मॉलिक्यूलर डॉयग्नोस्टिक्स फॉर एण्टिमाइक्रोबियल रेजिस्टेंस, के लिए चयनित

श्री दीपक पुरोहित (डॉ अतुल गोयल के छात्र)

- इंडियन सोसाइटी ऑफ केमिस्ट्स एण्ड बायोलॉजिस्ट्स द्वारा बेस्ट पोस्टर अवार्ड

सुश्री गीतू पाण्डेय (डॉ पीआर मिश्रा की छात्रा)

- 21वीं आईएससीबीसी इंटरनेशनल कांफ्रेंस में बेस्ट पोस्टर अवार्ड इन लाइफ साइंसेज
- एमएनआईटी, जयपुर द्वारा इण्टरनेशनल कांफ्रेंस ऑन करंट चैलेंजेज इन ड्रॉग डिस्कवरी रिसर्च में बेस्ट पोस्टर अवार्ड

श्री संगप्पा बसंना चदचन (डॉ राजेश कुमार झा के छात्र)

- एनआईआई, नई दिल्ली में आयोजित इंटरनेशनल कांग्रेस ऑन "एम्ब्रियो इम्प्लांटेशन एण्ड प्रेगनेंसी: इंट्रीकेसीज एण्ड स्ट्रेटेजीज फॉर सक्सेस", में बेस्ट पोस्टर अवार्ड

सुश्री मनीषा दीक्षित (डॉ रितु त्रिवेदी की छात्रा)

- आईसीसीबीएच द्वारा न्यू इन्वेस्टिगेटर अवार्ड

श्री विजय कुमार (डॉ राजेश कुमार झा के छात्र)

- इण्टरनेशनल सिम्पोजियम ऑन रिप्रोडक्टिव बायोलॉजी एण्ड कम्पेरेटिव एण्डोक्रिनोलॉजी, वाराणसी में बेस्ट पोस्टर अवार्ड
- नेशनल सेमिनार ऑन "ट्रांस्लेशनल रिसर्च इन बायोटेक्नोलॉजी फॉर इम्यूविंग एनिमल हेल्थ एण्ड प्रोडक्शन", बीकानेर में यंग साइंटिस्ट अवार्ड

श्री अभिषेक आर्य (डॉ एके द्विवेदी के छात्र)

- बीबीए यूनिवर्सिटी, लखनऊ में इंटरनेशनल फार्मास्यूटिकल कांफ्रेंस-2015 में पोस्टर प्रेजेंटेशन के लिए प्रथम पुरस्कार

सुश्री ऋचा श्रीवास्तव (डॉ स्मृति भदौरिया की छात्रा)

- इंटरनेशनल कांफ्रेंस ऑन स्टेम सेल एण्ड कैंसर, पुणे में बेस्ट ओरल प्रेजेंटेशन अवार्ड

NOTES

CSIR-Central Drug Research Institute, Lucknow

- आयोजित प्रमुख कार्यक्रम
- विशिष्ट अतिथि
- संस्थान के वैज्ञानिकों द्वारा दिये गये व्याख्यान
- विदेश यात्राएं/प्रतिनियुक्तियाँ
- विशिष्ट वैज्ञानिक समितियों की सदस्यता

अन्य गतिविधियाँ


आयोजित प्रमुख कार्यक्रम
विशिष्ट अतिथि
संस्थान के वैज्ञानिकों
द्वारा दिये गये व्याख्यान
विदेश यात्राएं/प्रतिनियुक्तियाँ
विशिष्ट वैज्ञानिक
समितियों की सदस्यता

अन्य गतिविधियाँ

आयोजित प्रमुख कार्यक्रम

सीएसआईआर-सीडीआरआई का 64वां वार्षिक दिवस समारोह एवं 40वां सर एडवर्ड मेलानबी स्मृति व्याख्यान

सीएसआईआर-सीडीआरआई ने 17 फरवरी, 2015 को अपना 64वां स्थापना दिवस मनाया। वार्षिक दिवस के मुख्य कार्यक्रम का आयोजन

अपराह्न में किया गया। मुख्य अतिथि प्रो. गौतम आर. देसिराजू और कार्यक्रम के अध्यक्ष के रूप में पूर्व निदेशक डॉ बीएन धवन की उपस्थिति ने कार्यक्रम को गरिमामय बना दिया। सीएसआईआर- सीडीआरआई के निदेशक डॉ आरए विश्वकर्मा, ने मुख्य अतिथि और अन्य गणमान्य व्यक्तियों का स्वागत किया और रिपोर्टिंग अवधि के दौरान सीएसआईआर-सीडीआरआई की उपलब्धियों का एक विस्तृत विवरण प्रस्तुत किया। कार्यक्रम का आरंभ इण्डियन इन्स्टीट्यूट ऑफ़ साइंस, बंगलुरू के प्रो गौतम आर. देसिराजू द्वारा प्रस्तुत किये गये व्याख्यान से हुआ। यह व्याख्यान संस्थान के संस्थापक निदेशक सर एडवर्ड मेलानबी की स्मृति में आयोजित 40वें सर एडवर्ड मेलानबी स्मृति व्याख्यान के अन्तर्गत दिया गया। व्याख्यान का शीर्षक ''क्रिस्टल इंजीनियरिंगः एन्हान्समेन्ट ऑफ़ फ़ार्मास्युटिकल फ़िज़ियोकेमिकल प्रापर्टीज'' था। प्रो. देसिराजू ने विकास के विभिन्न चरणों में औषधियों की असफलता के कारणों पर चिंता व्यक्त की और कुछ सूक्ष्म सुधारों सहित अगले चरण में ले जाने की संभावना पर चर्चा की। उन्होंने पॉलीमॉर्स, को-क्रिस्टल और सॉल्ट्स की प्रासंगिक तकनीक के विशेष संदर्भ सहित औषधि विकास कार्यक्रम के संबंध में क्रिस्टल इंजीनियरिंग के महत्व पर जोर दिया जिसके माध्यम से औषधीय विकास कार्यक्रम में धन और समय दोनों की बचत करते हुए नई औषधियां विकसित की जा सके।

इसके पश्चात् मंच पर उपस्थित विशिष्ट अतिथियों द्वारा वार्षिक रिपोर्ट 2014-15 का विमोचन किया गया और सर्वोत्तम कार्य निष्पादन करने वाले कर्मचारियों और छात्रों को वार्षिक पुरस्कार वितरित किये गये। इस अवसर पर औषधि अनुसंधान में उत्कृष्टता हेतु प्रतिष्ठित सीडीआरआई पुरस्कार-2015 की घोषणा भी की गयी। लाइफ़ साइंसेज श्रेणी में सीडीआरआई पुरस्कार-2015 आईआईटी, बम्बई की प्रो. रिन्ती बैनर्जी को एवं केमिकल साइंसेज में यह पुरस्कार मायलन लेबोरेट्रीज, मेदक, तेलंगाना के डॉ रामाकोटेश्वर राव जेट्टी को दिया जायेगा इस अवसर पर उत्कृष्ट शोध हेतु शोध छात्रों को सीडीआरआई पुरस्कार प्रदान किये गये।। केमिकल साइंसेज़ के लिए डॉ एमएम धर मेमोरियल कैरियर अचीवमेन्ट अवार्ड, डॉ बीनू बाला और बायोलॉजिकल साइंसेज के लिये डॉ अविनाश कुमार को दिया गया। प्री-क्लीनिकल और क्लीनिकल साइंसेज के लिये डॉ जेएम खन्ना मेमोरियल विशिष्ट कैरियर अचीवमेन्ट अवार्ड डॉ यशपाल सिंह छोंकर को प्रदान किया गया। डॉ जेएम खन्ना मेमोरियल अर्ली कैरियर अचीवमेन्ट अवार्ड श्री विवेक कुमार पवार को और महिला रिसर्च स्कॉलर हेतु डॉ स्वर्ण नित्य आनन्द मेमोरियल अर्ली कैरियर अचीवमेन्ट अवार्ड कु. समृद्धि शुक्ला को प्रदान किया गया। तत्पश्चात् श्रेणी I में 10 से अधिक इम्पैक्ट फैक्टर और श्रेणी II में 6 से अधिक इम्पैक्ट फैक्टर वाले प्रकाशनों को उत्कृष्टता अवार्ड दिये गये। विदेश में स्वीकृत पेटेण्ट और सर्वोत्तम प्रौद्योगिकी पुरस्कार भी प्रदान किया गया। इसके अलावा संस्थान की सेवा में 25 वर्ष पूरे करने वाले कर्मचारियों को भी सम्मानित किया गया। डॉ बीएन धवन ने अपने अध्यक्षीय भाषण में संस्थान द्वारा किये गये प्रयासों की सराहना की । वह पूर्व निदेशकों और विश्वसनीय नेतृत्वकर्ताओं द्वारा संस्थान को प्रदान की गयी दिशा और दशा, लय और गति को युवा वैज्ञानिकों द्वारा आगे बढ़ाए जाने से अत्यंत संतुष्ट थे, क्योंकि यह संस्थान कल्पना से अधिक आधुनिक है और सभी को भावी अनुसंधानकर्ताओं से बहुत आशाएं हैं। श्री विनय त्रिपाठी द्वारा धन्यवाद प्रस्ताव के साथ कार्यक्रम का समापन हुआ।

करेन्ट ट्रेण्डस इन ड्रग डिस्कवरी एण्ड डवेलपमेण्ट्स पर 21वीं आईएससीबी इन्टरनेशनल कांफ्रेन्स (आईएससीबी-2015)

सीएसआईआर-सीडीआरआई औषधि अनुसंधान संस्थान, लखनऊ तथा इण्डियन सोसाइटी ऑफ केमिस्ट्स एण्ड बायोलॉजिस्ट्स, लखनऊ ने संयुक्त रूप से 21वीं इण्टरनेशनल कांफ्रेन्स फरवरी 25-28, 2015 को आयोजित की। कांफ्रेन्स का शुभारंभ सीएसआईआर-सीडीआरआई के निदेशंक डॉ राम विश्वकर्मा के स्वागत भाषण तथा प्रोफेसर अनामिक शाह,

अध्यक्ष, आईएससीबी के अध्यक्षीय उद्भोदन के साथ हुआ। कांफ्रेन्स के 12 सत्रों में देश के विभिन्न क्षेत्रों से आये 40 से अधिक आमंत्रित वक्ताओं ने अपने व्याख्यान प्रस्तुत किए। 200 से अधिक प्रतिभागियों के कांफ्रेन्स में भाग लिया। आईएससीबी अवार्ड फॉर एक्सीलेन्स एवं आईएससीबी यंग सांइटिस्ट अवार्डस भी प्रदान किए गए। कार्यक्रम की अभूतपूर्व सफलता के निए आयोजन सचिव डॉ पी एम एस चौहान ने सभी प्रतिभागियों, आयोजनकर्ता टीमों एवं मीडिया के सदस्यों को धन्यवाद ज्ञापित किया।

एनिमल इन रिसर्च एण्ड टेस्टिंगः ए क्रॉस-टॉक बिटवीन रेलेवैन्स एण्ड एथिक्स पर राष्ट्रीय संगोष्ठी (एनएसएआरटी-2015)

सीएसआईआर-सीडीआरआई, लेबोरेट्री एनिमल साइंस एसोसिएशन ऑफ इण्डिया (एलएएसएआई) के सहयोग से एनिमल्स इन रिसर्च एण्ड टेस्टिंग ए क्रॉस-टॉक बिटवीन रेलेवैन्स एण्ड एथिक्स (एनएसएआरटी-2015) पर एक राष्ट्रीय संगोष्ठी का आयोजन मार्च 13-14, 2015 में किया गया जिसका उद्घाटन आईवीआरआई के निदेशक एवं उप-कुलपति, डॉ. आरके सिंह ने मुख्य अतिथि के रूप में किया। अपने उद्घाटन भाषण में डॉ. सिंह ने जन्तुओं पर अनुसंधान और प्रयोगों के दौरान उनके हितों को सुनिश्चित करने पर जोर दिया।

सीएसआईआर-सीडीआरआई के पूर्व निदेशक प्रो. बी. एन. धवन ने सम्मानित अतिथि के रूप में कार्यक्रम का गौरव बढ़ाया उन्होंने बताया कि जैव चिकित्सा अनुसंधान में जन्तुओं का प्रयोग अल्पतम मात्रा में (लगभग 8%) है किन्तु इसके बगैर मानवता के लिये कोई भी उपचार हेतु अभिकर्मक विकसित करना असंभव है। उन्होंने यह भी उल्लेख किया कि जब तक हम इन प्रायोगिक जन्तुओं की भलाई और मानवोचित प्रयोग सुनिश्चित नहीं करते, वैध एवं विश्वसनीय प्रयोग संबंधी परिणाम उत्पन्न नहीं किये जा सकते। एनएसएआरटी-2015 की अध्यक्षा डॉ शैलजा भट्टाचार्य ने कार्यक्रम की अध्यक्षता की और सभी अतिथियों का स्वागत किया। एलएएसएआई के अध्यक्ष डॉ रिशेन्द्र वर्मा ने हमारे देश में प्रयोगशाला जन्तु विज्ञान के वर्तमान परिदृश्य पर विशेष टिप्पणी प्रस्तुत की। अपने भाषण में उन्होंने पर्यावरण एवं वन मंत्रालय द्वारा जन्तु अनुसंधान एवं प्रयोग को नियंत्रित करने के मुद्दे को उठाया जबकि प्रयोगशाला जन्तु वन एवं पर्यावरण से संबंधित नहीं है, अतः उन्होंने इस मुद्दे को किसी उपयुक्त एजेन्सी के अन्तर्गत लाने की सिफारिश की। एनएसएआरटी-2015 के आयोजक सचिव डॉ डी एस उपाध्याय ने संगोष्ठी के महत्व की चर्चा की। लगभग 150 भागीदार और 25 से अधिक आमंत्रित वक्ताओं नें विभिन्न वैज्ञानिक सत्रों के दौरान अपने व्याख्यान प्रस्तुत किए। डॉ. राकेश शुक्ला ने धन्यवाद ज्ञापित किया और कहा कि प्रयोगशाला के उन सभी जीव जन्तुओं के प्रति हृदय से कृतज्ञ हूँ जिनके मूक बलिदान ने मानव कल्याण के लिये औषधि अनुसंधान में महत्वपूर्ण भूमिका निभाई है ।

पेटइन्फोर्मेटिक्स पर एक दिवसीय कार्यशाला

सीएसआईआर-सीडीआरआई लखनऊ ने सीएसआईआर-यूआरडीआइपी, पुणे के साथ संयुक्त रूप से पेटइन्फोर्मेटिक्स पर एक दिवसीय कार्यशाला का आयोजन 19 मार्च 2015 को किया। कार्यशाला का उद्घाटन निदेशक डॉ राम विश्वकर्मा ने किया तथा प्रतिभागयों का स्वागत करते हुए अनुसंधान एवं विकास के वर्तमान परिदृश्य में पेटइन्फोर्मेटिक्स की आवश्यकता पर जोर दिया। लखनऊ स्थित चारों सीएसआईआर प्रयोगशालाओं के प्रतिभागियों के कार्यशाला में भाग लिया। डॉ. राज हिरवानी, हेड, सीएसआईआर-यूआरडीआइपी, पुणे ने पेटइन्फोर्मेटिक्सः

बेसिक एण्ड एप्लिकेशन्स पर एक व्याख्यान प्रस्तुत किया। कार्यशाला के दौरान प्रतिभागियों ने पेटेन्ट रीडिंग/पेटेन्ट क्लासीफिकेशन, पेटेन्ट डॉटाबेस सर्चिग के साथ-साथ केस स्टडी ऑन पेटेन्ट लेण्डस्केप एनालिसिस, फ्रीडम टू ओपरेट एनालिसिस एवं पेटेन्टेविलिटी का अध्ययन किया।

केन्द्रीय विज्ञान एवं प्रौद्योगिकी मंत्री डॉ हर्ष वर्धन का सीएसआईआर-सीडीआरआई आगमन

केन्द्रीय विज्ञान एवं प्रौद्योगिकी मंत्री डॉ. हर्ष वर्धन का सीएसआईआर- सीडीआरआई में 11 अप्रैल 2015 को आगमन हुआ। इस अवसर पर उन्होंने घोषणा की कि भारतीय औषधि निर्माण क्षेत्र मलेरिया, ओस्टियोपोरोसिस और डॉयबिटीज हेतु 'कैन्डीडेट ड्रग्स' को शीघ्र ही प्रदर्शित करेगा। आगे होने वाले अनुसंधान और विकास के साथ इन परिस्थितियों के लिये प्रभावी चिकित्सा की महत्वपूर्ण खोज क्षितिज पर दिखना संभावित है। ये 'कैन्डीडेट ड्रग्स' वर्तमान समय में क्लीनिकल परीक्षण के दौर से गुजर रही है। उन्होंने आगे घोषणा की सीएसआईआर-सीडीआरआई साथ-साथ फ्रैक्चर हीलिंग, कैंसर, थ्राम्बोसिस, मलेरिया और हाइपरग्लामइसेमिया हेतु लीड मॉलीक्यूल्स पर भी आईएनडी अध्ययन पूर्ण कर रहा है।

मंत्री महोदय ने कहा, 'मुझे विश्वास है कि सीएसआईआर के अन्तर्गत आने वाली औषधि

प्रयोगशालाएं "स्वस्थ् भारत मिशन" को सहारा देने और आगे बढ़ाने में सक्षम हमारे वैज्ञानिक संक्रामक तथा जीवनशैली सम्बंधी दोनों ही बीमारियों को फोकस कर रहे हैं। हम नेक्स्ट जेनरेशन ड्रग्स, बायोलॉजिक्सल, बायोसिमिलर्स, जीन चिकित्सा, स्टेम सेल चिकित्सा, पर्सनलाइज्ड मेडिसिन और मल्टीफंक्शनल नैनो मेडिसिन विकसित कर रहे हैं। मंत्री महोदय ने कहा 'मुझे विश्वास है कि भारत में वैश्विक औषधि निर्माण पावर हाउस बनने की क्षमता है और इसमें कुछ अत्यंत महत्वपूर्ण संभावनाओं को स्थान देने की प्रक्रिया में हूँ। इनमें अनुसंधान एवं विकास को उचित प्रोत्साहन देना, निजी क्षेत्रों के साथ संबंधों को मजबूत बनाना और निजी क्षेत्रा को वित्तीय राहत देने के सुझाव पर खुला दृष्टिकोण रखना सम्मिलित है जिससे अनुसंधान और विकास में उसकी भूमिका में वृद्धि हो सके। उन्होंने कहा कि हाल के महीनों में उन्होंने अनेकों सीएसआईआर प्रयोगशालाओं का भ्रमण किया है और वह इस बात के प्रति आश्वस्त हैं कि उनमें क्लनिकल परीक्षण सहित नई औषधि खोज और विकास की क्षमता है और पिछले छः दशकों में भारत में औषधि निर्माण उद्योग और शिक्षा की उन्नति में उन्होंने महत्वपूर्ण भूमिका निभाई है।

इसके पूर्व यहाँ सीएसआईआर-सीडीआरआई प्रेक्षागृह में वैज्ञानिकों को संबोधित करते हुए उन्होंने यह स्पष्ट किया कि प्रधानमंत्राी सन् 2020 तक औषधि खोज और नवीन तकनीक में भारत को विश्व में श्रेष्ठ स्थान पर लाने के लिये वचनबद्ध है। उन्होंने आगे कहा "अनुसंधान एवं विकास पर्यावरण पद्धति को मजबूत करना हमारी प्राथमिकता है।" उन्होंने कहा कि भारत के लोग यह उम्मीद कर रहे हैं कि सीएसआईआर प्रयोगशालाएँ पुनः उभरकर सामने आने वाली संक्रामक बीमारियों, जैसे- डेंगू, चिकनगुनिया, इन्सेफलाइटिस, स्वाइन फ्लू, के साथ-साथ कैंसर, डॉयबिटिज, ओस्टियोपोरोसिस, हाइपरटेंशन, डिप्रेशन और अल्ज़ाईमर जैसी दशाओं के लिये उपचारात्मक और रक्षात्मक उपाय प्रस्तुगत करने में समर्थ होगी।

मंत्री महोदय ने औषधि निर्माण में निजी क्षेत्रा के प्रतिनिधियों को धन्यवाद दिया जो इस अवसर पर उपस्थित थे और उत्पादों को प्रयोगशाला से बाजार तक लाने के लिये सीएसआईआर प्रयोगशालाओं को सहयोग प्रदान किया था। आज भारत उत्पादन के मामले में वैश्विक बाजार में 10 प्रतिशत हिस्सेदारी के साथ तीसरे स्थान पर हैं और मूल्य की दृष्टि से 14वां सबसे बड़ा देश है। भारत को अक्सर ''विकासशील विश्व का औषधालय'' नाम से पुकारा जाता है। डॉ हर्ष वर्धन ने यद्यपि यह संकेत किया कि भारत को औषधि अनुसंधान एवं विकास में एक लम्बा रास्ता तय करना है। इसके अतिरिक्त भारतीय औषधि उद्योग को औषधि उत्पादन के चरण से नई तकनीक की ओर जाना है। उन्होंने इस बात पर चिंता व्यक्त की। वर्तमान समय में भारत में नई औषधि का अनुसंधान एवं विकास अधिकांशत सरकारी संगठनों का कार्य है।

मैं उद्योग प्रतिनिधियों से अनुरोध करता हूँ कि वे नई औषधि अनुसंधान एवं विकास में सीएसआईआर प्रयोगशालाओं का सहयोग करें। भागीदारी निरन्तरता से आम आदमी के लाभ के लिये उत्पादों और प्रौद्योगिकियों के विकास में मदद मिलेगी। ऐसा उन्होंने संकेत दिया। इस संदर्भ में ओस्टियोपोरोसिस हेतु एक नए वनस्पतिक उत्पाद सीडीआर4744एफ004 एवं स्थानीय संवेदनाहारी के रूप में सेन्टब्युक्रिडीन की लायसेन्सिंग, नवीन ऐण्टींथ्रॉमबोटिक कम्पाउण्ड एस007-867 एवं अश्वगंधा के ऐण्टी-स्ट्रोक केमोटाइप (एनएमआइटीएलआइ118आरटी) हेतु आईएनडी पैकेज सही दिशा में उठाए गए कदम हैं। उन्होंने घोषणा की कि सीएसआईआर-सीडीआरआई, लखनऊ की छत्र-छाया में सरकार शीघ्र ही एक बायोफार्मा इण्डस्ट्री इन्क्यूबेटर (बीआईआई) स्थापित करेगी। यह स्वास्थ्य की देख-रेख के क्षेत्र में उद्यमियों की एक नई पीढ़ा तैयार करने का संघर्ष पूर्ण कार्य करेगा। विज्ञान एवं प्रौद्योगिकी मंत्रालय, आईएनडी अध्ययनों की संपूर्ण श्रृंखला के लिये सीएसआईआर-सीडीआरआई में जीएलपी प्रमाणित प्रयोगशालाएं स्थायपित करने के विषय में विचार कर रहा है। उन्होंने कहा कि ये कदम नई औषधि विकास को पोषित करने के साथ-साथ प्रयोगशाला की वित्तीय सतह को भी सहारा देगा।

इसके पश्चात् मंत्री महोदय ने राष्ट्रीय और अन्तर्राष्ट्रीय दिशा-निर्देशों के अनुसार सीएसआईआर-सीडीआरआई के नये परिसर में प्रयोगशाला जन्तुओं के लिये राष्ट्रीय केन्द्र की स्थापना की घोषणा की। नया संस्थान नवीन औषधि विकास हेतु प्रयोगशाला जन्तु प्रजनन और प्रयोगों के लिये संदर्भित केन्द्र का कार्य करेगा।

'इन वीवो' इमेजिंग एण्ड एनालिसिस पर कार्यशाला

सीएसआईआर-एनडब्लूपी परियोजना 'UNDO' (BSC0103) के अंतर्गत *'इन वीवो'* इमेंजिंग एण्ड एनालिसिस पर एक तीन दिवसीय कार्यशाला सह प्रशिक्षण कार्यक्रम का आयोजन 8-10 अप्रैल 2015 को सीएसआईआर-सीडीआरआई में किया गया। विभिन्न प्रभागों के पीएचडी छात्रों ने इस प्रशिक्षण कार्यक्रम में भाग लिया और इस ऐडवान्स तकनीक के बेसिक और प्रैक्टिल प्रयोग सीखे।

फ्लो साइटोमीट्री में सीएसआईआर-सीडीआरआई बीसी सेन्टर ऑफ एक्सेलेन्सः फ्लो साइटोमीट्री आधारित मल्टीकलर इम्यूनोफेनोटाइपिंग, सेल साइकल एनालिसिज़ और एपॉपटॉसिस आमापन कार्यशाला

सीएसआईआर-सीडीआरआई - बेकमैन कोल्टर सेन्टर ऑफ एक्सेलेन्स इन फ्लो साइटोमीट्री के तत्वाधान में परजीवी विज्ञान प्रभाग में 21-23 अप्रैल, 2015 को एक कार्यशाला-सह-व्यवहारिक अनुभव का आयोजन किया गया। बेकमैन कोल्टर फ्लो साइटोमीटर FC500 में वर्कशॉप मॉड्यूल को तीन दिवसीय व्याख्यान एवं व्यवहारिक प्रयोग सत्रों में विभाजित किया गया। तीन दिवसीय कार्यशाला में फ्लो साइटोमीट्री का प्रयोग करके एपॉप्टॉसिस और सेल साइकल एनालिसिज़ से संबंधित विषय सम्मिलित किये गए। सीएसआईआर- सीडीआरआई के विभिन्न प्रभागों में 12 छात्रों ने फ्लो साइटोमीट्री की मूल बातें जैसे इन्स्ट्रूमेन्ट सेटअप, कैलिब्रेशन, सैम्पल तैयार करना, डेटा विश्लेषण आदि सीखा। कार्यशाला का आयोजन संयुक्त रूप से डॉ रितेश कुमार ऐप्लिकेशन स्पेशलिस्ट और श्रीमती साक्षी पॉल-प्रॉडक्ट एण्ड ऐप्लिकेशन मैनेजर (दोनों बीसी इन्डिया प्रा. लि.) तथा डॉ मधु दीक्षित, डॉ शैलजा भट्टाचार्य, डॉ अनुराधा दुबे, डॉ अनिल गायकवाड़ और डॉ मृगांक श्रीवास्तव (सभी सीएसआईआर- सीडीआरआई) द्वारा किया गया। कार्यशाला के अन्तिम दिन सीएसआईआर- सीडीआरआई की निदेशक डॉ मधु दीक्षित द्वारा सभी प्रतिभागियों को प्रशिक्षण को सफलतापूर्वक पूरा करने के लिये प्रमाण पत्रों का वितरण किया गया और अमित राय (डॉ अखिलेश ताम्रकार के छात्र) एवं मधुर सचान (डॉ अमित मिश्रा के छात्र) ने फ्लो साइटोमीट्री क्विज़ प्रतियोगिता में सुंयक्त रूप से प्रथम पुरस्कार प्राप्त किया।

स्वच्छता अभियान एवं श्रमदान कार्यक्रम

स्वच्छता अभियान और श्रमदान कार्यक्रम सीएसआईआर-सीडीआरआई स्टाफ सदस्यों के मध्य स्वच्छता अभियान को प्रोत्साहित कर रहा है। इसके लिये 15 मई, 2015 को सीडीआरआई स्टाफ क्लब ने एक 'श्रमदान' कार्यक्रम का आयोजन किया। डॉ. राम विश्वकर्मा ने वैज्ञानिकों एवं छात्रों को इस कार्य हेतु करते हुए प्रेरित परिसर की स्वच्छता की आवश्यकता और महत्व के विषय में जानकारी दी। कार्यक्रम के दौरान निदेशक महोदय के नेतृत्व में सभी वैज्ञानिकों और छात्रों ने परिसर में श्रमदान के लिये उत्साहपूर्वक भाग लिया।

डॉ (श्रीमती) मधु दीक्षित ने निदेशक का कार्यभार ग्रहण किया

सीएसआईआर-सीडीआरआई में 36 वर्षों की समर्पित अनुसंधान सेवाओं के पश्चात डॉ (श्रीमती) मधु दीक्षित ने संस्थान के नियमित निदेशक का कार्यभार 08 जून 2015 को ग्रहण किया। सीडीआरआई के 64 वर्षों के इतिहास में वह पहली महिला निदेशक है। डॉ दीक्षित को अनेक प्रतिष्ठित सम्मान प्राप्त हैं जिनमें एफएनएएससी, एफएएससी तथा एफएनए जैसी प्रतिष्ठित फेलोशिप भी सम्मिलित है। आपने अन्तर्राष्ट्रीय प्रतिष्ठा के 160 से अधिक शोध पत्र प्रकाशित किये हैं।

पदभार ग्रहण करने के पश्चात डॉ मधु दीक्षित ने संस्थान के समस्त वैज्ञानिकों, प्रशासनिक एवं तकनीकी अधिकारियों एवं शोध छात्रों को संबोधित करते हुए सहभागिता के साथ कार्य करते हुए राष्ट्र सेवा की संस्थान की परंपरा का आगामी दिनों में भी निर्वाह करने का वचन दिया। पूर्व निदेशकों के कार्यकालों में अर्जित उपलब्धियों का जिक्र करते हुए वर्तमान में कार्यरत सभी सदस्यों से संस्थान की इस गौरवशाली परम्परा को भविष्य में भी जारी रखने का अनुरोध किया। डॉ दीक्षित ने स्फूर्ति एवं तत्परता से कार्य करने पर जोर देते हुए कहा कि राष्ट्र ने हमारे संस्थान को जो मेण्डेट रूप में जिम्मेदारी सौंपी है उसे पूर्ण करने का हर संभव प्रयास करना है। साथ ही उन्होंने कहा कि वर्तमान में संस्थान में अच्छे वैज्ञानिक एवं अच्छा इन्फ्रास्ट्रक्चर मौजूद है जो हमें अपने सम्मिलित प्रयासों से हमारे मेण्डेट के अनुसार बेसिक एवं एप्लाइड सांइस के निर्धारित लक्ष्यों को हासिल करने में समर्थ बनाता है। संस्थान के समस्त वैज्ञानिकों, अधिकारियों एवं छात्रों ने भी डॉ (श्रीमती) मधु दीक्षित को कुशल नेतृत्व के लिए शुभकामनाएं दी एवं सहयोग के लिये आश्वस्त किया।

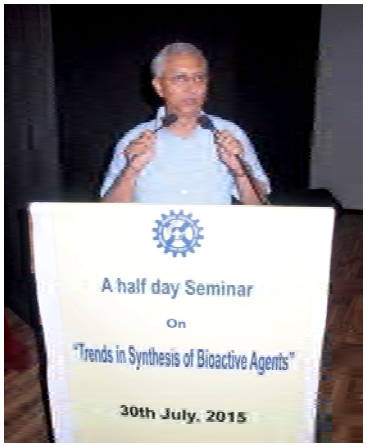
अन्तर्राष्ट्रीय योग दिवस समारोह

21 जून का दिन उत्तरी गोलार्द्ध में वर्ष का सबसे लम्बा दिन होता है और विश्व के अनेक भागों में इसका विशेष महत्व है तथा यह वर्ष का सबसे अधिक ऊर्जावान दिवस माना जाता है अतः संयुक्त राष्ट्र संघ की

महासभा ने भारत के सदियों पुराने योगदान को सम्मानित करने के लिये योग को शारीरिक मानसिक और आध्यात्मिक विषय के रूप में विकसित करने हेतु 11 दिसम्बर, 2014 को निर्णय लिया गया कि 21 जून को अन्तर्राष्ट्रीय योग दिवस के रूप में मनाया जाये। सीएसआईआर-सीडीआरआई ने भी इस अवसर पर सभी स्टाफ क्लब सदस्यों के लिये योग शिविर का आयोजन करके इस दिवस को मनाया। संस्था के प्रशासन नियंत्रक श्री विजय कर ने योग गुरु के रूप में योग सिखाया और और अनेक वैज्ञानिकों तथा शोध छात्रों ने इसमें भाग लिया।

ट्रेन्ड्स इन सिन्थेसिस ऑफ बायोऐक्टिव एजेन्ट्स पर आधे दिन का सेमिनार

औषधीय एवं प्रक्रिया रसायन प्रभाग के प्रभागाध्यक्ष डॉ. बिजोय कुण्डू एवं डॉ एके शॉ के सेवानिवृत्ति के अवसर पर एमपीसी डिवीजन द्वारा 30 जुलाई 2015 को एक अर्ध दिवसीय सेमिनार का आयोजन किया गया। सम्मेलन का प्रारंभ उद्घाटन समारोह से किया गया जहां डॉ मधु दीक्षित ने अतिथियों एवं वक्ताओं का स्वागत किया और डॉ कुन्डू तथा डॉ शॉ द्वारा दिये गए योगदान की चर्चा की। मुख्य अतिथि डॉ नौटियाल ने अपने और डॉ कुन्डू के बीच रिसर्च करियर से अब तक के पारस्परिक संबंधों को याद किया। प्रो. टण्डन ने डॉ कुण्डू के योगदान की चर्चा करते हुए अध्यक्षीय भाषण दिया।



तकनीकी सत्र बीएचयू वाराणसी के प्रो केएन सिंह, आईआईटी कानपुर के डॉ रमेश पनिकर के व्याख्यान से प्रारंभ हुआ। इसके अतिरिक्त सीडीआई लखनऊ के डॉ जीमुत कांति घोष, सीडीआरआई लखनऊ की डॉ नम्रता रस्तोगी और अजमेर राजस्थान की सेन्ट्रल यूनिवर्सिटी के डॉ देवेश सावन्त द्वारा तीन लघु व्याख्यान प्रस्तुत किये गए। इसके पश्चात् अभिनन्द समारोह में डॉ कुन्डू के छात्रों मनीषा, अरुनेन्द्र और देवेश ने अपने अनुभवों को याद किया। सीडीआरआई के नम्रता ओर दीपांकर तथा भू.पू. प्रभागाध्यक्षों के रूप में डॉ भादुड़ी और डॉ सक्सेना ने अपने-अपने संस्मरणों को साझा किया। डॉ. राकेश मौर्या ने एक शॉल भेंट कर डॉ कुन्डू का अभिनन्दन किया और डॉ संजय बत्रा ने उनको स्मृति चिन्ह भेंट किया। इस कार्यक्रम का समापन डॉ संजय बत्रा के धन्यवाद ज्ञापन से हुआ।

सांप्रदायिक एकता दिवस (सद्भावना दिवस) समारोह

संस्थान में सभी धर्मो, भाषाओं और क्षेत्रों के लोगों के मध्य राष्ट्रीय एकता और सांप्रदायिक सद्भावना बढ़ाने के लिये 20 अगस्त 2015 को 'सद्भावना दिवस' मनाया गया। सद्भावना दिवस मनाने का उद्देश्य हिंसा से दूर रह कर सद्भावना को बढ़ाना है। इस अवसर पर सीएसआईआर-सीडीआरआई के सभी कर्मचारियों ने कार्यक्रम में भाग लिया और 'सद्भावना शपथ' ली कि वे जाति, धर्म, क्षेत्रा और भाषा पर ध्यान दिये बगैर भारत के सभी लोगों की भावनात्मक एकता और सौहार्द्र के लिये काम करेंगे।

सीएसआईआर-सीडीआरआई की रिसर्च काउंसिल की 54वीं बैठक

24-25 अगस्त, 2015 को सीएसआईआर-सीडीआरआई की रिसर्च कांउसिल की 54वीं बैठक का आयोजन किया गया। बैठक में बडी संख्या में वैज्ञानिकों एवं शोध छात्रों ने भाग लिया। सीएसआईआर-सीडीआरआई की निदेशक डॉ मधु दीक्षित ने औपचारिक रूप से रिसर्च काउन्सिल के अध्यक्ष और सदस्यों का स्वागत किया। उन्होंने कहा कि इस प्रमुख संस्थान की निदेशक के रूप में कार्य भार ग्रहण करने के पश्चात यह प्रथम बैठक है। उन्होने आश्वस्त किया कि वह संस्था के औषधि विकास एवं अनुसंधान के अधिदेश पर फोकस करेगी। प्रो एनके गांगुली ने अपने भाषण में डॉ मधु दीक्षित को बधाई दी और आशा प्रकट की कि नई औषधि की खोज एवं विकास में संस्थान अपने दायित्व का निर्वाह करेगा। उन्होंने कहा कि हाल के वर्षों में नई औषधि खोज एवं विकास के लिये दृष्टिकोण

में परिवर्तन आया है। इसके पश्चात रिसर्च काउंसिल की 53वीं बैठक के मिनट्स का अनुमोदन किया गया।

इसके पश्चात निदेशक द्वारा आर एण्ड डी क्रियाकलापों की एक्जीक्यूटिव समरी का प्रस्तुतीकरण किया गया और इस प्रस्तुतीकरण पर चर्चा भी की गई। एरिया कोऑर्डिनेटर्स और नोडल ऑफिसर्स ने अपने कार्य को प्रस्तुत किया और रिसर्च काउंसिल के सदस्यों ने प्रस्तुतीकरण पर अपना फीडबैक उपलब्ध कराया। रिसर्च काउंसिल ने सर्वसम्मति से सभी प्रस्तावों का अनुमोदन किया और तेजी से क्रियान्वयन की सिफारिश की। अन्त में सीडीआरआई के निदेशक ने काउंसिल के अध्यक्ष और सदस्यों को उनके मूल्यवान सुझावों हेतु धन्यवाद दिया। उन्होंने समिति के सदस्यों को आश्वस्त किया कि उनके सुझावों पर आधारित उचित कार्यवाही शीघ्र प्रारंभ की जायेगी।

फ्लो साइटोमीट्री में सीएसआईआर-सीडीआरआई बीसी सेन्टर ऑफ़ एक्सेलेन्स :फ्लो साइटोमीट्री आधारित मल्टीकलर, इम्यूनोफ़ेनोटाइपिंग, सेल साइकल एनालिसिज़ और एपॉप्टॉसिस आमापन कार्यशाला

सीएसआईआर-सीडीआरआई- बेकमैन कोल्टर सेन्टर ऑफ एक्सेलेन्स इन फ्लो साइटोमीट्री के तत्वाधान में परजीवी विज्ञान प्रभाग में 2-4 सितम्बर, 2015 को एक कार्यशाला सह-व्यवहारिक प्रशिक्षण का आयोजन किया गया बेकमैन कोल्टर फ्लो साइटोमीटर FC 500 पर वर्कशॉप मॉड्यूल को चार दिवसीय व्याख्यान और व्यवहारिक प्रशिक्षण सत्रों में विभाजित किया गया। तीन दिवसीय कार्यशाला के लिये कुल 12 छात्रों को सूचीबद्ध किया गया जिसमें इन्स्ट्रूमेन्ट सेट अप और QC जिसमें डिजाइनिंग और कम्पेनसेशन कन्ट्रोल्स, मल्टीकलर इम्यूनो फेनोटाइपिंग और फ्लो साइटोमीट्री द्वारा एपॉप्टॉसिस/ नेक्रोसिस का मूल्यांकन हेतु विश्लेषण और ऐनेक्ज़िन V-PI आमापन सम्मिलित है। कार्यशाला का आयोजन संयुक्त रूप से डॉ. अमिताव मोहन्ती-मैनेजर मार्केटिंग, श्री चन्द्रा जुव्वा-ऐप्लिकेशन स्पेशलिस्ट श्री चन्द्र मोहन गुप्ता और दयानन्द तिवारी- एरिया सेल्स मैनेजर (सभी बीसी इण्डिया प्रा लि) और डॉ मधु दीक्षित, डॉ शैलजा भट्टाचार्य, डॉ अनुराधा दुबे, डॉ अनिल गायकवाड़ और डॉ मृगांक श्रीवास्तव (सभी सीएसआईआर-सीडीआरआई) कार्यशाला के अन्तिम दिन प्रशिक्षण को सफलतापूर्वक पूरा करने के लिये सभी प्रतिभागियों को मुख्य वैज्ञानिक तथा परजीवी विज्ञान प्रभाग की प्रभागाध्यक्ष डॉ शैलजा भट्टाचार्य एवं परजीवी विज्ञान प्रभाग की मुख्य वैज्ञानिक डॉ अनुराधा दुबे की छात्रा स्नेहा रत्नप्रिया और डॉ के के श्रीवास्तव के छात्रा आलोक मिश्रा ने फ्लो साइटोमीट्री क्विज़ कम्पटीशन में संयुक्त रूप से प्रथम पुरस्कार प्राप्त किया।

छोटे मॉलीक्यूल्स के लिये में व्यवहारिक प्रशिक्षण कार्यशालाः सिद्धान्त एवं प्रयोग

सैफ़ प्रभाग सीडीआरआई ने 10-11 सितम्बर, 2015 को छोटे मॉलीक्यूल्स के लिये एनएमआर में दो दिन की व्यवहारिक प्रशिक्षण कार्यशाला का आयोजन किया। कार्यशाला का उद्देश्य प्रतिभागियों को

एनएमआर इन्स्ट्रमेन्टेशन का मूल बातों की और उसके प्रयोग के सम्यक ज्ञान का प्रशिक्षण प्रदान करना प्रतिभागियों को उपयोगी हुनर और अनुभव प्रदान किया गया जो वह अपनी प्रयोगशाला में उपयोग करेगें। कार्यशाला में ऑर्गेनिक सिंथिसिज़ में सम्मिलित 16 शोध छात्रों को ही प्रशिक्षण प्रदान किया गया। प्रतिभागियों ने तकनीक की गहन जटिलताओं को भी सीखा।

चिकित्सा अधिकारियों का स्टडी टुअर

स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के अंतर्गत एक स्वायत्तशासी संस्थान, नेशनल इन्स्टीट्यूट ऑफ हेल्थ एण्ड फैमिली वेलफेयर, नई दिल्ली के छः एम डी छात्रों और दो शिक्षकों के दल ने 7 सितम्बर 2015 को संस्थान का भ्रमण किया। स्टडी टुअर का मुख्य उद्देश्य संस्थान की कार्यप्रणाली और

स्वास्थ्य तथा परिवार कल्याण में सीडीआरआई की भूमिका को समझना था। प्रतिनिधियों ने विभिन्न प्रभागों के वैज्ञानिकों से बातचीत की और संस्थान की प्रमुख सुविधाओं को देखा।

हिन्दी पखवाड़ा

सीएसआईआर-सीडीआरआई ने 14-28 सितम्बर 2016 को हिन्दी पखवाड़ा मनाया। पंद्रह दिनों तक चलने वाले समारोह का उद्देश्य सरकारी काम काज में हिन्दी के प्रयोग के प्रति जागरूकता उत्पन्न करना था। उद्घाटन कार्यक्रम के दौरान सीएसआईआर-सीडीआरआई की निदेशक डॉ मधु दीक्षित और प्रो. सूर्य प्रसाद दीक्षित ने स्टाफ सदस्यों को संबोधित किया। एक पखवाड़े तक मनाए जाने वाले समारोह में छात्रों सहित सभी स्टाफ सदस्यों के लिये सीडीआरआई में निबन्ध प्रतियोगिता, हिन्दी अनुवाद, हिन्दी वाद विवाद, हिन्दी लेखन और हिन्दी आशुलिपि, राजभाषा प्रश्नोत्तरी और हिन्दी काव्य पाठ प्रतियोगिता का भी आयोजन किया गया। हिन्दी पखवाड़ा के समापन के दिन, श्री विनोद चन्द्र पाण्डे ने श्रोताओं को संबोधित किया और विभिन्न प्रतियोगिताओं के विजेताओं को पुरस्कृत किया।

कौशल विकास कार्यक्रम

सीएसआईआर-सीडीआरआई ने 5-9 अक्टूबर 2015 को सीएसआईआर- एचआरडीसी, गाज़ियाबाद के सहयोग से प्रशासनिक स्टाफ सदस्यों के लिये एक चार दिवसीय कौशल विकास कार्यक्रम का आयोजन किया। संस्थान से बहुत से प्रतिभागियों ने इस कार्यक्रम में भाग लिया और कार्यस्थल पर कार्य निष्पादन और कार्य कुशलता में सुधार लाने हेतु अपनाई जाने वाली कार्य प्रणाली की जानकारी प्राप्त की।

सीएसआईआर का 73वां स्थापना दिवस

टीम सीएसआईआर लखनऊ (सीडीआरआई, सीमैप, आईआईटीआर एवं एनबीआरआई ने संयुक्त रूप से सीएसआईआर का 73वाँ स्थापना दिवस 26 सितम्बर, 2015 को सीएसआईआर-सीडीआरआई के जानकीपुरम परिसर में धूमधाम से मनाया। निदेशक, सीएसआईआर-सीडीआरआई डॉ मधु दीक्षित ने अतिथियों का स्वागत किया। सीएसआईआर-एनबीआरआई के निदेशक डॉ सीएस नौटियाल ने मुख्य अतिथि का संक्षिप्त परिचय दिया।

नेशनल इन्स्टीट्यूट ऑफ प्लांट जीनोम रिसर्च, नई दिल्ली के प्रोफेसर अखिलेश कुमार त्यागी कार्यक्रम के मुख्य अतिथि थे। उन्होंने इस अवसर पर "राइस जीनोम : ऑरेजिन, डोमिस्टीकेशन एण्ड फंक्शन्स" विषय पर स्थापना दिवस व्याख्यान प्रस्तुत किया। अपने व्याख्यान में उन्होंने भविष्य में राइस जीनोम के महत्व पर प्रकाश डाला। इस अवसर पर सीएसआईआर-सीडीआरआई के पूर्व निदेशक डॉ बीएन धवन ने अध्यक्षीय संबोधन देकर कार्यक्रम की गरिमा बढ़ाई। सुबह के कार्यक्रम का समापन सीएसआईआर-आईआईटीआर के निदेशक डॉ आलोक धवन के धन्यवाद प्रस्ताव से हुआ।

कार्यक्रम के द्वितीय सत्र में अपरान्ह, एक्सीलेन्स इन ड्रग रिसर्च के लिए सीएसआईआर-सीडीआरआई अवार्ड-2015, प्रदान किए गए तथा विजेताओं ने पुरूस्कार व्याख्यान प्रस्तुत किए। बायोलोजिकल साइंस का यह पुरूस्कार आईआईटी, मुंबई की डॉ रिन्टी बनर्जी को दिया गया उन्होंने अपना व्याख्यान "ट्रिगर रिस्पांसिव नेनोपार्टिकल्स फॉर ड्रग डिलेवरी" पर प्रस्तुत किया। केमिकल साइंस का यह पुरस्कार मायलन लेबोरेट्री मेंदक के डॉ रामकोटेश्वर राव जेट्टी को दिया गया उन्होंने अपने व्याख्यान "नोवेल सॉलिड फार्म्स ऑफ एक्टिव फार्मास्यूटिकल इन्ग्रेडिएन्ट्स" पर प्रस्तुत किया।

तत्पश्चात संस्थान में 25 वर्ष पूर्व कर चुके सहकर्मियों को सम्मानित किया गया। सीएसआईआर कर्मचारियों के मेधावी छात्रों को पुरस्कृत किया गया तथा समारोह के दौरान आयोजित विभिन्न प्रतियोगिताओं के विजेताओं को भी पुरस्कृत किया गया।

कार्यक्रम के अंत में प्रोफेसर अखिलेश त्यागी एवं अन्य मंचासीन अतिथियों ने सीएसआईआर-सीडीआरआई के समाचार पत्र

खण्ड 7 अंक 1 का विमोचन किया। कार्यक्रम का समापन श्री विनय त्रिपाठी के धन्यवाद प्रस्ताव से हुआ।

इंडियन फार्माकोलॉजिकल सोसायटी की लखनऊ शाखा द्वारा अर्द्ध दिवसीय संगोष्ठी

सीएसआईआर-केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में इंडियन फार्माकोलॉजिकल सोसायटी की लखनऊ शाखा एवं फार्माकोलॉजी

विभाग, सीडीआरआई द्वारा 7 अक्टूबर 2015 को एक अर्द्ध दिवसीय संगोष्ठी आयोजन किया गया। समारोह की अध्यक्षता माननीय कुलपति किंग जार्ज मेडिकल विश्वविद्यालय, प्रोफेसर रविकांत जी ने की। इंडियन फार्माकोलॉजी लखनऊ शाखा के अध्यक्ष एवं विभागाध्यक्ष, फार्माकोलॉजी विभाग, सीडीआरआई, डॉ राकेश शुक्ला ने इस अवसर पर अतिथि व्याख्याता प्रसिद्ध विज्ञानी प्रोफेसर अनिल गुलाटी का परिचय श्रोतागणों से कराया। प्रोफेसर गुलाटी वर्तमान में मिडवेस्टर्न विश्वविद्यालय, शिकागो, अमेरिका में डीन के पद पर कार्यरत हैं। व्याख्यान का विषय अंडरस्टेंडिंग न्यूरोजेनेसिस इन द एडल्ट ब्रेन, था। प्रो गुलाटी ने अपने व्याख्यान में बताया कि इंडोथीलियल बी रिसेप्टर पर कार्य करने वाली औषधि आईआरएल-620 मस्तिष्क आघात एवं अल्जाईमर में चूहों पर किए गए प्रयोग में कारगर पाई गई।

इस अवसर पर इंडियन फार्माकोलॉजिकल सोसायटी लखनऊ शाखा ने अपने आजीवन सदस्य प्रोफेसर आलोक धवन को सीएसआईआर-आईआईटीआर के निदेशक का पदभार ग्रहण करने हेतु सम्मानित किया। विभिन्न विख्यात संस्थानों के छात्रों, वैज्ञानिकों और शिक्षकों की उपस्थिति कार्यक्रम के दौरान रही। इंडियन फार्माकोलॉजी लखनऊ शाखा के सचिव डॉ अनिल गायकवाड़ ने धन्यवाद प्रस्ताव प्रस्तुत किया।

राष्ट्रीय एकता दिवस

30 अक्टूबर 2015 को सरदार वल्लभ भाई पटेल की जन्मतिथि पर एक कार्यक्रम में सीएसआईआर-सीडीआरआई की निदेशक डॉ मधु दीक्षित ने सीएसआईआर-सीडीआरआई के स्टाफ के सदस्यों को राष्ट्रीय एकता दिवस की शपथ दिलवाई। शपथ के पश्चात् उन्होंने सभी स्टाफ सदस्यों से समाज के बीच एकता को बढ़ाने के लिये बिना किसी भेदभाव के एक टीम के रूप में कार्य करने के लिये प्रेरित किया।

सतर्कता सप्ताह का आयोजन

सीएसआईआर-सीडीआरआई में 26-31 अक्टूबर, 2015 के दौरान सतर्कता सप्ताह का आयोजन किया। कार्यक्रम का शुभारंभ शपथ ग्रहण समारोह के साथ हुआ। अनेक प्रतियोगिताओं जैसे निबंध, वाद-विवाद प्रतियोगिता आदि का आयोजन किया गया। कार्यक्रम के समापन पर मुख्य अतिथि के रूप में श्री एसके रघुवंशी, आईएएस एवं सचिव (गृह, सतर्कता, नागरिक उड्डयन) उ.प्र. सरकार उपस्थित थे। उन्होंने विजेताओं को पुरस्कृत किया तथा प्रिवेन्टिव विजिलेन्स एज ए टूल ऑफ गुड गवर्नेंस पर व्याख्यान प्रस्तुत किया। इस अवसर पर संस्थान की निदेशक डॉ मधु दीक्षित ने व्यक्तिगत तथा व्यवसायिक कर्तव्यों के निर्वाहन में इमानदारी एवं निष्ठापूर्वक कार्य करने पर जोर दिया। प्रशासनिक अधिकारी श्री विजय कर के धन्यवाद प्रस्ताव के साथ कार्यक्रम संपन्न हुआ।

एपीआई मास स्पेक्ट्रोमीट्री और एनएमआर स्पेक्ट्रोस्कोपी द्वारा छोटे अणु विश्लेषण पर राष्ट्रीय कार्यशाला

सैफ़ सीएसआईआर-सीडीआरआई ने 2-3 नवम्बर, 2015 को एपीआई मास स्पेट्रोमीट्री और एनएमआर स्पेक्ट्रोमीट्री द्वारा स्मॉल कॉलीक्यूल एनालिसिस पर राष्ट्रीय कार्यशाला का आयोजन किया। कार्यशाला ने केमिकल साईसेज़ के क्षेत्रों में दिग्गज शोध वैज्ञानिकों, विद्वानों और नए शोधकर्ताओं के मध्य अपने ज्ञान को साझा करने के लिये अत्याधुनिक एलसी-एमएस, एलसी, एमएस के एमएस और एनएमआर तकनीक का अनुभव प्राप्त करने और विचार-विमर्श प्रारंभ करने के लिये एक अवसर प्रदान किया। नई शुरूआत करने वालों को एलसी-एमएस और एनएमआर तकनीक से परिचित होने का अवसर प्राप्त हुआ। साथ ही उनके प्रयोग और डेटा की व्याख्या का

अवलोकन कर आश्वस्त भी हुए। यह वर्कशॉप एलसी-एमआर, एचआरएमएस एमएस/एमएस और एनएमआर तकनीक का प्रयोग करके छोटे अणुओं के स्ट्रक्चर कैरेक्टराइज़ेशन पर केन्द्रित की। देश के विभिन्न भागों से कुल 31 प्रतिभागियों ने कार्यशाला में भाग लिया।

14वाँ डॉ बी मुकर्जी स्मृति व्याख्यान

सीएसआईआर-सीडीआरआई ने 27 नवम्बर 2015 को देश के प्रख्यात फ़ार्मॉकोलॉजिस्ट और सीएसआईआर-सीडीआरआई के प्रथम

भारतीय निदेशक डॉ विष्णुपाद मुकर्जी की स्मृति में सचिन एवं सिक्ता फाउंडेशन बिथेस्डॉ यूएसए द्वारा प्रायोजित डॉ बी मुकर्जी स्मृति व्याख्यान का आयोजन किया। डॉ मुधु दीक्षित ने अतिथियों का स्वागत किया। इस अवसर पर इण्डियन एसोसिएशन फॉर द कल्टीवेशन ऑफ साइंस, कोलकता के निदेशक प्रो. शान्तनु भट्टाचार्य ने ''फंक्शनल जीन डिलीवरी चैलेन्जेज एण्ड प्रॉमिसेज़'' पर स्मृति व्याख्यान प्रस्तुत किया। अतिथि महोदय को एक स्मृति चिन्ह भेंट किया गया। और श्री विनय त्रिपाठी के धन्यवाद प्रस्ताव के साथ कार्यक्रम का समापन हुआ।

प्रयोगशाला जन्तु टेक्नीशियन प्रशिक्षण कार्यशाला

सीएसआईआर-सीडीआरआई द्वारा नेशनल इन्स्टीट्यूट ऑफ़ ऐनिमल वेल फ़ेयर (पर्यावरण, वन एवं जलवायु परिवर्तन, भारत सरकार) के सहायेग से 7-18 दिसम्बर, 2015 को प्रयोगशाला जन्तु टैक्नीशियन प्रशिक्षण पाठ्यक्रम का आयोजन किया गया। प्रयोगशाला जन्तु प्रोफ़ेशनल्स,

टैक्नीशियन्स/अटेन्डेन्ट्स को प्रयोग में लाए जाने वाले जन्तुओं की सीपीसीएसईए के दिशा निदेशन के अनुसार मानवाचित देखभाल, प्रजनन और वैज्ञानिक तरीके से कृषि कार्यों और प्रबंधन बेसिक तथा बेसिक ऐनिमल टेक्नीक्स का व्यवहारिक प्रशिक्षण दिया गया। समापन समारोह में सीएसआईआर-सीडीआरआई की निदेशक की उपस्थिति में मुख्य अतिथि द्वारा प्रमाण पत्र दिये गए।

नाइपर, रायबरेली का तृतीय दीक्षान्त समारोह

नाइपर, रायबरेली का तृतीय दीक्षान्त समारोह 11 दिसम्बर, 2015 को आयोजित किया गया। इन्स्टीट्यूट ऑफ़ केमिकल टेक्नोलॉजी, मुम्बई के पूर्व निदेशक, पद्म भूषण, प्रो. एमएम शर्मा मुख्य अतिथि ने तथा औषधि निर्माण विभाग, रसायन एवं उर्वरक मंत्रालय, भारत सरकार के सचिव डॉ वीके सुब्बुराज आईएएस ने कार्यक्रम की अध्यक्षता की। कार्यक्रम में अन्य अतिथि एवं प्रतिभागियों में सीएसआईआर-सीडीआरआई की निदेशक, नाइपर-रायबरेली के शिक्षकगण, मार्ग-दर्शक संस्थान, सीएसआईआर-सीडीआरआई तथा अन्य शोध संस्थानों के वैज्ञानिक उपस्थित थे। सर्वोच्च स्थान पाने वाले छात्रों को प्रो. एमएम

शर्मा ने स्वर्ण एवं रजत पदक प्रदान किये तथा स्टीयरिंग कमेटी के अध्यक्ष डॉ वीके सुब्बुराज ने एमएस डिग्री प्रदान की। मुख्य अतिथि पद्म विभूषण प्रो. एमएम शर्मा द्वारा दीक्षान्त संबोधन प्रस्तुत किया गया। कार्यक्रम का समापन राष्ट्रगान से हुआ।

सीएसआईआर-सीडीआरआई ने इण्डियन साइंस कॉंग्रेस के 103वें सत्र में सीएसआईआर की टीम के रूप में भाग लिया

इण्डियन साइंस कॉंग्रेस का 103वाँ सत्र का आयोजन उसकी फोकल थीम ''साइंस एण्ड टेक्नोलॉजी फॉर इंडिजिनस डिवेलपमेन्ट इन इण्डिया'' पर 03-07 जनवरी 2016 को मैसूर विश्वविद्यालय, मैसूर में किया गया।

परंपरा के अनुसार भारत के प्रधानमंत्री श्री नरेन्द्र मोदी ने 3 जनवरी 2016 को इण्डियन साइंस कॉंग्रेस'' के 103वें सत्र का उद्घाटन किया। हज़ारों की संख्या में राष्ट्रीय एवं अन्तरराष्ट्रीय प्रतिगियों ने, जिनमें नोबेल पुरस्कार विजेता, प्रख्यात वैज्ञानिक, उद्योग प्रतिनिधि, नीति निर्धारक एवं शिक्षाविद सम्मिलित थे, कार्यक्रम में भाग लिया। इण्डिया एक्सपो के एक प्रतिभागी के रूप में भारत सरकार के स्वस्थ भारत मिशन के अंतर्गत सीएसआईआर ने विभिन्न प्रौद्योगिकियों को प्रदर्शित किया जिनमें सीएसआईआर-सीडीआरआई औषधियों (सहेली कॉन्ट्रासेप्टिव पिल, कीनमाइंड मेमोरी एनहान्सर, ईमॅल एवं लैरिथर-मलेरिया रोधी) तथा संस्थान के अन्य शक्तिशाली लीड मॉलीक्यूल्स सहित अनुसंधान एवं विकास क्रियाकलापों के साथ विशेष रूप से प्रदर्शित किया गया। बड़ी संख्या में छात्रों एवं अन्य आगंतुकों ने सीएसआईआर पैविलियन का भ्रमण किया और वैज्ञानिकों से बातचीत की।

सीएसआईआर-सीडीआरआई रिसर्च काउन्सिल की 55वीं बैठक

4-5 जनवरी 2016 को सीएसआईआर-सीडीआरआई रिसर्च काउंसिल की 55वीं बैठक का आयोजन किया गया। संस्थान के वैज्ञानिकों ने बैठक में सक्रिय भागीदारी की। संस्थान की निदेशक डॉ मधु दीक्षित ने रिसर्च काउंसिल के अध्यक्ष एवं सदस्यों का औपचारिक स्वागत किया।

अपने उद्घाटन भाषण में प्रो. एनके गाँगुली ने कहा कि हाल के वर्षों में नवीन औषधि खोज एवं विकास में बहुत परिवर्तन आ गया है अतः हमको स्वयं को अद्यतन (अपडेटेड) रखना होगा। इसके पश्चात् रिसर्च काउंसिल की 54वीं बैठक के कार्यवृन्त का अनुमोदन किया गया। इसके पश्चात निदेशक महोदया ने अनुसंधान एवं विकास क्रियाकलापों की एक्जीक्यूटिव समरी प्रस्तुत की और इस प्रस्तुतीकरण पर चर्चा की गई। एरिया कोऑर्डिनेटर और नोडल ऑफिसर्स ने अपने कार्य का प्रस्तुतीकरण किया और रिसर्च काउंसिल सदस्यों ने प्रस्तुतीकरण की प्रतिपुष्टि की। रिसर्च काउंसिल ने सभी प्रस्तावों का सर्वसम्मति से अनुमोदन किया और द्रुतगति से कार्यान्वयन की संस्तुति की। अन्त में सीडीआरआई की निदेशक ने अध्यक्ष एवं काउंसिल के सदस्यों को उनके मूल्यवान योगदान के लिये धन्यवाद दिया। उन्होंने सदस्यों को आश्वासन दिया कि उनके सुझावों के आधार पर उचित कार्रवाई प्रारंभ की जाएगी।

रिन्यूइंग द ट्रेडिशन ऑफ नैचुरल प्रोडक्ट रिसर्च इन इंडिया विषय पर तीन दिवसीय ब्रेन स्टोर्मिंग मीटिंग

सीइसआईआर-सीडीआरआई लखनऊ, भारत में प्राकृतिक उत्पादों पर अनुसन्धान की परंपरा को पुनः स्थापित करने के उद्देश्य से विज्ञान एवं प्रोद्योगिकी विभाग के सहयोग से संस्थान में रिन्यूइंग द ट्रेडिशन ऑफ नैचुरल प्रोडक्ट रिसर्च इन इंडिया विषय पर तीन दिवसीय ब्रेन स्टोर्मिंग मीटिंग का आयोजन 21-23 जनवरी 2016 को किया गया। निदेशक डॉ मधु दीक्षित ने अतिथियों का स्वागत करते हुए कहा की यह तीन दिवसीय

सम्मलेन एक ऐतिहासिक चिन्ह छोड़ेगा और भारत में प्राकृतिक उत्पाद अनुसन्धान के लिए नई प्रेरणा प्रदान करेगा जो मानवता के कल्याण के लिए किये जा रहे हैं। उन्होंने आगे उल्लेख किया की भारत प्राकृतिक संसाधनों की चिकित्स्कीय क्षमता के प्रति सदैव से जागरूक रहा है और मनुष्य के उपचार के लिए वनस्पतियों का उपयोग आयर्वेद का मुख्य आधार रहा है। एसइआरबी के पूर्व सचिव डॉ टीके चंद्रशेखर ने भारत में प्राकृतिक उत्पाद अनुसन्धान की परंपरा का नवीनीकरण करने की आवश्यकता और वर्तमान परिदृश्य में उसके महत्त्व पर चर्चा की।

अपने उद्घाटन भाषण में जो 'नेचुरल प्रोडक्ट्स, ऑर्गेनिक सिन्थिसिज़ एण्ड ड्रग डिस्कवरी सिम्बायोसिस फॉर बेटर ह्यूमन वेल बीइंग' पर प्रस्तुत किया गया, पद्मश्री प्रोफ गोवर्धन मेहता ने कहा की मानवता के कल्याण के लिए आगे कुछ भी हम करना चाहते हैं तो सर्वप्रथम हमें प्रकृति की ओर वापस लौटना होगा। अपने व्याख्यान में उन्होंने उल्लेख किया की रासायनिक संश्लेषण के साधन पूर्ण रूप से अपनी चिकित्स्कीय क्षमता के प्रबंध, विस्तार और नियंत्रण के लिए पूर्ण रूप से तैयार है और हम किस प्रकार रासायनिक संश्लेषण एवं प्राकृतिक उत्पादों के मध्य पूर्ण क्षमता के साथ भविष्य में औषधि विकास के लिए सहक्रियाशीलता को प्रयोग में लाएं, इस पर जोर देने की आवश्यकता है। उद्घाटन सत्र के बाद प्रख्यात औषधीय रसायन शास्त्री डॉ के नागराजन ने अपने व्याख्यान "नई ड्रग डिस्कवरी एण्ड नैचुरल प्रोडक्ट्स" में प्राकृतिक स्रोत से नई औषधि विकास पर चर्चा की।

बाद में लगातार दो दिनों तक देश के कोने-कोने से आये वैज्ञानिकों ने चर्चा में भाग लिया तथा प्राकृतिक उत्पाद अनुसन्धान की नीति पर विचार विमर्श कर प्रतिष्ठित वैज्ञानिकों से मार्गदर्शन लिया। तीन दिनों के विचार मंथन के बाद विषेशज्ञों नें भारत में प्राकृतिक उत्पादों पर अनुसन्धान की परंपरा को पुनः स्थापित करने के लिए पुनर्विचार की आवश्यकता पर जोर दिया।

मास स्पेट्रोमीट्री द्वारा प्रोटीन आईडेन्टीफ़िकेशन पर कार्यशाला

सैफ, सीएसआईआर-सीडीआरआई, लखनऊ ने मास स्पेक्ट्रोमीट्री द्वारा प्रोटीन आइटेन्टिफिकेशन पर एक कार्यशाला का आयोजन 19-21 जनवरी को किया। कार्यशाला का मुख्य उद्देश्य एमएस एनालिसिस एवं एसमएस डॉटा प्रोसेसिंग के लिए सैम्पल तैयार करने की विधि सिखाना था। यह प्रशिक्षण मुख्यतः उन शोध छात्रों के लिए था जो पीएचडी की प्रारंभिक अवस्था में है। लगभग 20 से अधिक शोध छात्रों ने इस विशिष्ट प्रशिक्षण कार्यशाला में भाग लिया।

नेक्सट जेनेरेशन सीक्वेंसिंग पर कार्यशाला

केन्द्रीय औषधि अनुसंधान संस्थान लखनऊ में 27-30 जनवरी, 2016 को डॉ राजेन्द्र सिंह ने नेक्स्ट जेनरेशन सीक्वेंसिंग वर्कशॉप का आयोजन किया। कार्यशाला का मुख्य उद्देश्य लोगों को माडर्न डीएनए और आरएनए सीक्वेंसिग मेथड से परिचित करवाना था। डीएनए सीक्वेसिंग के क्षेत्र में हाल के वर्षों में क्रान्तिकारी परिवर्तन देखे गए, जिनमें और अधिक इन्वेस्टिगेटिव रिसर्च की संभावनाएं हैं। सीडीआरआई ने अत्याधुनिक डीएनए सीक्वेंसिग फैसिलिटी इल्युमिनामिसेक को प्रारंभ किया है। 25 से अधिक छात्रों पर केंद्रित कर वैज्ञानिकों ने संपूर्ण देश से इस कार्यशाला ने भाग लिया।

67वां गणतन्त्र दिवस

सीएसआईआर-केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में 67वां गणतन्त्र दिवस धूमधाम से मनाया गया। इस अवसर पर संस्थान की निदेशक डॉ मधु दीक्षित नें सभी वैज्ञानिकों, छात्रों एवं कर्मचारियों को बधाई देते हुए कहा कि हमारे गणतन्त्र ने वैज्ञानिक, आर्थिक और सामाजिक क्षेत्रों में बहुत प्रगति कर ली है, किन्तु बदलती हुई आकांक्षाओं और आवश्यकताओं के साथ तालमेल बिठाने के लिए हमें अपने प्रयासों को वर्तमान परिस्थितियों के अनुसार परिवर्तित करना है। हम स्वतन्त्रता के तुरन्त पश्चात् स्थापित किये गए वैज्ञानिक संस्थान से की जा रही उम्मीदों से पूरी तरह से अवगत हैं। विज्ञान आर्थिक समृद्धि को आगे ले जाने वाले इंजन के समान है और राष्ट्र हमसे हमारे अनुसंधान कार्यों की दिशा का स्वावलोकन करने और समाज को प्रभावशाली योगदान देने के लिये आवश्यक संशोधन किये जाने की आशा रखता है।

सामाजिक गतिविधियाँ

सीएसआईआर-सीडीआरआई विज्ञान और समाज को अपने योगदान के माध्यम से "समर्थ भारत-सशक्त भारत" के रूप में विकसित करने के लिये एक उत्प्रेरक एजेण्ट के रूप में काम करने के लिये प्रतिबद्ध है। विज्ञान को समाज से जोड़ने के लिये हम मानव संसाधन विकास, स्किल डेवलपमेन्ट और युवाओं में विज्ञान एवं स्वास्थ्य के मुद्दों पर जागरूकता फैलाने के लिये कार्य कर रहे हैं।

"छात्र राष्ट्र के भविष्य है" इसको ध्यान में रखते हुए हम युवाओं को स्वास्थ्य एवं स्वच्छता के विषय में शिक्षित करके समाज में परिवर्तन लाने का प्रयास कर रहे हैं जिससे वे "स्वच्छ भारत-स्वस्थ भारत" मिशन के लिये महत्त्वपूर्ण भूमिका का निर्वाह कर सकें। विज्ञान को समाज से जोड़ने के लिये रिपोर्टिंग अवधि के दौरान छात्रों और शिक्षकों के लिये विभिन्न कार्यक्रमों का आयोजन किया गया जैसे एसीएसआईआर कार्यक्रम के अंतर्गत ग्रामीण क्षेत्रों में सीएसआईआर-800 सोसाइटल प्रॉजेक्ट्स, सीडीआरआई वैज्ञानिकों द्वारा नवोदय विद्यालय और अन्य स्कुल कॉलेजों में पॉपुलर लेक्चर, ग्रामीण क्षेत्रों में स्वास्थ्य जागरूकता कार्यक्रम, ग्रामीण विद्यालयों के लिये आउटरीच कार्यक्रम, छात्रों और शिक्षकों के लिये मोटीवेशन (प्रेरणा) प्रोग्राम, आम आदमी को संस्थान से जोड़ने के लिये जनता के लिये ''ओपन-डे'' (मुक्त दिवस) का आयोजन आदि। इसके अतिरिक्त, विभिन्न शिक्षण संस्थानों और विश्वविद्यालयों में विज्ञान एवं प्रौद्योगिकी की उन्नति के लिये विशेष वैज्ञानिक कार्यक्रमों का आयोजन, जैसे प्रशिक्षण एवं कौशल विकास कार्यक्रम और देश के सभी भागों से आए हुए लाभार्थियों को बायोलॉजिकल ऐक्टिविटी स्क्रीनिंग में तकनीकी सहयोग सम्मिलित है। इससे उन शोधकर्ताओं को सहायता मिलती है जिनके पास ऐसी सुविधाएं नहीं है परिणामस्वरूप इससे देश के वैज्ञानिक परिदृश्य को सुधारने में सहायता मिलती है।

संस्थान का भ्रमण और युवाओं द्वारा वैज्ञानिकों से आमने-सामने वार्तालाप उनके-ध्येय को उच्च सफलता दिलाने में सहायक है। संस्थान की उपलब्धियाँ और वातावरण उनको विज्ञान की शिक्षा के लिये प्रेरित करता है। इससे युवाओं को मेडिकल एवं इंजीनियरिंग के अतिरिक्त दूसरे विकल्प के रूप में विज्ञान को एक कैरियर (आजीविका) के रूप में अपनाने के लिये भविष्य के विज़न के रूप में देखने का अवसर प्राप्त होता है।

प्रतिष्ठित अतिथि

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एमेरिटस प्रोफेसर ऑफ एमिनेन्स, आईसीटी मुम्बई
द्वारा प्रोसेस केमेस्ट्री पीसी (आर एण्ड डी) पर व्याख्यान 10.12.2015

अन्य अतिथि

	अतिथि	व्याख्यान का शीर्षक	दिनांक
	डॉ नितिश गुप्ता, डिपार्टमेंट ऑफ पैरासिटोलॉजी, हम्बोल्ट यूनिवर्सिटी, बर्लिन	ए लेथल इन्टिमेसी-मेटाबोलिक बेसिस ऑफ पैरासाइट-होस्ट इन्टरप्ले एण्ड इन्फिडेलिटी	18.02.2015
	डॉ विवेक राग्नेकर, प्रोफेसर ऑफ रेडिएशन मेडिसिन, असोसिएट डॉयरेक्टर, मार्के कैंसर सेंटर, यूनिवर्सिटी ऑफ केंटुकी, यूएसए	स्पेशल कैंसर बायलॉजी सेमिनार ऑन एम्पॉवरिंग नॉर्मल सेल अगेंस्ट कैंसर	02.03.2015
	श्री अमिताभ श्रीवास्तव, सीईओ, सीएसआईआर-टेक प्रा. लि. (सीटीपीएल)	इन्टरेक्टिव सेशन ऑन कैटेलाइजिंग लैब टू मार्केट जर्नीज़	15.04.2014
	प्रोफ. जीएन पाण्डे, डॉयरेक्टर एमडीएसआर, डिपार्टमेंट ऑफ सायकियट्री, यूनिवर्सिटी ऑफ इलिनॉइस, शिकागो	इम्यूनिटी डिप्रेशन एण्ड सुसाइडः ए सर्च फॉर बायोमार्कर्स	01.05.2015
	डॉ सीता नाइक, रिटा. प्रोफेसर एण्ड हेड, डिपार्टमेंट ऑफ इम्यूनोलॉजी, एसजीपीजीआई, लखनऊ	साइन्स एज्युकेशनः रियलिटीज़ एण्ड चैलेन्जेज़	01.05.2015
	प्रोफे. नदेश पलनियार, प्रोफेसर, डिपार्टमेंट ऑफ लेबोरेटरी मेडिसिन एण्ड पेथोलॉजी, यूनिवर्सिटी ऑफ टोरण्टो, कनाडॉ	मिसिंग लिंक्स इन न्यूट्रोफिल एक्सट्रासेल्युलर ट्रैप फोर्मेशन (नेटोसिस) पाथवेज़ः आइडेन्टिफाइंग ड्रग टार्गेट्स	06.05.2015

	अतिथि	व्याख्यान का शीर्षक	दिनांक
	डॉ फरीद अहमद लुडविग मैक्सीमिलियंस यूनिवर्सिटी, जर्मनी	ड्रग्स फॉर द ट्रीटमेन्ट ऑफ ऐक्यूट मायलॉइड ल्यूकीमियाः *इन विट्रो* स्टडीज़ रैशनल कॉम्बीनेशन ऑफ एक्सपेरीमेन्टल	23.07.2015
	डॉ संजय वी मल्होत्रा एसोसिएट प्रोफेसर, स्टैनफर्ड स्कूल ऑफ मेडिसिन, स्टैनफर्ड यूनिवर्सिटी, यूएसए	डिज़ाइनिंग ड्रग्स अगेन्स्ट प्रोटीन्स-प्रोटीन्स इन्टरैक्शन्स एण्ड ड्रग रेज़िस्टेन्स	27.07.2015
	प्रोफ. विरिन्दर एस. परमार, प्रोफ. ऑफ ऑर्गैनिक केमिस्ट्री एवं हेड दिल्ली विश्वविद्यालय	बायोकैटलिटिक सिंथिसिज ऑफ नॉवेल पालीमेरिक ऐडवान्स्ड मटीरियल्स फॉर एप्लिकेशन्स इन हेल्थ एण्ड इन्डस्ट्रियल सेक्टर्स	03.08.2015
	डॉ प्रकाश चन्द भूतपूर्व वैज्ञानिक, निस्केयर, नई दिल्ली	इण्डियन साइटेशन इन्डेक्स, आईसीआई	07.08.2015
	डॉ राजीव के त्यागी बायोमेडिकल पैरासिटोलॉजी यूनिट इन्स्टीट्यूट पाश्चर पेरिस फ्रांस	*प्लाज्मोडियम फाल्सीपेरम* इन्फैक्टेड माउस-ह्यूमन किमेरा(ज़): मोर देन ए टूअर दे फोर्स	09.09.2015
	डॉ. सुशील कुमार डीन एवं प्रोफेसर, सेन्टर फॉर बिजनेस सस्टैनेबिलिटी, इंडिया इन्टीट्यूट ऑफ मैनेजमेण्ट, लखनऊ	लीडरशिप इन लार्ज साइंटिफिक आर्गेनाइजेशन	16.09.2015
	प्रोफेसर अनिल गुलाटी, असोसिएट डीन मिडवेस्टर्न यूनिवर्सिटी ऑफ शिकागो, यूएसए	अन्डरस्टेन्डिंग न्यूरोजेनेसिस इन द एडल्ट ब्रेन	07.10.2015
	डॉ डीटर ब्रोमे, प्रोफेसर एण्ड कनाडॉ रिसर्च चेयर, यूनिवर्सिटी ऑफ ब्रिटिश कोलंबिया, कनाडॉ	एक्टोस्टेरिक इन्हिबिटर्स ऑफ केथेप्सिन के एज़ एण्टिरिज़ोर्प्टिव ड्रग्स	23.10.2015
	डॉ श्रीधर सिवासुब्बू, सीएसआईआर-आईजीआईबी नई दिल्ली	नॉन-कार्डिंग आरएनए बेस्ड रेगुलेशन ऑफ वेस्कुलर डेवेलपमेंट इन ज़ेब्राफिश	05.11.2015

	प्रोफेसर साब्यसाची सिन्हा, इन्डियन इंस्टिट्यूट ऑफ मेनेजमेंट, लखनऊ	डेवलपिंग साइंटिस्ट एन्टरप्रेन्योर	20.11.2015
	डॉ प्रतिमा श्रीवास्तव, असोसिएट डॉयरेक्टर, बायलॉजी डिस्कवरी एण्ड सर्विसेज, जीवीके बायो, हैदराबाद	रोडमेप्स ऑफ सक्सेस इन नोवेल ड्रग डिस्कवरी एण्ड डेवलपमेन्ट	24.11.2015
	डॉ जेएस यादव, जेसी बोस फेलो, पूर्व निदेशक, सीएसआईआर-आईआईसीटी, हैदराबाद	नेवेल सिंथेटिक रुट्स टू नेचुरल प्रोडक्ट्स	26.11.2015
	डॉ सुरेश वर्मा सेन्टर ऑफ ट्रांसलेशनल रिसर्च, टेम्पल यूनिवर्सिटी, यूएसए	एण्टि-इन्फलेमेटरी एप्रोच फॉर ट्रीटमेंट ऑफ कार्डियक हायपरट्रोफी एण्ड हार्ट फेल्योर	07.12.2015
	प्रोफे. राज छाबरा, डिपार्टमेंट ऑफ केमिकल इंजिनियरिंग, आईआईटी, कानपुर	नेचर ऑफ रिसर्च एण्ड स्किल्स रिक्वार्ड	17.12.2015
	डॉ एसपीएस खनूजा, पूर्व निदेशक, सीएसआईआर-सीमैप, लखनऊ	बायो एन्टरप्रेन्योरशिप अप्पॉर्चुनिटीज़ थ्रू नेचुरल प्रोडक्ट आर एण्ड डी लीड्स	19.01.2016
	डॉ सुकान्त खुराना, आइआईएसईआर, कोलकाता	ड्रग डिस्कवरी फॉर न्यूरोनल डिस्ओर्डर्स, यूजिंग नेचुरल प्रोडक्ट्स एज ए स्टार्टिन्ग पॉइंट	04.02.2016

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2.	प्राणवीर सिंह इंस्टीट्यूट ऑफ टेक्नोलॉजी, कानपुर	40	16.04.2015
3.	अवध इंटरनेशनल स्कूल, फैजाबाद	45	21.08.2015
4.	नेशनल इंस्टीट्यूट ऑफ हेल्थ एण्ड फेमिली वेलफेयर, नई दिल्ली	07	07.09.2015
5.	कॉल्विन ताल्लुकदार्स कॉलेज, लखनऊ	25	29.09.2015
6.	एयर फोर्स स्कूल, बमरौली, इलाहाबाद	25	09.11.2015
7.	रामा हास्पिटल, कॉलेज एण्ड रिसर्च सेंटर, कानपुर	40	19.11.2015
8.	उत्तर प्रदेश एवं उत्तराखण्ड के 20 जवाहर नवोदय विद्यालय	120	24.11.2015
9.	जगन्नाथ किशोर कॉलेज, पुरुलिया, पश्चिम बंगाल	20	23.12.2015
10.	शासकीय दिग्विजय ऑटोनोमस कॉलेज, राजनांदगांव, छत्तीसगढ़	40	07.01.2016

संस्थान के वैज्ञानिकों द्वारा दिये गए व्याख्यान

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डॉ प्रेम एन यादव

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डॉ मनीष के चौरसिया

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डॉ सतीश मिश्रा

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डॉ संजीव के शुक्ला

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- टू डॉइमेन्शनल एनएमआर स्पेक्ट्रॉस्कोपी, इसाबेला थोबर्न कॉलेज, लखनऊ 14 नवम्बर, 2015

डॉ राजेन्द्र सिंह

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डॉ नम्रता रस्तोगी

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डॉ राजेश कुमार झा

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- इम्प्लिकेशन्स ऑफ Rho GT Pase सिगनलिंग इन द ओवेरियन पैथोफ़िज़ियोलॉजी, डिपार्टमेन्ट ऑफ़ जूऑलॉजी, बीएचयू, वाराणसी (इन्टरनेशनल सिम्पोज़ियम ऑन रिप्रोडक्टिव बायोलॉजी एण्ड कम्पैरेटिव इन्ड्रोक्राइनोलॉजी ड्यूरिंग 27 फरवरी 2015

डॉ विवेक के भोंसले

- क्लीनिकल ट्रायल्स ऑफ़ न्यू ड्रग्स एण्ड ड्रग डोज़ियर प्रिपरेशन, 9वीं उत्तराखण्ड स्टेट साइंस एण्ड टैक्नोलॉली कॉंग्रेस (USSTC), सेशन ब्लेन्डिंग आयुर्वेद विद माडर्न साइंस एण्ड रिवर्स फ़ार्माकोलॉजी, देहरादून 28 फरवरी 2015
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डॉ श्रीपति राव कुलकर्णी

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- IP इश्यूज़ इन एकेडमिक्स एण्ड रिसर्च, ऐमिटी इन्स्टीट्यूट ऑफ़ बायोटेक्नोलॉजी, लखनऊ 29 अक्टूबर, 2015
- पेटेन्ट्स, कॉपीराइट्स एण्ड रिलेटेड राइट्स वर्कशॉप ऑन इन्टेलेक्युअल प्रॉपर्टी राइट्सः इशूज़ एण्ड चैलेन्जेज़, जॉइन्टली ऑर्गनाइज़्ड बाई इग्नू, लखनऊ एण्ड लखनऊ यूनिवर्सिटी, लखनऊ 21 जुलाई, 2015
- WIPO-IP डे लेक्चरः लेटेस्ट डिवेलपमेन्ट्स इन इन्टेलेक्चुअल प्रॉपर्टी राइट्स, सीएसटी-उप्र, लखनऊ, 26 अप्रैल, 2015
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डॉ प्रेम प्रकाश यादव

- मदर नेचर : एन इंस्पिरेशन टू ड्रग डिस्कवरी रिसर्च, जवाहर नवोदय विद्यालय, पिपरसंड लखनऊ, रीजनल साइंस कांग्रेस-2015 21 नवंबर, 2015
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विदेशों में प्रतिनियुक्तियाँ

वैज्ञानिक का नाम	देश	यात्रा का उद्देश्य (प्रतिनियुक्ति की अवधि)
डॉ एके द्विवेदी	ग्रीस	फेडरेशन ऑफ यूरोपियन न्यूरोसाइन्सेज– फीचर्ड रीज़नल मीटिंग में आमंत्रित (05 से 09 अक्टूबर 2015)
डॉ अमित मिश्रा	इटली	3री इंटेरनेशनल टीबी मीटिंग ऑन इन्हेल्ड थेरेपीज़ फॉर ट्यूबेर्कूलोसिस एंड अदर इन्फेक्शियश डीजीजेज़ में आमंत्रित (14 से 16 अक्टूबर 2015)
डॉ नीना गोयल	जर्मनी	यूरोपियन रिसर्च कंसोर्शियम एनएमट्रिप (न्यू मडिसिन्स फॉर ट्रिप्नोसोमैटिडिक इन्फेक्शन्स) (09 से 11 सितम्बर 2015)की मिडटर्म मीटिंग में आमंत्रित
डॉ संजय बत्रा	यूके	22वें ग्रासमेअर हेट्रोसाइक्लिक सिंपोजियम में भाग लेने हेतु (07 से 11 मई 2015)
डॉ मो. इमरान सिद्दिकी	इटली	वाटर एट द इन्टरफेज बिटवीन बायलॉजी, केमिस्ट्री, फिजिक्स एण्ड मटेरियल साइंस पर कार्यशाला में भाग लेने हेतु (05 से 09 अक्टूबर 2015)
डॉ जियाउर आर गाइन	जर्मनी	जर्मन डायबिटीज सेन्टर के निदेशक, प्रोफे. डॉ माइकल रॉडेन के साथ शोध करने हेतु आमंत्रित (01 नवंबर 2014 से 30 अप्रैल 2015)

विशिष्ट वैज्ञानिक समितियों की सदस्यता

डॉ मधु दीक्षित

सदस्यः 1. काउन्सिल ऑफ इंडियन अकेडमी ऑफ साइंसेज 2. सेक्शनल कमेटी (हेल्थ साइंसेज) इंडियन नेशनल साइंस अकेडमी 3. अकेडमी काउंसिल, जवाहर लाल नेहरू यूनिवर्सिटी नई दिल्ली 4. प्रोग्राम एडवायजरी कमेटी ऑन हेल्थ साइंसेज, एसइआरबी, डीएसटी 5. साइंटिफिक एडवायजरी कमेटी, डीबीटी-आईआईसी पार्टनरशिप प्रोग्राम 6. नेशनल रिसर्च एववायजरी कमेटी मीटिंग ऑफ नेशनल इन्नोवेशन फाउन्डेशन-इंडिया, अहमदाबाद 7. स्टीयरिंग कमेटी ऑफ नायपर्स, डिपार्टमेन्ट ऑफ फार्मास्यूटिकल्स, मिनिस्ट्री ऑफ केमिकल्स एण्ड फर्टिलाइजर्स 8. पीएसी इंडियन काउंसिल ऑफ मेडिकल रिसर्च 9. सीएसआईआर (आर्गेनिक एण्ड मेडिसिनल केमिस्ट्री एण्ड केमिकल टेक्नोलॉजी रिसर्च कमेटी 10. ड्रग टेक्निकल एडवायजरी बोर्ड, डॉयरेक्टोरेट जनरल ऑफ हेल्थ सर्विसेज, डीसीजीआई, इंडिया 11. इंस्टीट्यूट बॉडी ऑफ एसजीपीजीआई, लखनऊ (2015-2019) 12. एक्सपर्ट कमेटी ऑन मलेरिया डॉयग्नॉस्टिक एण्ड कोमोथेरेपी एण्ड प्रोस्पेक्ट्स ऑफ मलेरिया इलिमिनेशन इन द कंट्री 13. एडवायजरी-कम-मॉनिटरिंग कमेटी ऑफ बायोटेक पार्क लखनऊ (2015-17) 14. ऑर्गेनिक केमिकल्स, एल्कोहल्स एण्ड एलाइड प्रॉडक्ट्स सेक्शनल कमेटी, पीसीडी 09, ब्यूरो ऑफ इंडियन स्टेण्डर्ड्स नई दिल्ली 15. एकेडेमी स्टेण्डर्ड कमेटी नाइपर 16. लखनऊ मेनेजमेण्ट असोसिएशन

सदस्य सोयटीजः 1. इंडियन सोसायटी ऑफ फ्री रेडिकल रिसर्च 2. इंटरनेशनल सोसायटी ऑफ हार्ट रिसर्च (इंडियन सेक्शन) 3. इंडियन फार्माकोलॉजिकल सोसायटी 4. सोसायटी ऑफ बायलोजिकल केमिस्ट्स 5. इंडियन अकेडमी ऑफ न्यूरोसाइंसेस, इंडिया 6. यूपी असोसिएशन ऑफ साइंस एण्ड टेक्नोलॉजी 7. नेशनल अकेडमी ऑफ मेडिकल साइंसेज, इंडिया 8. द सायटोमीट्रि सोसायटी ऑफ इंडिया 9. इंडियन सोसायटी फॉर एथरोस्कलेरोसिस रिसर्च 10. पल्मोनरी वैस्कुलर रिसर्च इंस्टिट्यूट, इंडिया

डॉ ऐके द्विवेदी

सदस्यः 1. ड्रग्स पेनल फॉर न्यू ड्रग मेन्युफेक्चरिंग लायसेंस, डॉयरेक्टर ऑफ मेडिकल एण्ड हेल्थ सर्विसेज यूपी, 2. एक्सपर्ट सब-कमेटी फॉर प्रोडक्ट डेवलपमेन्ट ऑफ ड्रग फ्रॉम नेचुरल सोर्सेज इंडियन काउन्सिल ऑफ मेडिकल रिसर्च

ज्वाइंट सेक्रेटरीः इंडियन सोसायटी ऑफ केमिस्टस, लखनऊ

डॉ असीम घटक

सदस्यः 1. अमेरिकन कॉलेज ऑफ क्लीनिकल फार्माकोलॉजी, यूएसए, 2. नेशनल अकादमी ऑफ़ मेडिकल साइंसेज, इण्डिया

फेलोः 1. इण्डियन कॉलेज ऑफ फिजिशियन्स

इलेक्टेड काउन्सलरः एक्सिक्युटिव कमेटी ऑफ साउथ एशियन चैप्टर ऑफ अमेरिकन कॉलेज ऑफ क्लिनिकल फार्माकोलॉजी, मुम्बई

डॉ नैबेद्य चट्टोपाध्याय

सदस्यः एडिटेरियल एडवायजरी बोर्ड, 1. बायोकेमिकल फार्माकोलॉजी, 2. अमेरिकन जर्नल ऑफ फिजियोलॉजी एण्डोक्राइनोलॉजी एण्ड मेटाबोलिज्म 3. अमेरिकन जर्नल ऑफ फिजियोलॉजी सेल फिजियोलॉजी

डॉ अरुण कुमार सिन्हा

सदस्यः 1 साइंटिफिक एडवायजरी कमेटी 2. सेन्टर ऑफ इन्नोवेटिव एण्ड एप्लाइड बायोप्रोसेसिंग मोहाली, पंजाब

डॉ आरपी त्रिपाठी

सदस्यः 1. ज्वाइंट वर्किंग ग्रुप ऑन फ्रेगरेन्स एण्ड फ्लेवर (एमएसएमई मंत्रालय, भारत सरकार) 2. लेब रिसर्च कांसिल, डीआरडीई (डीआरडीओ) ग्वालियर

सदस्य संपादक मंडलः 1. एआरकेआईवीओसी, 2. जर्नल ऑफ ऑर्गेनिक बाइलॉज़िकल केमिस्ट्री

डॉ डीएस उपाध्याय

सदस्यः 1. लाइव स्टॉक फीड, इक्यूपमेन्ट्स एण्ड सिस्टम, सेक्शनल कमेटी, एफएडी, ब्यूरो ऑफ इण्डियन स्टैन्डर्ड, नई दिल्ली, 2. वेटेनरी काउंसिल ऑफ इण्डिया, 3. यूपी स्टेट वेटेनरी कॉन्सिल, लखनऊ 4. सीपीसीएसईए सब-कमेटी फॉर रिहैबिलिटेशन ऑफ लेबोरेटरी एनीमल्स, 5. मैनेजमेन्ट कमेटी ऑफ़ द नेशनल इन्स्टीट्यूट ऑफ ऐनिमल वेलफेयर, मिनिस्ट्री ऑफ एनवॉयरमेन्ट एण्ड फॉरेस्ट, गवर्नमेन्ट ऑफ़ इण्डिया, 6. इंस्टीट्यूशनल एनिमल एथिक्स कमेटीज़ ऑफ, सीएसआईआर-सीमैप, आईआईटीआर, इन्टिग्रल यूनिवर्सिटी, एएच डिपार्टमेन्ट, सरस्वती डेण्टल कॉलेज़ एण्ड यूनिवर्सिटी, ऐमिटी यूनिवर्सिटी, लखनऊ

डॉ एमएन श्रीवास्तव

सदस्यः बोर्ड ऑफ पैनल फॉर पीएससी ऑन आर एण्ड डी ऑफ सेन्ट्रल सेक्टर स्कीम फॉर कन्सर्वेशन डिवेल्पमेन्ट एण्ड सस्टेनेबल मैनेजमेन्ट ऑफ मेडिसिनल प्लांट्स, नेशनल मेडिसिनल प्लांट्स बोर्ड, (आयुष), मिनिस्ट्री ऑफ हेल्थ एण्ड फैमिली वेल्फेयर, गवर्नमेन्ट ऑफ इंडिया

डॉ पीएमएस चौहान

जनरल सेक्रेटरीः इंडियन सोसाइटी ऑफ केमिस्ट्स एण्ड बायलाजिस्ट

सदस्यः एडवायजरी बोर्ड सेन्ट्रल यूनिवर्सिटी गुजरात

डॉ वीएल शर्मा

सदस्यः रिसर्च एण्ड डिवेल्पमेन्ट कमेटी, डिपार्टमेंट ऑफ फार्मेसी, इन्टीग्रल यूनिवर्सिटी, लखनऊ

डॉ अतुल कुमार

सदस्यः ग्लोबल एडवाइजरी बोर्ड मेम्बर ऑफ साइफाइन्डर, केमिकल एब्स्ट्रेक्ट्स सर्विस (सीएएस) अमेरिकन केमिकल सोसाइटी (एसीएस), कोलम्बस, यूएसए; टेक्नीकल इवैल्यूऐशन पैनल (टीईपी) बीआईआरएसी, नई दिल्ली

डॉ समन हबीब

सदस्यः 1. एनीमल साइंसेज़ रिव्यू कमेटी, सीएसआईआर, नई दिल्ली, 2. सिलेक्शन कमेटी फॉर सीएसआईआर नेहरू पोस्ट डॉक्टरल फेलोज़ (लाईफ साइंसेज.)

डॉ जवाहर लाल

सदस्य संपादक मंडल: अमेरिकन जर्नल ऑफ मॉडर्न क्रोमेटोग्राफी, यूएसए

कार्यकारी सदस्य: इण्डियन सोसायटी ऑफ बायोलॉजिस्ट एण्ड केमिस्ट्स, लखनऊ

सदस्य संपादक सलाहकार मंडल: केमेस्ट्री एण्ड बायलॉजी इन्टरफेज

डॉ आर रविशंकर

सदस्य: वर्किंग ग्रुप ऑन न्यू टीबी ड्रग्स (डब्ल्यूजीएनडी)

डॉ श्रीकांत कुमार रथ

सदस्य1. रिव्यू कमेटी ऑन जेनेटिक मेनिपुलेशन, डीबीटी, इंडिया 2. सब-कमेटी ऑन फार्मुलेटिंग बायोसेटी गाइडलाइस टू कंडक्ट एण्ड मॉनिटर कंन्फांइन्ड रिसर्च ट्रायल्स ऑन जेनेटिकली इंजिनियर्ड राइस, डीबीटी, इंडिया 3.कमेटी फॉर सेफ्टी एण्ड टॉलेरेबिलिटी ऑफ एक्सीपिएण्ड्स यूज्ड इन पेरेन्टल फॉमुलेशन इन सब्सिक्युेन्ट न्यू ड्रग, डीसीजीआई, एफडीए, नई दिल्ली 4. कमेटी फॉर यूज ऑफ पीईटी इन पेकेजिंग ऑफ ड्रग फॉर्मुलेशन्स फॉर पीडियाट्रिक यूज, जेरियाट्रिक यूज एण्ड फॉर यूज इन केस ऑफ वीमेन एण्ड वीमेन ऑफ रिप्रोडक्टिव एज ग्रुप, मिनिस्ट्री ऑफ हेल्थ एण्ड फेमिली वेलफेयर 5. एकेडेमिक काउन्सिल, जेएनयू, नई दिल्ली

सदस्य संपादक मंडल: टॉक्सिकोलॉजी इन्टरनेशनल

डॉ अमित मिश्रा

सदस्य: 1. एक्सपर्ट कमिटी ऑन ट्यूबरक्यूलोसिस, डिपार्टमेन्ट ऑफ बायोटेक्नॉजी, भारत सरकार 2. यूएनडीपी कंसल्टेटिव ग्रुप ऑन बायोलॉजिकल्स एण्ड बायोसिमिलर्स 3. इंडियन फार्मास्यूटिकल एसोसिएशन

उपाध्यक्ष: एशियन फेडरेशन फॉर फार्मास्यूटिकल साइंसेज

सदस्य आयोजन समिति: 1. थर्ड इन्टरनेशनल टीबी मीटिंग इन्हेल्ड थेरेपीज फॉर ट्यूबरकुलोसिस एण्ड अदर इन्फेक्शियस डिजिजेज, इटली 2. फोर्थ ग्लोबल फोरम ऑन टीबी वेक्सीन्स, चीन

डॉ संजय बत्रा

सदस्य: 1. रॉयल सोसायटी ऑफ केमेस्ट्री यूके 2. काउंसिल ऑफ एनओएसटी, इण्डिया (2011-2014) 3. गवर्निंग काउंसिल, कैमिकल रिसर्च सोसाइटी ऑफ़ इंडिया, बंगलुरू, 4. प्रोजेक्ट एडवाइजरी कमेटी फॉर केमिकल साइंसेज कमेटी फास्ट ट्रैक, एसईआरबी-डीएसटी

डॉ कुमकुम श्रीवास्तव

सदस्य कार्यकारी समिति: इण्डियन सोसाइटी फॉर पैरासिटोलॉजी, इण्डिया

डॉ गौतम पाण्डा

सदस्य: नेशनल अकादमी ऑफ़ साइंसेज़, इलाहाबाद इण्डिया

डॉ केआर आर्या

संयुक्त सचिव: सोसायटी ऑफ एथनोबोटनिस्ट्स (2014-2017) नेशनल बाटेनिकल रिसर्च इंस्टिट्यूट, लखनऊ

डॉ पीआर मिश्रा

सदस्य संपादक मंडल: 1. रिसेन्ट पेटेन्ट्स इन ड्रग डिलेवरी एण्ड फॉर्मुलेशन्स (बेंथम साइंसेज) 2. जर्नल ऑफ फार्मास्यूटिकल एण्ड बायोमेडिकल साइंसेज

संस्थापक सदस्य: इंडियन नेनोसाइंस सोसायटी

डॉ मनीष कुमार चौरसिया

सदस्य: बीआईआरएसी एक्सपर्ट कमैटी फॉर सीआरएस एण्ड बीआईजी ग्रांट्स

डॉ मो इमरान सिद्दीकी

सदस्य: एडवायजरी कमेटी फॉर बायोटेक्नोलॉजी, कॉउन्सिल ऑफ साइन्स एण्ड टेक्नालॉजी, यूपी

डॉ डी हंसदा

सदस्य: 1. वेस्ट बंगाल वेटरनरी काउन्सिल, कन्स्टीयूटअन्डर वेटरनरी काउन्सिल ऑफ इण्डिया 2. लाइवस्टॉक फीड, एक्विप्मेंट्स एण्ड सिस्टम, सेक्शनल कमिटी, एफएडी, बीआईएस, नई दिल्ली

डॉ राजेन्दर सिंह

सदस्य: सीनेट ऑफ़ अकादमी ऑफ़ साइंटिफ़िक एण्ड इन्नोवेटिव रिसर्च

डॉ मोनिका सचदेव

सदस्य: 1. सोसायटी फॉर फ्रंटियर्स इन रिप्रोडक्शन यूएस 2. सोसायटी फॉर स्टडी ऑफ रिप्रोडक्शन, यूएसए 3. इन्टरनेशनल सोसायटी ऑफ ट्रांसजेनिक टेक्नोलॉजी

डॉ जियाउर आर गाइन

सदस्य: लेबोरेटरी एनिमल साइंस असोसिएशन ऑफ इंडिया

डॉ रबी शंकर भट्टा

सदस्य संपादक मंडल: जर्नल ऑफ ड्रग फॉर्मुलेशन एण्ड प्रोडक्शन

सदस्य: इन्टरनेशनल सोसायटी फॉर स्टडी ऑफ ज़ीनोबायोटिक्स यूएसए

डॉ मृगांक श्रीवास्तव

सदस्य: सोसायटी फॉर ल्यूकोसाइट बायलॉजी

डॉ वहाजुद्दीन

सदस्य संपादक मंडल: 1. जर्नल ऑफ बायोइक्विवैलेन्स एण्ड बायोएवैलेबिलिटी, 2. एनालिटिक फार्मास्यूटिक एक्टा, 3. फार्मास्यूटिकल रेगुलेटरी अफेयर्स

आजीवन सदस्य: नेशनल अकादमी ऑफ़ साइंसेज़ (इण्डिया)

डॉ एचके बोरा

सदस्य: असम वेटरनरी काउंन्सिल, कन्स्टीट्यूट अन्डर वेटरनरी काउन्सिल ऑफ इण्डिया

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Namrata Rastogi, M.Sc. Ph.D.

Principal Technical Officer

R.K. Asthana, M.Sc., Ph.D.
S.C. Tripathi, B.Sc. (Retired on 30-06-2015)
Keshav Prasad, AMIE, M.Tech. (Retired on 30-08-2015)
Sr. Technical Officer (3)
Suresh Chandra, B.Sc. (Retired on 30-08-2015)
Zahid Ali, B.Sc. (Retired on 31-01-2016)
Tara Rawat, B.Sc.
Deepali Pandey, B.Sc.
Sr. Technical Officer (1)
Atma Prakash Dwivedi, M.Sc.

Technical Officer

Ashok Kumar Sharma, B.Sc., D.Ch.E., A.M.I.E.
K.S. Anil Kumar, M.Sc., Ph.D., P.G.D.C.A.,
Tahseen Akhtar, M.Sc.
Surya Pratap Singh, M.Sc., Ph.D

Technical Assistant

Vidisha Sharma (Resigned on 01-10-2015)

Sr. Technician (2)

Preeti Rastogi, M.Sc.
Ramjeet, B.Sc., PGDC
Zaheer Ahmad (Glass Blowing) (Retired on 30-11-2015)
Radha Rani Gupta, B.Sc.
Raju Arora, B.Sc.
Anoop Kumar Srivastava, M.Sc
Shashi Rastogi, M.Sc.
Mithilesh Sharma, M.Sc.
Veena Mehrotra, M.Sc.
A.K. Pandey, B.Sc.
S.C. Tiwari, B.Sc.

Sr. Technician (1)

Rajesh Kumar Verma
Manju, B.Sc.
Ram Lakhan

Technician (2)

H.R. Misra, M.Sc.
N.P. Misra, M.Sc.
Krishna Kumar, B.Sc.

Private Secretary

Avadhesh Kumar, B.A.

Sr. Steno

Surendra Kumar, B.Com

Lab. Assistant

M.S. Bhol
J.C. Rajan

Lab Attendant (2)

Satish Chandra Yadav, B.Sc.

MICROBIOLOGY

Sr. Principal Scientist

P.K. Shukla, M.Sc., Ph.D. *In-Charge*
K.K. Srivastava, M.Sc., Ph.D.

Principal Scientist

B.N. Singh, M.Sc., Ph.D.

Senior Scientist

Arunava Dasgupta, M.Sc., Ph.D.
Sudhir Kumar Singh, M.Sc., M.Tech., Ph.D.
Y. K. Manju, M.Sc.,Ph.D
Sidharth Chopra, M.Sc., Ph.D.
Mukesh Pasupuleti, M.Sc, Ph.D

Trainee Scientist

Neha Topno, M.Sc.

Principal Technical Officer

Bikram Banerjee, B.Sc.

Sr. Technical Officer (3)

Agney Lal, B.Sc.

Sr. Technical Officer (1)

Sandeep Kumar Sharma, M.Sc. Ph.D

Technical Assistant

Atul Krishna, B.Sc., DMLT
Umamageswaran V., M.Sc.

Sr. Technician (2)

Nuzhat Kamal, B.Sc.
D.K. Tripathi, M.Sc.

Lab. Assistant

A.N. Dixit, B.A.

Lab. Attendant (2)

Ravi Shankar Misra
Ram Prakash, B.A.

Lab. Attendant (1)

Shyam Sunder Yadav, B.A.

MOLECULAR & STRUCTURAL BIOLOGY

Senior Principal Scientist

Saman Habib, M.Sc., Ph.D., FASc
Ravishankar Ramachandran, M.Sc., Ph.D. *In-Charge*

Principal Scientist

Jimut Kanti Ghosh, M.Sc., Ph.D., FNASc
J. Venkatesh Pratap, M.Sc., Ph.D.
Mohammad Imran Siddiqi, M.Sc., Ph.D.

Senior Scientist

Ashish Arora, M.Sc., Ph.D.
Mohammad Sohail Akhtar, M.Sc., Ph.D.
Amogh Anant Sahasrabuddhe, M.Sc., Ph.D.
Shakil Ahmed, M.Sc., Ph.D.

Scientist

Dibyendu Banerjee, M.Sc., Ph.D.
Tejender S. Thakur, M.Sc., Ph.D.

Sr. Technical Officer (3)

J.P. Srivastava, B.Sc., LL.B.
R.K. Srivastava, B.Sc.

Sr. Technical Officer (1)

Ruchir Kant, M.Sc. Ph. D

Technical Officer

Anupam Jain, M.Sc.
Rima Ray Sarkar, M.Sc

Technical Assistant

Sarita Tripathi, M.Sc.

Sr. Technician (2)

Ram Radhey Shyam
Kishan Singh (Retired on 31-03-2015)

PARASITOLOGY

Chief Scientist

Shailja Bhattacharya, M.Sc., Ph.D., FNASc, *In-Charge & Supervising Scientist-in-Charge, KRC*
Anuradha Dube, M.Sc., Ph.D., FNASc, FNA., FASc. JC Bose National Fellow (Retired on 30-11-2015)

Senior Principal Scientist

Renu Tripathi, M.Sc., Ph.D.

Principal Scientist

Kumkum Srivastava, M.Sc., Ph.D.

Senior Scientist

Satish Mishra, M.Sc, Ph.D

Scientist

Mrigank Srivastava, M.Sc., Ph.D.
Susanta Kar, M.Sc., Ph.D.
Niti Kumar, M.Sc., Ph.D.

Technical Assistant

Shikha Mishra, M.Sc.
Ashan Manhas, B.Sc., M.L.T

Sr. Technician (2)

K.K. Singh, M.Sc.

Lab. Attendant (2)

Prem Babu

Lab. Attendant (1)

Ram Das
Om Prakash

PHARMACEUTICS

Chief Scientist

A.K. Dwivedi, M.Sc., Ph.D.

Senior Principal Scientist

Amit Misra, M.Pharm., Ph.D., *In-Charge*

Principal Scientist

Prabhat Ranjan Mishra, M.Pharm., Ph.D.

Senior Scientist

Manish Kumar Chourasia, M.Pharm., Ph.D.

Technical Assistant

V. Saravanakumar, M.Sc., M.Phil.,PGDCA, DIS
Deepak, M.Sc.,

Sr. Technician (2)

S.K. Bhatnagar, B.Sc.

Lab. Attendant (1)

Ram Kumar

PHARMACOKINETICS & METABOLISM

Sr. Principal Scientist

S.K. Singh, M.Sc., Ph.D (Retired on 30-04-2015)
Jawahar Lal, M.Pharm., Ph.D. *In-Charge*

Senior Scientist

R.S. Bhatta, M.Pharm., Ph.D.

Scientist

Wahajuddin, M.S. Pharm., Ph.D
Jiaur Rahaman Gayen, M.Pharm., Ph.D.

Principal Technical Officer

S.K. Pandey, M.Sc.

Sr. Technician (2)

Narendra Kumar, B.Sc

Private Secretary

Nandita Pandey, B.A.

Technician (2)

Akhilesh Kumar

Lab. Assistant

Shiv Lal

Lab. Attendants (2)

Ram Bhajan Shukla

Lab. Attendants (1)

Ram Sunder Lal, B.A.

Chandramani

PHARMACOLOGY

Chief Scientist

Rakesh Shukla, M.Sc., Ph.D., FIPS., FIAN., *In-Charge*

Senior Scientist

Manoj K. Barthwal, M.Sc., Ph.D.
Anil Gaikwad, MS (Pharma), Ph.D.
Prem N Yadav, M.Sc., Ph.D.
Kumaravelu Jagavelu, M.Sc., Ph.D.

Scientist

Kashif Hanif, M.Sc., Ph.D.
Shubha Shukla, M.Sc., Ph.D.

Sr. Technical Officer (3)

Jharna Arun, B.Sc. (Retired on 31-12-2015)
V.S. Nigam, B.Sc.
C.P. Pandey, M.Sc., Ph.D.

Technical Officer

Sheeba Saji Samuel, M.Sc.
Sachi Bharti, M.Sc.

Technical Assistant

Smriti, M.Sc.
Pankaj Kumar Shukla, B.Sc., P.G.D.B.T.
Divya Mohan, M.Sc.
Deep Mala, M.Sc

Sr. Stenographer

Varun Kumar Pathak, B.A

Sr. Technician (2)

H.C. Verma, B.A.
Bharti Bhushan, B.Sc.
Ramesh Chandra, M.Sc.

Sr. Technician (1)

Anil Kumar Verma, B.Sc.

Technician (2)

Surendra Singh, M.Sc., Ph.D

Lab. Attendent (1)

Hari Joshi
K.P. Mishra

Toxicology

Chief Scientist

C. Nath, M.B.B.S., M.D., (Retired on 31-01-2015)

Senior Principal Scientist

R.K. Singh, M.Sc., Ph.D., D.Sc. *In-Charge*
Sharad Sharma, M.B.B.S., M.D.
S.K. Rath, M.Sc., Ph.D.

Principal Scientist

R.K. Tripathi, M.Sc., Ph.D.

Senior Scientist

Aamir Nazir, M.Sc., Ph.D.
Smrati Bhadauria, M.Sc., Ph.D.
Sarika Singh, M.Sc., Ph.D.

Scientist

Poonam Singh, M.Sc., Ph.D.

Sr. Technical Officer (3)

P.K. Agnihotri, M.Sc., Ph.D.
Sadan Kumar, M.Sc

Technical Officer

Anurag Kumar Srivastava, B.Sc.

Technical Assistant

Anil Kumar Meena, M.Sc., B.Ed.
Navodayam Kalleti, M.Sc.
Sudhakar Yadav, M.Sc., M.L.T.

Sr. Technician (2)

Anupma, B.Sc.

Lab. Assistant

Mahabir (Retired on 31-01-2016)
Shree Krishan

Lab. Attendant (2)

Ram Kumar

Lab. Attendant (1)

Nand Pal Yadav
Ganesh Prasad

TECHNICAL INFRASTRUCTURE DIVISIONS / UNITS

ACADEMIC AFFAIRS UNIT

Principal Scientist

Anju Puri, M.Sc., Ph.D.

Private Secretary (Officiating)

Renuka Mushran

Sr. Technician (2)

A.K. Pandey, B.Sc.

BUSINESS DEVELOPMENT& INTELLECTUAL PROPERTY UNIT

Chief Scientist

Rajendra Prasad, M.Sc., Ph.D (Retired on 31-07-2015)

Scientist

Naseem Ahmed Siddiqui., B. Pharma, M.B.A.
Sripathi Rao Kulkarni, M.Sc., Ph.D., P.G. Dip.

Sr. Technical Officer (2)

A.S. Kushwaha, B.Sc.

Technical Assistant

Neelima Srivastava, M.C.A

Technician (1)

Preeti Agarwal, M.C.A.

COMPUTER CENTRE

Chief Scientist

A.K. Srivastava, B.E., *In-Charge*

Sr. Principal Scientist

Kural, B.E.

Scientist

Santhosh Shukla, B.Tech.

Technical Officer

Ajay Kumar Maurya, M.C.A.

Technical Assistant

Arbind Kumar, B.C.A, PGDCA

Sr. Technician (2)

Suresh S. Bhakuni

Technician (2)

R.A. Prajapati, M.A.

Technician (1)

Sumit Khichi

Lab Assistant

Lakshmi Prasad

LABORATORY ANIMALS FACILITY

Senior Principal Scientist

D.S. Upadhyay, M.V.Sc., Ph.D., *In-Charge*

Principal Scientist

S. Raja Kumar, M.Sc

Senior Scientist

Dhananjoy Hansda, M.V.Sc.

Trainee Scientist

H.K. Bora, M.V.Sc

Principal Technical Officer (3)

S.N.A. Rizvi, M.Sc.

Sr. Technical Officer (3)

Karunesh Rai, M.Sc.

Technical Assistant

Chandra Shekhar Yadav, M.Sc.

Sr. Technician (2)

A.K. Dubey, B.A.

Ravinder Singh, M.Sc., Ph.D.
S.R. Yadav, B.A.
Sanjeev Kumar Saxena, B.Sc.
Ravi Kumar Shukla

Sr. Technician (1)

Narendra Kumar, B.A.
Dinesh Kumar, B.A.
Pradeep Tirkey

Technician (2)

Arun Sharma, B.Sc.

Sr. Steno (H)

Raj Kumar, B.A.

Lab. Assistant

V.B.L. Srivastava
S.K. Verma
Shiv Pal Singh
P.B. Thapa
O.P. Verma, B.A.
Mohd. Saleem
R.P. Maurya (Retired on 30-06-2015)
G.K. Sharma
Dilip Kumar

Lab. Attendants (1)

Changa Lal
Jameel Beg
Najbullah

KNOWLEDGE RESOURCE CENTRE

Chief Scientist

S.K. Mallik, M.A., M.L.I.Sc., *In-Charge*

Principal Technical Officer

Sanjay Kumar, M.L.I.Sc
G.C. Gupta, B.Sc.

Sr. Technical Officer (3)

A.K. Verma, M.A., M.L.I.Sc. (Retired on 31-10-2015)
R.M. Pathak, B.F.A. (Comm. Art) (Retired on 31-07-2015)

Technical Officer

Ramesh Chandra Gupta, M.L.I.Sc.

Sr. Steno

Himanshu Upadhyay, B.A

Technical Assistant

Pankaj Upreti, M.L.I.Sc

OTHER LAB SERVICES

Senior Principal Scientist

N.K. Agarwal, M.Sc.,

Sr. Scientist

Manoj Kumar Rawat, M. Tech.

Sr. Technical Officer (3)

R.N. Lal, M.Sc.

Sr. Technical Officer (1)

Ram Karan Harijan, AMIE
Sanjay Kumar, Diploma

Sr. Technician (2)

V.K. Mishra, Diploma
Kamal Kishore Verma, ITI
Kamal Singh, ITI
Laxmi Narain, ITI
Shailendra Mohan, M.Sc., PGDCA
K.M. Shukla, B.Sc.

Technician (1)

Kul Bahadur Thapa, ITI (Electronics)

Lab. Assistant

Mohd. Islam

S & T MANAGEMENT UNIT

Sr. Principal Scientist

Vinay Tripathi, M.Sc., M.B.A., P.G. Dip., *In-Charge*
D.N. Upadhyay, M.Sc., Ph.D.

Principal Scientist

Prem Prakash, M.Pharm.

Senior Scientist

Anand P. Kulkarni, M.Sc., Ph.D. (*Director Secretariat)*

Junior Scientist

Sanjeev Yadav, M.Sc., Ph.D.

Sr. Technical Officer (2)

Ravindranath S. Londhe, GD Art (Comm.), Art Teachers Dip.

Hindi Officer

Neelam Srivastava, M.A., B.Ed., L.L.B.

Technical Officer

Savita Tripathi, M.Sc., B.Ed.

Technical Assistant

Farha Khan, M.C.A *(Director's Secretariat)*
M. Muruganantham, B.Sc., M.B.A

Private Secretary

Manoshi Chatterjee, B.A., B.L.I.Sc.

Sr. Technician (2)

Krishna Prasad, B.Sc. (Retired on 30-08-2015)
Chandrika Singh, B.Sc., LL.B.

Technician (2)

Susheel Kumar, B.Sc

Lab. Assistant

Kishori Kumari

Lab. Attendant (1)

Pankaj Sengupta
Pradeep Kumar Srivastava, B.Sc.

SOPHISTICATED ANALYTICAL INSTRUMENT FACILITY

Sr. Principal Scientist

Brijesh Kumar, M.Sc., Ph.D. *Mass Unit In-charge, and Overall Facility In-charge*

Senior Scientist

Ravi Sankar Ampapathi, M.Sc., Ph.D. *NMR Unit In-charge*
Jagadeshwar Reddy Thota, M.Sc., Ph.D
Sanjeev Kumar Shukla, M.Sc., Ph.D.
Sanjeev Kanojiya, M.Sc., Ph.D.
Kalyan Mitra, M.Sc., Ph.D. *Electron Microscopy Unit In-charge,*

Principal Technical Officer

H.M. Gauniyal, M.Sc. Ph.D
A.L. Vishwakarma, M.Sc.
Rakesh Khanna, B.Sc., A.I.C
A.K. Mandwal, M.Sc., Ph.D.
A.K. Sinha, M.Sc.

Sr. Technical Officer (3)

Sunil Kumar, B.Sc.
Pramod Kumar, M.Sc.

Sr. Technical Officer (2)

R.K. Purshottam, B.Sc.

Technical Officer

Kavita Singh, M.Sc., Ph.D.
Binod Kumar Saw, M.Sc.

Technical Assistant

Garima Pant, M.Sc.
Pooja Soni, Diploma
Tofan Kumar Rout, M.Sc. Ph.D.

S. Mehazabeen, B.Sc.
Amit Kumar, M.Sc., M.Tech

Sr. Technician (2)

Ashok Pandey, B.Sc.
Sandeep Sengupta, B.Sc.
Radhey Krishna, B.Sc., L.T., C.Lib.Sc.
V.K. Maurya, ITI
Akhilesh Kumar Srivastava, B.Sc.
Madhuli Srivastava, B.A.
O.P. Gupta, B.Sc.
S.A. Singh, B.Sc., PGDCA
D.N. Vishwakarma
Madhu Chaturvedi, Diploma

Asst. (G) Grade I

V.K. Kanal

Lab. Attendants (2)

J.S. Singh

LABORATORY ENGINEERING SERVICES

Senior Superintending Engineer

Parvez Mahmood,
B.Sc.,Engineering(Civil), *In-Charge*

Superintending Engineer

Kamal Jain, B.E., (Electrical)

Assistant Executive Engineer

Mohit Kumar Shukla, A.M.I.C.E (Civil)
Jai Prakash, Diploma
Sidho Hembrom, Diploma

Assistant Engineer

D.K. Vishwakarma, Diploma

Junior Engineer

Madhukar Saroj, Diploma
Ajay Kumar, Diploma

Asstt. (G) Grade I

B.K. Shukla, B.Com

Sr. Technician (2)

B.P. Sunwar, Diploma
Radhey Lal
A.K. Sonkar, ITI
K.K. Kaul, ITI
Mahindra Singh, ITI
S.K. Kar, B.A. (Retired on 30-09-2015)
Basudev Pradhan
M.S. Verma, BA, ITI
Mohammad Naseem
Harish Kumar
Vijay Kumar
Swapan Karmi
Ramesh Kunwar
Arun Kumar Srivastava, ITI

Sr. Technician (1)

G.C. Roy, ITI

Lab. Assistants

R.K. Yadav (Retired on 31-01-2016)
Ramanuj
Rama
Popinder Singh
S.K. Bhattacharya
T.P. Pathak
S.K. Yadav
Bishan Singh
A.K. Misra
Om Prakash
Iftikhar Ahmad (Expired on 27-04-2015)
Shankar Roy
Z.U. Beg
Ramesh Chandra

Lab Attendant (2)

Sandeep Roy
Dhirendra Misra
Mohd. Irfan
Raju Vishwakarma
Ram Autar
Hari Om Garg

Lab. Attendant (1)

Darshan Lal
Vishwanath Nigam
Satyajeet Roy
Ram Samujh
Bindeswari Prasad
Suresh Kumar
Ram Bilas
Gaya Prasad
Ram Asrey

Group D

Om Prakesh
Hanuman
Radhey Shyam
Hari Prasad
Maiku Lal-II
Surendranath (Retired on 30-04-2015)

GENERAL ADMINISTRATION AND FACILITIES

ADMINISTRATION

COA OFFICE

Controller of Administration

Bijay Kumar Kar (Transferred to CSIR – IMMT on 31-11-2015)
CP Arunan, BA (Transferred from CSIR-IITR to CSIR-CDRI on 01-12-15)

Administrative Officer

K.P. Sharma, B.A, LLB, (Transferred to CSIR-CEERI on 13-11-2015)

Asstt. (G) Grade I

Kamla Kandpal, M.A

Lab. Assistants

Sohan Lal

Multi Tasking Staff

Ravi Kant Sarkar

DIRECTOR'S OFFICE

Private Secretary

Sumit Srivastava, B.Com.
Sunita Chopra, B.A.

Sr. Technician (1) (Driver)

Shakeel Ahmad Khan

Lab. Attendant (2)

Nand Kishore

Group D

Ramswarth Prasad Rai (Retired on 31-01-2015)

Trainee

Rajesh

ESTABLISHMENT I

Section Officer (G)

Sunil Kumar, B.A (Transferred to CSIR-CCMB on April, 2015)
Krishna Raj Singh, B.Sc, MSW

Asstt. (G) Grade I

Vibhash Kumar, B.A (Hons), CIC
Jagdish Prasad, B.Sc., MPA
Saju P. Nair
Reena Bisaria, B.A

Asstt. (G) Grade III

Nida Parveen, B.Com

Sr. Steno

Deepak Dhawan, BA

Lab. Assistant

Vinod Kumar

Group-C

Manju Yadav

ESTABLISHMENT II

Section Officer (G)

Biranchi Sarang, B.Sc, M.B.A
(Transferred to CSIR-IIP on April, 2015)
Nitu Kumari, B.Sc., M.A

Asstt. (G) Grade I

Rashmi Srivastava, B.A, B.Ed
Dilip Kumar Sen, B.Com
Tej Singh, B.Sc (Retired on 28-02-2015)
Gangadin Yadav, B.A
Javed Sayed Khan, B.A.
Riti Chaudhary, B.A
Neena Raizada, B.A
Aparna Bajpai, B.A

Sr. Steno

Vinod Kumar Yadav, B.A

Lab. Assistant

Bhagwanti Devi

MTS

Ram Kumar, B.Com

GENERAL SECTION

Section Officer (G)

C.S. Rao, B.Com (Retired on 31-01-2016)

Asstt. (G) Grade I

Kailash Chandra
Rajendra Prasad, B.A

Sr. Steno (ACP)

Seema Srivastava, M.A

Asstt. (G) Grade II

Ajay Shukla, M.Com
Rani
Mohd. Irfan

Sr. Technician (1) (Driver)

K.K. Kashyap

Drivers

Prem Chand
Daya Shankar Singh

Multi Tasking Staff

Kalpanath Sharma
Mohd. Saleem

BILL SECTION

Section Officer (G)

Madhuranjan Pandey, M.B.A (Transferred to CSIR-IIP on April, 2015)
Anil Kumar, B.Sc.

Asstt. (G) Grade I

H.K. Johar, B.A
Valsala G. Nair, B.A
Vivek Bajpai, M.A
Dilip Kumar (Cash), B.A, LLB
Md. Rijwan, B.Tech, MPA

Lab. Attendant (2)

Lalji Prasad
Vinod Kumar Sharma

Trainee

Faizi

VIGILANCE

Section Officer

Krishna Raj Singh, B.Sc, MSW

Asstt. (G) Grade I

Prashant, BE

Sr. Steno

Vineet Pandey, B.A., P.G. Comp.

Lab. Assistant

Shanti Devi

RECORDS

Asstt. (G) Grade I

Birendra Singh, B.A

Lab. Assistant

Ved Prakash Misra

HINDI SECTION

Senior Hindi Officer

V.N. Tiwari, M.A., Ph.D.

Sr. Steno (Hindi)

Anil Kumar, B.Com

SECURITY

Security Officer

Anil Kumar Upadhyay, M.A.

FINANCE & ACCOUNTS

Controller of Finance & Accounts

A.K. Dwivedi, B.Sc, M.A

Finance & Accounts Officer

IB Dixit, M.Sc, M.B.A
Bhaskar Kumar Ravi, MBA

Section Officer (F&A)

Kanak Lata Mishra, M.Sc, M.B.A (Promotion Transfer as FAO to CSIR-IITR in January, 2016)
Kailash Singh
Ram Rishi Raman, M.A (Transferred to CSIR-CBRI)
R.P. Tripathi, M.Com, LL.B

Private Secretary

V.P. Singh, B.A

Asstt. (F&A) Grade I

R.C. Bisht, B.A (Retired on 30-06-2015)
Mahesh Babu, B.A
S.L. Gupta, B.A
Sasidharan Radha
U.K. Tewari, B.Sc
Rekha Tripathi, B.H.Sc.
Ajay Kumar, B.A

Asstt. (F&A) Grade II

D.K. Khare, M.Com
Mahender Kumar, B.Com
Sanjay Kumar, B.A
Tahseen Tilat, B.A
S.A. Siddiqui, B.A
Chandrashekhar

Asstt. (F&A) Grade III

Abhishek Kumar

Lab. Attendants (2)

Vikramaditya

Lab. Attendants (1)

Angad Prasad

MTS

Mohd. Firoz, B.A

STORES & PURCHASE

Stores & Purchase Officer

S.K. Singh, M.A, GDMM, PGDBA.
Ravi Shanker Choudhary, B.A.
Koushul Kishore

Asstt. (S&P) Grade I

P.S. Chauhan, B.Sc
Arun Wadhera
A.K. Misra, B.A
A.K. Govil, B.A
H.B. Neolia, M.A

Asstt. (S&P) Grade II

K.K. Mishra, B.A (Retired on 30-06-2015)
R.C. Dwivedi, B.Com
M.C. Verma, B.Com
Srikant Mishra, B.A

Asstt. (S&P) Grade III

Kanchan Bala, B.A
Vandana Parwani, B.A
G.P. Tripathi
Chakrasen Singh

Private Secretary

K.P. Ballaney, B.A (Retired on 30-06-2015)

Sr. Steno (H)

Jitendra Patel, M.A.

Sr. Technician(2)

Ravi Kumar Mehra, B.A.

Lab. Assistant

Kishan Kumar (Retired on 31-01-2016)
Rama Shukla
Kamlesh

Attendant

Hardwari

CSIR DISPENSARY

Medical Officer Group III (7)

Asha Negi, M.B.B.S., M.D. In charge

Medical Officer Group III (5)

N.K. Srivastava, M.B.B.S.

Sr. Technician (2)

Nandita Dhar, Diploma in Nursing
H.U. Khan, B.M.S., B.Sc. (Retired on 30-06-2015)

Technician (1)

Shraddha, M.A., Diploma in Nursing
Shabana, B.A., Diploma in Pharmacy

Lab. Assistant

S.K. Paswan

Lab Attendant

Shubhendra Kumar

CANTEEN

Manager Gr. II (ACP)

J.P. Satti, B.A

Asstt. Manager & Store Keeper (ACP)

R.S. Tewari

Count Clerk (ACP)

Ram Jiyawan Tewari
Y.K. Singh, B.A

Cook (ACP)

Man Bahadur

Asstt. Halwai

Uma Shanker Tewari

Bearer

Ganga Ram
Rajender
Sukhdev Prasad

S/Man

Raj Kumar

Wash Boys

Ram Murat
Dinesh Pal Singh

The Indian EXPRESS
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Shift into Modi mode to think afresh: Harsh Vardhan

EXPRESS NEWS SERVICE
LUCKNOW | APRIL 11

UNION Minister Dr Harsh Vardhan Saturday urged the scientist community to "break out of (their) shells" and think afresh by shifting into "Modi mode" as the money needed to fund their research comes from the common man and "350 million Indians are still below the poverty line".

Speaking at Central Drug Research Institute (CDRI), Harsh Vardhan said the people of India are expecting that CSIR laboratories would be able to produce therapeutic and preventive measures for re-emerged infectious diseases like dengue, chikungunya, swine flu as well as for conditions like cancer, diabetes, osteoporosis and depression.

"If you look at the average calorific intake of an Indian, it is still much less than the required 2,250 calories, and only 70 per cent of our children have access to the free vaccines provided by the government. Let us take this challenge in a fresh perspective, in a new mode, which I call ...

His address was beamed live to all CSIR labs in the country.

He announced that the Indian pharmaceutical sector will soon be showcasing 'candidate drugs' for malaria, osteoporosis and diabetes. The drugs are currently undergoing clinical trials at CDRI. He said the CSIR-CDRI is carrying out Investigational New Drug (IND) studies on lead molecules for fracture-healing, cancer, thrombosis, malaria and leishmaniasis.

The minister also announced that the government would soon set up Pharma Industry Incubator (BRI) under the umbrella of CSIR-CDRI, Lucknow, and that the ministry is also considering setting up Government Laboratory Practices (GLP)-certified labs for complete range of IND studies. He said the step would foster new drug development as well as shore up the financial bottom line of the laboratory.

He also announced the formation of a National Centre for Laboratory Animals in the CSIR-CDRI, conforming ...

बन सकते हैं वैश्विक औषधि निर्माण हाउ...

भारत में है क्षमता

- शोध का लाभ आमजन तक पहुंचना जरूरी
- वैज्ञानिक अपने दायरे से बाहर आकर मस्तिष्क मंथन करें
- देशवासियों की समस्याओं के समाधान के लिए तेज गति से काम करें

सीडीआरआइ में आयोजित कार्यक्रम में बोल... विज्ञान एवं प्रौद्योगिकी मंत्री डॉ. हर्षवर्धन

छतर मंजिल सीएसआइ... हब के रूप में हो विकसि...

यह हुई घोषणा

THE HINDU

NEWS » NATIONAL

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'New drugs soon for malaria, diabetes'

STAFF REPORTER

The "candidate drugs" for malaria, osteoporosis and diabetes were currently undergoing clinical trial...

The "candidate drugs" for malaria, osteoporosis and diabetes were currently undergoing clinical t...

...he Indian pharmaceutical sector would soon be showcasing 'candidate drugs' for malaria, osteopor... ...cience and Technology and Earth Sciences Harsh Vardhan said on Saturday.

...ith further R&D, important breakthroughs could be on the horizon for these diseases, he said follo...

अमर उजाला

साइंटिफिक नेटवर्क को साथ आएंगे राजधानी के वैज्ञानिक

रविवासरीय

हिन्दुस्तान

तरक्की को चाहिए नया नजरिया

हर छह माह पर कोलेस्ट्रॉल की जांच उचित नहीं

राष्ट्रीय सहारा

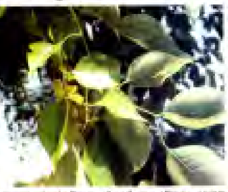
उच्चस्तरीय मेडिसिनल केमेस्ट्री जरूरी

NBT नवभारत टाइम्स

जड़ी-बूटियों में हर दर्द की द...

sunday pioneer

Sheesham leaf gives out wonder drug



the pioneer

CONVOCATION

National Institute of Pharmaceutical Education and Research, Rae Bareli, organised its third convocation ceremony on Friday at CSIR-Central Drugs Research Institute (CDRI). Project director, NIPER, PK Shukla welcomed the guests and presented the report. After the pledge to serve the nation by degree recipients, students were felicitated. Medals and certificates were given away to Maheshkumar Dave, Kishan Shamjibhai, Nem Kumar Jain, and Harjeet Kaur. Emeritus Professor of Eminence, Institute of Chemical Technology (Deemed University), Mumbai ...

...मेडिसिनल केमेस्ट्री को उच्चस्तरीय बनाने की जरूरत : शर्मा

राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान रायबरेली ने मनाया तीसरा दीक्षांत समारोह

चार छात्रों को मिला गोल्ड व सात को सिल्व...

इन्हें मिला सम्मान

'मानवता के लिए प्रकृति की ओर लौटना होगा'

Pro. Govardhan Mehta

NBT नवभारत टाइम्स

सीडीआरआई ने तैयार किया एक्सट्रैक्ट

ऑस्टियोपोरोसिस में मल्टीपल फ्रैक्चर दर्द से नहीं कराहेंगी महिलाएं

फ्रैक्चर अब जल्द होगा ठीक

सीडीआरआई निदेशक मधु दीक्षित

इन बीमारियों पर चल रहा है शोध

'सीडीआरआई की निदेशक बनना गर्व की बात'

स्वस्थ भारत निर्माण में सीडीआरआई की अहम भूमिका

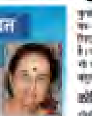
अमर उजाला

आयुर्वेदिक दवाओं की भी होगी एक्सपायरी डेट

स्वतंत्र भारत

...क ही दिन में नहीं बनता कोई वैज्ञानिक

शख्सियत




Acta Biomaterialia
Volume 26, 15 October 2015, Pages 169–183
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Volume 56, July 2015, Pages 92–103
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