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वार्षिक प्रतिवेदन
ANNUAL REPORT
2014-15

वै.औ.अ.प.–केन्द्रीय औषधि अनुसंधान संस्थान
CSIR - CENTRAL DRUG RESEARCH INSTITUTE
Sector 10, Jankipuram Extension, Sitapur Road, Lucknow – 226 031

CSIR-Central Drug Research Institute, Lucknow

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 & 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 and viral (HIV and 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

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

6. Safety & Clinical Development

- 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.

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(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)

CSIR - CENTRAL DRUG RESEARCH INSTITUTE
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HIGHLIGHTS OF ACHIEVEMENTS

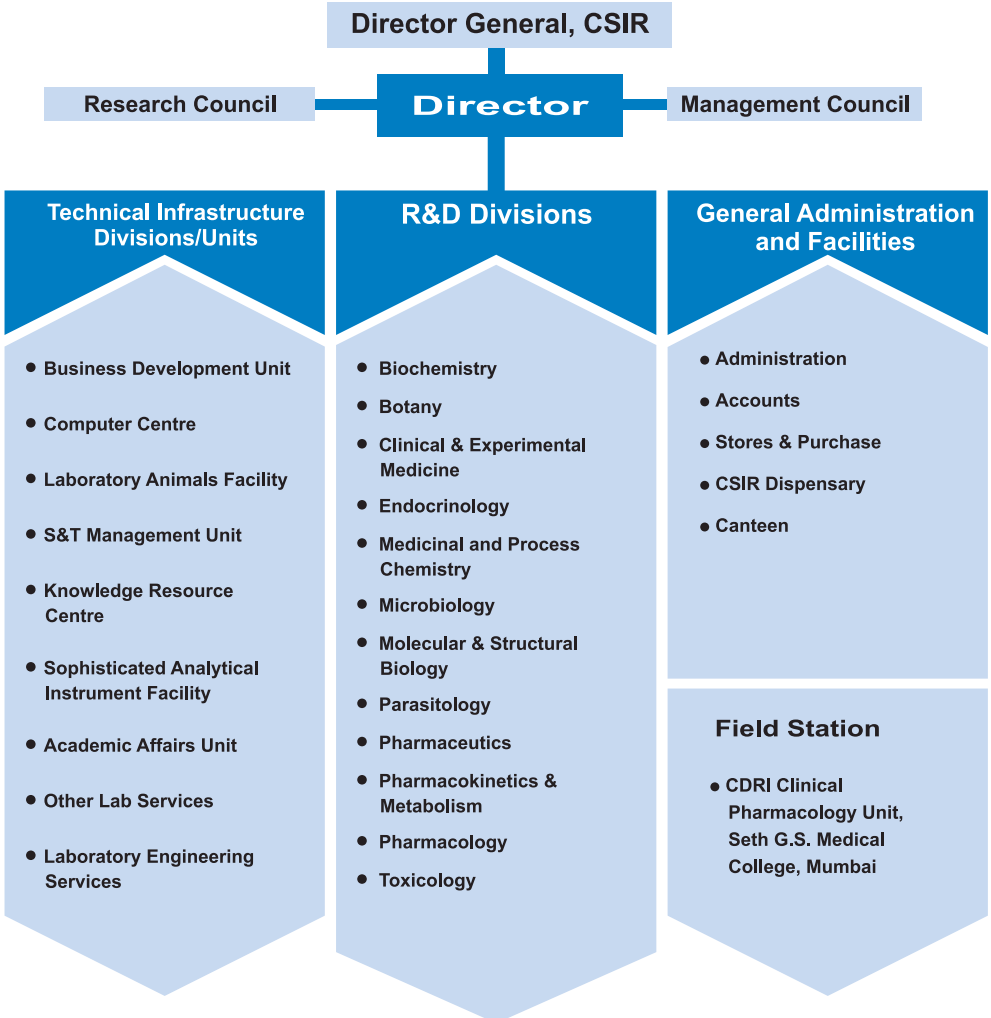
◆ **Publications in SCI Journals (2014)**	:	**391**
- Average Impact Factor	:	**3.21**
- Publications with >5 Impact Factor	:	**47**
◆ **Patents (2014)**		
- Filed Abroad	:	**12**
- Filed in India	:	**13**
- Granted Abroad	:	**5**
- Granted in India	:	**-**
◆ **Ph.D. Thesis Submitted (2014)**	:	**71**
◆ **New Projects Initiated (2014)**	:	**27**
Grant-in-Aid Projects	:	**25**
Sponsored Projects	:	**2**
◆ **Total External Budgetary Resources (2014-15)**	:	**₹ 1639.39 Lakh**

Provisional data as on 01/02/2015

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.

Organizational Structure



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निदेशक की कलम से

वै.औ.अ.प.–केन्द्रीय औषधि अनुसंधान संस्थान का वार्षिक प्रतिवेदन 2014–15 प्रस्तुत करना मेरे लिये वास्तव मे हर्ष का विषय है। यहाँ विकसित नवीन एवं सुलभ औषधियों और प्रौद्योगिकियों के माध्यम से जन सेवा के प्रयास चारों ओर परिलक्षित है। लगभग 30 वर्ष बाद एक बार फिर मैं इस महान संस्थान का एक भाग बन गया हूँ जहाँ वास्तव में इस विशिष्ट क्षेत्र के लिये मेरे करियर को कठिन परिश्रम से संवारा गया था। मैं संस्थान और नई औषधि अनुसंधान एवं विकास में असीमित परिवर्तन देख रहा हूँ। संस्थान ने अपनी क्षमताओं का आधुनिकीकरण किया, विभिन्न विषयों के युवा वैज्ञानिकों को सम्मिलित किया, अत्याधुनिक नए परिसर में स्थानांतरित हुए और औषधि खोज एवं विकास हेतु सभी आधारभूत सुविधाओं सहित एशिया महाद्वीप में एक अद्वितीय औषधि अनुसंधान संस्थान के रूप में अविर्भाव हुआ। इस संस्थान ने राष्ट्रीय और अन्तर्राष्ट्रीय संगठनों और उद्योगों के साथ प्रचुर सहयोग, नेटवर्क और संबंध स्थापित किये। मैं एक बार पुनः इस महान संस्थान का एक हिस्सा होने पर गौरवान्वित अनुभव करता हूँ और इसे आगे और अधिक ऊँचाइयों पर ले जाने के लिये स्वयं को समर्पित करता हूँ।

पिछले अनेक वर्षों में संस्थान में अनुसंधान की मात्रा और गुणवत्ता में बहुत वृद्धि हुई है। वर्तमान समय में 21 नेटवर्क परियोजनाएं, 88 सहायता अनुदान परियोजनाएं और दो NMITLI परियोजनाएं चल रही है। वर्ष 2014 के दौरान कुल 25 सहायता अनुदान परियोजनाएं और 2 प्रायोजित परियोजनाएं 7.81 करोड़ रुपये के अनुमोदित बजट के साथ प्रारंभ हो चुकी हैं। संस्थान में नई लीड्स और राष्ट्रीय महत्व की बीमारियों के क्षेत्र हेतु कैण्डीडेट ड्रग्स पाइप लाइन में हैं जिनमें मलेरिया, अस्थिसुशुरता, कैन्सर, मधुमेह, थ्रॉम्बोसिस, ट्युबरकुलोसिस (यक्ष्मा) और स्ट्रोक सम्मिलित है। जीएलपी के समान अवस्थाओं में अन्तर्विषयी वैज्ञानिकों की एक समर्पित टीम के साथ विकासात्मक अध्ययन प्रारंभ किये जा रहे है। मेरी पहली प्राथमिकता इन अणुओं के विकास की गति को तेज करना है जिससे उनमें से दो को, शीघ्र से शीघ्र बाजार में पहुँचाया जा सके।

अनुसंधान प्रकाशनों के संदर्भ में विगत् वर्षों में उनकी संख्या और गुणवत्ता में अत्यधिक वृद्धि हुई है। दस वर्ष पहले, वर्ष 2014 में 171 वैज्ञानिकों की संख्या द्वारा औसत 2.38 इम्पैक्ट फ़ैक्टर सहित 159 अनुसंधान पेपर प्रकाशित किये गये। वर्ष 2014 में 139 वैज्ञानिकों ने >3.21 औसत इम्पैक्ट फ़ैक्टर सहित 391 अनुसंधान प्रकाशन किये। इसी प्रकार 2004 में प्रस्तुत की गयी पीएच.डी. थीसिस की संख्या 14

थी, जबकि 2014 में यह संख्या 72 है। पीएच.डी. डिग्री हेतु औषधि खोज कार्यक्रम का विकल्प चुनने वाले छात्रों की संख्या बढ़ी है। संस्थान, नाइपर, रायबरेली को मार्गदर्शन देने के अतिरिक्त, बायोमेडिकल रिसर्च के विभिन्न पक्षों में 200 पोस्ट ग्रैजुएट छात्रों और प्रोज़ेक्ट फ़ेलो को हर वर्ष प्रशिक्षण प्रदान कर रहा है। वैज्ञानिक एवं छात्र विभिन्न विज्ञान एकैडमी की फ़ेलोशिप के साथ–साथ युवा वैज्ञानिक पुरस्कार, करियर अचीवमेन्ट अवार्ड आदि प्रतिष्ठित पुरस्कार और सम्मान ला रहे हैं। मैं उन सभी स्टाफ़ सदस्यों और छात्रों को हार्दिक बधाई देता हूँ जो कठिन परिश्रम कर रहे हैं और संस्थान को विशेष सम्मान दिला रहे हैं।

मैं व्यक्तिगत रूप से संस्थान की सफलता के लिये संस्थान के महान नेतृत्वकर्ताओं का ऋणी हूँ जिन्होंने इसके प्रारंभ होने के समय ही इसकी मजबूत आधारशिला रखी, अनुसंधान की सुनिश्चित दिशा द्वारा अनुसंधान कार्यक्रमों को अथक परिश्रम से सही दशा में पहुँचाया, केन्द्रित प्रयासों के लिये मार्ग प्रशस्त किया, विज्ञान एवं प्रौद्योगिकी के आधारभूत ढाँचे और गुणवत्ता पद्धतियों को मजबूत बनाया और नये प्रशिक्षित युवाओं को अवसर दिया। 1 जनवरी, 2015 को हमने पद्मश्री डॉ. नित्यानन्द, एक अद्वितीय व्यक्तित्व, विज्ञान एवं मानव मूल्यों के मर्मज्ञ, एक महान नेतृत्वकर्ता, का 90वां जन्मदिवस एक दिवसयी संगोष्ठी का आयोजन करके मनाया, जो अतिविशिष्ट व्यक्तियों एवं उनके समकालीन साथियों तथा छात्रों का यादागार समारोह था। इस अवसर पर संस्थान के युवा वैज्ञानिकों और छात्रों ने भारत में विज्ञान की विभिन्न शाखाओं के अग्रणी लोगों से बातचीत के माध्यम से ज्ञान प्राप्त किया।

किसी भी क्षेत्र में अग्रणी रहने के लिये नई प्रौद्योगिकियों, नए दृष्टिकोण और लगातार आधुनिकीकरण को अपनाना मूलमंत्र है। यद्यपि संस्थान ने बहुत कुछ करने में सफलता प्राप्त की है किन्तु और भी सुधारों की अवश्यकता है। संस्थान से सर्वोत्तम का अविर्भाव होना अभी भी बाकी है। यद्यपि प्रकाशन, पेटेण्ट और मानव संसाधन के संबंध में संस्थान के परिणाम असाधारण रूप से विस्मयकारक है, किन्तु सीडीआरआई औषधि को बाजार में पहुँचे हुए एक लंबी अवधि बीत चुकी है। वैश्विक मानकों के अनुसार औषधि खोज और विकास कार्यक्रमों के लिये सहायता और अनुसंधान सुनिश्चित करना मेरा दायित्व है। इस दिशा में मेरी पहली प्राथमिकता होगी प्रयोगशालाओं हेतु बहु–प्रतीक्षित जीएलपी प्रमाणन, ट्रांसजेनिक फ़ैसिलिटी की स्थापना, बीएसएल3 फ़ैसिलिटी, फ़ास्ट ट्रैक मोड में नई औषधि की खोज और विकास हेतु अपने प्रयासों में इसे आत्मनिर्भर बनाने लिये के लिये एक आकर्षक एचआर पॉलिसी कार्यान्वित करना है। मैं औषधि विकास कार्यक्रमों को आगे बढ़ाने के लिये विशेषकर उद्योग जगत के सहभागियों का अधिक से अधिक सहयोग प्राप्त करने के लिये एक आकर्षक व्यावसायिक नीति के साथ–साथ परियोजना प्रबंधन के रास्तों की तलाश में हूँ।

राष्ट्रीय और अन्तर्राष्ट्रीय स्तर पर व्यापार के लिये सकारात्मक परिवर्तनों की एक लहर चल रही है। नई चुनौतियों के लिये हमारा तंत्र उत्तरोत्तर सहयोग कर रहा है। स्वास्थ्य और औषधि निर्माण अनुसंधान सरकार के लिये एक प्राथमिकता का क्षेत्र रहा है। हमारे संस्थान को राष्ट्रीय महत्व की बीमारियों के लिये नई औषधियों के विकास के कार्य का अधिदेश दिये जाने के कारण और बड़ी भूमिका का निर्वहन करना है, क्योंकि हम अवसरों का लाभ उठाने के लिये उपयुक्त स्थिति में है। मुझे पूर्ण विश्वास है कि इस क्षेत्र में हम महत्वपूर्ण योगदान करेंगे और प्रगति के राष्ट्रीय आंदोलन और विकास को नेतृत्व प्रदान करेंगे।

मैं सभी कर्मचारियों और छात्रों को उनके मूल्यवान योगदान के लिये हृदय से धन्यवाद देता हूँ और मुझे विश्वास है कि आने वाले वर्षों में वे इसे सर्वाधिक लाभकारी संस्थान बनाने के लिये और कठिन परिश्रम करना जारी रखेंगे।

17 फरवरी, 2015

(डॉ. राम विश्वकर्मा)

FROM THE DIRECTOR'S DESK

It is indeed a great pleasure for me to present the Annual Report 2014-15 of CSIR-Central Drug Research Institute, which has made resounding accomplishments in its endeavor to serve the populace through affordable new drugs and technologies. Nearly after thirty years, once again, I am part of this great institute, which actually carved my career in this niche area. I witness immense changes in the organization and approaches to new drug R&D. Institute has modernized its capabilities, inducted young multidisciplinary scientists, shifted to a state of the art new campus and emerged as unique drug research institute in Asian continent having all the infrastructure facilities for drug discovery and development. It has established prolific collaborations, networks and linkages with national and international organizations and industries. I feel privileged for being part of this great Institute once again and bestow myself to take it to further heights.

Over the years, quantum and quality of research in the Institute has increased manifold. Currently, 21 Network Projects, 88 Grant-in-Aid projects and couple of Sponsored and NMITLI projects are ongoing. During 2014, a total of 25 Grant-in-Aid projects and 2 Sponsored Projects with an approved budget of Rs. 7.81 Cr have been initiated. Institute has a rich pipeline of new leads and candidate drugs for different disease areas of national importance including malaria, osteoporosis, cancer, diabetes, thrombosis, tuberculosis and stroke. Developmental studies are being undertaken with a dedicated team of interdisciplinary scientists in GLP like conditions. It is my first priority to fast track the development of these molecules so that couple of them will reach market at the earliest.

In terms of research publications, there is a magnitude increase in the number and quality over the years. Ten years back, in the year 2004, with scientist strength 171 on role, published 159 research publications with average IF 2.38. In the last year, 2014, with 139 Scientists on role, published more than 391 research publications with average IF >3.21. Similarly, number of Ph.D. thesis submitted in 2004 was 14, while in 2014, the

number is 72. There is an increased interest among the students opting for drug discovery programs for their Ph.D. degree. Institute is imparting training to more than 200 post graduate students and project fellows every year in different aspects of biomedical research apart from mentoring NIPER, Raebareli. Scientists and students are fetching prestigious honours and awards including Fellowship of Science Academies, Young Scientist Awards, Career achievement awards, etc. I heartily congratulate all the staff members and students who are working hard and bringing laurels to the Institute

Personally, I owe the success of the Institute to the great leaders of the Institute since its inception, who laid the robust foundation, set the tone and temper of research, relentlessly overhauled the research programs, paved the way for focused efforts, strengthened the S&T infrastructure, quality systems and introduced the innovative and trained youngsters. On January 1, 2015, we celebrated the 90th birthday of Padma Shri Dr. Nitya Anand, an unique personality, connoisseur of science and human values, and a great leader, with a most befitting One-day symposium. It was a historical get together of several distinguished personalities, contemporaries of Dr. Nitya Anand and his students. On this occasion, young scientists and students of the institute relished and learnt a lot through interaction with pioneers of different branches of science in India.

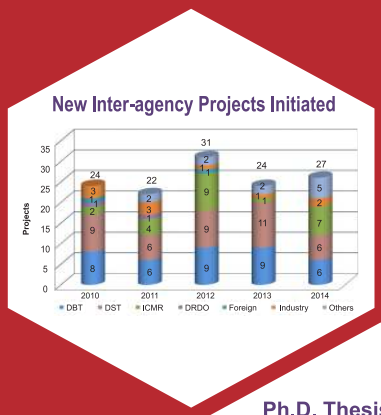
Adapting to newer technologies, approaches and incessant modernization is the key factor to be a front runner. Though, the Institute has accomplished a lot, but I still see scope for surgical improvements. Best from the Institute is yet to come. Though outputs of the Institute in terms of Publications, Patents and Human resource is exceptionally astounding, but it has been a long time since the CDRI drug has reached the market. It is my responsibility to ensure all the support & resources and facilitate the drug discovery and development programs as per the global norms. In this direction, my first priority would be getting the much awaited GLP certification of laboratories, establishment of transgenic facility, BSL3 facility apart from formulating a vibrant HR policy to make it self-reliant in its endeavor to new drug discovery and development in fast track mode. I also look for a vibrant business policy as well as project management approaches to bring in more and more collaborations, particularly industry partners to propel the drug development programs.

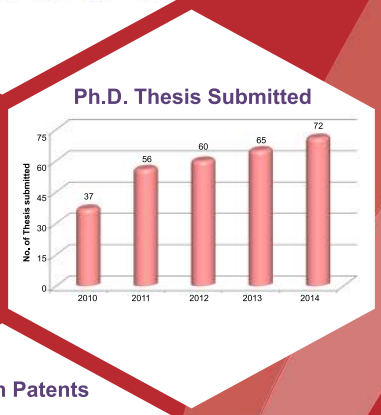
There is a wave of positive changes in business establishments at national and international level. System is becoming progressively conducive for new innovative ventures. Funding for focused research programs is on overhaul. Health and pharmaceutical research has always been a priority sector for the Government. Our institute, being mandated with a task of new drugs and development for diseases of national importance, has to play a bigger role. As we are in a better position to capitalize the opportunities, I am sure we will significantly contribute and lead the national movement of Growth and Development in this sector.

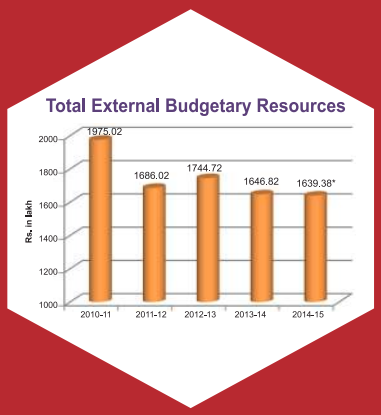
I take this opportunity to convey my heartfelt thanks to all the staff and students for their valuable contributions and am confident that they shall continue to work even harder during the years ahead to make it a most productive Institute.

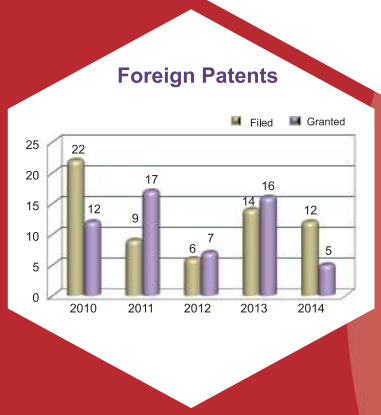
(Ram Vishwakarma)

17 February 2015









Performance Report

CSIR-Central Drug Research Institute, Lucknow

Performance Report

Performance Report

CSIR-CDRI Drug Pipeline

Discovery → **Translational** → **Launch**

Lead Optimization

Anti-cancer
- S011-2101
- S009-131
- S012-1332
- S012-1411

Anti-dyslipidemic
- CDR4655K09

Spermicidal
- S010-1255

Antidiabetic
- S009-629

Anti-tuberculosis
- S006-830

Anti-obesity
- S013-1593

Pre-clinical Studies

Antimalarial
- 99-411
- S011-1793

Fracture healing
- CDR914K058
- S007-1500

Osteoprotective
- CDR4744F004
- CDR1020F147

Anti-thrombotic
- S007-867
- S002-333

Anti-diabetic
- S007-1261

Anti-dyslipidemic
- CDR267F018

Memory enhancer
- Gugulipid

Anti-cancer
- S007-1235

Anti-stroke
- NMITLI118R(T+)
- Herbal Medicament

Phase I Clinical Trial

Antimalarial
- 97-78

Anti-osteoporotic
- 99-373

Anti-diabetic
- CDR134F194

Phase II /III Clinical Trial

Anti-dyslipidemic
- 80-574 + Atorvastatin

Hepatoprotective
- Picroliv

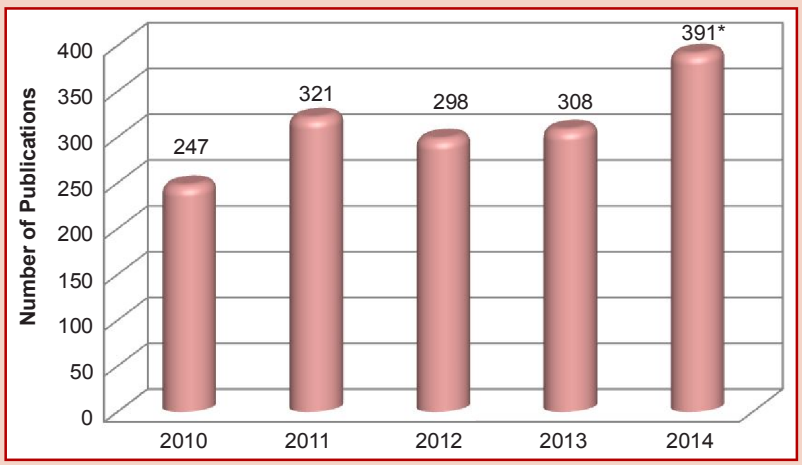
Approval for Marketing

Anti-hyperglycemic
- CDR134D123 (Approval awaited from AYUSH for marketing in herbal mode)

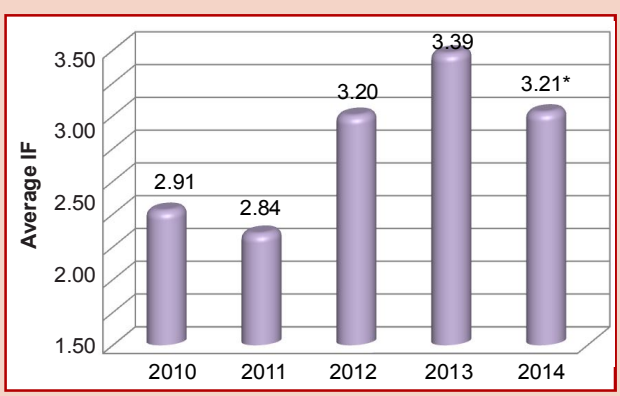
For further details & business queries, please contact: Director, CSIR-Central Drug Research Institute, Sector 10, Jankipuram Extension, Sitapur Road, Lucknow-226 031, Phone: 0522-2771940, Fax: 0522-2771941, Email: director@cdri.res.in Website: www.cdriindia.org

PUBLICATIONS

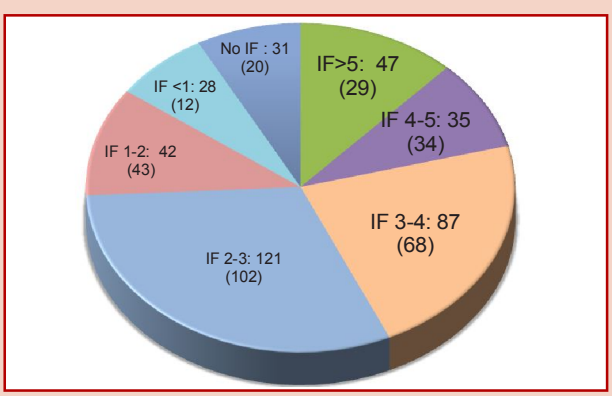
Total No. of Publications



Average Impact Factor

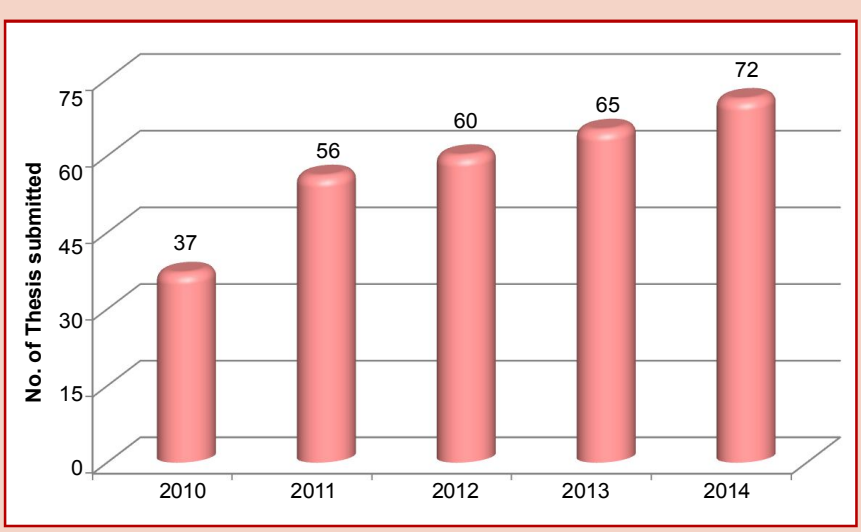


Impact Factor-wise No. of Publications 2014*



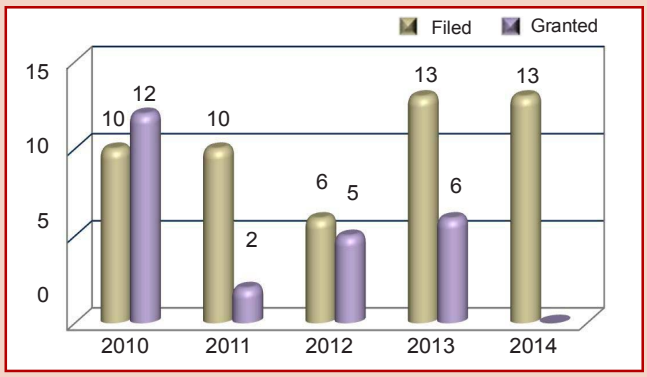
*Provisional data as on 31-01-2015

Ph.D. THESIS SUBMITTED

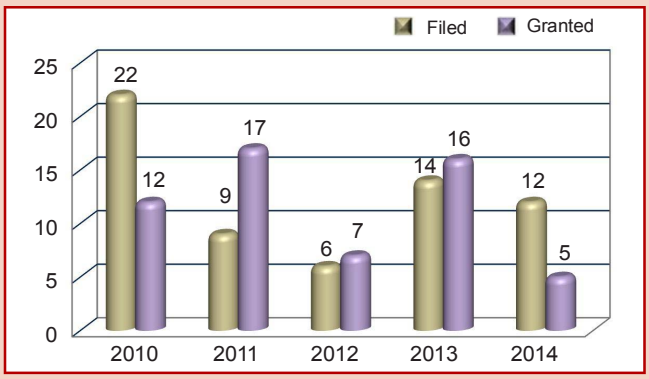


Intellectual Property

Indian Patents

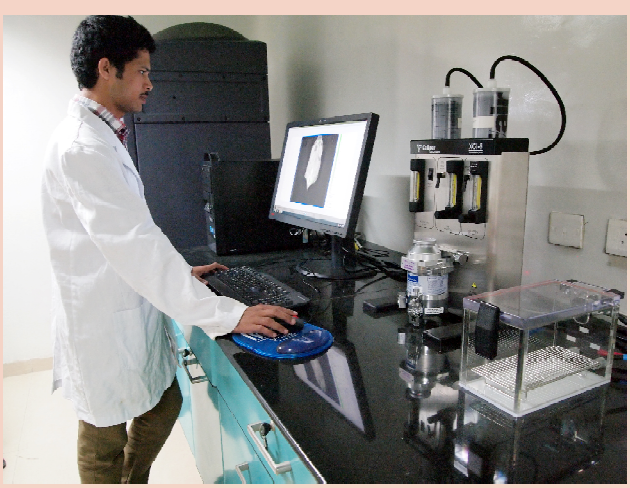


Foreign Patents



*Provisional data as on 31-01-2015

New Facilities Established



***In vivo* Animal Imaging System**

Label Free Interaction Analysis Lab (Biacore)

Atomic Force Microscope

New Generation DNA Analyser

Some Important Publications 2014

Chemical Sciences

Authors	Title	Journal, Vol.(Iss), PP	IF (2013)
Koley D, Krishna Y, Srinivas K, Khan AA and Kant R	Organocatalytic Asymmetric Mannich Cyclization of Hydroxylactams with Acetals: Total Synthesis of (—)-Epilupinine, (—)-Tashiromine, and (—)-Trachelanthamidine	**Angew. Chem. Int. Ed.,** 53(48), 13196-13200	**11.336**
Pramanik MMD, Chaturvedi AK and Rastogi N	Substituent Controlled Reactivity Switch: Selective Synthesis of α–Diazoalkylphosphonates or Vinylphosphonates via Nucleophilic Substitution of Alkyl Bromides with Bestmann-Ohira Reagent	**Chemical Communications,** 50(85), 12896 - 12898	**6.718**
Viswanadham, KKD R, Reddy MP, Sathyanarayana P, Ravi O, Kant R and Bathula SR	Iodine-Mediated Oxidative Annulation for One-Pot Synthesis of Pyrazines and Quinoxalines using a Multipathway Coupled Domino Strategy	**Chemical Communications**, 50(88),13517-13520	**6.718**
Hussain MK, Ansari MI, Kant R and Hajela K	Tandem C-2 Functionalization-Intramolecular Azide-Alkyne 1,3-dipolar Cycloaddition Reaction: A Convenient Route to Highly Diversified 9H-benzo [b] pyrrolo [1,2-g][1,2,3]triazolo[1,5-d][1,4] diazepines	**Organic Letters,** 16(2), 560 - 563	**6.142**
Goel A, Sharma A, Kathuria M, Bhattacharjee A, Verma A, Mishra PR, Nazir A and Mitra K.	New Fluoranthene FLUN-550 as a Fluorescent Probe for Selective Staining and Quantification of Intracellular Lipid Droplets	**Organic Letters,** 16(3), 756 - 759	**6.142**
Krishna Y, Sharma S, Ampapathi RS and Koley D	Furan Based LOCKED Z-Vinylogous γ-Amino Acid Stabilizing α-Turn in Water-Soluble Cyclic α3γ Tetrapeptides	**Organic Letters,** 16(8), 2084 - 2087	**6.142**
Pulukuri KK and Chakraborty TK	Formal Synthesis of Actin Binding Macrolide Rhizopodin	**Organic Letters,** 16(8), 2284-2287	**6.142**
Das D, Kant R and Chakraborty TK	An Approach to a Bislactone Skeleton: A Scalable Total Synthesis of (+/-)-Penifulvin A	**Organic Letters,** 16(10), 2618-2621	**6.142**
Thirupathi N, Babu MH, Dwivedi V, Kant R and Reddy MS	Palladium-Catalyzed Tandem Intramolecular Oxy/Amino-Palladation/Isocyanide Insertion: Synthesis of α–Benzofuranyl/Indolylacetamides	**Organic Letters,** 16(11), 2908 - 2911	**6.142**
Gunaganti N, Kant R and Narender T	Copper (II) Catalyzed Expeditious Synthesis of Furoquinoxalines through a One-Pot Three-Component Coupling Strategy	**Organic Letters,** 16(17), 4528 - 4531	**6.142**
Puri S, Thirupathi N and Reddy MS	Iodo Meyer–Schuster Rearrangement of 3–Alkoxy-2-yn-1-ols for β–Mono (Exclusively Z–Selective) –/Disubstituted α–Iodo-α, β–Unsaturated Esters	**Organic Letters,** 16(20), 5246-5249	**6.142**
Samala S, Pallavi P, Kumar R, Arigela RK, Singh G, Ampapathi RS, Priya A, Datta S, Patra A and Kundu B	One-Pot Synthesis of Highly Fluorescent Pyrido[1,2-a]indole Derivatives through C-H/N-H Activation: Photo physical Investigations and Application in Cell Imaging	**Chem. Eur. J.,** 20(44), 14344 - 14350	**5.696**
Singh C, Verma VP, Hassam M, Singh AS, Naikade NK and Puri SK	New Orally Active Amino- and Hydroxy-Functionalized 11-Azaartemisinins and Their Derivatives with High Order of Antimalarial Activity against Multidrug-Resistant *Plasmodium yoelii* in Swiss Mice	**J. Med. Chem.,** 57(6), 2489 - 2497	**5.614**
Shivahare R, Korthikunta V, Chandasana H, Suthar MK, ... Saxena JK, Gupta S and Narender T	Synthesis, Structure–Activity Relationships, and Biological Studies of Chromenochalconesas Potential Antileishmanial Agents	**J. Med. Chem.,** 57(8), 3342 - 3357	**5.614**
Chakravarti B, Akhtar T, Rai B, Yadav M, ... Sanyal S, Chattopadhyay N and Kumar A	Thioaryl Naphthylmethanone Oxime Ether Analogs as Novel Anticancer Agents	**J. Med. Chem.,** 57(19), 8010 - 8025	**5.614**

*Provisional data as on 31-01-2015

Biological Sciences

Authors	Title	Journal, Vol.(Iss), PP	IF (2013)
Singh AK, Joharapurkar AA, Khan MP, Mishra JS, Singh N, Yadav M, Hossain Z, Khan K, ...Godbole MM, Gayen JR, Chattopadhyay N and Sanyal S.	Orally Active Osteoanabolic Agent GTDF Binds to Adiponectin Receptors, With a Preference for AdipoR1, Induces Adiponectin-Associated Signaling, and Improves Metabolic Health in a Rodent Model of Diabetes.	**Diabetes,** 63(10), 3530- 3544	7.895
Pawar VK, Panchal SB, Singh Y, Meher JG, Sharma K, Singh P, Bora HK, Singh A, Datta D and Chourasia MK	Immunotherapeutic Vitamin E Nanoemulsion Synergies the Antiproliferative Activity of Paclitaxel in Breast Cancer Cells via Modulating Th1 and Th2 Immune Response	**J. Controlled Rel.** 196, 295-306	7.261
Jyoti A, Singh AK, Dubey M, Kumar S, Saluja R, Keshari RS, Verma A, Chandra T, Kumar A, Bajpai VK, Barthwal MK and Dikshit M	Interaction of Inducible Nitric Oxide Synthase with Rac2 Regulates Reactive Oxygen and Nitrogen Species Generation in the Human Neutrophil Phagosomes: Implication in Microbial Killing	**Antioxidants & Redox Signaling,** 20(3), 417 - 431	7.189
Tripathi C, Tewari BN, Kanchan RK, Baghel KS, Nautiyal N, Shrivastava R, Kaur H, Bhatt ML and Bhadauria S.	Macrophages are Recruited to Hypoxic tumor Areas and Acquire a Pro-Angiogenic M2-Polarized Phenotype via Hypoxic Cancer Cell Derived Cytokines Oncostatin M and Eotaxin.	**Oncotarget,** 5(14), 5350 - 5368	6.636
Tyagi AM, Mansoori MN, Srivastava K, Khan MP, Kureel J, Dixit M, Shukla P, Trivedi R, Chattopadhyay N and Singh D	Enhanced Immunoprotective Effects by Anti-IL17 Antibody Translates to Improved Skeletal Parameters Under Estrogen Deficiency Compared to Anti-RANKL and Anti-TNFα Antibodies.	**Journal of Bone And Mineral Research,** 29, 9, 1981-1992	6.128
Kushwaha P, Khedgikar V, Gautam J, Dixit P, Chillara R, Verma A, Thakur R, Mishra DP, Singh D, Maurya R, Chattopadhyay N, Mishra PR and Trivedi R.	A novel Therapeutic Approach with Caviunin-based Isoflavonoid that en routes Bone Marrow Cells to Bone Formation via BMP2/Wnt- β-Catenin Signalling.	**Cell Death & Disease,** 5, e1422	6.044
Chandra V, Fatima I, Manohar M, Popli P, Sirohi VK, Hussain MK, Hajela K, Sankhwar P and Dwivedi A.	Inhibitory Effect of 2-(Piperidinoethoxyphenyl)-3-(4-Hydroxyphenyl)-2H-Benzo(b)pyran (K-1) on Human Primary Endometrial Hyperplasial Cells Mediated via Combined Suppression of Wnt/β-Catenin Signaling and PI3K/Akt Survival Pathway	**Cell Death & Disease,** 5, e1380	6.044
Trivedi R, Maurya R and Mishra DP.	Medicarpin, a Legume Phytoalexin Sensitizes Myeloid Leukemia Cells to TRAIL-Induced Apoptosis Through the Induction of DR5 and Activation of the ROS-JNK-CHOP Pathway	**Cell Death & Disease,** 5, e1465	6.044
Kureel J, Dixit M, Tyagi AM, Mansoori MN, SrivastavaK, Raghuvanshi A, Maurya R, Trivedi R, Goel A and Singh D	miR-542-3p Suppresses Osteoblast cell Proliferation and Differentiation, Targets BMP-7 Signaling and Inhibits Bone Formation	**Cell Death & Disease,** 5, e1050	6.044
Rastogi N, Gara RK, Trivedi R, Singh A, Dixit P, Maurya R, Duggal S, Bhatt MLB, Singh S and Mishra DP	(6)-Gingerol Induced Myeloid Leukemia Cell Death is Initiated by Reactive Oxygen Species and Activation of miR-27b Expression.	**Free Radical Biology and Medicine,** 68, 288-301	5.271
Gupta S, Verma DK, Biswas J, Rama Raju KS, Joshi N, Wahajuddin and Singh S	The Metabolic Enhancer Piracetam Attenuates Mitochondrion-Specific Endonuclease G Translocation and Oxidative DNA Fragmentation.	**Free Radical Biology and Medicine,** 73, 278-290	5.271
Shukla P, MathurV, Kumar A, Khedgikar V, Teja BV, Chaudhary D, Kushwaha P, Bora HK, Konwar R, Trivedi R and Mishra PR	Nanoemulsion Based Concomitant Delivery of Curcumin and Etoposide: Impact on Cross Talk Between Prostate Cancer Cells and Osteoblast During Metastasis	**Journal of Biomedical Nanotechnology,** 10(11), 3381-3391	5.256
Kansal S, Tandon R, Verma A, Misra P, Choudhary AK, Verma R, Verma PRP, Dube A and Mishra PR	Coating Doxorubicin Loaded nanocapsules with Alginate Enhances Therapeutic Efficacy Against Leishmania in Hamsters by Inducing Th1 Type Immune Responses	**Br. J. Pharmacol.,** 171(17), 4038-4050	5.067
Singh K, Veluru NK, Trivedi V, Gupta CM and Sahasrabuddhe AA.	An Actin-Like Protein is Involved in Regulation of Mitochondrial and Flagellar Functions as well as in Intramacrophage Survival of *Leishmania donovani*.	**Molecular Microbiology,** 91(3), 562-578	5.026

*Provisional data as on 31-01-2015

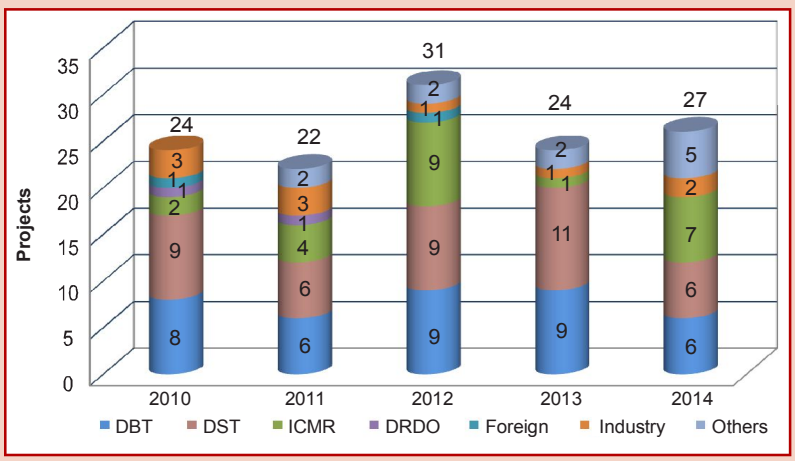
BUDGET

₹ in Lakh

	Heads	2010-11	2011-12	2012-13	2013-14	2014-15 (Allocation)
(A)	**Recurring**					
	Pay and Allowances	3821.022	3926.863	4340.300	4631.798	4453.125
	Contingencies	393.437	409.510	797.111	910.384	626.075
	HRD	4.535	4.00	4.000	-	-
	Maintenance	248.190	283.125	475.374	416.574	320.000
	Chemical and Consumables	601.112	1041.550	1092.250	260.000	635.000
	Sub-Total	**5068.296**	**5665.048**	**6709.035**	**6218.756**	**6034.200**
(B)	**Capital**					
	Works and Services/ Electrical Installation	109.370	-1682.478	98.522	96.326	-
	Apparatus and Equipments/ Computer Equipments	1550.000	3466.500	820.000	286.834	650.000
	Office Equipments, Furniture and Fittings	7.031	6.950	7.000	4.019	-
	Library Books and Journals	275.000	240.587	175.000	75.469	200.000
	Sub-Total	**1941.401**	**2031.559**	**1100.522**	**462.648**	**850.000**
	Total (A+B)	**7009.697**	**7696.605**	**7809.557**	**6681.404**	**6884.200**
(C)	**Special Projects SIP/NWP/IAP / /HCP/ BSC/CSC**	**1312.323**	**995.599**	**1901.464**	**3543.532**	**2075.965**
(D)	**CMM0015 (New CDRI)**	**9504.300**	**3843.710**	**-**	**-**	**4000.000**
	Grant Total (A+B+C+D)	**17826.32**	**12535.914**	**9711.021**	**10224.936**	**12960.165**

*Provisional data as on 31-01-2015 included expenditure against LRF

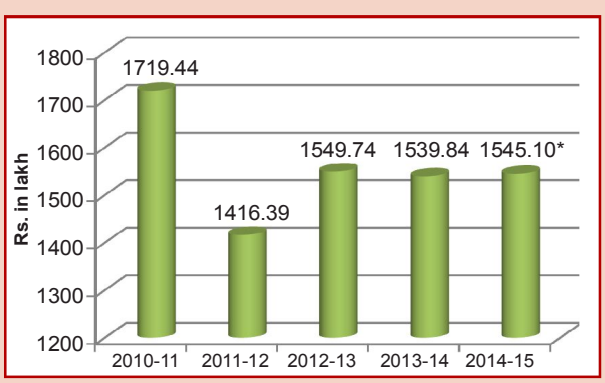
New Inter-Agency Projects Initiated



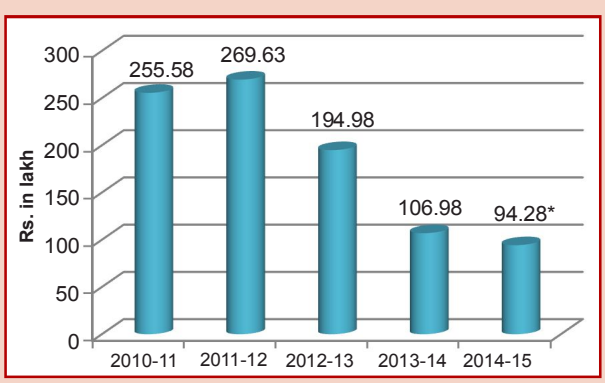
External Budgetary Resources

₹ in Lakh

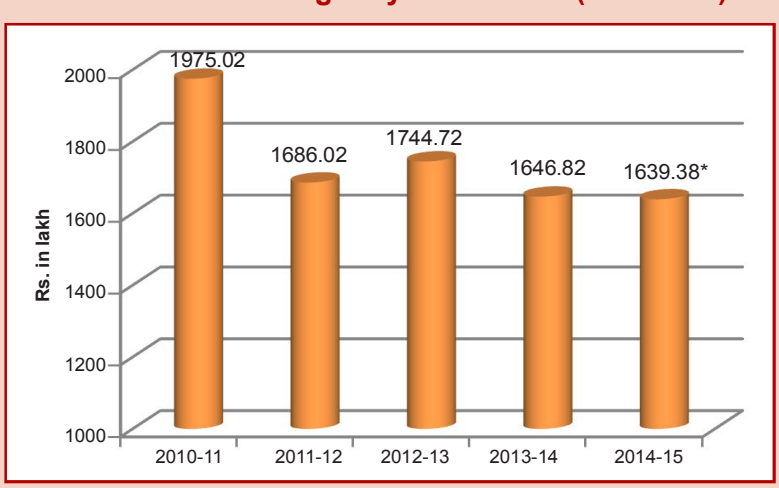
External Cash Flow
(Including Govt Agencies, Foreign Agencies and Industries)



Lab Reserve Fund Generated



Total External Budgetary Resources (ECF+LRF)



Provisional data as on 01-02-2015

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

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

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

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

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

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

Agency Representative

Dr. Bindu Dey
Adviser
Department of Biotechnology,
CGO Complex, Lodhi Colony,
New Delhi -110 003

DG Nominee

Dr. Girish Sahni
Director
CSIR-Institute of Microbial Technology
Sector 39-A,
Chandigarh - 160036

Sister Laboratory

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

Director

Dr. Ram A. Vishwakarma
Director
CSIR-Central Drug Research Institute
Lucknow – 226 031

Permanent Invitee

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

Secretary

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

Management Council

(January 2014- December 2015)

Chairman

Dr. Ram A. Vishwakarma
Director,
CSIR-Central Drug Research Institute,
Lucknow – 226 031

Members

Dr. C.S. Nautiyal
Director
CSIR-National Botanical Research Institute
Lucknow – 226 001

Dr. Rajendra Prasad
Chief Scientist
Business Development Unit
CSIR-Central Drug Research Institute
Lucknow - 226 031

Dr. W. Haq
Senior Principal Scientist
Medicinal and Process Chemistry
CSIR-Central Drug Research Institute
Lucknow - 226 031

Dr. B. N. Singh
Principal Scientist
Microbiology Division
CSIR-Central Drug Research Institute
Lucknow - 226 031

Dr. M. I. Siddiqi
Senior Scientist
Molecular and Structural Biology
CSIR-Central Drug Research Institute
Lucknow - 226 031

Dr. Shubha Shukla
Scientist
Pharmacology
CSIR-Central Drug Research Institute
Lucknow - 226 031

Mr. Parvez Mahmood
Senior Superintending Engineer
Laboratory Engineering Services
CSIR-Central Drug Research Institute
Lucknow - 226 031

Mr. AK Dwivedi
Controller of Finance & Accounts
CSIR-Central Drug Research Institute
Lucknow - 226 031

Member Secretary

Mr. BK Kar
Controller of Administration
CSIR-Central Drug Research Institute,
Lucknow – 226 031

ANNOUNCEMENT

CDRI Awards 2015

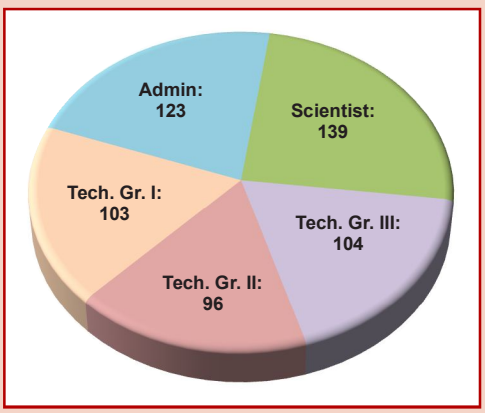
The prestigious CDRI Awards 2015 for Excellence in Drug Research in Life Sciences category has been awarded to Prof. Rinti Banerjee, Nanomedicine, IIT-Mumbai for her work on "Trigger Responsive Nanoparticles for Drug Delivery". In the Chemical Sciences category, the award has gone to Dr. Ramakoteswara Rao Jetti, Mylan Laboratories Ltd., Medak, Telengana for his work on "Novel Solid Forms of Active Pharmaceutical Ingredients"

Our heartiest congratulations to both the awardees!

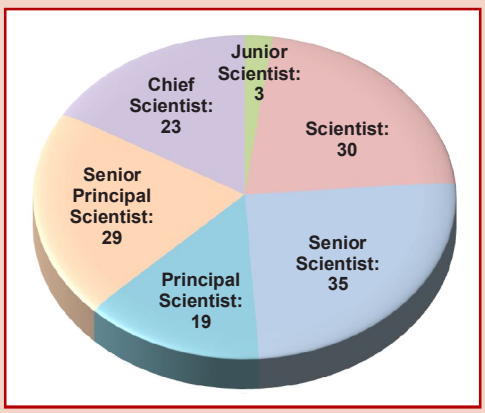
The felicitation ceremony will be held on 26th September 2015

MANPOWER

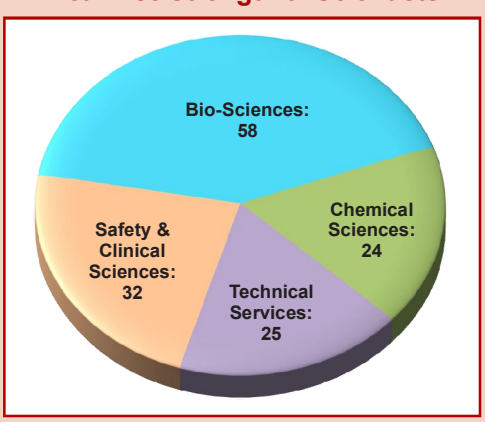
Total Staff (565)



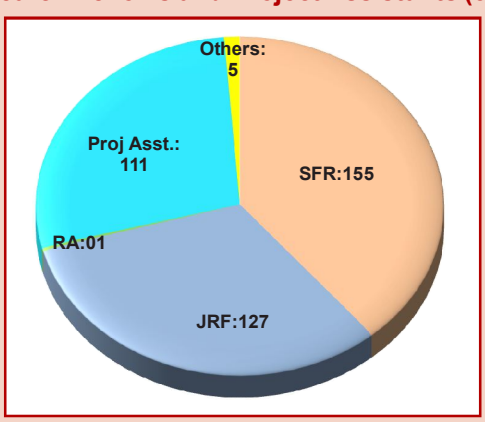
Designation-wise Number of Scientists



Area-wise Strength of Scientists



Research Fellows and Project Assistants (399)

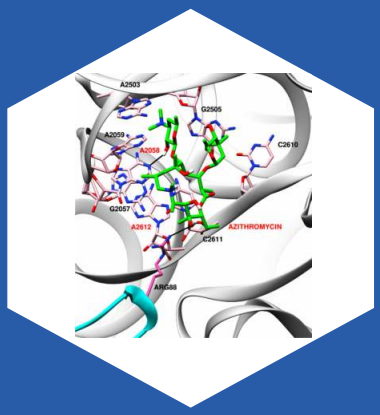


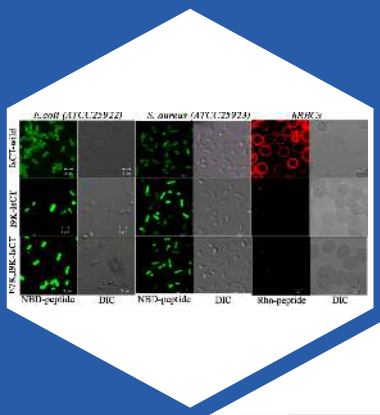
*Data as on 31-12-2014

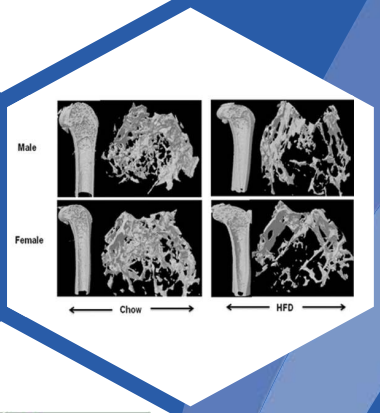
Members of ASTHI Team of CSIR-CDRI among the Most Productive Authors in Osteoporosis Research in India

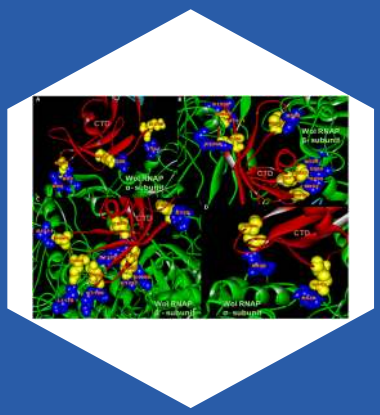
In a mapping of Indian research output on osteoporosis, published by Annals of Library and Information Studies, AIIMS and CDRI were found to be most productive research Institutions in this area in India. Among the top ten most prolific authors contributing to osteoporosis research in India, five are affiliated to Central Drug Research Institute, Lucknow. N. Chattopadhyay is the researcher with most number of papers. The top author with highest h-index value is N. Chattopadhyay (h-index12)*.

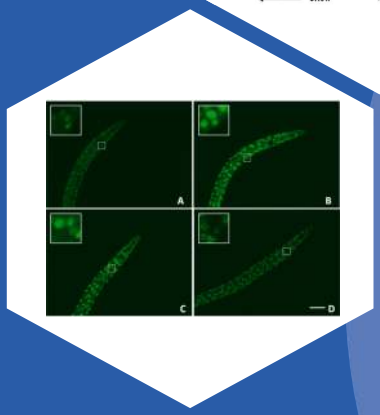
*Ref.: Annals of Library and Information Studies, vol. 60, Dec 2013, pp 276-283.











Progress in Research Projects

CSIR-Central Drug Research Institute, Lucknow

Performance Report

1 Malaria and other Parasitic Diseases

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, diseases caused by these three parasites 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 investigation 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, investigation 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.

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

1.1 Malaria

1.1.1 Synthesis and Screening

1.1.1.1 Screening against *Plasmodium falciparum in vitro*

During the reporting period approximately 500 novel compounds, synthesized at the institute or received from various research organizations across the country, were screened against both chloroquine sensitive (3D7) chloroquine resistant (K1) strains of human malaria parasite, *P. falciparum.* Approximately 340 novel chemical moieties representing diverse chemical classes including pyridoimidazole aryl amines, beta-carbolines, thiazolidinediones, aryl sulfonyloxy acetamidamides, benzazepino-indoles, indolodiazepines, fused-isoquinolines isochromenes, dibenzonaphthyridine, benzoisaoxazoles, 1, 5-disubstituted phenyl pentadienone dithiocarbamate hybrids, chalcone hybrids, curcumin and 4-aminoquinoline–triazoles, triazole-thiocarbamates, indazoles and amino acid conjugates, urea, glycosylated iminocoumarins, benzimedazoles, and emodines were evaluated. Most of these molecules were also evaluated for cytotoxic profile against vero cell line. Compounds belonging to 1, 5-disubstituted phenyl pentadienone-dithiocarbamate hybrids, curcumin derivatives and 4-aminoquinoline–triazoles and triazole-thiocarbamates exhibited IC_{50} values between 100nM and 1μM against both 3D7 as well as K1 strains whereas compounds belonging to 4-aminoquinoline-indazole derivatives and -amino acid conjugates exhibited IC_{50} values less than 100nM against both strains of the parasite. In addition a few of the triazole derivatives displaying IC_{50} < 2μM against *Pf*3D7 and *Pf*K1, respectively were found to elicit >75% inhibition of β- haematin formation against *P. yoelli nigeriensis* MDR at 100μM concentration.

In addition antimalarial assessment of different solvent fractions and two sesquiterpenoid lactones of the flowers of *Sphaeranthus indicus* was also carried out.

1.1.1.2 *In vivo* evaluation of anti-malarial activity in *P. yoelii*-Swiss mice model

(i) Antimalarial activity of a new SNEDD formulation of Arteether in Swiss mice

Aiming to improve the bioavailability of the poorly water-soluble drug arteether for oral delivery a lipid-based self nano-emulsifying drug delivery system (SNEDDS) was prepared. These formulations were found to be highly effective for the treatment of *Plasmodium yoelii nigeriensis* infected Swiss mice, even at the lower dose of 12.5 mg/kg × 5 days with mean survival rate of more than 28 days. Overall the developed formulations are safe, provide a non-toxic platform for further clinical studies, and can be used in artemisinin-based combination therapies (**RSC Adv., 2014, 4, 64905-64918**).

(ii) Evaluation of a 4-aminoquinoline compound series

In the attempt to identify a back-up molecule for S011-1793 belonging to 4-aminoquinoline series, 25 synthetic compounds were evaluated against chloroquine resistant *P. yoelii* (N-67)–Swiss mice model. Preliminary screening resulted in identification of 5 compounds which displayed curative activity at 100 mg/kg dose. Follow-up studies with these compounds at lower doses demonstrated that compound S012-1785 had curative activity at 12.5 mg/kg x 4 dose regimen.

1.1.1.3 Screening of S011-1793 against *Plasmodium cynomolgi* – Rhesus monkey model

Dose response studies with compound S011-1793 against simian malaria model showed that 10 mg/kg x 3 dose regimen is curative against *P. cynomolgi* in monkeys. Four animals treated with initial parasitaemia load of 8000-15000/mm^3 showed parasite clearance within 48 hours and no recrudescence was recorded during 70 day post-treatment observation period. Treatment at 5 mg/kg x 3 dose in 2 monkeys showed parasite clearance in 72 hours. While one of the monkeys showed recrudescence on day 13, the other was cured. Chloroquine at 10 mg/kg x 3 dose regimen was observed to be curative in this model.

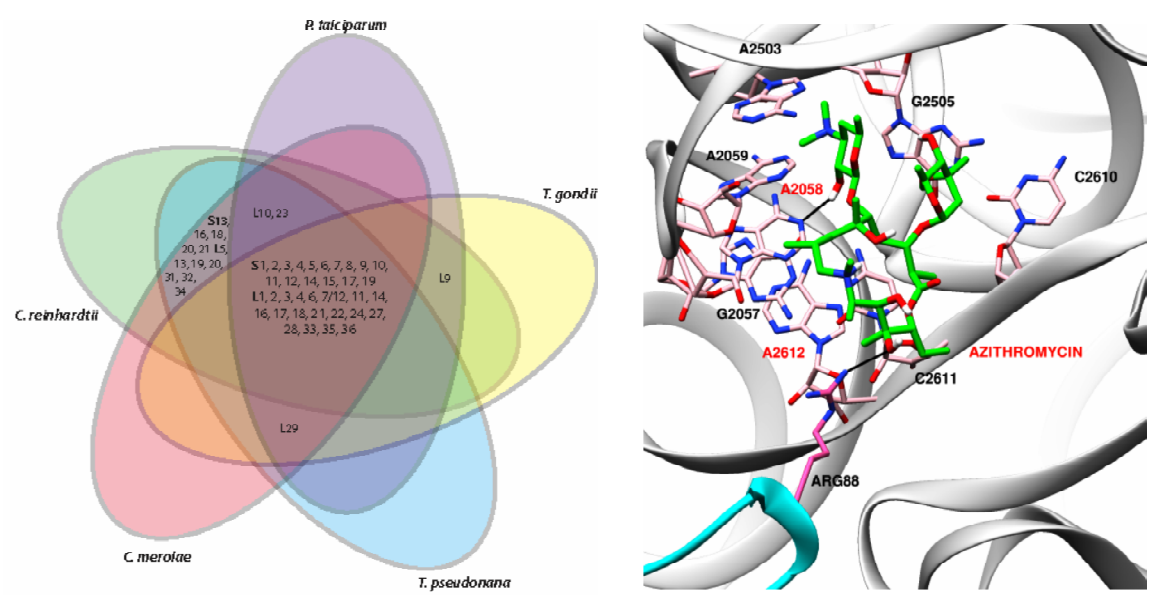
1.1.2 Molecular and Biochemical Investigations

1.1.2.1 Reduced ribosomes in organelles of *Plasmodium falciparum* and their interaction with antibiotics

Apicomplexan protists such as *Plasmodium* contain a mitochondrion and a relic plastid (apicoplast) that are sites of protein translation. There is interest in the partitioning and function of translation factors that participate in apicoplast and mitochondrial peptide synthesis, but the composition of organellar ribosomes remained to be elucidated. Analysis of the complement of core ribosomal protein subunits that are encoded by either the parasite organellar or nuclear genomes indicated that *Plasmodium* and *Toxoplasma* organellar ribosomes have a unique composition, resulting from the loss of several large and small subunit proteins accompanied by significant sequence and size divergences in parasite orthologues of ribosomal proteins (***Open Biol.* 4 (5), 140045**). Structural models of sections of organellar ribosomes were also assembled and predicted interactions with translation inhibitory antibiotics such as azithromycin and clindamycin. Differences in predicted drug-ribosome interactions with some of the modeled structures suggested specificity of inhibition between the apicoplast and mitochondrion.

1.1.2.2 The apicoplast SUF pathway of [Fe-S] complexation as a possible target for drug design

The apicoplast of the malaria parasite encodes for a component of the unique SUF pathway of Fe-S cluster biogenesis, with the rest of the assembly proteins encoded by the parasite nucleus. The first step in [Fe-S] assembly is sulphur mobilization carried out by SufS, a cysteine desulphurase in conjunction with SufE which is an enhancer of SufS activity. Structure modelling of the *P. falciparum* apicoplast SufS-E complex revealed proximal positioning of conserved cysteine residues of the two proteins that would allow sulphide transfer from the PLP-cofactor bound active site of *Pf*SufS. Sulphide release from the L-cysteine substrate catalysed by *Pf*SufS was inhibited by the PLP-inhibitor D-



A B

Fig. **(A) Venn diagram showing the distribution of nuclear- or plastid–encoded ribosomal proteins that would constitute the plastid ribosomes of apicomplexans. (B) Azithromycin docked onto modeled apicoplast ribosome.**

cycloserine that forms an adduct with *Pf*SufS-bound PLP. D-cycloserine is also inimical to parasite growth with an IC_{50} close to that reported for *Mycobacterium tuberculosis* against which the drug is in clinical use (***Antimicrob. Agents Chemother.* 58(6): 3389-3398**). This provides rationale for drug design based on inactivation of the PLP-cofactor of *Pf*SufS.

1.1.2.3 SNP haplotypes of IFN-α receptor (*IFNAR1*) and Interferon-γ (*IFNG*) microsatellite repeat are associated with enhanced malaria susceptibility in Indian populations

Pro-inflammatory cytokines IFNγ and IFNα act through their cellular receptors (IFNγR1 and IFNαR1, respectively) to mediate immune processes during infection. A total of 21 SNPs, 2 ins/del polymorphisms and a microsatellite repeat were analyzed for association with *P. falciparum* malaria susceptibility in a case-control study based in a disease-endemic and a -nonendemic region of India. A 3'UTR and an intron 3 SNP of *IFNG* associated with disease in the endemic region. Also, large $(CA)_n$ repeats of *IFNG* intron1 correlated with protection from disease manifestation with a stronger association observed for protection from severe malaria in the endemic region. The TA11CAG haplotype (-1616 T/C, +874 A/T, +875 $(CA)_n$, +3232 T/C, +5171 A/G, +5610 G/A) carrying a short CA_{11} repeat also exhibited very strong association with severe malaria, particularly in the endemic region ($P=3x10^{-5}$). One SNP each from the *IFNA8* and *IFNA17* of *IFNA* gene cluster had a protective effect in the non-endemic region but not in the endemic region. A promoter and an intron2 SNP of *IFNAR1* were risk factors for disease and the *IFNAR1* haplotype GCCAGG (-645 C/G, -19 C/T, +6993 C/T, +10779 G/A, +16724 G/C, +18416 G/C) carrying both the risk alleles associated strongly with disease manifestation ($P<1x10^{-4}$) in the endemic region. Data indicates dissimilar contribution of cytokine and cytokine receptor variants to disease in populations residing in areas of differential malaria endemicity (***Infect. Genetics Evol.*, in press, doi: 10.1016/j.meegid.2014.10.030**).

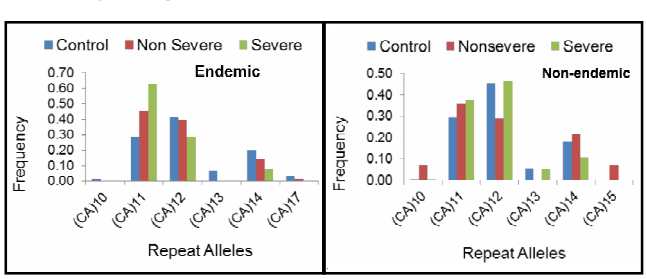


Fig. Distribution of *IFNG* $CA_{(n)}$ repeats in patient and control groups of the endemic (A) and non-endemic region (B)

1.1.2.4 Targeting approaches against sporozoite proteins

Genetic manipulation and drug targeting approaches against *Plasmodium* sporozoite specific proteins are being addressed. The laboratory has generated several knock-outs using the *P. berghei* model. A candidate Plasmepsin VII which was knocked out by regular method was dispensable throughout the *Plasmodium* life cycle (***Mol. Biochem. Parasitol.* 195(1):10-13**). Other gene knock-outs generated are under investigation. A *Plasmodium* sporozoite generation facility has been set up and is being used for screening of compounds against parasite liver stages.

1.1.2.5 Establishment of an *in vitro* and *in vivo* cerebral malaria model

The effect of standard antimalarials on cytoadherence inhibition of *P. falciparum* K1 to the endothelial cell line BB19 was evaluated. The percent inhibition ranges between 6.7 to 70%. Chloroquine was the least effective with 6.7% inhibition at 100 µg/ml (a concentration 100 times higher than the IC_{50} of Chloroquine against *Pf*K1). The percent inhibition of Artemether, Arteether, Artesunate and Mefloquine were 71.7, 69.9, 53.8 and 49.3, respectively. The antimalarials were also tested for their cytotoxicity against the BB19 cell line. Mefloquine was the most toxic antimalarial whereas Artemether was the safest.

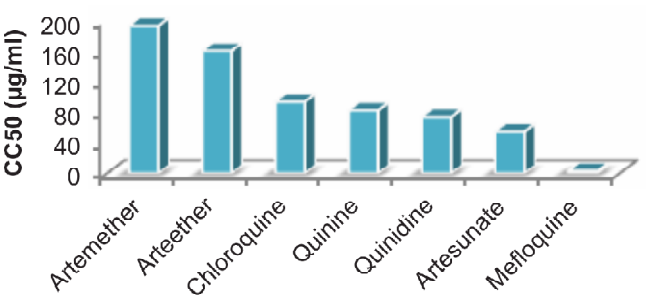


Fig. CC_{50} of antimalarials against BB19 cell line (µg/ml)

Several parameters for cerebral malaria were validated in the *P. berghei* ANKA mouse model. The CM symptomatic mice shows compromised blood brain barrier as evident by evan's blue leakage. The cerebellum region of the brain was more affected in comparison to cerebral cortex and medulla. The brain samples of CM mice showed endothelial damage, microvascular plugging primarily of mononuclear cells and multifocal haemorrhages in brain parenchyma and cerebellum. The relative mRNA expression of vascular adhesion receptors *viz.* ICAM-1 and VCAM-1 was found to be increased in the cerebellum.

For the study of hypoxia in Cerebral Malaria (CM), the mRNA expression of HIF 1α, HIF 1β and GLUT1, GLUT3 was studied in healthy and *Plasmodium berghei* ANKA (Pb ANKA) infected C57BL/6 mice brain. The mRNA expression of HIF 1α, HIF 1β, GLUT1 and GLUT3 was significantly elevated in Pb ANKA infected C57BL/6 mice brain as compared to healthy, which suggest hypoxia in brain of infected mice and this is likely a key event in development of acute cerebral dysfunction in CM.

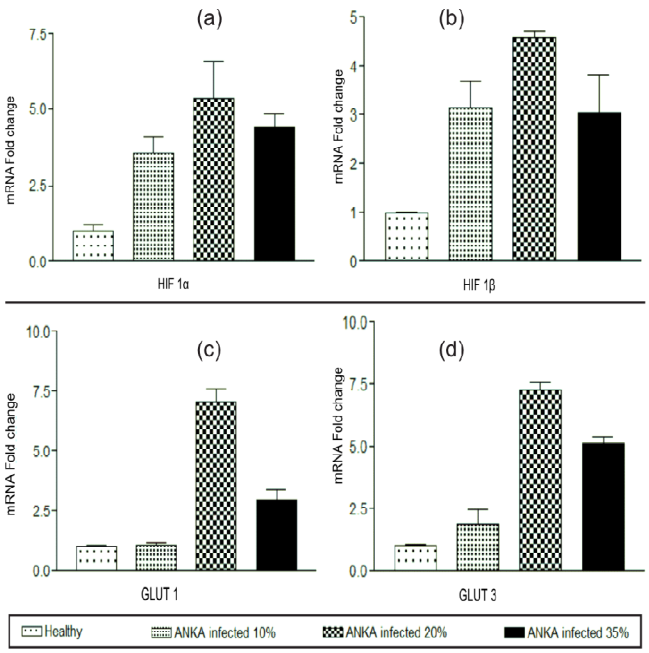


Fig. mRNA expression of HIF1α (a), HIF1β (b), GLUT1(c) and GLUT 3 (d) in brain samples of healthy and PbA infected C57BL6 mice at different parasitemia.

1.2 Leishmaniasis

1.2.1 Synthesis and Screening

Novel synthetic moieties representing several prototypes viz. benzisoxazoles, 2, 3 di substituted quinoline-4-ones, chalcones, oxazoles, beta amino acids, 1, 3 quinazoline-4-ones were synthesized and screened for antileishmanial activity against experimental models. About 101 synthetic compounds were evaluated at 50 µM and 25 µM concentrations, respectively against *in vitro* macrophage-amastigote model out of which five compounds belonging to di-substituted quinoline-4-one and pyrazolo-dihydropyridine series showed significant activity (>90% inhibition of parasite multiplication. These compounds (IC_{50} <10 µM and SI >5) were revaluated for *in vivo* efficacy in *L. donovani* hamster model, where they showed no significant anti-leishmanial (<70% inhibition of parasite multiplication) activity. Further, 22 compounds out of 43 compounds belonging to 9-anilinoacridine triazines series which were synthesized as inhibitors of trypanothione reductase, exhibited good antileishmanial activity against intracellular amastigotes with SI >10. *In vivo* evaluation of these compounds revealed identification of two promising compounds showing >75% anti-leishmanial activity.

1.2.2 Mechanism of Drug Resistance

Sodium antimony gluconate (SAG) unresponsiveness of *L. donovani* (Ld) had effectively compromised the chemotherapeutic potential of SAG. Previously, through a proteomic analysis, proliferating cell nuclear antigen (PCNA) was found to be over-expressed in sodium antimony gluconate (SAG)-resistant clinical isolate compared to a SAG-sensitive clinical isolate of *L. donovani*. PCNA was overexpressed by ≥ 3-fold in the log phase, stationary phase, and procyclic and metacyclic stages of the promastigote form and by ~5-fold in the amastigote form of the SAG-resistant isolate. LdPCNA was overexpressed as a green fluorescent protein (GFP) fusion protein in a SAG-sensitive clinical isolate of *L. donovani*, and modulation of the sensitivities of the transfectants to pentavalent antimonial (SbV) and trivalent antimonial (SbIII) drugs was assessed *in vitro* against promastigotes and intracellular (J774A.1 cell line) amastigotes. Overexpression of LdPCNA in the SAG-sensitive isolate resulted in an increase in the 50% inhibitory concentrations (IC_{50}) of SbV (from 41.2±0.6 µg/ml to 66.5±3.9 µg/ml) and SbIII (from 24.0±0.3 µg/ml to 43.4±1.8 µg/ml). Moreover, PCNA-overexpressing promastigote transfectants exhibited less DNA fragmentation compared to that of wild-type SAG-sensitive parasites upon SbIII treatment. In addition, SAG-induced nitric oxide production was found to be significantly inhibited in the macrophages infected with the transfectants compared with that in wild-type SAG-sensitive parasites. It was thus inferred that LdPCNA has a significant role in SAG resistance in *L. donovani* clinical isolates, which warrants detailed investigations regarding its mechanism **(Antimicrob. Agents and Chemother. 2014, 58(6):2997-3007).**

Modulation of expression of many genes on antimony resistance in lab mutants as well clinical isolates has been identified, but very few have been characterized. A mitogen activated protein kinase 1 homologue was observed to be down-regulated in antimony resistant clinical isolates. The gene was found to be an active MAP kinase. Over-expression studies confirmed that LdMAPK1 indeed has a role in antimony resistance. Further studies to explore the mechanism revealed that LdMAPK1 negatively regulates the expression of P-glycoprotein like efflux pumps, thus affecting antimony-mediated apoptosis.

1.2.3 Immunobiology

1.2.3.1 Characterization of glycolytic enzymes - rAldolase and rEnolase of *Leishmania donovani*, for their immunogenicity and immunoprophylactic efficacies against experimental Visceral Leishmaniasis

Th1 immune responses play an important role in controlling Visceral Leishmaniasis (VL). Hence, *Leishmania* proteins stimulating T-cell responses in host, are thought to be good vaccine targets. Search of such antigens eliciting cellular responses in Peripheral Blood Mononuclear Cells (PBMCs) from cured/exposed Leishmania patients and

hamsters led to the identification of two enzymes of glycolytic pathway in the soluble lysate of a clinical isolate of *L. donovani* - Enolase (LdEno) and aldolase (LdAld) as potential Th1 stimulatory proteins. Recombinant LdEno and LdAld displayed strong ability to proliferate lymphocytes of cured hamsters along with significant nitric-oxide production and generation of Th1-type cytokines (IFN-c and IL-12) from stimulated PBMCs of cured/endemic VL patients. Assessment of their prophylactic potentials revealed ~90% decrease in parasitic burden in rLdEno vaccinated hamsters against *Leishmania* challenge, strongly supported by an increase in mRNA expression levels of iNOS, IFN-g, TNF-α and IL-12 transcripts along with extreme down-regulation of TGF-β, IL-4 and IL-10. However, animals vaccinated with rLdAld showed comparatively lesser prophylactic efficacy (~65%) with inferior immunological response. Further, with a possible implication in vaccine design against VL, identification of potential T-cell epitopes of both the proteins was done using computational approach. Comparative molecular and immunological characterization identifies rLdEno as a potential vaccine candidate against VL and supports the notion of it being an effective T-cell stimulatory protein **(PLoS One, 2014; 9 (1):e8607).**

1.2.3.2 Nucleosomal Histone proteins of *L. donovani* offer optimum prophylactic efficacy against Leishmania challenge in hamsters

Leishmania histone proteins were expressed and purified from the heterologous bacterial system. *Leishmania* infected cured patients/endemic contacts as well as cured hamsters exhibited significantly higher proliferative responses to individual recombinant histones and their pooled combination (rLdH2B+rLdH3+rLdH2A+rLdH4) than those of *L. donovani* infected hosts. The *L. donovani* soluble antigens (SLD) stimulated PBMCs of cured/exposed and *Leishmania* patients to produce a mixed Thl/Th2-type cytokine profile, whereas rLdH2B, rLdH3, rLdH2A, rLdH4 and pooled combination (rLdH2-4) stimulated the production of Th1 cytokines IFN-g, IL-12 and TNF-α but not Th2 cytokines IL-4 or IL-10. The immunogenicity of these histone proteins along with their combination was also checked in cured hamsters where they stimulated higher lymphoproliferation and nitric oxide production in lymphocytes of cured hamsters than that of infected controls. Moreover, significantly increased lgG2 response, an indicative of cell mediated immunity, was observed in cured hamsters against these individual proteins and their combination as compared to infected hamsters. Further, it was demonstrated that rLdH2B, rLdH3, rLdH2A and rLdH4 and pooled combination were able to provide considerable protection for hamsters against *L. donovani* challenge. The efficacy was supported by increased inducible nitric oxide synthase (iNOS) mRNA transcripts and Th1-type cytokines - IFN-g, IL-12 and TNF-α and down-regulation of IL-4, IL-10 and TGF-β. It was thus inferred that pooled rLdH2-4 elicits Thl-type of immune responses exclusively and confer considerable protection against experimental visceral leishmaniasis. **(PLoS One, 2014;9(6):e97911).**

1.2.3.3 Comparative cellular and protective responses of rTriose phosphate isomerase, rProtein disulfide isomerase and rElongation factor-2 in combination with rHSP70 against visceral leishmaniasis

Several proteins of *L. donovani* –triose phosphate isomerase (TPI), protein disulfide isomerase (PDI) and elongation factor-2 (EL-2) etc. including heat shock protein 70 (HSP70) have been previously identified as inducers of Th1-type of cellular responses in both cured *Leishmania* patients/hamsters. The potential of HSP70 to further enhance the immunogenicity and protective responses of the above said Th1-stimulatory proteins was assessed by generating recombinant HSP70 and testing its potential to stimulate immune responses in lymphocytes of cured *Leishmania* infected hamsters as well as in the peripheral blood mononuclear cells (PBMCs) of cured patients of VL either individually or in combination with above mentioned recombinant proteins. rLdHSP70 alone elicited strong cellular responses along with remarkable up-regulation of IFN-c and IL-12 cytokines and extremely lower level of IL-4 and IL-10. Among the various combinations, rLdHSP70 + rLdPDI emerged as the superior one, augmenting improved cellular responses followed by rLdHSP70 + rLdEL-2. These combinations were further evaluated for its protective potential wherein rLdHSP70 + rLdPDI again conferred utmost protection (~80%) followed by rLdHSP70 + rLdEL-2 (~75%) and generated a strong cellular immune response with significant increase in the levels of iNOS transcript as well as IFN-g and IL-12 cytokines which was further supported by the high level of lgG2 antibody in vaccinated animals. These observations indicated that vaccine(s) based on combination of HSP70 with Th1-stimulatory protein(s) may be a viable proposition against intracellular pathogens **(*PLoS One,* 2014; 9 (9):e108556)**.

1.2.4 Drug Target Identification and Characterization

1.2.4.1 Actin-network in *Leishmania* parasites

The actin cytoskeleton in a eukaryotic cell mediates a plethora of essential biological processes, the dynamics of which are controlled by multiple actin binding proteins that contract, expand, stabilize, crosslink or sever actin filaments. Coronin is one such actin binding protein whose mechanism is still unclear. Typically, it is made of an N-terminal WD repeat domain and a C-terminal coiled-coil domain. In *L. donovani* CRN12, the C-terminal domain is 53 residues long, with five heptad repeats, making it one of the longest coronin tail domains. Structural characterization of coronin was initiated to provide a rationale for its function. Crystals of the Selenomet labeled CRN12 tail domain were obtained using ammonium

sulphate as the precipitant. Diffraction data was collected at the European Synchrotron Radiation Facility (ESRF), Grenoble and the structure solved from the anamolous diffraction of Selenium. The structure reveals an anti-parallel four helix bundle, which is observed for the first time among coronins, which are usually trimers.

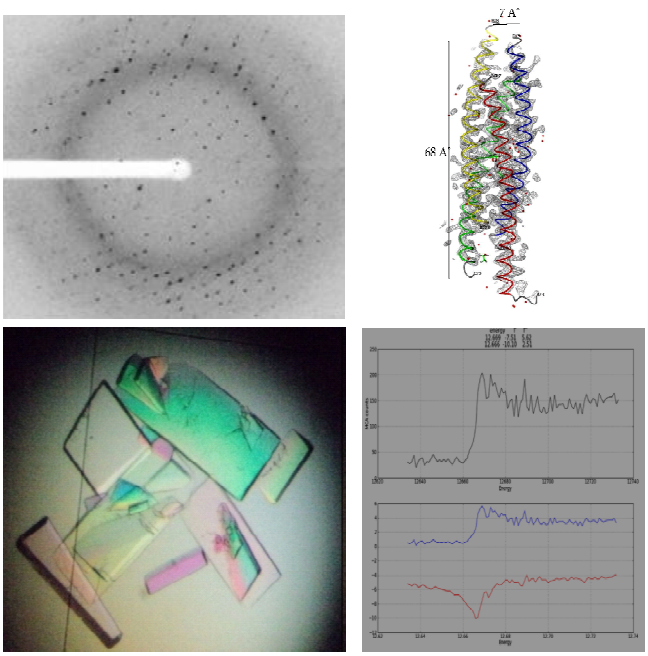


Fig. Photograph of a typical crystallization drop that produced diffracting Se-Met labeled crystals, fluoresence spectra showing the incorporation of Se, diffraction pattern and the resultant electron density map with a cartoon representation of the coronin structure.

The role of actin-network proteins in *Leishmania* was also investigated with an aim to deduce its physiological importance in the parasite survival focusing on various physiological processes such as flagella biogenesis, cell division and mitochondrial functions regulated by actin-network proteins in *Leishmania* cells. Using ADF/cofilin and myosin gene knockout mutants, identified several proteins involved in difference pathways, whose expression is dependent on acto-myosin motor function and actin-dynamics in *Leishmania* cells. Out of these, those that are promisingly involved in paraflagellar rod formation are being studied further.

The actin-filament binding protein, coronin, which regulates cytokinesis in *Leishmania* cells is also being functionally characterized. This protein, unlike other orthologs, exists in a higher oligomeric state by virtue of its C-terminal coiled-coil domain and oligomerization of this protein is required for its actin-filament promoting activity. One of the closest relatives of actin, ARP1, localizes primarily in the mitochondrion and regulates its function (**Molecular Microbiology, 2014, 91(3), 562-578**). Further analysis reveals that this protein besides regulating mitochondrial function, also affects mitotic spindle formation and cell division.

1.3 Filariasis

1.3.1 Synthesis and Screening

A total of 75 compounds were tested against *Brugia malayi* adult and microfilariae *in vitro*. Of these, six compounds were found active against adult worm with IC_{50} varying between 4.14 and 7.52 µM. The selectivity index (SI) showed that all these compounds were safe for *in vivo* follow-up. Twelve coumarin analogs were received from BHU, Varanasi. Out of these, eight were picked up *in vitro* at 10 µM conc. The IC_{50} values ranged between 1.99 µm and 0.014 µM against adult *B. malayi* while those against microfilaria ranged between 0.33 µM and 0.0056 µM; the SI of all the compounds was above 10. Out of these eight, six samples which were available in sufficient quantity were tested in vivo in primary adult *B. malayi* I.P. transplanted jird model at 100 mg/kg x 5 days by subcutaneous route. All six compounds exhibited macrofilaricidal (adulticidal) activities though to varying degrees with two compounds (compound 8 and 9) being the most effective (75 And 70% activity). These two compounds will be retested in the secondary s.c. L3 induced *Mastomys coucha* model to confirm antifilarial activity.

1.3.2 Antifilarial efficacy of moxidectin alone and in combination with other antifilarials

Moxidectin (MOX) is a macrocyclic lactone closely related to ivermectin and is currently progressing towards Phase III clinical trial against human *Onchocerca volvulus* infection. The *in vitro* and *in vivo* antifilarial efficacy of MOX was evaluated against *B. malayi*. *In vitro* Moxidectin showed 100% reduction in adult female worm motility at 0.6 µM concentration within 7 days with 67.67% inhibition in MTT reduction and IC_{50} for adult worm and microfilaria were 0.242 µM. In adult *B. malayi* transplanted primary screening model (*Meriones unguiculatus*), MOX at a single dose of 20 mg/kg by oral and subcutaneous routes was found to be optimally effective on adult parasites and microfilariae. In secondary screen (*Mastomys coucha*, subcutaneously inoculated with infective larvae) at the same dose subcutaneously it brought about 49.33% worm death causing sterilization in 53.57% of the recovered live female worms and the animals exhibited a continuous and sustained reduction in peripheral blood microfilaraemia throughout the observation period of 90 days. Confocal microscopy and real-time investigations on Moxidectin-treated adult worms revealed a decrease in the population of *Wolbachia*. Though the mechanism of action of milbemycin is suggested to be similar to avermectins, *in silico* docking revealed close interaction of MOX with various ligand sites GluCl of *B. malayi*. (**Folia Parasitologica; doi: 10.14411/fp.2014.068**)

1.3.3 Molecular characterization of *Wolbachia* endosymbiont proteins of *Brugia malayi* as antifilarial drug targets

1.3.3.1 Transcription elongation factor GreA

Wolbachia, an endosymbiont of the filarial nematode, is considered as a promising target for therapy against lymphatic filariasis. Transcription elongation factor GreA is an essential factor that mediates transcriptional transition from abortive initiation to productive elongation by stimulating the escape of RNA polymerase (RNAP) from native prokaryotic promoters. Biophysical characterization of Wol

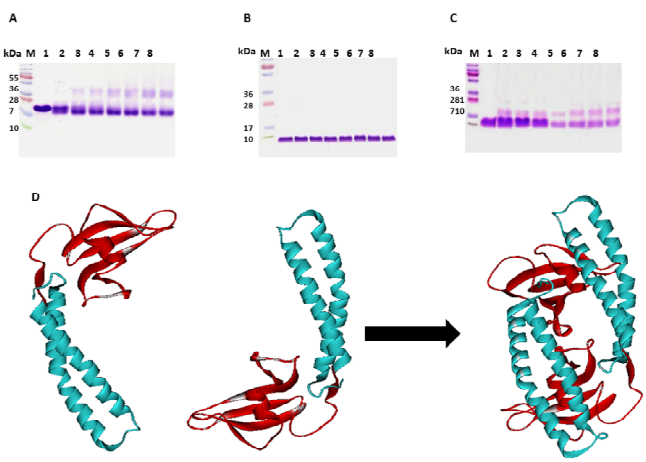


Fig. Inter-molecular chemical cross-linking of Wol GreA, Wol NTD, and Wol CTD using glutaraldehyde. Cross-linking study of Wol GreA (A), Wol NTD (B) and Wol CTD (C). (D) Residual interaction between Wol GreA monomers.

GreA with its N-terminal domain (NTD) and C-terminal domain (CTD) determined the domain responsible for interaction with $\alpha 2\beta\beta'\sigma$ subunits of RNAP. Protein-protein docking studies explored the residual interaction of RNAP with Wol GreA. The factor and its domains were found to be biochemically active. Wol GreA and CTD exist in a dimeric conformation while NTD subsists in monomeric conformation. Asp120, Val121, Ser122, Lys123, and Ser134 are the residues of CTD through which monomers of Wol GreA interact and shape into a dimeric conformation. The dimeric CTD through Lys82, Ser98, Asp104, Ser105, Glu106, Tyr109, Glu116, Asp120, Val121, Ser122, Ser127, Ser129, Lys140, Glu143, Val147, Ser151, Glu153, and Phe163 residues exclusively participated in binding with $\alpha 2\beta\beta'\sigma$ subunits of polymerase. These findings may be crucial to understanding the transcription mechanism of this aproteobacteria and in deciphering the role of Wol GreA in filarial development **(PLoS Negl Trop Dis. 2014;8(6): e2930. doi:10.1371/journal.pntd.0002930.)**

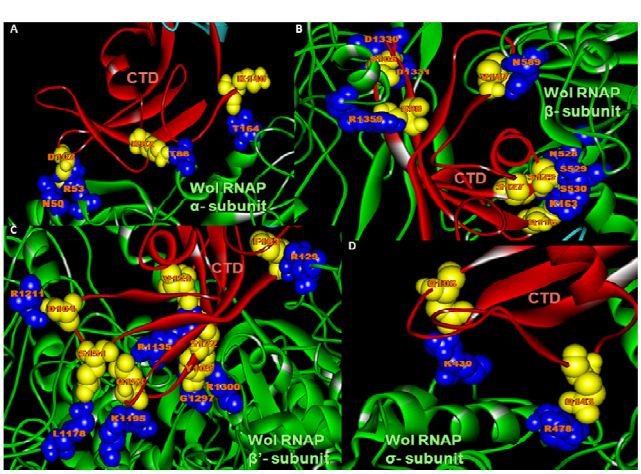


Fig. Residual interaction between Wol GreA and $\alpha 2\beta\beta'\sigma$ subunits of Wol RNAP.

1.3.3.2 Characterization of UDP-N-acetylglucosamine enolpyruvyl transferase (MurA)

Although functional characterization of *Wolbachia* peptidoglycan assembly has not been fully explored, the *Wolbachia* genome provides evidence for coding all genes involved in lipid II biosynthesis, a part of peptidoglycan biosynthesis pathway. UDP-N-acetylglucosamine enolpyruvyl transferase (MurA) is one of the lipid II

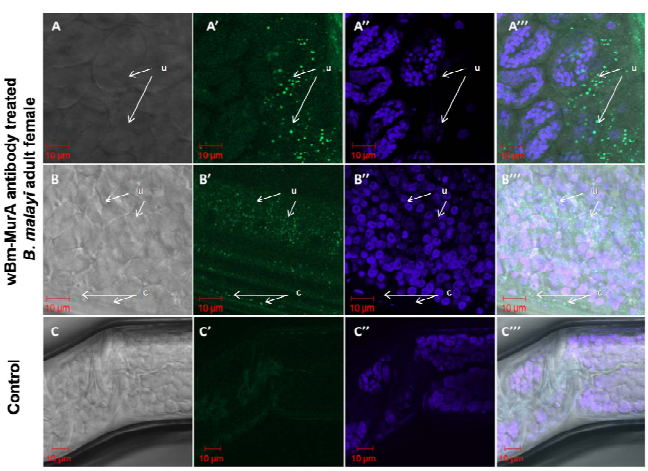


Fig. Immunolocalization of wBm-MurA in female *B. malayi* adult worm by confocal microscopy.

biosynthesis pathway enzymes and it has been recognized as an antibiotic target. MurA ortholog from *Wolbachia* endosymbiont of *B. malayi* (wBm-MurA) was cloned, expressed and purified for further molecular characterization. The enzyme kinetics and inhibition studies were undertaken using fosfomycin. wBm-MurA was found to be immunolocalized in *Wolbachia* within the microfilariae and female adults by the confocal microscopy. The amino acids crucial for enzymatic activity are conserved and the purified wBm-MurA possessed the EPSP synthase (3-phosphoshikimate 1-carboxyvinyltransferase) like activity at a broad pH range with optimal activity at pH 7.5 and 37 ^{0}C temperature. The apparent affinity constant (K_m) for the substrate UDP-N-acetylglucosamine was found to be 0.03149 mM and for phosphoenolpyruvate 0.009198 mM. The relative enzymatic activity was inhibited 2-fold in presence

of fosfomycin. Superimposition of the wBm-MurA homology model with the structural model of *Haemophilus influenzae* (Hi-MurA) suggests binding of fosfomycin at the same active site. Further exploitation of wBm-MurA is warranted as a putative antifilarial drug target antifilarial screening of novel compounds (**PLoS ONE 9(6): e99884.doi:10.1371/journal.pone.0099884)**

1.3.4 Immunobiology: Immunoprophylactic evaluation of *B. malayi* / *Wolbachia* proteins

1.3.4.1 *Wolbachia* Translation initiation factor-1 (Wol TI IF-1)

Wolbachia Translation initiation factor-1 (Wol TI IF-1) is one of the factors required for *Wolbachia* growth and viability. Wol TI IF-1 that exhibited strong immuno-reactivity with various categories of bancroftian sera was cloned, over expressed and purified. Immunization with the recombinant protein resulted in significant reduction in microfilarial density (70-72%) and adult worm establishment (61-63%) in susceptible *Mastomys coucha*. Protection offered by Wol TI IF-1 was found to be associated with the humoral immune arm as observed by an increased antibody level with preponderance of IgE, IgM, IgG1 and IgG2a isotypes. The anti-Wol TI IF-1 antibodies promoted profound adherence of peritoneal exudate cells to the surface of microfilariae and infective larvae causing cytotoxicity and their death suggesting protective effect. This indicates potential of recombinant Wol TI IF-1 as another vaccine candidate against human filarial infection. **[Acta Tropica, 2014, 51-59; doi: 10.1016/j.actatropica.2014.04.033. PMID:24929215]**

1.3.4.2 *Wolbachia* Surface Protein (WSP)

Recombinant Wsp was expressed, purified and administered to mice, either alone or in combination with infective larvae of *B. malayi* (Bm-L3) to investigate the immune response of infected animals. Spleens and mesenteric lymph nodes of mice immunized with either r-wsp or infected with Bm-L3 showed increased percentages of CD4+ Th17 cells and Th1 cytokines like IFN-y and interleukin-2 (IL-2) along with decreased percentages of regulatory T cells, Th2 cytokines like IL-4 and IL-10 and TGF-b levels in culture supernatants of splenocytes. These observations were stronger in mice immunized with r-wsp alone. Interestingly, when mice were first immunized with r-wsp and subsequently infected with Bm-L3, percentages of CD4+ Th17 cells and levels of Th1 cytokines increased even further while regulatory T cells, Th2 cytokines and TGF-β levels decreased. The results for the first time show that r-wsp acted synergistically with Bm-L3 in promoting a pro-inflammatory response by increasing Th17 cells and at the same time diminished host immunological tolerance by decreasing the regulatory T cells and TGF-β secretion **(Immunology, 2014).**

1.3.4.3 Independent *B. malayi* phosphoglycerate mutase (Bm-iPGM)

Phosphoglycerate mutases, the key enzymes in the glycolytic and gluconeogenic pathways, exist in two different forms possessing different mechanism of action and structure. The absence of independent form (iPGM) from humans and being indispensable in all nematodes including filariids advocates its potential as anthelminthic drug target. The structural and immunological characterization demonstrated the expression of protein in all major life-stages which is excreted/secreted out by adult *B. malayi*. Antibody present in all the categories of human bancroftian patient's sera including endemic normals reacted with Bm-iPGM in ELISA/ immunoblots. Bm-iPGM on *in vivo* administration with FCA generated mixed Th1/Th2 immune response and offered 58.2% protection against larval challenge in BALB/c and 65–68% protection in *M. coucha*. *In vitro* studies confirmed participation of anti-Bm-iPGM antibodies in ADCC mediated killing of *B. malayi* larvae and microfilariae. The findings reveal the immunogenic and protective nature of this enzyme. (**BioMed Res. Int., 2014, Article ID 590281, http://dx.doi.org/-10.1155/2014/590281)**

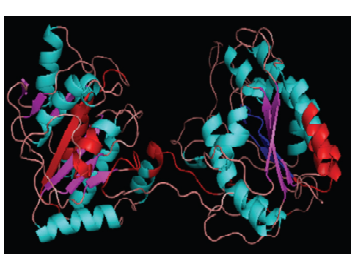


Fig. Bm-iPGM *in silico* generated structure (red is presented by MHCI while the blue are presented by MHCII).

1.3.5 Antifilarial drug delivery

Nano-IVM (ivermectin) was prepared, optimized by nanoprecipitation method and the selected nano-IVM (F5) showed a uniform spherical shape with 96 nm diameter and 74.12% entrapment efficiency. At a suboptimal dose of 100 µg/kg, it completely eliminated microfilaria from systemic circulation on 60 days post-infection in *B. malayi* infected rodents. Nevertheless, the co-administration of nano-IVM (F5) along with standard filaricide diethylcarbamazine (DEC) was found to be superior in suppressing microfilarial stage and completely eliminated microfilariae at 45 days post treatment. Both the drugs in free form were unable to impart such effect resulting in to recurrence of the infection. Interestingly, nano-IVM (F5) was also found to be effective against adult stage parasites causing 36.67% worm mortality alone and 75.89% in combination with DEC; with almost similar embryostatic effect. Thus, the combination of entrapped IVM with DEC exhibited enhanced microfilaricidal and marginally better macrofilaricidal efficacy than any of the single formulations or drug combination (**Parasitol Res., 2014;113(2):681-91**).

2 Reproductive Health Research, Diabetes & Energy Metabolism

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.

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.

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.

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

2.1 Reproductive Health Research

2.1.1 Male/Female Contraception and Infertility

2.1.1.1 Combining a synthetic spermicide with a natural trichomonacide for safe, prophylactic contraception

Broad-spectrum vaginal agents like nonoxynol-9 (N-9) and cellulose sulfate have failed clinically as microbicides due to non-specific off-target effects whereas agents that specifically targeted retroviruses have shown promise in clinical trials. CDRI-S003-296 and Sapindus saponins, respectively, specifically target human sperm and *T. vaginalis in vitro*. A comprehensive study of efficacy and safety was undertaken to evaluate whether a specifically acting synthetic spermicide can be combined with a natural microbicide (saponins) for safe, prophylactic contraception, using *in vitro* (human cells) and *in vivo* (rabbit) models. The 1:1 combination of S003-296 and Sapindus saponins was based on the *in vitro* spermicidal and anti-Trichomonal activities of the two components. N-9, the spermicide in clinical use, served as reference control. Free sperm thiols were fluorescently glinted to reveal differences in the targets of the test agents. On/off-target effects were evaluated *in vitro* against human sperm, *T. vaginalis*, HeLa, Vk2/E6E7, End1/E6E7 and *Lactobacillus jensenii*, using standard assays of drug susceptibility, cell viability, flow cytometric assessment of cell apoptosis and qPCR for expression of pro-inflammatory cytokine mRNAs. The spermicidal effect was also recorded live (http://youtu.be/2iOvEhYPDfM and http://youtu.be/qf—AKj9Stk), and free thiols on sperm were fluorescently visualized using a commercial kit. *In vivo* contraceptive efficacy (pregnancy/fertility rates) and safety (vaginal histopathology and *in situ* immune-labeling of inflammation markers VCAM-1, E-selectin and NFkB) were evaluated in rabbits. Results indicated that a 0.003% drug 'combination' containing 0.0015% each of S003-296 and Sapindus saponins in physiological saline irreversibly immobilized 100% human sperm in ~ 30 s and eliminated 100% *T. vaginalis* in 24 h, without causing any detectable toxicity to human cervical (HeLa) cells and Lactobacilli in 24-48 h, *in vitro*. N-9 at 0.003% exhibited lower microbicidal activity against Trichomonas but failed in spermicidal assays while causing severe toxicity to HeLa cells and Lactobacilli in 12-24 h. The 'combination' of DSE-37 and Sapindus saponins completely prevented pregnancy in rabbits at a vaginal dose of 20 mg (1% in K-Y Jelly), while application of 5% 'combination' in K-Y Jelly for 4 consecutive days caused negligible alterations in epithelial lining of rabbit vagina with only minor changes in levels of inflammation markers. N-9

at a 20 mg vaginal dose prevented pregnancy in 33% animals and a 4-day repeat application of 2% N-9 gel caused severe local toxicity to vaginal epithelium with molecular expression of acute inflammation markers. It is concluded that a 1:1 (w/w) combination of S003-296 and Sapindus saponins can target sperm and *Trichomonas vaginalis* precisely without any noticeable off-target effects on somatic cells at effective concentrations. Anti-Trichomonal contraceptives with

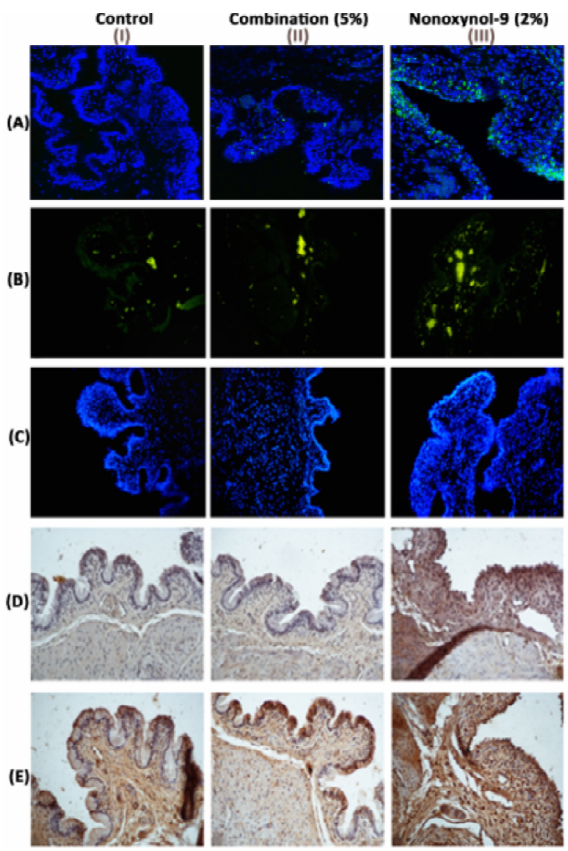
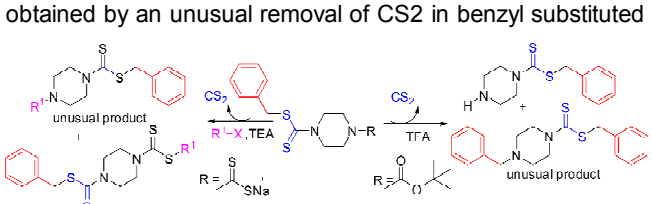


Fig. Immunohistochemical localization of proinflammatory/toxicity markers in cervico-vagina of rabbits treated intravaginally with (I) vehicle, (II) 5% combination, (III) 2% nonoxynol-9, for 4 consecutive days. (A) Terminal UDP nick end labeling (TUNEL-FITC); (B-C) Nuclear Factor-κB and DAPI staining of DNA; (D) Vascular Adhesion Molecule-1 (VCAM-1), (E) E-selectin

specifically acting synthetic component and clinically-proven safe natural component may define a new concept in empowering women to control their fertility and reproductive health. [***Hum Reprod* 29:242-252, 2014**]

2.1.1.2 A unique dithiocarbamate chemistry during design & synthesis of novel sperm-immobilizing agents

1-Substituted piperazinecarbodithioates were obtained by an unusual removal of CS2 in benzyl substituted



dithiocarbamate derivatives under acid and basic conditions during design and synthesis of 1,4-(disubstituted) piperazinedicarbodithioates as double edged spermicides. A plausible mechanism for CS2 removal has been proposed.

All synthesized compounds were subjected to spermicidal, antitrichomonal and antifungal activities. Twenty-one compounds irreversibly immobilized 100% sperm (MEC, 0.06-31.6 mM) while seven compounds exhibited multiple activities. Benzyl 4-(2-(piperidin-1-yl)ethyl) piperazine-1-(carbodithioate) (18) and 1-benzyl 4-(2-(piperidin-1-yl)ethyl)piperazine-1,4-bis(carbodithioate) (24) exhibited appreciable spermicidal (MEC, 0.07 and 0.06 mM), antifungal (MIC, 0.069-0.14 and >0.11 mM) and antitrichomonal (MIC, 1.38 and 0.14 mM) activities. The probable mode of action of these compounds seems to be through sulfhydryl binding which was confirmed by fluorescence labelling of sperm thiols. [***Org Biomol Chem* 12:3090-9, 2014**]

2.1.1.3 Alteration in endometrial proteins during early- and mid-secretory phases of the cycle in women with unexplained infertility

The proteomic profile of early- (LH+2) and mid-secretory (LH+7) phase endometrium of women with unexplained infertility was analyzed and compared with a view to analyze the cyclical changes during the transition from early-(LH+2) to mid-secretory (LH+7) phase endometrium in infertile women. Among differentially expressed proteins, the expression of Ras-related protein Rap-1b, Protein disulfide isomerase A3, Apolipoprotein-A1 (Apo-A1), Cofilin-1 and RAN GTP-binding nuclear protein (Ran) were found to be significantly increased, whereas, Tubulin polymerization promoting protein family member 3, Superoxide dismutase [Cu-Zn], Sorcin, and Proteasome subunit alpha type-5 were significantly decreased in mid-secretory phase as compared to early-secretory phase endometrium of infertile women. Most of the differentially expressed proteins identified during the transition phase from early- to- mid secretory, revealed an altered expression

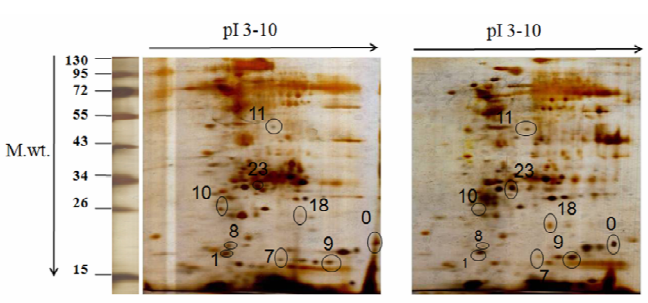
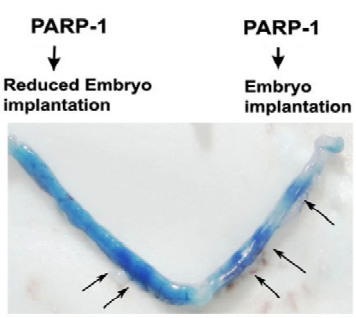


Fig. Representative gel images showing 2D-PAGE of early-secretory (LH+2) and mid-secretory (LH+7) phase endometrium of women with unexplained infertility. The number denotes spot ID (0-23). LH+2 = 2 days after luteinizing hormone surge, LH+7 = 7 days after luteinizing hormone surge.

pattern as compared to that of fertile women. The study gave evidence that de-regulation of the expression of Sorcin, Cofilin-1, Apo -A1 and Ran, during early- to mid-secretory phase may have physiological significance and it may be one of the causes for altered differentiation and/or maturation of endometrium, in women with unexplained infertility (**PLoS One. 2014, 9(11): e111687**).

2.1.1.4 PARP-1 can regulate embryo implantation process

A successful pregnancy requires implantation of an embryo, which occurs during 'receptivity phase' of the endometrium. PARP is studied in the uterus, but not in relation with embryo implantation. Results showed upregulation of the native form of PARP1 (w116 kDa) in the implantation and non-implantation sites at day 5 (0500 h) during the embryo implantation period. Inhibition of activity of PARP1 decreased the number of embryo implantation sites and blastocysts at day 5 (1000 h). Further, cleavage of native PARP1 was due to the activity of caspase-3 during the peri-implantation stage (day 5, 0500 h), and is also required in the process of embryo implantation. Expression of PARP1 in the uterus was found to be in response to estrogen hormone. This particular study clearly demonstrates an



important role of PARP1 in the process of embryo implantation. However, further study is required to explore this particular protein signalling pathway for female fertility regulation exploration (**Reproduction, 147(6), 765-780**).

2.1.2 Osteoporosis and other Related Endocrine Disorders

2.1.2.1 The thiocarbamate disulphide drug, disulfiram induces osteopenia in rats by inhibition of osteoblast function due to suppression of acetaldehyde dehydrogenase activity

Dithiocarbamates (DTC), a sulfhydryl group containing compounds are extensively used by humans which include metam, thiram and other synthetic composites due to their pesticide properties, and disulfiram (DSF) as an alcohol deterrent. These DTC were screened in an osteoblast viability assay. DSF exhibited the highest cytotoxicity (IC_{50} 488nM). Loss in osteoblast viability and proliferation was due to induction of apoptosis via G1 arrest. DSF treatment to osteoblasts reduced glutathione (GSH) levels and exogenous addition of GSH prevented DSF-induced ROS generation and osteoblast apoptosis. DSF also inhibited osteoblast differentiation *in vitro* and *in vivo*, and the effect was associated with inhibition of aldehyde dehydrogenase (ALDH) activity. Out of various ALDH isozymes, osteoblasts expressed only ALDH2 and DSF down regulated its transcript as well as activity. Alda-1, a specific activator of ALDH2 stimulated osteoblast differentiation. DSF treatment at human-equivalent dose of 30mg/kg p.o. to adult Sprague Dawley rats caused trabecular osteopenia and suppressed the formation of mineralized nodule by bone marrow stromal cells. Moreover, DSF diminished bone regeneration at the fracture site. In growing rats, DSF diminished growth plate height, primary and secondary spongiosa, mineralized osteoid and trabecular strength. Substantially reduced bone formation was also observed in the cortical site of these rats. It is concluded that DSF has a strong osteopenia inducing effect by impairing osteoblast survival and differentiation due to the inhibition of ALDH2 function.

DSF acts as an alcohol deterrent due to ALDH inhibition. Chronic alcoholism is an independent risk factor for bone loss. Preclinical data suggest that DSF is potent osteopenia inducing drug. DSF also has the potential to worsen the fracture risk in existing osteoporosis, e.g. in post-menopausal women and patients receiving synthetic glucocorticoids. Thus the effect of DSF therapy on bone mineral content in chronic alcoholism should be carried out. ***Toxicol Sci 139:257-70, 2014***

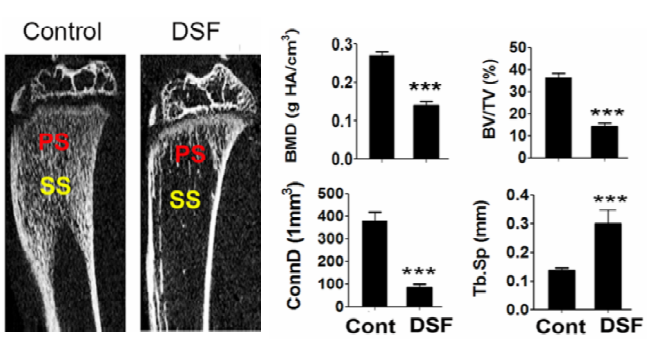
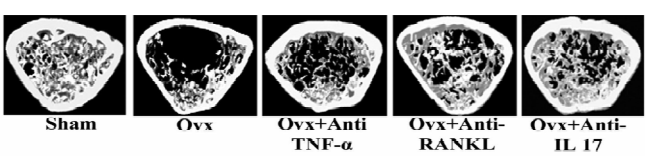


Fig. DSF negatively impacts trabecular bones of growing rats. Recently weaned male rats were treated with 30mg/kg/p.o. DSF for 4 weeks. (A) **Representative coronal section images exhibited deteriorated trabeculae in DSF group compared to control. (B) Trabecular response was evaluated using 3-D µCT. Volumetric BMD (bone mineral density), trabecular bone volume (BV/TV), connection density (Conn.D) and trabecular separation (Tb.Sp) were quantified. PS, primary spongiosa and SS, secondary spongiosa. ***p<0.001 vs. cont.**

2.1.2.2 Enhanced immunoprotective effects by anti-IL17 antibody translates to improved skeletal parameters under estrogen deficiency compared to anti-RANKL and anti-TNFα antibodies

In this study, the effects of anti-TNFα, anti-RANKL or anti-IL17 antibody administration to estrogen deficient mice

on CD4+T cell proliferation, CD28 loss, Th17/Treg balance and B lymphopoesis was investigated, and finally, the translation of these immunomodulatory effects on skeletal parameters. It was observed that while anti-RANKL and anti-TNFα therapies had no effect on Ovx-induced CD4+T cell proliferation and B lymphopoesis; anti-IL17 effectively suppressed both events with concomitant reversal of CD28 loss. Anti-IL17 antibody reduced pro-inflammatory cytokine production and induced Tregs. All three antibodies restored trabecular microarchitecture with comparable efficacy; however cortical bone parameters, bone biomechanical properties and histomorphometry were best preserved by anti-IL17 antibody likely due to its inhibitory effect on osteoblast apoptosis and increased number of bone lining cells and Wnt10b expression. Based on the superior immunoprotective effects of anti-IL17 which appears to translate to a better skeletal preservation, we propose beginning clinical trials using a humanized antibody against IL-17 for treatment of post-menopausal osteoporosis **[*J Bone Miner Res.* 2014; 29:1981-92].**

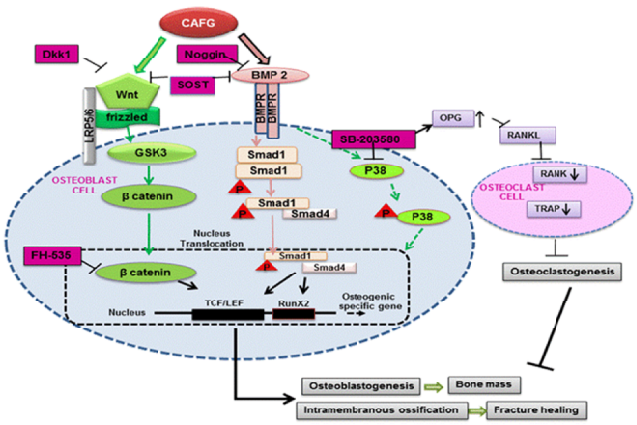


2.1.2.3 CDRI-S007-1500 accelerates fracture healing by activation of BMP Signalling Pathway

The aim of this study was to evaluate the mechanism by which S007-1500 promotes bone healing in the osteoporotic rat model. For the study, adult female Sprague–Dawley rats were ovariectomized and rendered osteopenic. A drill hole injury was generated in mid femoral bones of all the animals and then treatment commenced for 15 days. Fifteen days post-treatment, the animals were sacrificed. RNA and protein from newly generated bone was harvested from the area adjoining the drill hole site. One of the possible mechanism through which S007-1500 promotes bone healing is by activating BMP signalling pathway, evident by increased transcript and protein levels of BMP signalling components like BMP-2, Smad1, Smad5, Smad8 and master transcription factor Runx-2 at the injury site. These results support the potential of S007-1500 as a fracture healing agent.

2.1.2.4 A novel therapeutic approach with Caviunin based isoflavonoid that *en routes* bone marrow cells to bone formation via BMP2/Wnt-β-catenin signalling

This study shows that the osteogenic potential of Caviunin 7-O-[β-D-apiofuranosyl-(1-6)-β-D-glucopyranoside] **(CAFG),** a novel isoflavonoid, as an alternative for anabolic therapy for the treatment of osteoporosis by stimulating BMP-2 and Wnt/β-catenin mechanism. CAFG supplementation improved trabecular micro-architecture of the long bones,

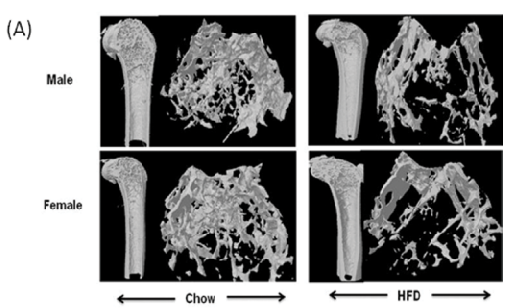


increased biomechanical strength parameters of the vertebra and femur and decreased bone turnover markers better than genistein. Oral administration of CAFG to osteopenic ovariectomized mice increased osteoprogenitor cells in the bone marrow and increased expression of osteogenic genes in femur and show new bone formation without uterine hyperplasia. CAFG increased mRNA expression of osteoprotegerin in bone and inhibited osteoclast activation by inhibiting expression of skeletal osteoclastogenic genes. CAFG is also an effective accelerant for chondrogenesis and has stimulatory effect on the repair of cortical bone after drill hole injury at the tissue, cell and gene level in mouse femur. At cellular levels CAFG stimulated osteoblast proliferation, survival and differentiation. Signal transduction inhibitors in osteoblast, demonstrated involvement of p-38 mitogen activated protein kinase pathway stimulated by BMP2 to initiate Wnt/β-catenin signaling to reduce phosphorylation of GSK3-β and subsequent nuclear accumulation of β-catenin. Osteogenic effects were abrogated by Dkk1, Wnt-receptor blocker and FH535, inhibitor of TCF-complex by reduction in β-catenin levels. CAFG modulated MSC responsiveness to BMP2 which promoted osteoblast differentiation via Wnt/β-catenin mechanism. CAFG at 1mg.kg^{-1}d^{-1}dose in OVx mice (human dose~0.081mg/kg) led to enhanced bone formation, reduced bone resorption and bone turnover better than well-known phytoestrogen genistein. Owing to CAFG's inherent properties for bone it could be positioned as a potential drug, food supplement, for postmenopausal osteoporosis and fracture repair. (**Cell Death Differ. 2014 18;5:e1422**.)

2.1.2.5 Micro architectural changes in cancellous bone differ in female and male C57BL/6 mice in high fat diet induced osteoporosis model

Relationship between fat and bone mass at distinct trabecular and cortical skeletal compartments in (high fat diet) HFD induced osteoporosis model was studied. Data shows that male mice being fed HFD were heavier and gained more weight versus those on control diet or when compared to the female group on HFD. Observed increased

lipid profile in both males and females with significantly higher lipid levels in males. However, assessment of glucose intolerance data shows more pronounced glucose intolerance in females than males on HFD. Micro-architectural assessment of bones shows that compared with female mice on HFD, male mice on HFD showed more deterioration at trabecular region. This was corroborated by the urinary marker confirming greater loss in males. Cortical bone parameters and strength remained unchanged after 10 week HFD treatment to both sexes. Direct effect of HFD on bone at mRNA level in the progenitor cells isolated from the femoral bone marrow shows significantly increased expression of adipogenic marker genes versus the osteogenic genes. Overall, data indicates that obesity induced by high fat diet aggravates bone loss in the cancellous bone compartment with a greater loss being in the males, than the females although 10 weeks HFD treatment did not alter cortical bone mass and strength in both males and females. **(Br J Nutr. 2014 May 28; 111(10):1811-21)**



2.1.2.6 Inhibitory effect of 2-(piperidinoethoxyphenyl)-3-(4-hydroxyphenyl)-2H-benzo(b)pyran on human primary endometrial hyperplasial cells mediated via combined suppression of Wnt/β-catenin signaling and PI3K/Akt survival pathway

The current study was undertaken to explore the effect of benzopyran compound 2-(piperidinoethoxyphenyl)-3-(4-hydroxyphenyl)-2H-benzo (b) pyran (K-1) on growth and Wnt signaling in human endometrial hyperplasial cells. Primary culture of atypical endometrial hyperplasial cells were characterized by epithelial cell marker cytokeratin-7. Results revealed that compound K-1 reduced the viability of primary endometrial hyperplasial cells and expression of ERα, PR, PCNA, Wnt7a, FZD6, pGsk3β, β-catenin without affecting the growth of primary culture of normal endometrial cells. The β-catenin target genes CyclinD1 and c-myc were also found to be reduced whereas the expression of axin2 and Wnt/β-catenin signaling inhibitor Dkk-1 was found to be up-regulated which caused the reduced interaction of Wnt7a and FZD6. Nuclear accumulation of β-catenin was found to be decreased by compound K-1. K-1 also suppressed pPI3K/pAkt survival pathway and induced the cleavage of caspases and PARP, thus subsequently causing the apoptosis in endometrial hyperplasial cells. In conclusion, compound K-1 suppressed the growth of human primary endometrial hyperplasial cells through discontinued Wnt/β-catenin signaling and induced apoptosis via inhibiting PI3K/Akt survival pathway (**Cell Death Dis. 2014 21;5:e1380**).

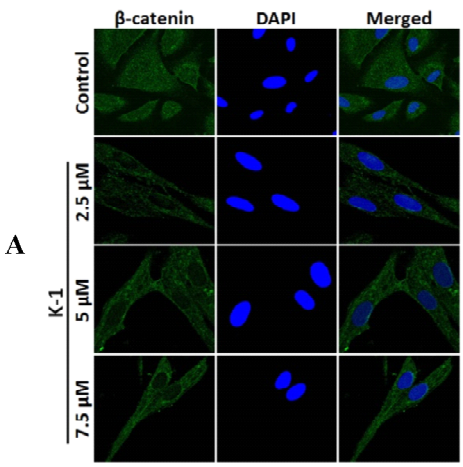


Fig. (A) Demonstration of nuclear β-catenin accumulation in primary endometrial hyperplasial cells by confocal microscopy. (B) K-1 induces apoptosis and activates Caspase-3 in primary endometrial hyperplasial cells. p values are a-p<0.001, b-p<0.01, c-p<0.05 and d-p>.05 vs. control.

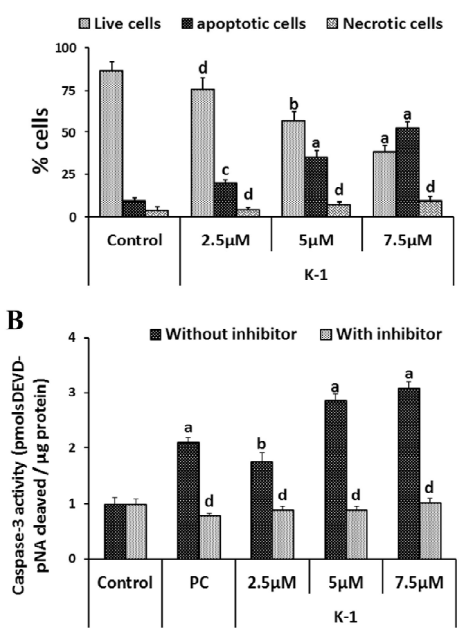


Fig. (A) Structure of MND and (B) regression of xenograft tumor by MND in athymic nude mice. * (p<0.05) and ** (p<0.01) vs. corresponding vehicle (control) group.

2.1.3 Agents against endocrine cancers

2.1.3.1 Thioarylnaphthylmethanone oxime ether analogs as novel anti-cancer agents: the most active compound of the series signal through putative serpentine receptor family

Employing a rational design of Thioarylnaphthyl-methanone oxime ether analogs containing functional

properties of various anti-cancer drugs, a series of compounds were identified that displayed potent cytotoxicity towards various cancer cells, out of which, *4-(methylthio)phenyl)(naphthalen-1-yl)methanoneO-2-(diethylamino)ethyl oxime* (MND) exhibited best safety profile. MND induced apoptosis, inhibited migration and invasion, strongly inhibited cancer stem cell population on a par with salinomycin, and demonstrated orally potent tumor regression in mouse MCF-7 xenografts. Mechanistic studies revealed that MND strongly abrogated EGF-induced proliferation, migration and tyrosine kinase (TK) signaling in breast cancer cells. However, MND failed to directly inhibit EGFR or other related receptor TKs in a cell-free system. Systematic investigation of putative target upstream of EGFR revealed that the biological effects of MND could be abrogated by pertussis toxin. Together, MND represents a new nonquinazoline class having a substantial antiproliferative effect on breast cancer cells by likely involvement of a $G\alpha_{i/0}$-coupled serpentine receptor. This study provides the proof-of-concept in preclinical cellular, molecular and animal settings toward MND being a low-molecular mass and orally potent anti-cancer agent. MND could contribute to an enhanced understanding of structure-based drug design to facilitate drug discovery and development of phenyl naphthylmethanoneoxime as GPCR inhibitors and non-toxic cancer chemotherapeutic agents. (***J Med Chem* 57: 8010-25, 2014)**

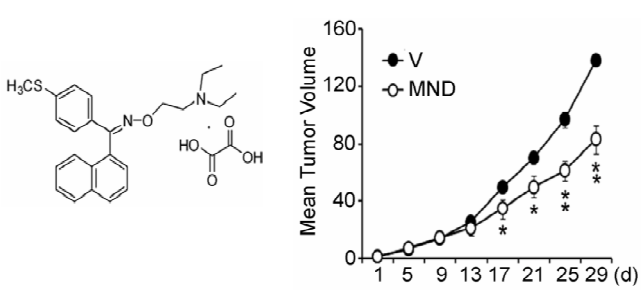


Fig. (A) Structure of MND and (B) regression of xenograft tumor by MND in athymic nude mice. * (p<0.05) and ** (p<0.01) vs. corresponding vehicle (control) group.

2.1.3.2 Novel alkylphospholipid-DTC hybrids as promising agents against endocrine related cancers acting via modulation of Akt-pathway

A new series of 2-(alkoxy(hydroxy)phosphoryloxy)ethyl dialkylcarbodithioate derivatives was synthesized and evaluated against endocrine related cancers, acting via modulation of Akt-pathway. Eighteen compounds were active at 7.24-100 µM against MDA-MB-231 or MCF-7 cell lines of breast cancer. Three compounds (14, 18 and 22) were active against MCF-7 cells at IC_{50} significantly better than miltefosine and most of the compounds were less toxic towards non-cancer cell lines, HEK-293. On the other hand, twelve compounds exhibited cell growth inhibiting activity against prostate cancer cell lines, either PC-3 or DU-145 at 14.69-95.20 µM, while nine of these were active against both cell lines. The most promising compounds 14 and 18 were about two and five fold more active than miltefosine against DU-145 and MCF-7 cell lines respectively and significantly down regulated phospho-Akt. Possibly anti-cancer and pro-apoptotic activity was mostly due to blockade of Akt-pathway **[*Eur J Med Chem* 85:638-47, 2014]**

2.1.3.3 Centchroman suppresses breast cancer metastasis by reversing epithelial-mesenchymal transition via downregulation of HER2/ERK1/2/MMP-9 signaling

Effect of Centchroman (CC)-treatment against breast cancer metastasis and associated molecular mechanism has been investigated using *in vitro* and *in vivo* models. CC significantly inhibited the proliferation of human and mouse mammary cancer cells. CC-treatment also inhibited migration and invasion capacities of highly metastatic MDA-MB-231 and 4T1 cells, at sub-IC_{50} concentrations (*Fig. 1*). Inhibition of cell migration and invasion was found to be associated with the reversal of epithelial-to-mesenchymal (EMT) transition as observed by the upregulation of epithelial markers and downregulation of mesenchymal markers as well as decreased activities of matrix metalloproteinases. Experimental EMT induced by exposure to TGFβ/TNFα in nontumorigenic human mammary epithelial MCF10A cells was also reversed by CC as evidenced by morphological changes and modulation in the expression levels of EMT-markers (*Fig. 2*). CC-mediated inhibition of cellular migration was, at least partially, mediated through inhibition of ERK1/2 signalling, which was further validated by using MEK1/2 inhibitor (PD0325901). Furthermore, CC-treatment resulted in suppression of tumor growth and lung metastasis in 4T1-syngeneic mouse model. 4T1-syngeneic mouse model has been widely used to study the chemotherapeutic potential of various compounds against breast cancer metastasis. This model possesses several advantages over athymic nude mice model by not compromising immunological parameters and also possesses close pathological relevance to those of stage IV breast cancer in humans. Therefore, the anti-

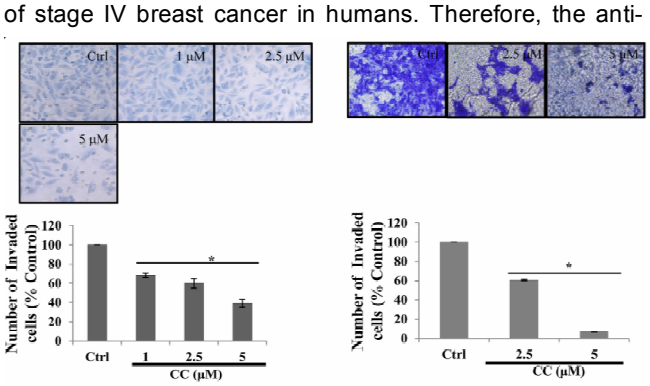


Fig. 1. CC inhibits invasion capacities of human breast cancer MDA-MB-231 and mouse mammary cancer 4T1 cels

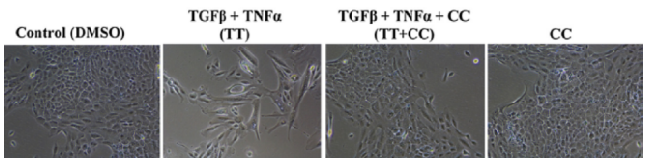


Fig 2. CC inhibits TGFβ-TNFα induced EMT in brest MCF10A cells

metastatic effect of CC was investigated in this highly metastatic 4T1 mouse model. Oral administration of CC at 5 mg/kg and 10 mg/kg b.w. significantly suppressed the tumor volume compared with vehicle control (p<0.05) (Fig. 3A). CC-treated mice also had lesser tumor outgrowth as compared to vehicle treated mice. Treatment with CC at both 5 mg/kg and 10 mg/kg doses significantly decreased the average number of metastatic lung nodules (p<0.05) (Fig. 3B). The spleen size in the control group animals was enlarged due to higher tumor burden, whereas in treatment group animals the spleen size was normal or slightly enlarged. These *in vivo* results proved that CC inhibits tumor growth and suppresses mammary tumor metastasis to lungs, which further supports the *in vitro* antimetastatic activity of CC. Collectively, findings suggest that CC-treatment at higher doses specifically induces cellular apoptosis and inhibits cellular proliferation; whereas at lower doses, it inhibits cellular migration and invasion. Therefore, CC could further be developed as an effective drug candidate against metastatic breast cancer. [***Int. J. Biochem. & Cell Biol. 58: 1-16*, 2015**]

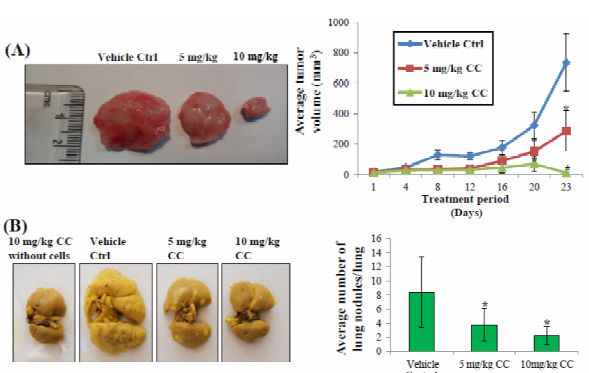


Fig. 3. CC inhibits tumor growth (A) and lung metastasis (B) in 4T1 syngenic mice.

2.2 Diabetes and Energy Metabolism

2.2.1 Biological Screening

A total of 327 compounds, submitted for *in vitro* antidiabetic activity assay were evaluated for glucose uptake stimulatory effect in L6 skeletal muscle cell lines. From these, 17 compounds with code number S014-0750, S014-0754, S014-0001, S014-0212, S014-0255, S014-0260, S014-0427, S013-1141, S013-1142, S013-1143, S014-1231, S014-1233, S014-1333, S014-1334, S014-1338, S014-1340, and S014-1341were found to stimulate glucose uptake in a significant manner and effect was comparable to standard drug Rosiglitazone. *In vitro* active compounds were further processed to *in vivo* activity evaluation in streptozotocine-induced diabetic rat model. From the previously identified active compounds, compound with code number S013-1142, S013-1143, S013-330, S013-867 were found to exert significant blood glucose lowering effect in streptozotocine-induced diabetic rat model. Similarly, compounds with codes S013-1304, S013-1310, S013-1311, S013-1549, S014-754, and S012-1965 were found to show significant antihyperglycemic effect in streptozotocine-induced diabetic rat model. The identified compounds are at different stages of further validation in other *in vivo* models of diabetes.

2.2.2 Basic Research

2.2.2.1 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 was made in leptin receptor-deficient diabetic mouse in C57/BLKS background (db). 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 PPARg 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 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. We conclude that PGC-1α upregulation in osteoblasts could reverse type 2 diabetes-associated deterioration in skeletal health **(Diabetes.2015 doi: 10.2337/db14-1611)**.

2.2.2.2 4-Hydroxyisoleucine ameliorates fatty acid-induced insulin resistance and inflammatory response in skeletal muscle cells.

The 4-Hydroxyisoleucine (4-HIL), an unusual amino acid isolated from the seeds of *Trigonella foenum-graecum* was investigated for the metabolic effects to ameliorate free fatty acid-induced insulin resistance in skeletal muscle cells. An incubation of L6 myotubes with palmitate inhibited insulin stimulated- glucose uptake and -translocation of glucose transporter 4 (GLUT4) to cell surface. Addition of 4-HIL strongly prevented this inhibition. Then insulin signaling pathway was examined, where 4-HIL effectively inhibited the ability of palmitate to reduce insulin-stimulated phosphorylation of insulin receptor substrate-1(IRS-1), protein kinase B (PKB/AKT), AKT substrate of 160 KD (AS160) and glycogen synthase kinase 3β (GSK-3 β) in L6 myotubes. Moreover, 4-HIL presented strong inhibition on palmitate-induced production of reactive oxygen species (ROS) and associated inflammation, as the activation of NF-κB and, JNK1/2, ERK1/2 and p38 MAPK was greatly reduced. 4-HIL also inhibited inflammation-stimulated IRS-1 serine phosphorylation and restored insulin-stimulated IRS-1 tyrosine phosphorylation in presence of palmitate, leading to enhanced insulin sensitivity. These findings suggested that 4-HIL could inhibit palmitate-induced, ROS-associated inflammation and restored insulin sensitivity through regulating IRS-1 function (***Molecular and Cellular Endocrinology*** **(2014), 395: 51-60**).

2.2.2.3 Mechanism of action of Aegeline

Aegeline is an alkaloidal-amide and have earlier been shown antihyperglycemic and antidyslipidemic activities in the validated animal models of type 2 diabetes mellitus. Aegeline significantly enhanced GLUT4 translocation mediated glucose uptake in both time and concentration-dependent manner and glucose uptake was completely stymied by the transport inhibitors (wortmannin and genistein) in C2C12 myotubes. Pharmacological inhibition of Akt and Rac1 suggest that Akt and Rac1 operate aegeline-stimulated glucose transport via distinct parallel pathways. Moreover, aegeline activates cofilin (an actin polymerization regulator) and p21 protein-activated kinase 1 (PAK1). Wortmannin and Rac1 inhibit II completely blocked aegeline-induced phosphorylation of cofilin and p21 protein-activated kinase 1 (PAK1). In summary, these findings suggest that aegeline stimulates the glucose transport through Akt and Rac1 dependent distinct parallel pathways and have cytoskeletal roles in the skeletal muscle cells via stimulation of the PI3-Kinase-Rac1-PAK1-cofilin pathway. Thus, aegeline have multiple targets for the improvement of insulin sensitivity in the skeletal muscle cells.

2.2.2.4 *Nymphaea rubra* ameliorates TNF-α-induced insulin resistance through suppression of c-Jun NH2-Terminal Kinase and Nuclear-κB in rat skeletal muscle cells

The chloroform fraction of the ethanolic extract of *Nymphaea rubra* flowers was also found to enhance the GLUT-4 mediated glucose transport in a dose dependent manner and also increases tyrosine phosphorylation of both IR-β and IRS-1, and IRS-1 associated PI-3 kinase activity in TNF-α treated L6 myotubes. Moreover, the chloroform fraction decreases Ser^{307} phosphorylation of IRS-1 by the suppression of JNK and NF-κB activation concluding that *Nymphaea rubra* reverses insulin resistance by the inhibition of c-Jun NH2-Terminal Kinase and Nuclear-κB. (**Appl. Biochem. Biotechnol.**DOI 10.1007/s12010-014-1192-6)

2.2.2.5 Ethanolic extract of *Allium cepa* stimulates Glucose transporter Typ 4-mediated glucose uptake by the activation of Insulin Signaling

Allium cepa stimulates glucose uptake by rat skeletal muscle cells (L6myotubes) in both time and concentration dependent manners. This effect was shown to mediated by the increased translocation of glucose transporter type 4 protein. The effect of *A. cepa* extract also enhances the tyrosine phosphorylation of the insulin receptor –β. Insulin receptor substrate-1 and the serine phosphorylation of Akt under both basal; and insulin-stimulated conditions without affecting the toptal amount of these proteins. Furthermore, it also shown that the activation of Akt is indispensable for the *A. cepa*-induced glucose uptake in L6 myotubes. Taken together, these findings provide ample evidence that the ethanolic extract of *A. cepa* stimulates glucose transporter typ 4 translocation- mediated glucose uptake by the activation of the phosphatidylinositol-4,5-bisphosphate 3-kinase /Akt dependent pathway (**Planta Medica** (2015); **81**, 1-7)

3 Tuberculosis and Microbial Infections

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.

Area Coordinators:

Dr. K.K. Srivastava

Dr. B.N. Singh

Dr. Gautam Panda

3.1 Biological Screening of Compounds, Biologics and Formulations

3.1.1 Anti-mycobacterial evaluation of compounds

A total of 53 samples including 42 synthetic compounds and 11 compounds/extracts from plants were tested by Agar Proportion Assay against *M. tuberculosis* H37Ra. Thirty compounds showed activity at different MICs, e.g. 3.12 µg/ml (n=5), 6.25 µg/ml (n=10), 12.5 µg/ml (n=14) and 25.0 µg/ml (n=1).

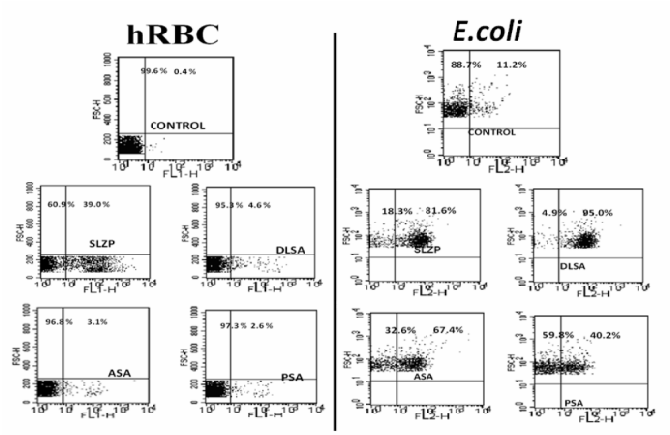
3.1.2 Anti-bacterial and antifungal screening

A total of 434 (synthetic 242, liposomal preparations 7, marine 168, and plants 17) compounds/extracts were evaluated for *in vitro* antifungal and antibacterial activity by micro broth dilution method by standard protocol (as per CLSI guide lines) initially against 6 human bacteria viz. *1. E. coli* (ATCC 9637), *2. Pseudomonas aeruginosa* (ATCC BAA-427), 3. *Staphylococcus aureus* (ATCC 25923), 4. *Klebsiella pneumoniae* (ATCC 27736), 5. *Staphylococcus aureus* (ATCC 700699 MRSA), *Staphylococcus aureus* (ATCC 29213), and six human fungi viz. 1. *Candida albicans* 2. *Cryptococcus neoformans* 3. *Sporothrix schenckii, 4. Trichophyton mentagrophytes, 5. Aspergillus fumigatus* 6. *Candida parapsilosis* (ATCC-22019). Synthetic compounds S013-1151 - 1155 and 1157, S014-068-71 exhibited antifungal activity *in vitro* against different species and strains of *Candida* (MIC 3.12 to 12.5 µg/ml) while the compounds S013-0902-0912 exhibited antibacterial activity (MIC 0.19-3.12 µg/ml) against *Staphylococcus aureus* (ATCC 25923), *Staphylococcus aureus* (ATCC 700699 Methicillin Resistant), *Staphylococcus aureus* (ATCC 29213), *Staphylococcus aureus* (ATCC 33592 Gentamycin resistant), one of the marine compounds (ILS1/20 MIC 1.56-3.12) exhibited *in vitro* efficay against bacteria and the *in vivo* experiments are under progress.

3.1.3 Design and characterization of short antimicrobial peptides using leucine zipper templates with selectivity towards microorganisms

Design of antimicrobial peptides with selective activity towards microorganisms is an important step towards the development of new antimicrobial agents. Leucine zipper sequence has been utilized for the design of novel antimicrobial peptides with modulated cytotoxicity. To understand further the impact of substitution of amino acids at 'a' and/or 'd' position of a leucine zipper sequence of an antimicrobial peptides on its antimicrobial and cytotoxic properties four short peptides (14-residue) were designed on the basis of a leucine zipper sequence without or with replacement of leucine residues in its 'a' and 'd' positions with D-leucine or alanine or proline residue. The original short leucine zipper peptide (SLZP) and its D-leucine substituted analog, DLSA showed comparable activity against the tested Gram positive and negative bacteria and the fungal strains. The alanine substituted analog (ASA) though showed appreciable activity against the tested

bacteria, it showed to some extent lower activity against the tested fungi. However, the proline substituted analog (PSA) showed lower activity against the tested bacterial or fungal strains. Interestingly, DLSA, ASA and PSA showed significantly lower cytotoxicity than SLZP against both human red blood cells (hRBCs) and murine 3T3 cells. Cytotoxic and bactericidal properties of these peptides matched with peptide-induced damage/permeabilization of mammalian cells and bacteria or their mimetic lipid vesicles suggesting cell membrane could be the target of these peptides. The results show significant scope for designing antimicrobial agents with selectivity towards microorganisms by substituting leucine residues at 'a' and/or 'd' positions of a leucine zipper sequence of an antimicrobial peptide with different amino acids (**Amino Acids. 2014;46(11):2531-43**).



3.1.4 Monoclonal antibody against 47.2 kDa cell surface antigen of *Candida albicans*:

Antibodies are believed to play anti-*Candida* activity by different mechanisms, like inhibition of adhesion and neutralization of virulence-related antigens. Inhibition of adhesion is one of the important strategies to prevent *Candida* infections and biofilm formation. In this study, monoclonal antibody (MAb 7D7) against *C. albicans* biofilm cell surface antigen (47.2 kDa) was generated to determine the changes in adherence and viability of *C. albicans*. In this regard XTT assay was carried out in 30, 60, 90 min and 48 h (maturation time) time points using MAb 7D7 and it (MAb 7D7) was found to be effective against adhesion and the formation of *C. albicans* biofilm on polystyrene as well as monolayer of human epithelial cells (HeLa). This result may also prove to be a valuable addition to the reagents available to study *C. albicans* cell surface dynamics and interaction of the fungus with host cells.

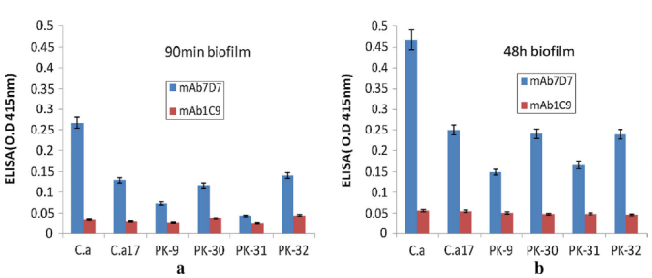


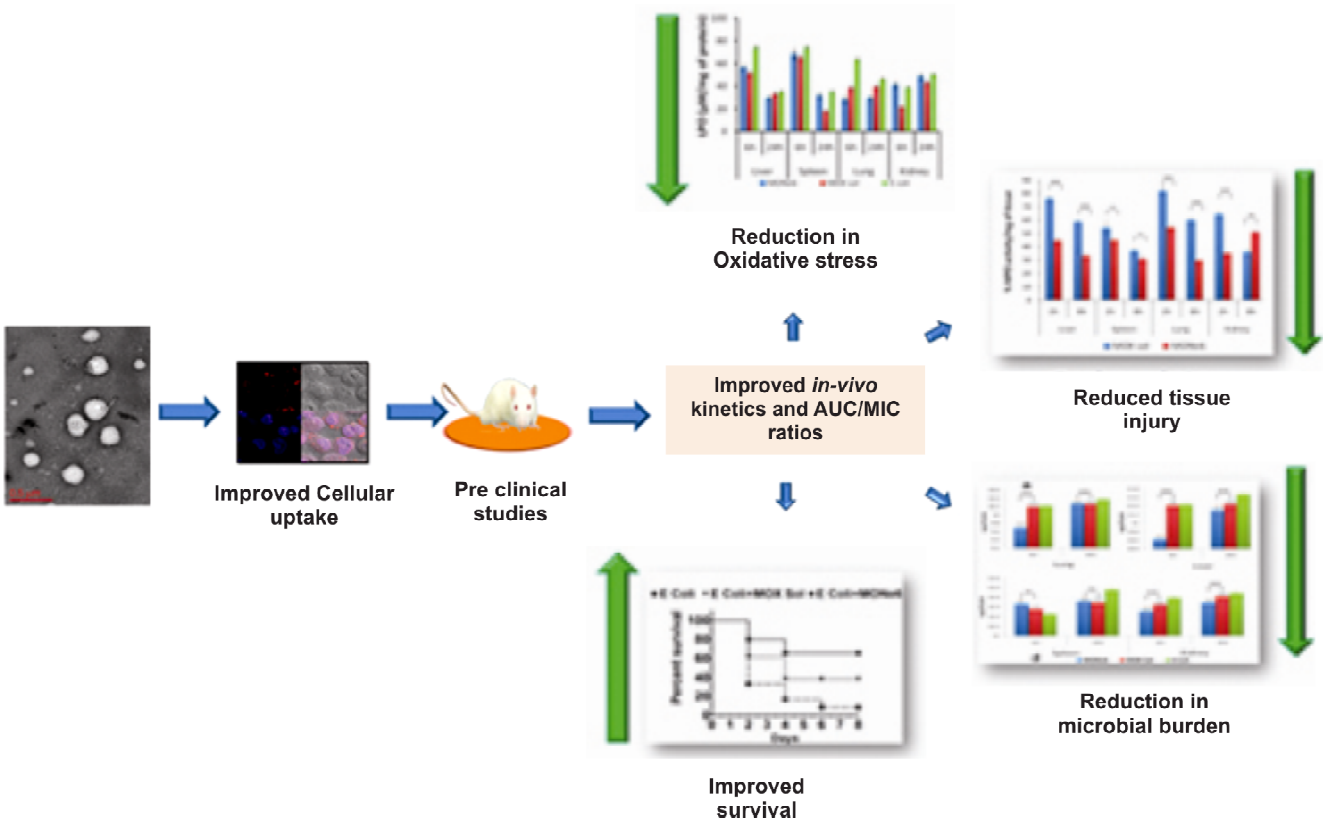
Fig: Expression of the surface antigen of *C. albicans* (ATCC-10231 and ATCC-14053) and patient isolates (PK-9, PK-30, PK-31 and PK-32) detected by ELISA in adhesion phase (90 min) as well as in mature (48 h) biofilm using MAb 7D7 as primary antibody. From left to right C.a (*Candida albicans* ATCC-10231), C.a17 (*C. albicans* ATCC-14053) and patient isolates (PK-9, PK-30, PK-31and PK-32). No significant reaction was detected for the strains incubated with MAb1C9 (irrelevant antibody). a The expression level in adhesion phase (90 min) and b the expression level in mature biofilm (48 h)

3.1.5 Rational design and synthesis of novel thiazolidin-4-ones as non-nucleoside HIV-1 reverse transcriptase inhibitors

A series of novel thiazolidin-4-one analogues, characterized by different substitution patterns at positions C-2 and N-3 of the thiazolidin-4-one scaffold for anti-HIV-1 activity has been investigated. Most of the compounds showed anti-HIV-1 activity at micromolar concentrations when tested in TZM-bl cells *in vitro*. Among the thirty-three compounds tested, compound **16** was the most potent inhibitor of HIV-1 replication against HIV-$1_{IIIB,}$ HIV-1_{ADA5}, HIV-1_{UG070} and HIV-1_{VB59} (EC_{50} = 0.02, 0.08, 0.08 and 0.08 µM, respectively) with selectivity index (SI = 6940, 1735, 1692 and 1692) against tested viral strains, respectively. The results of the present study suggested that the substitution of the nitro group at 62 position of the C-2 phenyl ring and 4,6-dimethylpyridin-2-yl at the N-3 position of thiazolidin-4-one had a major impact on the anti-HIV-1 activity and was found to lower cytotoxicity. The substitution of the heteroaryl ring with bromo group and bicyclic heteroaryl ring at N-3 thiazolidin-4-one was found to lower anti-HIV-1 activity and increase cytotoxicity. The undertaken docking studies thus facilitated the identification of crucial interactions between the HIV-1 RT enzyme and thiazolidin-4-one inhibitors, which can be used to design new potential inhibitors ***(Bioorganic & Medicinal Chemistry* (2014), doi: http://dx.doi.org/10.1016/j.bmc. 2014.04.018)**

3.1.6 Novel tocopheryl acetate nanoemulsions for intervention in sepsis

Septic shock is a life-threatening clinical situation, with no clear and effective line of treatment. Nano-structured injectable delivery systems laden with curcumin or moxifloxacin were developed with the purpose of (a) reducing tissue damage and (b) safely killing systemic infection with smaller doses of antibiotic in disseminated infection. Nanoemulsions of vesicle sizes 168 ± 28 and 246 ± 08 nm and zeta potentials of -41.1 ± 1.2 and 24.78 ± 0.45 mV mV and drug content of 1.25 mg/ml were developed. The emulsions induced negligible hemolysis and cytotoxicity. Cultured macrophages of mouse (RAW 264.7) or human



(THP-1) origin readily took up the vesicles, and if exposed to bacterial lipopolysaccharide (LPS), secreted significantly lower amounts of proinflammatory cytokines (interleukin-6 and tumor necrosis factor) than untreated cells exposed to LPS. Injections of the nanoemulsion in rats resulted in enhancement of circulation lifetime of curcumin by a factor of 8.8 as compared to free curcumin, and accumulation of the drug in the lungs, liver etc. In rats, a reduction in LPS-induced lung and liver injury was observed after treating with the curcumin nanoemulsion rather than free curcumin, due to less neutrophil migration, reduced TNF-α and oxidative stress (demonstrated by levels of lipid peroxides as well as carbonylated proteins) and confirmed by histopathological analysis. In a rat model of sepsis, induced by intra-peritoneal injection of a large inoculum of *E. coli*, enhanced survival on treatment with nanoemulsion containing moxifloxacin (65.44%) was observed compared to the control group (8.22%) The findings suggest that the therapeutic performance can be enhanced by the nanoemulsion.

3.2 Mycobacterial Infections

3.2.1 Characterization of *M. tuberculosis* SerB2, an essential HAD-family phosphatase, reveals novel properties

M. tuberculosis harbors an essential phosphoserine phosphatase (MtSerB2, Rv3042c) that contains two small-molecule binding ACT-domains (Pfam 01842) at the N-terminus followed by the phosphoserine phosphatase (PSP) domain. It was found that exogenously added MtSerB2 elicits microtubule rearrangements in THP-1 cells. Mutational analysis demonstrates that phosphatase activity is co-related to the elicited rearrangements, while addition of the ACT-domains alone elicits no rearrangements. The enzyme is dimeric, exhibits divalent metal- ion dependency, and is more specific for L-phosphoserine unlike other classical PSPases. Binding of a variety of amino acids to the ACT-domains influences MtSerB2 activity by either acting as activators/ inhibitors/ have no effects. Additionally, reduced activity of the PSP domain can be enhanced by equimolar addition of the ACT domains. Further, it has been identified that G18 and G108 of the respective ACT-domains are necessary for ligand-binding and their mutations to G18A and G108A abolish the binding of ligands like L-serine. A specific transition to higher order oligomers is observed upon the addition of L- serine at ~0.8 molar ratio as supported by Isothermal calorimetry and Size exclusion chromatography experiments. Mutational analysis shows that the transition is dependent on binding of L- serine to the ACT-domains. Furthermore, the higher-order oligomeric form of MtSerB2 is inactive, suggesting that its formation is a mechanism for feedback control of enzyme activity. Inhibition studies involving over eight inhibitors, MtSerB2, and the PSP domain respectively, suggests that targeting the ACT-domains can be an effective strategy for the development of inhibitors.

3.2.2 Gene regulation and protein identification in Mycobacteria

3.2.2.1 Deciphering *cis*-regulatory architecture of the *kas* operon in mycobacteria.

The *kas* operon in mycobacteria comprises a set of five genes which enables the characteristic elongation of FAS-I generated fatty acyl primers to long carbon chain fatty acids, mycolic acids. These genes transcriptionally respond to antimycobacterial drugs, upon exposure to intracellular and extracellular stresses and during macrophage infection. This implies that their *cis*-regulatory regions employ, possibly, a network of transcriptional regulators to modulate the expression of *kas* operon genes during different cellular states. The orthologous *kas* operon promoters were deciphered and identified thirteen sequence motifs corresponding to different families of transcriptional regulators. Some of the transcription factors were shown to bind to their predicted motifs by electrophoretic mobility shift assay. Using a panel of recombinant strains carrying promoter deletions, the influence of these motifs on the reporter gene expression was examined. Three transcription factors were over expressed *in vivo* and found to have altered basal level expression of *kas* operon genes in *Mycobacterium bovis* BCG. These findings suggest that in mycobacteria the expression of *kas* operon genes is orchestrated by a network of transcriptional regulators. The structural conservation of transcription factors binding motifs suggests a high degree of functional relatedness in expression of *kas* operon genes in mycobacteria.

3.2.2.2 Post-translationally modified EspJ protein is important in growth and in intra-cellular survival of mycobacteria

Mycobacterium tuberculosis (MTB) co-ordinates multiple processes and subverts host defense machinery using a cascade of events involving serine threonine protein

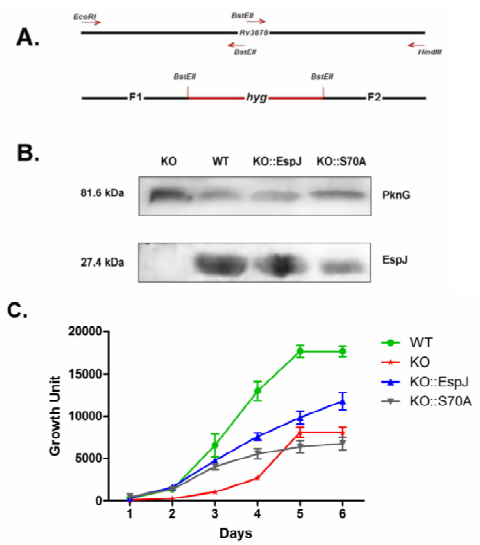


Fig: Growth kinetics of Knock-out Mtb strain (A) Diagrammatical representation of knock-out (KO) construct of Rv3878. The hyg gene was inserted into Rv3878 gene ORF to make it non-functional. The disrupted gene construct has been cloned in oriM- pMV261 vector. (B) Western blot analysis of Mtb KO, wild-type (WT), KO complemented with espJ (KO::EspJ) and KO complemented with espJ_S70A (KO::S70A) lysate. (C) Growth of Mtb KO, WT, KO::EspJ and KO::S70A were recorded by MGIT BACTEC 960. Cultures were grown to early log phase and equal no. of cells was seeded in MGIT vial by measuring OD_{600}.

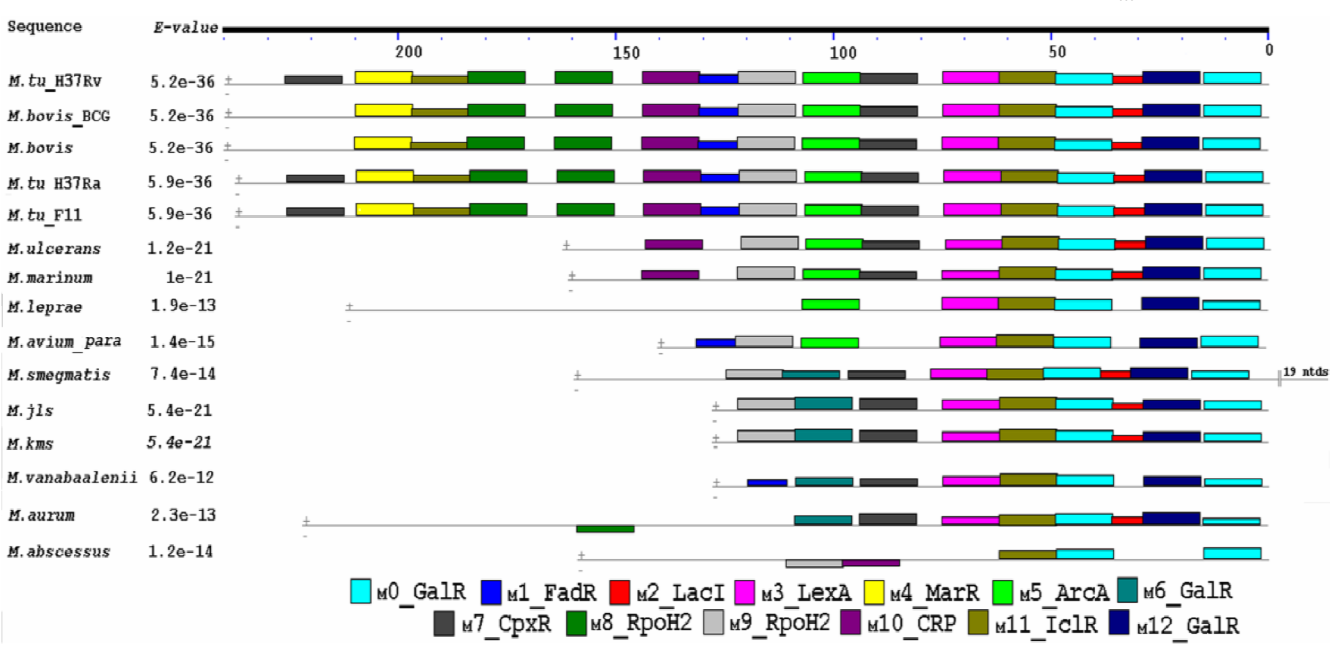


Fig: Co-occurrence of transcription factors binding motifs in kas operon upstream regions of different mycobacterial species. The combined occurrence of NestedMICA inferred motifs was deciphered. A highly conserved assemblage of motifs was identified towards the 3'end of intergenic regions in all the mycobacterial species analyzed. Motifs are presented as coloured boxes along the lines representing upstream sequences. The significance (E-value) of combined occurrence is mentioned at the 5' end of each sequence.

kinases (STPKs) which make them proficient to dwell inside macrophages. This study has demonstrated such phenomenon by using one of the hypothetical proteins of the RD1 region; EspJ. We have employed knock-out MTB strain and *M. bovis* BCG as a surrogate strain to describe the events of phosphorylation of EspJ. Biochemical assays as well as mass spectrometric analysis indicated EspJ as a putative substrate of STPKs. Ectopic expression of phosphoablative mutants in *M. bovis* BCG reveals effect of phosphorylation on the growth and survival of mycobacteria. Surprisingly, its phosphorylation potential also differs between pathogenic $H_{37}Rv$ (Rv) and non-pathogenic $H_{37}Ra$ (Ra) strains of MTB, suggesting the possible involvement of STPKs in mycobacterial growth and subsequently in the establishment of pathogenicity in mycobacterial species.

3.2.2.3 Suppression of Eis and expression of Wag31 and GroES in *Mycobacterium tuberculosis* cytosol under anaerobic culture conditions

An Indian clinical isolate of *M. tuberculosis* was cultured under aerobic and anaerobic conditions following Wayne's hypoxia model and its cytosolic proteins were resolved by two-dimensional gel electrophoresis (2DE). Peptide mass fingerprinting of 32 differentially expressed spots using MALDI TOF-TOF MS-MS resulted in identification of 23 proteins. Under the anaerobic culture conditions, expression of 12 of these proteins was highly suppressed (>2 fold reduction in spot volumes), with 4 of them (GrpE, CanB, MoxR1 and Eis) appearing as completely suppressed since corresponding spots were not detectable in the anaerobic sample. On the other hand, 4 proteins were highly expressed, with two of them (Wag31 and GroES) being uniquely expressed under anaerobic conditions. Suppression of Eis could make the anaerobically persisting bacilli susceptible to the aminoglycoside antibiotics which are known to be acetylated and inactivated by Eis. Although all 4 over-expressed proteins can be considered as putative drug targets for LTBI, Wag31 appears particularly interesting in view of its role in the cell wall biogenesis. **[Ind J Exp Biol, 2014, 52, 773].**

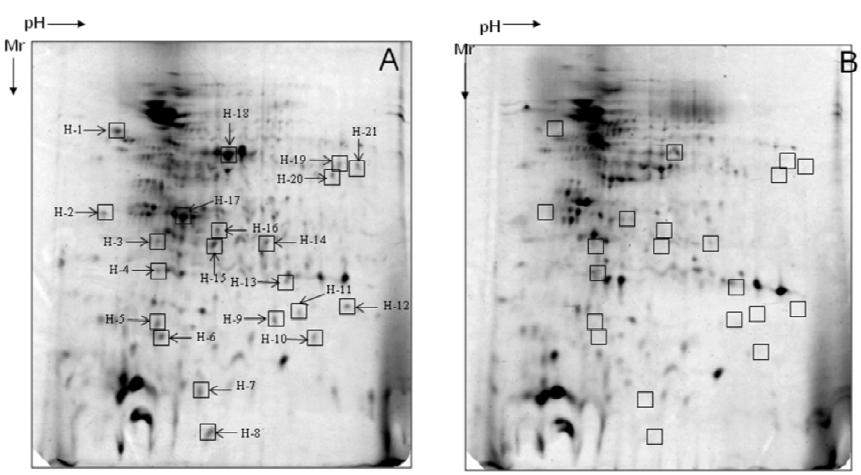


Fig: Resolution by 2DE of the cytosolic proteins of M. tuberculosis (clinical isolate) cultured under aerobic (Panel A) and anaerobic (Panel B) conditions. 21 protein spots (H-1 to 21, panel A), which appeared either completely (H-2, 11-13, 19-21) or partially suppressed under anaerobic conditions (corresponding loci shown in panel B), were picked and processed for identification.

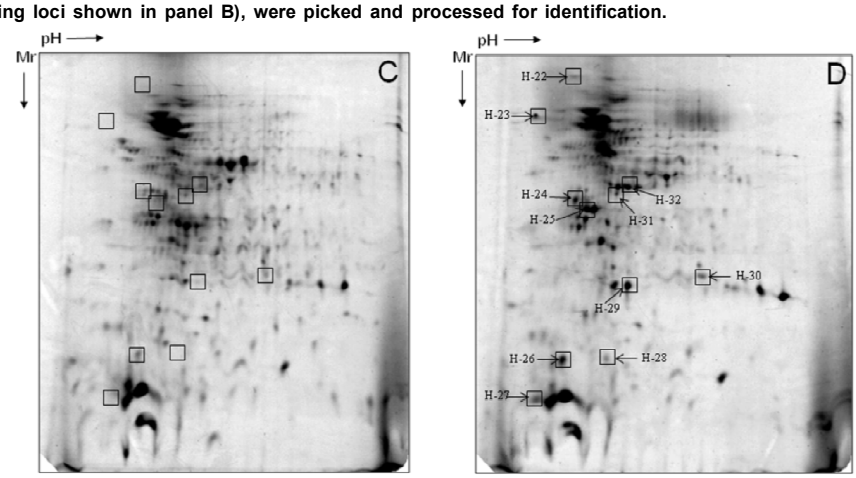


Fig: Resolution by 2DE of the cytosolic proteins of M. tuberculosis (clinical isolate) cultured under aerobic (Panel C) and anaerobic (Panel D) conditions. 11 protein spots (H-22 to H-32, panel D) which appeared either uniquely (H-22, 23, 25, 27 and 28) or highly expressed in the anaerobic sample were picked for identification. Corresponding loci are marked in panel C.

3.3 Microbial Infections

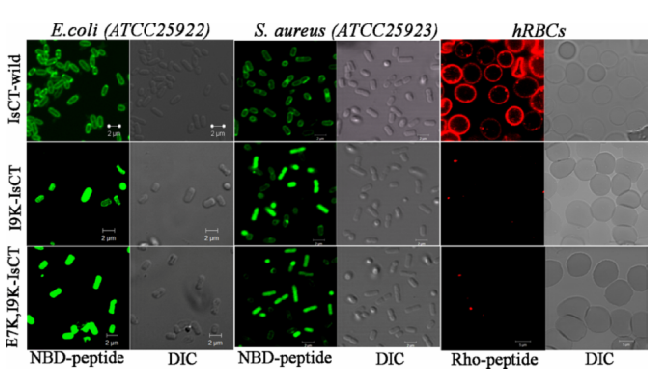
3.3.1 Structure-Function Studies

3.3.1.1 Unprecedented alteration in mode of action of IsCT resulting in its translocation into bacterial cytoplasm and inhibition of macromolecular syntheses

IsCT, a 13-residue, non-cell-selective antimicrobial peptide is comprised of mostly hydrophobic residues and lesser cationic residues. Assuming that placement of an additional positive charge in the non-polar face of IsCT could reduce its hydrophobic interaction, resulting in its reduction of cytotoxicity, an analog, I9K-IsCT was designed. Two more analogs, namely, E7K-IsCT and E7K,I9K-IsCT, were designed to investigate the impact of positive charges in the polar face as well as polar and non-polar faces at a time. These amino acid substitutions resulted in a significant enhancement of therapeutic potential of IsCT. IsCT and E7K-IsCT seem to target bacterial membrane for their anti-bacterial activity. However, I9K-IsCT and E7K,I9K-IsCT inhibited nucleic acid and protein syntheses in tested *E. coli* without perturbing its membrane. This was further supported by the observation that NBD-IsCT localized onto bacterial membrane while NBD-labeled I9K-IsCT and E7K,I9K-IsCT translocated into bacterial cytoplasm. Interestingly, IsCT and E7K-IsCT were significantly helical while I9K-IsCT and E7K,I9K-IsCT were mostly unstructured with no helix content in presence of mammalian and bacterial membrane-mimetic lipid vesicles. Altogether, the results identify two novel cell-selective analogs of IsCT with new prototype amino acid sequences that can translocate into bacterial cytoplasm without any helical structure and inhibit macromolecular syntheses.

3.3.1.2 NMR Solution structures of ADF/Cofilins UNC-60A and UNC-60B from *Caenorhabditis elegans*

To understand the structural basis of functional differences of UNC-60A and UNC-60B proteins, the NMR structures determined and characterized backbone dynamics. The G-actin (globular actin)-binding regions of the two proteins are structurally and dynamically conserved. Accordingly, UNC-60A and UNC-60B individually bind to rabbit ADP–G-actin with high affinities, with K_d values of 32.25 nM and 8.62 nM respectively. The primary differences between these strong and weak severing proteins were observed in the orientation and dynamics of the F-actin (filamentous actin) - binding loop (F-loop). In the strong severing activity isoform UNC-60B, the orientation of the F-loop was towards the recently identified F-loop binding region on F-actin, and the F-loop was relatively more flexible with 14 residues showing motions on a fast NMR timescale. In contrast, in the weak severing protein isoform UNC-60A, the orientation of the F-loop was away from the F-loop-binding region and inclined towards its own C-terminal and strand β 6. It was also relatively less flexible with only five residues showing motions on fast NMR timescale. The main finding of the study was that, with reference to their putative binding region on F-actin, the relatively flexible vertical orientation of F-site, as observed for UNC-60B, was associated with stronger severing activity and co-sedimentation property, whereas the relatively rigid inclined orientation of F-site, as observed for UNC-60A, was associated with weak severing activity. This conclusion was further corroborated by structural comparisons with other strong and weak severing ADF/cofilin proteins such as yeast cofilin, Actophorin, human cofilin, chick cofilins and *Leishmania donovani* cofilin. (**Biochemical Journal, 2015, 465, 63-78**).



3.4 Viral Infections

3.4.1 Computational studies on Human T-Cell Leukemia Virus.

HTLV mechanism of malignant cell growth in adult T-cell leukemia (ATL) /lymphoma, and the HTLV-PR has been an attractive target for anti cancer drug development. In comparison to other retroviruses HTLV also encodes protease (PR) enzyme, which is essential for maturation. Designing a novel inhibitor is important for termination of HTLV replication, although retroviral protease inhibitors of HIV fail to terminate the HTLV proteolytic activity. In this work, we are computing the similar compounds (90%) of HIV inhibitor's against HTLV-PR and understand the capacity of ligand towards HTLV-PR. Our screening of new compounds is depending on good scoring parameters, sensible electron transfer reaction, binding reactions and finally based on ADME/Toxocological properties prediction, we have reported the subsets of HIV-PR inhibitors, having more supremacy towards inhibition of HTLV-PR. ***(Molecular Biosystems* 2014. DOI: 10.1039/C4MB00486H.**)

4 CVS, CNS and Related Disorders

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

- **Cardiovascular system** *(Cardiometabolic, Dyslipidemia, Atherosclerosis, Thrombosis, Hypertension and Myocardial Infarction)*
- **Central nervous system** *(Anxiety, Depression, Psychosis, Dementia and Stroke)*
- **Other disorders** *(Stress, Gastric ulcers and Inflammation).*

In addition, suitable animal models and *in vitro* tests (isolated cells, cell lines and enzymes assays) mimicking the pathologies of CVS-CNS and related disorders were also developed. Molecular mechanisms involved in the pathologies of the above mentioned disorders were explored to identify new therapeutic targets, and to understand the mechanism(s) of action of the candidate drugs.

Area Coordinators:
Dr. Manoj K Barthwal
Dr. Prem N. Yadav
Dr. Maddi Sridhar Reddy

4.1 Discovery and Development of NCE's

Total 485 pure molecules (462-Synthetic and 23-natural) were received during this year for evaluation in CVS, CNS and related disorders. These molecules were tested for anti-thrombotic (101 molecules), 128 anti-adipogenic (54 molecules), anti-acetylcholine esterase (17 molecules) activities and for G-Protein Coupled Receptor (GPCR) profiling (85 molecules). Furthermore, 170 molecules were evaluated for various activities (Anti-inflammatory, anti-angiogenesis & GPCR profiling) under the project "Drugs from Sea" (Funded by Ministry of Earth Sciences – MOES). Identified active molecules are currently in lead validation phase and their results are discussed in following sections.

4.1.1 Curcuma oil attenuates accelerated atherosclerosis and macrophage foam-cell formation by modulating genes involved in plaque stability, lipid homeostasis and inflammation.

In the present study, the anti-atherosclerotic effect and the underlying mechanism of curcuma oil (C. oil), a lipophilic fraction from turmeric (*Curcuma longa* L.), was evaluated in a hamster model of accelerated atherosclerosis and in THP-1 macrophages. Male golden Syrian hamsters were subjected to partial carotid ligation (PCL) or FeCl3-induced arterial oxidative injury (Ox-injury) after 1 week of treatment with a high-cholesterol (HC) diet or HC diet plus C. oil (100 and 300 mg/kg, orally). Hamsters fed with the HC diet were analysed at 1, 3 and 5 weeks following carotid injury. The HC diet plus C. oil-fed group was analysed at 5 weeks. In hyperlipidaemic hamsters with PCL or Ox-injury, C. oil (300 mg/kg) reduced elevated plasma and aortic lipid levels, arterial macrophage accumulation, and stenosis when compared with those subjected to arterial injury alone. Similarly, elevated mRNA transcripts of matrix metalloproteinase-2 (MMP-2), MMP-9, cluster of differentiation 45 (CD45), TNF-α, interferon-γ (IFN-γ), IL-1β and IL-6 were reduced in atherosclerotic arteries, while those of transforming growth factor-β (TGF-β) and IL-10 were increased after the C. oil treatment (300 mg/kg). The treatment with C. oil prevented HC diet- and oxidized LDL (OxLDL)-induced lipid accumulation, decreased the mRNA expression of CD68 and CD36, and increased the mRNA expression of PPARα, LXRα, ABCA1 and ABCG1 in both hyperlipidaemic hamster-derived peritoneal and THP-1 macrophages. The administration of C. oil suppressed the mRNA expression of TNF-α, IL-1β, IL-6 and IFN-γ and increased the expression of TGF-β in peritoneal macrophages. In THP-1 macrophages, C. oil supplementation prevented OxLDL-induced production of TNF-α and IL-1β and increased the levels of TGF-β. The present study shows that C. oil attenuates arterial injury-induced accelerated atherosclerosis, inflammation and macrophage foam-cell formation (***Br J Nutr. 2014; 13:1-14***)

4.1.2 Anti-thrombotic activity of chiral lactamcarboxamides of aminomethy-lpiperidine

A series of chiral lactamcarboxamides of aminomethylpiperidine were synthesized and investigated for the collagen induced *in vitro* anti-platelet efficacy and collagen plus epinephrine induced *in vivo* pulmonary thromboembolism. The active compound (30 μM/Kg) displayed a remarkable antithrombotic efficacy (60% protection) which was sustained for more than 24 hours and points to its excellent bioavailability. The compounds **A** (IC_{50}= 6.6μM) and **B** (IC_{50}=37μM), as well as their racemic mixture **C** (IC_{50}=16μM) significantly inhibited collagen-induced human platelet aggregation *in vitro*. Another compound displayed dual mechanism of action against both collagen (IC_{50}=3.3μM) and U46619 (IC_{50}=2.7mM) induced platelet aggregation. The pharmacokinetic study indicated very faster absorption, prolonged and constant systemic exposure and thereby exhibiting better therapeutic response (***Eur J Med Chem. 2014; 81: 456-472,***). *N*-substituted-2-prolinamides were assessed for the antithrombotic activity using mice collagen and ferric chloride induced thrombosis, which led to the identification of two prolinamides with appreciable activity. Antithrombotic activity of the prolinamides is attributed to the specific inhibition of collagen induced platelet aggregation (***J Org Chem. 2014, in press***).

4.1.3 Protective effect of Silymarin (SYM) against MI-RP injury

High dietary fructose causes insulin resistance syndrome (IRS) in part due to simultaneous induction of genes *involved in* glucose, lipid and mitochondrial oxidative metabolism. Present study evaluates effect of a hepatoprotective agent, Silymarin (SYM) on fructose-induced metabolic abnormalities and its associated thrombotic complication in rat. Wistar rats were kept on high fructose (HFr) diet for a total study period of 12 weeks. After 9 weeks of HFr feeding, animals were treated with SYM (orally once daily) for the subsequent 3 weeks. SYM treatment significantly reduced HFr diet induced increased expression of peroxisome proliferator-activated receptor gamma coactivator (PGC)-1α, PGC-1β, peroxisome proliferator-activated receptor (PPAR)-α, forkhead box protein O1 (FOXO1), sterol regulatory element binding protein (SREBP)-1c, liver X receptor (LXR)-β, fatty acid synthase (FAS) and PPARγ genes in liver. SYM improved HFr diet mediated increased triglycerides (TG), non-esterified fatty acids (NEFA), uric acid, malondialdehyde (MDA), total nitrite and pro-inflammatory cytokines (*C-reactive protein* [*CRP*], *interleukin-6* [*IL-6*], *interferon-gamma* [*IFN-γ*] and *tumor necrosis factor* [*TNF*]) *levels in plasma.* Furthermore, SYM ameliorated HFr diet induced decreasedglucose utilization and endothelial dysfunction. SYM treatment also significantly reduced platelet activation (adhesion and aggregation), prolonged ferric chloride *induced blood vessel occlusion and protected against myocardial ischemia reperfusion (MI-RP) injury.* It is concluded that, SYM treatment prevented HFr induced mRNA expression of hepatic PGC-1α/β and its target transcription factors which was accompanied with recovery in insulin sensitivity and reduced propensity towards thrombotic complications and MI-RP injury (***Eur J Pharmacol. 2014; 727: 15-28, 2014***).

4.1.4 *Withania somnifera* shows a protective effect in monocrotaline-induced pulmonary hypertension

Withania somnifera (Linn.) Dunal (Solanaceae) is a clinically used cardio-protective herbal formulation in Ayurveda. However, the efficacy of *W. somnifera* in pulmonary hypertension (PH) remains unexplored. Treatment of male SD rats with 60 mg/kg monocrotaline (MCT) increased right ventricle pressure (42.96 ± 1.78 mmHg) compared to control (19.64 ± 1.17 mmHg). Preventive treatment with *W. somnifera* significantly reduced the right ventricle pressure (29.98 ± 1.11 mmHg) and hypertrophy in MCT-challenged rats. Treatment with *W. somnifera* talso improved inflammation, oxidative stress and endothelial dysfunction and attenuated proliferation and apoptosis resistance in lungs (Fig). Furthermore, curative treatment with *W. somnifera* also reduced RVP and RVH. This study demonstrated that *W. somnifera* can be used for treatment of PH, due to its antioxidant, anti-inflammatory, pro-apoptotic, and cardioprotective properties (***Pharm Biol. 2014; 19: 1-11***).

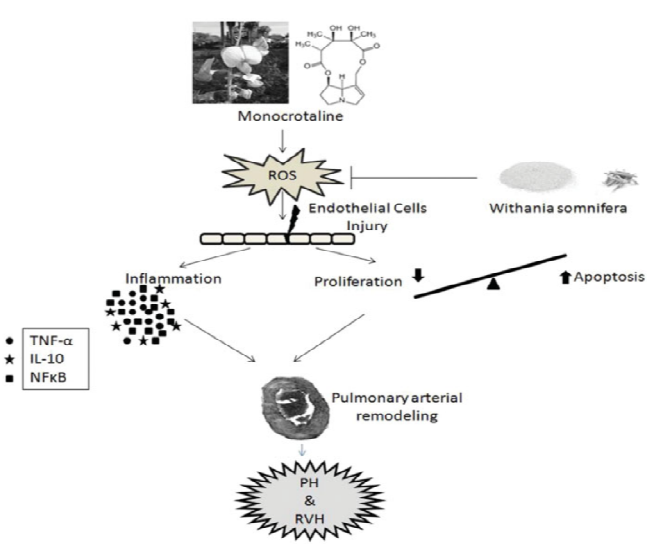


Fig: Schematic illustration of mechanism of *Withania somnifera* mediated suppression of monocrotaline induced pulmonary hypertension via inhibiting inflammatory mediators.

4.1.5 Rohitukine as an anti-adipogenic and anti-dyslipidemic agent

A common feature pharmacophore model has been developed using known antiadipogenic compounds (CFPMA). Rohitukine has been identified as a potential hit using modelled CFPMA (Fig). Studies were designed to assess the anti-adipogenic potential of rohitukine. Rohitukine was isolated from *Dysoxylum binacteriferum* Rohitukine was indeed found to be an anti-adipogenic molecule. It inhibited lipid accumulation and adipogenic differentiation. Rohitukine downregulated expression of PPAR α, CCAAT/ enhancer binding protein β, adipocyte protein 2 (aP2), FAS, and glucose transporter 4. Rohitukine arrested cells in S phase during mitotic clonal expansion. Rohitukine was bioavailable, and also exhibited *in vivo* anti-dyslipidemic effects (***J. Lipid Res. 2014; 55: 1019-1032***).

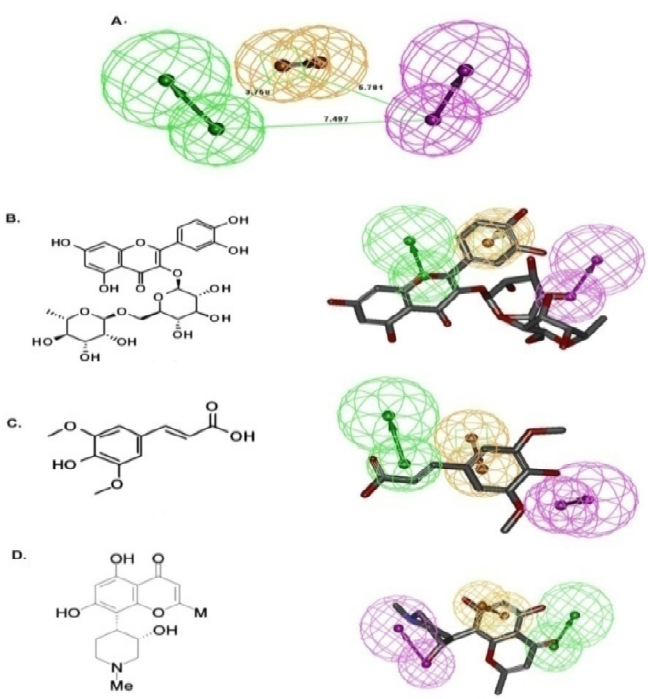


Fig. The CFMPA pharmacophore model and compound mapping. (A) The CFPMA pharmacophore model with the inter-feature distance. The structure and pharmacophore mapping of the most active compound (B) Rutin, (C) the least active compound Sinapinic acid, (D) Identified hit Rohitukine.

4.1.6 Synthesis and evaluation of new 3-phenylcoumarin derivatives as potential antidepressant agents

Coumarins and their derivatives are known to possess a broad range of biological activities including antidepressant activity, depending on their substitution pattern. Therefore a series of amine substituted 3-phenyl coumarin derivatives were screened for the antidepressant like activity in forced swimming test (FST) model in male Swiss mice. Among the series, compounds 5c and 6a potentially decreased the immobility time of mice, by 73.4% and 79.7% at a dose of 0.5 mg/kg, i.p. as compared to the standard drug fluoxetine (FXT) which reduced the immobility time by 74% at a dose of 20 mg/kg, ip. Further, the activity of effective compounds was confirmed in tail suspension test (TST), another model to test antidepressant like activity. It was observed that compounds 5c and 6a significantly reduced the induced immobility time of mice by 49% and 53% ($p<0.001$), respectively. These active compounds also did not show any neurotoxicity as confirmed by locomotor activity and rotarod test. Hence studies demonstrate that the new 3-phenylcoumarin derivatives may serve as a promising antidepressant lead (***Bioorg Med Chem Lett. 2014; 24: 4876-80***).

4.2 Basic Studies and Experimental Models of CVS/CNS Disorders

4.2.1 Post-translational modification of L-plastin leads to defective PMNs functions

Post-translational modifications (PTMs) of cytoskeleton proteins due to oxidative stress associated with several pathological conditions often lead to alterations in cell function. The present study evaluates the effect of nitric oxide (DETA-NO) induced oxidative stress related S-glutathionylation of cytoskeleton proteins in human PMNs. By using *in vitro* and genetic approaches it is showed that S-glutathionylation of L-plastin (LPL) and β-actin promotes reduced chemotaxis, polarization and bactericidal activity, which were reversed by DTT. Identified Cys-206, Cys-282 and Cys-460 as S-thiolated residues in the β-actin-binding domain of LPL. Inhibition of S-thiolation diminished binding as well as the bundling activity of LPL. The presence of S-thiolated LPL and β-actin was detected in neutrophils from both diabetic patients and db/db mice with impaired PMN function. Thus, enhanced nitroxidative stress may result in LPL and β-actin S-glutathionylation leading to impaired chemotaxis, polarization and bactericidal activity of human PMN providing a mechanistic basis for their impaired function in diabetes mellitus. Altogether findings support that enhanced LPL S-glutathionylation and associated changes in the function of PMNs in db/db mice and diabetic patients, represent an important molecular and regulatory mechanism to control PMNs functions and also contributing to explain defective PMNs functions in various pathological conditions.

4.2.2 Inflammatory regulator MAPKAPK2 reduces endothelial microparticle generation

The present study addresses the role of MAPKAPK2 (MK2) in the endothelial microparticles generation. EMPs

are small membrane bound vesicles ranging from 100nM-1000nM released by blebbing of the plasma membrane of endothelial cells due to the cellular activation. The released EMPs play an important role in the trans-signalling and modulating the cardiovascular disease pathogenesis. Here it is showed using genetic and pharmacological inhibitors that MK2 both *in vivo* and *in vitro* reduced the EMP generation. Similarly, MK2 inhibition led to the decreased expression of TNF-α regulated adhesion genes like ICAM and E-selectin and angiogenic genes such as VEGF-A, VEGF-R2 and NRP2. Overall results show that MAPKAPK2 regulates the EMP generation and might play a role in the cardiovascular disease progression (Fig).

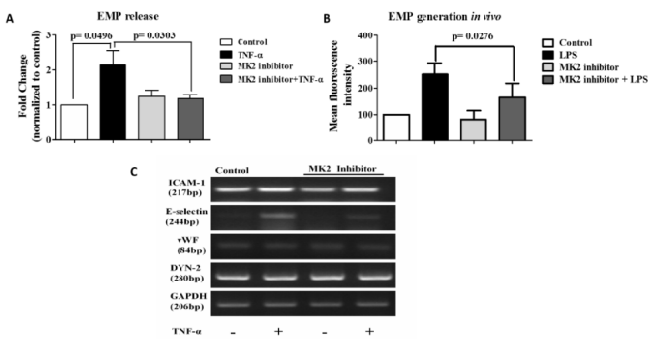


Fig Effect of MK2 inhibitor on EMP generation. (A) *in vitro*, (B) *in vivo*, and (C) effect of MK2 inhibitor on inflammatory genes.

4.2.3 SMAD transcription factor, Sma-9, attunes TGF-β signaling cascade towards modulating Amyloid Beta aggregation and associated outcome in transgenic *C. elegans*

It was endeavored to study whether the transcriptional cofactors, associated with the TGF-β pathway, have a role to play in modulating the disease outcome. Employing transgenic *C. elegans* model, studied β-amyloid aggregation, acetylcholine levels, and associated endpoints and figured that SMAD transcriptional cofactor, Sma-9, modulates the outcome associated with Alzheimer's disease (AD) (Fig). Studies conclude that Sma-9, a subset of the TGF-β-mediated signaling pathway, can be a potential target in neurodegenerative AD as it can influence neuronal, and organismal, survival and play crucial role in limiting adverse effects of AD (***Mol. Neurobiol. 2014; Nov 19: PMID: 25407930***).

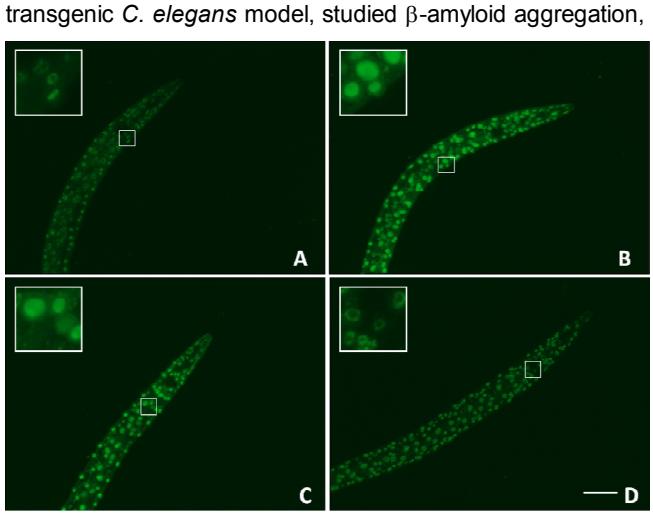


Fig. The nuclear localization of DAF-16::GFP in transgenic TJ356 strain of *C. elegans* in worm fed on OP-50 without heat shock (A), OP-50 after heat shock (B), vector control after heat shock (C), and sma-9 silenced worm after heat shock (D). Scale bar, 50 µm.

4.2.4 Docosahexanoic acid (DHA) modulates brain-derived neurotrophic factor level in primary cortical neurons and astrocytes through Free Fatty acid Receptor-1 (GPR40)

Free fatty acid receptor-1(FFAR-1, also known as GPR40) is one amongst the long chain fatty acid receptors which is a G Protein Coupled Receptor (GPCR). GPR40 is highly enriched in pancreatic beta cells and in brain**.** It was also identified that GPR40 and GPR120 binds with Docosahexanoic acid (DHA) and Ecosapentanoic acid (EPA) a class of omega 3 fatty acids. However, it's not clear if DHA/EPA produces several beneficial effects via GPR40 as a target receptor or not in CNS. In this study it is reported that GPR40 is highly expressed in several brain regions of mouse brain and administration of selective agonist of this Receptor GW9508 (i.p.) in mice induces cfos expression in hippocampus, hypothalamus and various cortical regions. More interestingly, it has been found that GW9508 and DHA stimulated Brain-derived neurotrophic factor (BDNF)

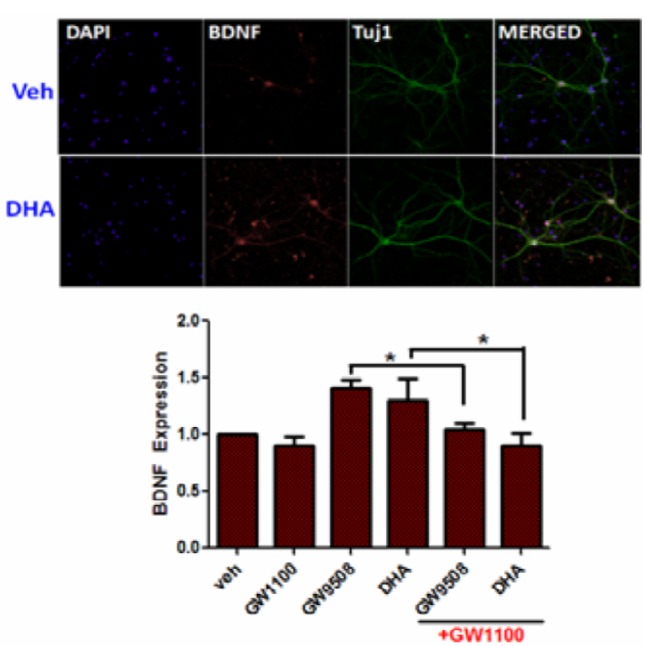


Fig. DHA increases BDNF in the primary cortical neurons via GPR40. DHA and Gw9508 (selective agonist of GPR40) increases BDNF in primary cortical neurons which is blocked by GW1100 (GPR40 selective antagonist).

expression in primary cortical neurons and astrocytes (Fig), which was blocked by GW1100, a GPR40 selective antagonist. Furthermore, using shRNA mediated knockdown of GPR40 in cortical neurons, it could be showed that GPR40 is essential for omega-3-fatty acid DHA and GW9508 mediated BDNF synthesis and CREB signaling in primary cortical neurons. Thus, for the first time demonstrated the GPR40 is molecular target of omega-3 fatty acids in brain (***P-25***, ***IAN 2014, Bengaluru, INDIA***).

4.2.5 Memantine, a NMDA receptor antagonist attenuates streptozotocin induced inflammatory mediators in via modulation of insulin receptor and CREB phosphorylation

Insulin receptor (IR) dysfunction and neuroinflammation in astrocytes, is associated with Alzheimer's disease (AD) pathology. Memantine, NMDA receptor antagonist shows beneficial effects in AD. Nevertheless, it cannot be excluded that neuroprotective mechanism of memantine other than NMDA receptor. To address this question, explored the effect of memantine on streptozotocin (STZ) induced IR dysfunction and neuroinflammation in astrocytes. STZ (100 µM) treatment for 24 h in astrocytes, resulted significant decrease in IR protein expression, phosphorylation of IRS-1, Akt and GSK-3β, which was protected by memantine (1-10µM) treatment

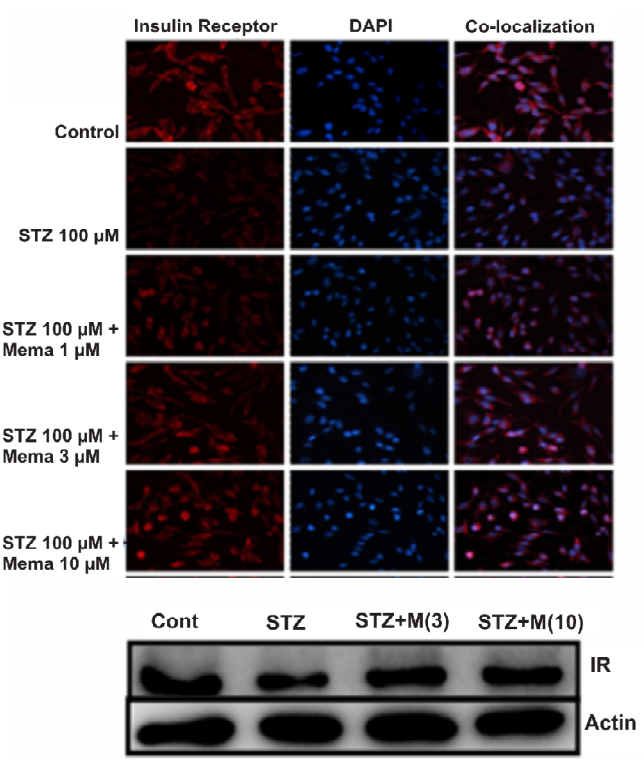


Fig. Effect of memantine on Insuline Receptor (IR) expression in Strteptazotacine (STZ) stimulated C6 astrocytic cell line. Various concentration of Memantine (M) treatment significantly improves the STZ induced decrease in the IR receptor expression

(Fig). Furthermore, found that Memantine (5µM), clinically used NMDA receptor antagonist significantly alleviated the NR1, NR2B, NR2A, Calpain, p-CREB, CREB, CaMKIIα and GFAP expressions in STZ treated cells. STZ also increased the level of neuroinflammatory markers which was prevented by Memantine. These results suggest that STZ induces glial activation and neuroinflammation via regulation of NMDA receptor, Calpain, p-CREB and CamKIIαthat may be ameliorated by Memantine. Thus NMDA receptor linked CREB phosphorylation may facilitate STZ induced glial activation **(DM-5 & P129, IAN- 2014, Bengaluru, India).**

4.2.6 A comparative study on neuroinflammatory response and memory functions in lipopoly-saccharide (ICV) treated spontaneously hypertensive and normotensive rats

The present study aimed to explore involvement of chronic hypertension in neurodegeneration and memory impairment in the presence of Lipopolysaccharide (LPS). Memory impairment was induced by repeated intracerebroventricular (ICV) injections of LPS on 1st, 4th, 7th, and 10th day in spontaneously hypertensive rats (SHRs) and in normotensive wistar rats (NWRs). Memory functions were evaluated by the Morris water maze (MWM) test on day 13-15, followed by biochemical and molecular studies in the cortex and hippocampus regions. LPS (ICV) administration at the dose of 25 µg resulted in memory impairment in SHRs. However, a higher dose (50 µg ICV) of LPS caused memory impairment in NWRs. Control SHRs exhibited increased neuroinflammation (increased TNF-α, GFAP and decreased IL-10), oxidative stress (increased ROS, nitrite and iNOS), and TUNEL positive cells as compared to control NWRs. Further, LPS (25 µg) exaggerated inflammatory response, oxidative stress and apoptosis in SHRs but similar effects were witnessed at 50 µg of LPS in NWRs. Data demonstrated that chronic hypertension enhances the susceptibility of the brain for neurodegeneration and memory impairment induced by neuroinflammatory stimulus **(P107, IAN- 2014, Bengaluru, India)**.

4.2.7 Promising Role of Melatonin as Neuroprotectant in Neurodegenerative Pathology

Rotenone, a pesticide induced neurotoxicity involves the oxidative stress. However, the involvement of endoplasmic reticulum (ER) stress has not been explored. Recently the involvement of ER stress in rotenone-induced neuronal death has been investigated. Rotenone treatment exhibited altered expression of glucose regulated protein 78 (GRP78), growth arrest- and DNA damage-inducible gene 153 (GADD153), phosphorylation of eukaryotic translation initiation factor 2 subunit α (eIF2-α) and altered cell physiology

in rotenone-treated neuro-2A cells which were inhibited with salubrinal implicating the specific involvement of ER stress in rotenone induced neurotoxicity (**Fig**) ***(Mol Neurobiol. 2014, PMID: 25428620).*** Recently, the involvement of mitochondrial endonuclease G in neuroprotective mechanism of nootropic drug piracetam has been shown. (***Free Radic Biol Med. 2014;73: 278-90***).

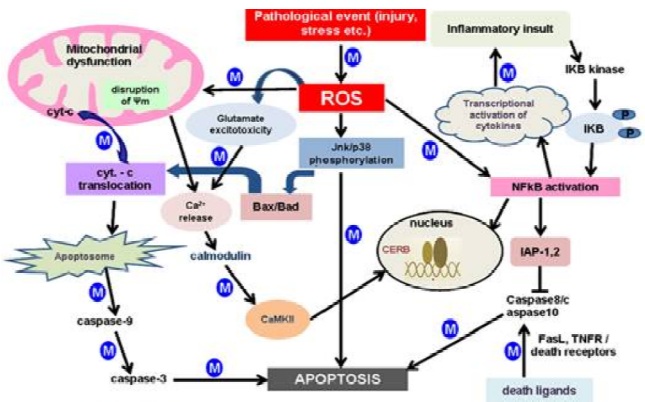


Fig. A schematic representation of melatonin induced inhibition of cell death mechanisms. Melatonin inhibits the augmented reactive oxygen species (ROS), altered calcium homeostasis and mitochondria mediated cytochrome-c (cyt-c) translocation induced caspase dependent apoptotic pathway. Melatonin treatment also led to inhibition of death ligand mediated extrinsic apoptotic pathway and inflammatory cytokine mediated death mechanisms. By inhibiting the inflammatory and apoptotic death pathways melatonin could enhance cell protective mechanisms during neurodegenerative conditions.

4.2.8 PKCδ-IRAK1 axis regulates oxidized LDL-induced IL-1β production in monocytes.

This study examined the role of interleukin (IL)-1 receptor-associated kinase (IRAK) and protein kinase C (PKC) in oxidized LDL (Ox-LDL)-induced monocyte IL-1β production. In THP1 cells, Ox-LDL induced time-dependent secretory IL-1β and IRAK1 activity; IRAK4, IRAK3, and CD36 protein expression; PKCδ-JNK1 phosphorylation; and AP-1 activation. IRAK1/4 siRNA and inhibitor (INH)-attenuated Ox-LDL induced secreted IL-1β and pro-IL-1β mRNA and pro-IL-1β and mature IL-1β protein expression, respectively. Diphenyleneiodonium chloride (NADPH oxidase INH) and N-acetylcysteine (free radical scavenger) attenuated Ox-LDL-induced reactive oxygen species generation, caspase-1 activity, and pro-IL-1β and mature IL-1β expression. Ox-LDL-induced secretory IL-1β production was abrogated in the presence of JNK INH II, Tanshinone IIa, Ro-31-8220, Go6976, Rottlerin, and PKCδ siRNA. PKCδ siRNA attenuated the Ox-LDL-induced increase in IRAK1 kinase activity, JNK1 phosphorylation, and AP-1 activation. In THP1 macrophages, CD36, toll-like receptor (TLR)2, TLR4, TLR6, and PKCδ siRNA prevented Ox-LDL-induced PKCδ and IRAK1 activation and IL-1β production. Enhanced Ox-LDL and IL-1β in systemic inflammatory response syndrome (SIRS) patient plasma demonstrated positive correlation with each other and with disease severity scores. Ox-LDL-containing plasma induced PKCδ and IRAK1 phosphorylation and IL-1β production in a CD36-, TLR2-, TLR4-, and TLR6-dependent manner in primary human monocytes. Results suggest involvement of CD36, TLR2, TLR4, TLR6, and the PKCδ-IRAK1-JNK1-AP-1 axis in Ox-LDL-induced IL-1β production (***J Lipid Res. 2014; 55(7):1226-1244.***) A cartoon of proposed model of this pathway is given in fig.

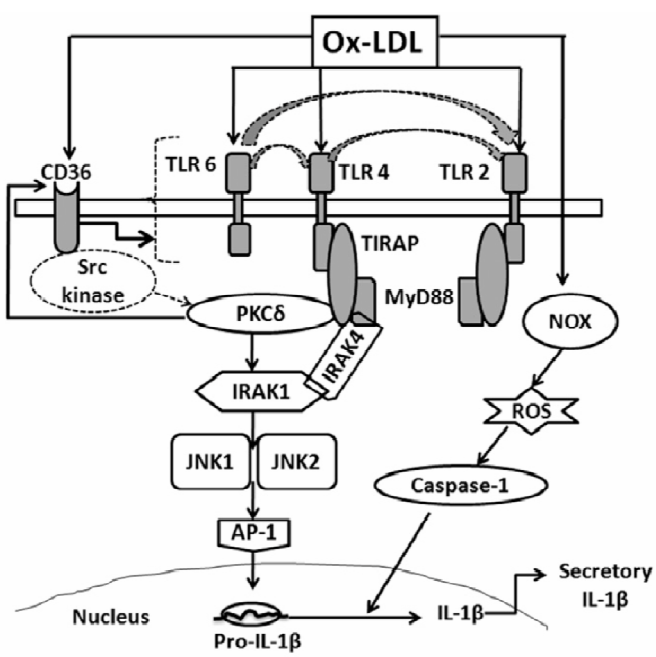


Fig: Model for Ox-LDL-induced IL-1β production in monocytes. Schematic signaling flow diagram integrating reported and presently studied Ox-LDL signaling. Ox-LDL involves CD36, TLR2, TLR4, and TLR6 for PKCδ-IRAK1-JNK-AP-1 axis activation and IL-1β production. ROS generated after Ox-LDL treatment induce caspase-1 activation and IL-1β processing. PKCδ positively regulates CD36. Ox- LDL-induced PKCδ activation can be mediated by CD36, CD36-dependent TLR dimerization, TLR upregulation, Toll-interleukin 1 receptor (TIR) domain-containing adapter protein or Src activation.

5 Cancer and Related Areas

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

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

5.1 Biological Screening

5.1.1 Anti-cancer Screening (SRB Assay)

No. of indicated extracts and pure compounds received during 2014 was screened using Suphorhodamine Assay (SRB) as per following table:

TYPE	No. of Samples tested during reporting time					
	Results					
	Received	Tested	Primary Screening (Single dose)	Secondary Screening (IC 50 Value)	Inactive	Results pending
Plant Extracts	152	141	134	29	105	09
Pure Compounds	589	543	524	65	459	22

5.2 Drug Delivery Systems

5.2.1 Nanoparticles of Centchroman as anti-cancer agent

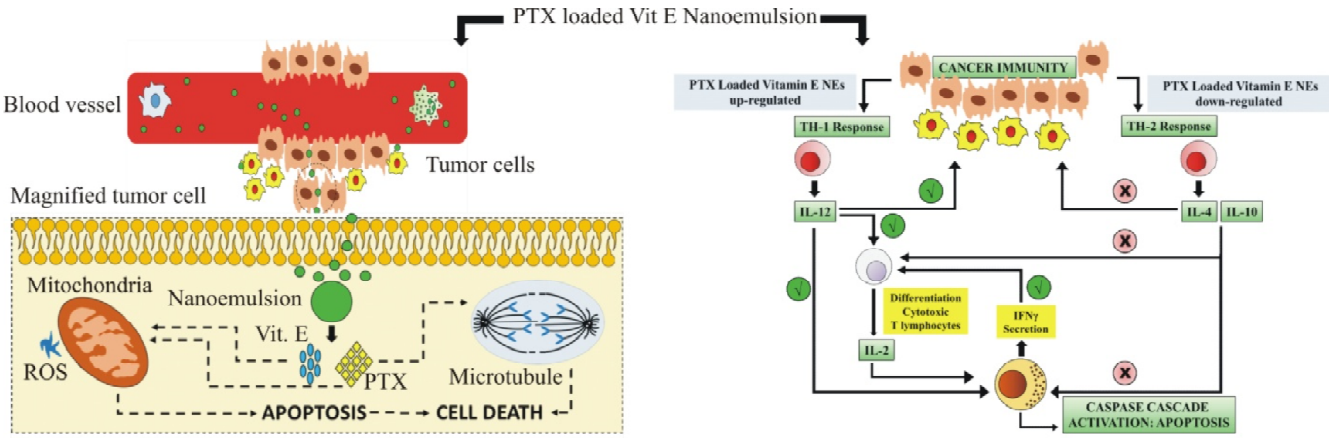
Centchroman loaded PLGA/Polycaprolactone nanoparticles were prepared by solvent emulsification followed by solvent evaporation method. Optimized formulation had average size range of 238 nm with PDI value 0.104 and about 67% drug entrapment efficiency for PLGA nanoparticles and had average size range of 150.6 nm with PDI value 0.212 and 71.7% drug entrapment efficiency for polycaprolactone nanoparticles. MTT assay performed on MCF-7 and MDA-MB231 cell lines showed significantly reduced IC_{50} value of formulations compared with drug suspension indicating better cytotoxic effect of formulations.

5.2.2 Folic acid conjugated Gliadin nanoparticles in colorectal cancer

Folic acidrich Gliadin nanoparticles loaded with curcumin were prepared and found to be more effective in targeting the over expressed folate receptors in colorectal cancer when compared to unconjugated nanoparticles loaded with curcumin. The *in vitro* uptake studies indicate that the nanoparticles are taken up better by cells expressing the folate receptor. Toxicological investigation revealed the safety of the nanoparticles. On the basis of *ex-vivo* and *in vitro* characterization of these nanoparticles it was decided to coat the particles with Eudragit S- 100 so that they may be targeted to the colon. A comparison of Eudragit-coated and un-coated nanoparticles is underway, using gamma scintigraphy, measurement of drug in different segments of the digestive tract and calculation of pharmacokinetic parameters after oral administration

5.2.3 Vitamin E nanoemulsion of Paclitaxel: Bridging immunomodulation and anticancer therapy

To sideline deleterious tendencies of paclitaxel (PTX), it was incorporated in a vitamin E nanoemulsion using high pressure homogenization. The encapsulation efficiency of PTX in nanoemulsion was 97.81 ± 2.7% and sustained drug release was obtained. PTX loaded nanoemulsion exhibited higher cytotoxicity, G2-M phase arrest and mitochondrial membrane potential disruption induced apoptosis in breast cancer cell line (MCF-7) when compared to free PTX and marketed formulation. Results also suggested inclusion of vitamin E in nanoemulsion showcased resurrection of Th-1 response, negligible haemolytic potential, greater *invivo* anticancer activity, and conveniently modified pharmacokinetic profile in which the AUC and MRT were extended considerably.



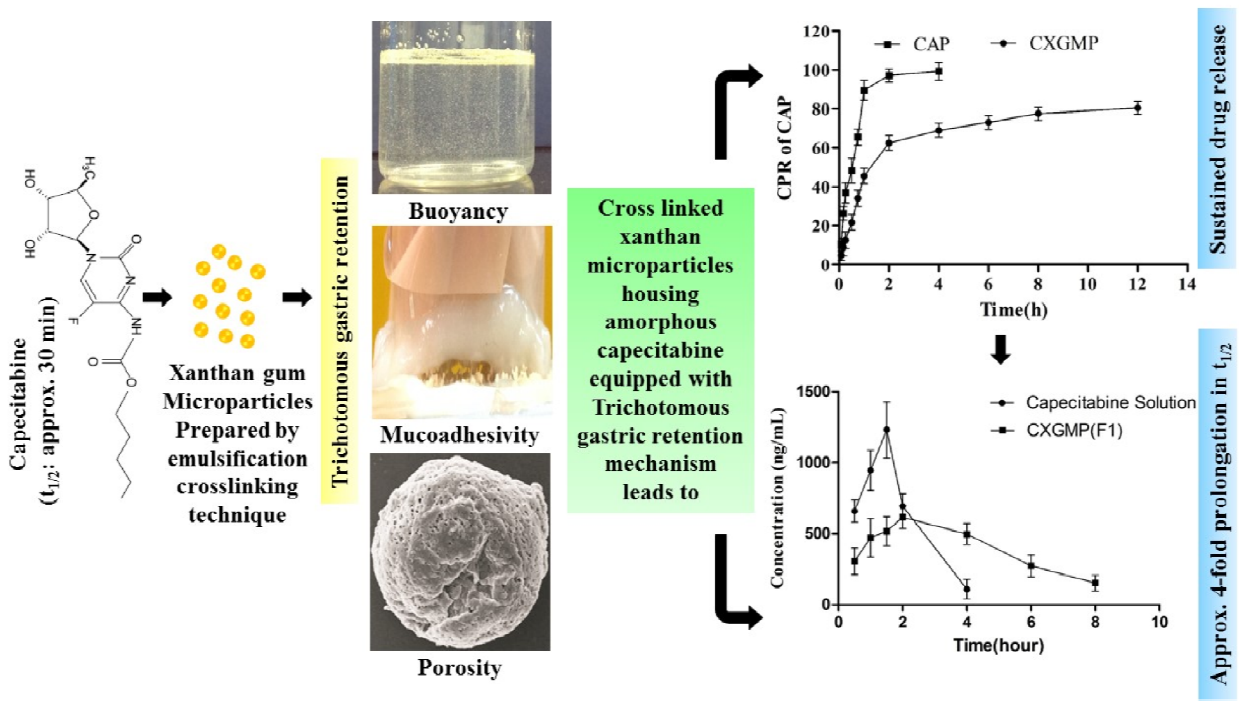
5.2.4 Formulation of trichotomous gastric retention system bearing Capecitabine to overcome pharmacokinetic gap

Capecitabine (CAP) is an oral drug of choice for treatment of colorectal cancer. But it's short plasma half-life limits clinical utility and the usually prescribed dosing regimen results in significant periods of therapeutic inactivity. To overcome this pharmacokinetic void a trichotomousgastroretentive (TRGDDS) system made of CAP housed in xanthan gum microparticles (CXGMP) has been developed for extending its gastric residence time thereby prolonging the subsequent elimination. TRGDDS was evaluated for particle size, surface morphology, entrapment efficiency, buoyancy, mucoadhesiveness, swelling index. X-Ray diffraction and differential scanning calorimetry of CXGMP suggested CAP had been rendered amorphous, a property which uncharacteristically slows its dissolution. Control was offered by CXGMP compared to crystalline CAP in terms of drug release. Pharmacokinetic studies further revealed that CXGMP increased MRT, elimination half- life and AUC of CAP. The developed system thus extends the duration for which CAP stayed in the rodent model, providing evidence for potentially obtaining a more efficacious dosing regimen in allometric models.

5.3 Basic Research

5.3.1 ATRA induced Max binding protein (Mnt) expression through inhibition of E6AP is required for myeloid differentiation

In the present study, MAX-binding protein, Mnt has been identified as a novel interacting partner of E6AP. Mnt



(74kDa), a nuclear protein is the member of the Myc/MAX/Mad network of transcription factors that regulates cell proliferation, differentiation and cellular transformation. Thus, in this study we sought to identify novel interacting proteins of E6AP and elucidate its significance in the pathophysiology of myeloid leukemia, wherein differentiation blockade is a conspicuous feature. Findings demonstrated that E6AP physically associates with Mnt and promotes its degradation through ubiquitin-mediated proteasome pathway thereby controlling its functions, including growth arrest and differentiation promoting ability in myeloid leukemia cells.

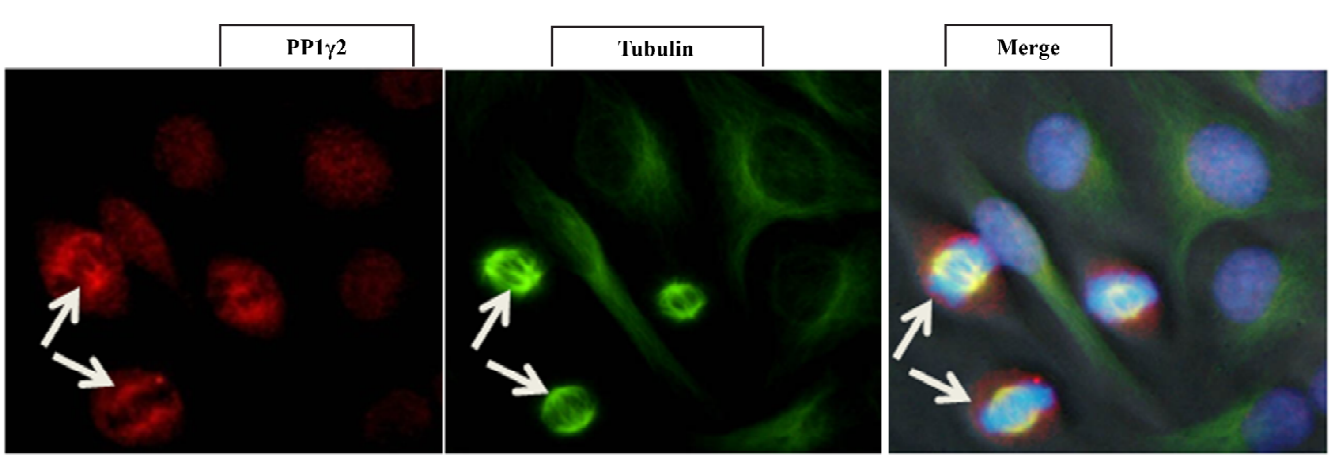
5.3.2 Cancer-Testis Antigen (CTA) Biomarker PP1γ2

A novel cancer-testis antigen (CTA) biomarker, Serine Threonine Protein phosphatase-1 Gamma 2 (PP1g2), testis specific isoform, had been reported to play a key role during spermatogenesis has been identified and characterized. The expression of PP1γ2 in various cancer cell lines as well as biopsy samples of cancer patients has been demonstrated through various techniques including RT-PCR, Western blotting and immuno-localization, which confirmed the existence of PP1γ2 isoform at both transcript as well as protein level in cancerous cells. Immuno-fluorescence of HeLa Cells (Cervical cancer cell line) with PP1γ2 antibodies revealed the spatio-temporal localization of the protein in the nucleus of the mononuclear cells, which was redistributed to the spindle poles on entry into the mitotic phase of the dividing cells.

Further, the clinical significance of PP1γ2 expression was evaluated and assessed the humoral immune response in cancer patients. It was observed that in early stage of cervical cancer, a substantial number of patients exhibited PP1γ2 expression and generated antibodies, indicating possible deployment of the antigen as a biomarker for early detection and diagnosis of cervical cancer and development of non-invasive therapeutic techniques for cancer treatment.

5.3.3 Macrophages are recruited to hypoxic tumor area and acquire a proangeogenic M2-polarised phenotype via hypoxic cancer cell derived cytokines oncostatin M and Eotaxin

TAMs, a unique and distinct M2-skewed myeloid population of tumor stroma, exhibiting pro-tumor functions is fast emerging as a potential target for anti-cancer immunotherapy. Macrophage-recruitment and M2-polarization represent key TAMsrelated phenomenon that are amenable to therapeutic intervention. However successful translation of these approaches into effective therapeutic regimen requires better characterization of tumor-microenvironment derived signals that regulate macrophage recruitment and their polarization. Owing to hypoxic milieu being a persistent feature of tumor-microenvironment and a major contributor to malignancy and treatment resistance, the current study was planned with an aim to decipher tumor cell responses to hypoxia vis-a-vis macrophage homing and phenotypem switching. Here, we show that hypoxia-primed cancer cells chemoattract and polarize macrophages to pro-angiogenic M2-polarized subtype via Eotaxin and Oncostatin M. Concordantly, hypoxic regions of human breast-cancer specimen exhibited elevated Eotaxin and Oncostatin M levels with concurrently elevated M2-macrophage content. Blockade of Eotaxin/Oncostatin M not only prevented hypoxic breast-cancer cells from recruiting and polarizing macrophages towards an M2-polarized phenotype and retarded tumor progression in BalbC/4T1-syngenic-mice-model of breast-cancer but also enhanced the efficacy of anti-angiogenic Bevacizumab. The findings established these two cytokines as novel targets for devising effective anticancer therapy particularly for tumors that are refractory or develop resistance to anti-angiogenic therapeutics. **(Oncotarget, 5(14):5350-5368)**



Immunolocalization of PP1γ2 (red) and Tubulin (green) in HeLa cells showing temporal localization and redistribution during cell division

5.3.4 Cucurbitacin B inhibits NNK-induced lung tumorigenesis

Non-small cell lung cancer accounts for the maximum number of cancer-related deaths worldwide. Majority of lung cancer cases arise due to the environmental factors such as cigarette smoke, asbestos, chemical carcinogens etc. Bioactive natural compounds have been a major focus of interest as preventive and therapeutic options against various classes of diseases including cancer. Cucurbitacin B (CuB) is a natural triterpenoid isolated from Cucurbitaceae plants, which has shown myriad of biological activities. Since, in our previously study, CuB was found to alter the expression of DNMTs and HDACs *in vitro*, we selected 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK)-induced lung cancer mice model to assess the *in vivo* lung anti-cancer potential of CuB. NNK is a tobacco-specific lung pro-carcinogen, which is known to induce lung carcinogenesis after activation by cytochrome P-450. NNK has been shown to induce lung carcinogenesis through both genetic and epigenetic mechanisms. Early changes during NNK-induced lung carcinogenesis include altered expression of DNMT1 and HDACs. As shown in *Fig. 1*, NNK-administered A/J mice had significantly higher incidence of lung cancer (100%) and tumor multiplicity (17.75±7.4 lung tumors per mouse) compared with vehicle-administered control mice. Interestingly, treatment with 0.1 mg/Kg body weight (b.w.) and 0.2 mg/Kg b.w. CuB resulted in a significantly reduced lung tumor incidence and tumor multiplicity compared with vehicle alone-treated NNK-induced lung tissues (*Fig. 1*). Further, histopathological analysis of the lung tumors in the NNK-treated groups showed the presence of vascular changes including angiogenesis, congestion and hemorrhage, epithelial hyperplasia, tumor multiplicity as well as incidence, inflammatory infiltration. The lungs of

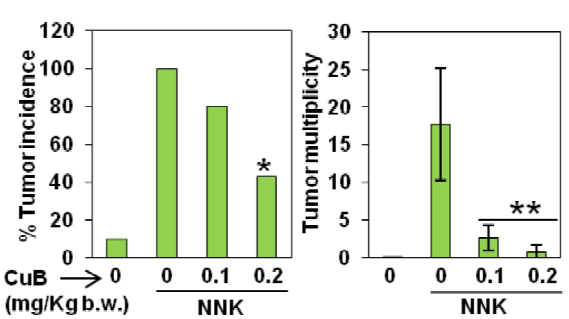


Fig. 1. CuB reduced the severity of neoplastic lesions induced by NNK in A/J lung tissues

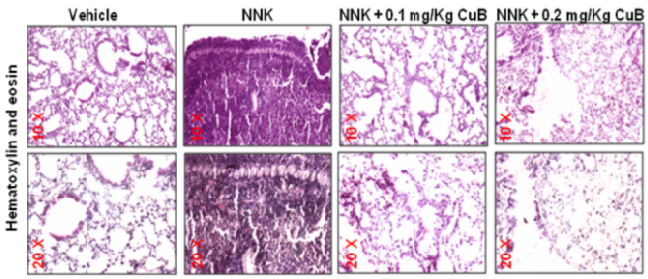


Fig.2. Histopathological analysis of effect of CuB on the NNK-induced lung tissue

NNK-induced A/J mice showed abundance of bronchiolar as well as alveolar hyperplasia, adenocarcinomas and micro-adenomas. Tumor angiogenesis, which is marked by the formation of new and irregular blood vessels, was also prevalent in the NNK-induced lungs. The NNK-induced lungs treated with 0.1 and 0.2 mg/Kg b.w. CuB showed dose-dependent decrease in the presence of neoplastic lesions as well as in the vascular changes and inflammatory infiltrations *(Fig. 2)*.

Collectively, finding suggests that CuB inhibits NNK-induced lung tumorigenesis by reducing the severity of NNK-induced lung lesions. Therefore, CuB could be developed as a very potent lung anti-cancer molecule and it could also be used in designing novel epigenetic therapeutic strategy against NSCLC in humans.

5.3.5 Localization of Lipid Droplets with AFN-575

Highly fluorogenic AFN-575 has been characterized as a novel in-house synthesized nontoxic, cell-permeable, highly selective and stable fluorescent probe for staining lipid droplets in fixed/live HeLa cells. As lipid droplets are highly concentrated in cancerous cells, the new LD-specific biocompatible fluorescent probe AFN-575 (with visible excitation and distinct emission band) may find useful applications in monitoring the progression of cancers.

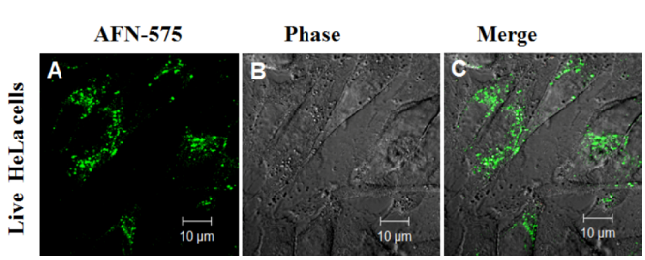


Fig. Specific localization of Lipid Droplets with AFN-575 (0.5 µM) in live HeLa cells through confocal microscopy using the laser line of 405 nm.

6 Safety and Clinical Development

The report embodies the studies conducted on existing drugs and CDRI drug candidates at Pharmaceutics, Pharmacokinetic and Metabolism, Pharmacology, Toxicology and Clinical and Experimental Medicine divisions.

Translational Research Team

Chairperson:
Dr. Madhu Dikshit

Members:
Dr. Bijoy Kundu
Dr. Ashim Ghatak
Dr. AK Dwivedi
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Dr. SK Rath
Dr. Amit Misra
Dr. Sripathi Rao Kulkarni
Mr. Naseem Siddiqui

6.1 Pharmaceutics

6.1.1 Pharmaceutical analysis

Pharmaceutical analysis of 32 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 9.5 days, down from 11.05 days from the previous year. Semi-preparative HPLC purification was undertaken for two CSIR-CDRI compounds.

6.1.2 Preparation of reference standards

Suitable HPLC methods were developed and validated for the analysis of Centchroman, Atenolol and Primaquine diphosphate for using them as Reference standards: Uncertainty budgets according to ISO/IEC Guide 99:2007 were calculated and samples (100mg each) along with protocols were submitted to CSIR-NPL, New Delhi.

6.1.3 Identification of internal standards for pharmaceutical analysis

Ciprofloxacin, Metformin, Griseofulvin, Gliclazide, Curcumin, Carbamazepine, CDRI compounds S002-333, S007-867, 99/411, Curcumin, Quercetin, Rutin, Piroxicam, Azithromycin, Ciprofloxacin, Acyclovir, Metformin, Ciprofloxacin, Metformin, Griseofulvin HPLC methods were developed so as to use Gliclazide as the compound of choice as an external standard.

6.1.4 Preformulation and stability studies

Preformulation studies including validated HPLC method development and stability studies as per ICH guidelines for CDRI compound S007-867 were completed for filing the IND application. Fill material for capsules of the lead compound identified in the NMITLI project (NMITLI118RT+) was screened and characterized on the basis of IR, DSC-TGA, flow properties, loss on drying, weight variation, content uniformity, disintegration time and HPLC analysis.

6.1.5 Inhalable particles containing anti-tuberculosis agents

A Confidential Disclosure Agreement was signed with M/s. Camus Pharma, who are currently evaluating the data on preparation, characterization, storage stability, preclinical safety and preclinical efficacy of this formulation with a view to commercialize the product.

6.2 Pharmacokinetics & Metabolism

6.2.1 LC-MS/MS method development and validation for S006-830: application to Pharmacokinetic and plasma protein binding studies in Rats

6.2.2 LC-MS/MS assay for quantification of S006-830 in SD Rat plasma

A highly sensitive and selective LC-MS/MS assay with a linearity range of 0.15-40 ng/ml. was developed and validated for antitubercular compound S006-830 in rat plasma. The precursor to production ion transitions selected for quantification of S006-830 and IS were m/z 424.353/ 203.00 and 330.300/267.400 respectively **(Fig. 1).** Recoveries of S006-830 from spiked plasma samples were consistent and found to be more than 70%.

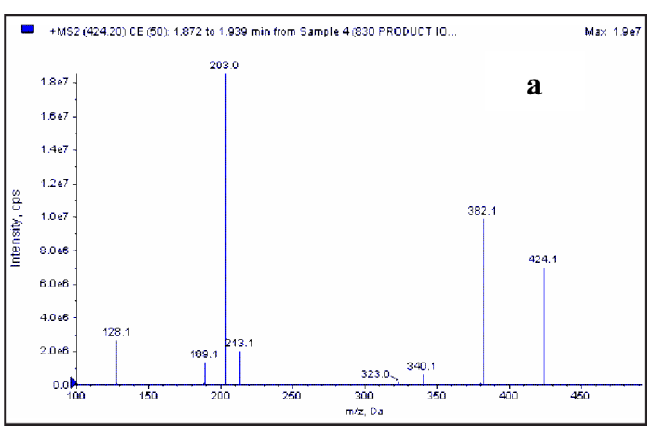


Fig.1: Ion transition spectra of S006-830 (a) and α-arteether (b)

6.2.3 Pharmacokinetics of S006-830 in SD Rats and Plasma protein binding studies

Oral PK profile of S006-830 at 50 mg/Kg demonstrated that mean (±SEM) $T_{1/2}$ and mean residence time were 8.30 ± 1.30 h and 8.44 ± 0.57 h, while Cmax and AUC0-last were 1.94 ± 0.30 µg /ml and 6.25± 1.66 µg.h /ml respectively. Plasma protein binding for S006-830 was 58.63 ± 3.4%. **Fig. 2** represents plasma conc.-time profile in rats.

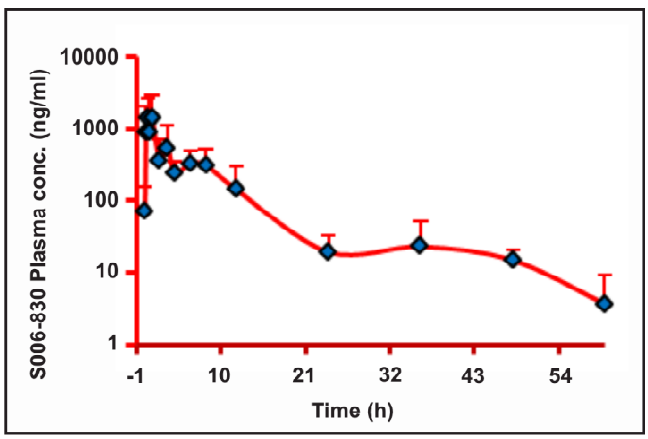


Fig. 2: Plasma concentration–time profile of S006-830 in SD rats

6.2.4 Determination of metabolic profile of novel triethylamine containing thiophene S006-830 in rat, rabbit, dog and human liver microsomes

The observed *in vitro* t1/2 and Clint values were 9.9 ± 1.29, 4.5 ± 0.52, 4.5 ± 0.86, 17 ± 5.21 min and 69.60 ± 8.37, 152.0 ± 17.26, 152.34 ± 27.63, 33.62 ± 21.04 µL/min/mg in rat, rabbit, dog and human liver microsomes respectively. These observations suggests that S006-830 metabolized rapidly in liver microsomes of rat, rabbit and dog, while moderately in human liver microsomes **(Fig. 3)**. The plots

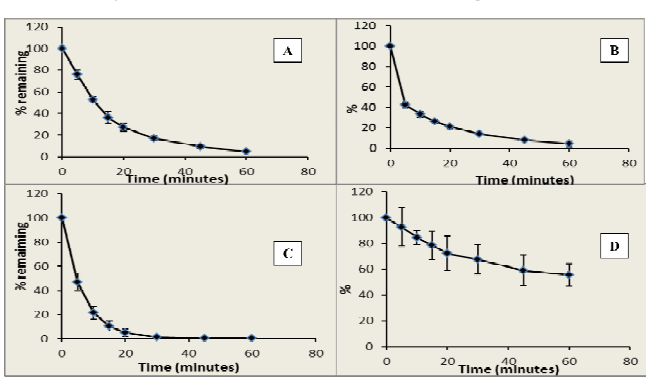


Fig. 3: Depletion profile of CDRI S006-830 in (A) rat (B) rabbit (C) dog and (D) human liver microsomes

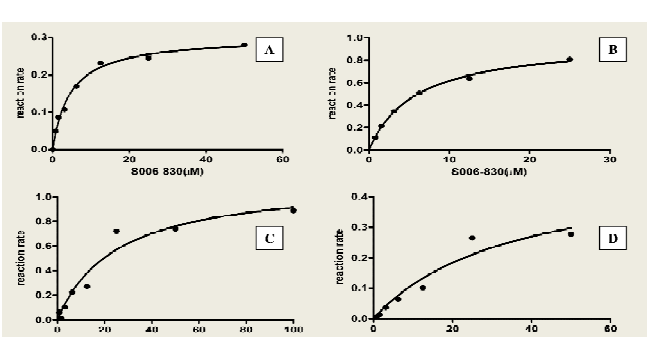


Fig. 4: Representative Michaelis–Menten enzyme kinetic plots of CDRI S006-830 in (A) rat (B) rabbit (C) dog and (D) human liver microsomes

illustrated in **Fig. 4** shows hyperbolic saturation with a kinetics following Michaelis–Menten enzymatic reaction, suggesting that metabolic reactions are catalyzed predominantly by a single P450 isoform or by more than one isoform with similar Kmvalues.

6.2.5 Drug-drug interaction study of centchroman with concomitantly commonly administered drugs in rat

Pharmacokinetic interaction of centchroman with concomitantly commonly administered drugs (anti-hyperlipidemic drugs: atorvastatin and rosuvastatin; antiasthmatic drug: monteleukast; anti-allergic drugs: levocetrizine and fexofenadine; antihypertensive drug: losartan and antimalarial drugs: pyrimethamine and arteether) was studied in female Sprague Dawley rats (n=3 per group) using DBS method of sampling. Following LC-MS/MS and pharmacokinetic parameters analysis, alteration of centchromanCmax was observed on rosuvastatin, monteleukast and pyrimethamine co-administration. Absence of secondary centchroman Cmax was noticed in centchroman's pharmacokinetic profile when the rats were co-administered with rosuvastatin, monteleukast and losartan. However, variation in clearance of centchroman was observed on losartan and levocetrizine co-administration.

6.2.6 PK studies of antithrombotic compound S002-333 and its isomers S004-1032 &S007-1558

Four major metabolites (M-1 to M-4) were separated on HPLC –UV and their structures were characterized through LC-MS/MS. Product ions 169, 171, 215, 327 and 341 were found to be major fragments. The m/z for the [M+H]+ of M-1, M-2, M-3 and M-4 metabolites were 402, 372, 402 and 384 respectively, representing the incorporation of one oxygen (M-1 and M-3), loss of methyl group (M-2) or loss of two hydrogen atoms (M-4). Enzyme kinetic parameters for each of the identified metabolite M-1 through M-4 were determined by the relationship between relativeformation rates of metabolites and substrate concentration in pooled HLM. As shown in **Table 1**, the sum of relative Vmax/Km ratio for M-3 and M-4 metabolite (rel. Vmax/Km (M-3) + rel. Vmax/Km (M-4); 0.015) is ~2-folds greater than that of M-1 and M-2 metabolites (rel. Vmax/Km(M-1) + rel. Vmax/Km(M-2); 0.007) for S004-1032. In case of S007-1558, for M-1 and M-2 metabolite the sum (rel. Vmax/Km(M-1) + rel. Vmax/Km(M-2) ; 0.043) is 6-folds greater than that of M-3 and M-4 metabolites (rel. Vmax/Km(M-3) + rel. Vmax/Km(M-4) ; 0.007). It implicates greater enzymatic clearance for M-1 and M-2 from S-enantiomer and M-3 and M-4 from R- enantiomer. The sum total of relative Vmax/Km ratio for M-1 through M-4 for S007-1558 (S-form) is ~2-folds greater than that of S002-333 (racemate) and S004-1032 (R-form) showing that it is more prone to phase- I metabolic degradation.

Table 1: Km and Vmax values of different metabolites of S002-333, S004-1032 and S007-1558

	Metabolite	Relative Vmax	Km (µM)	Relative Vmax/Km
S002-333 (*Racemate*)	M-1	0.13	21.8 ± 2.5	0.006
	M-2	0.11	14.5 ± 1.4	0.008
	M-3	0.07	24.3 ± 1.8	0.003
	M-4	0.07	18.7 ± 1.6	0.004
S004-1032 (*R-enantiomer*)	M-1	0.08	38.3 ± 6.4	0.002
	M-2	0.09	18.0 ± 3.0	0.005
	M-3	0.34	40.1 ± 10	0.008
	M-4	0.16	22.3 ± 1.4	0.007
S007-1558 (*S-enantiomer*)	M-1	0.34	17.2 ± 2.0	0.020
	M-2	0.4	17.3 ± 1.4	0.023
	M-3	0.17	34.4 ± 4.1	0.005
	M-4	0.08	35.1 ± 1.1	0.002

6.2.7 Pharmacokinetics of antithrombotic compound S007-867

Oral and intravenous pharmacokinetics of S007-867 conducted in the mouse, rat and rabbit model. Tissue distribution was conducted in the mouse. S007-867 was rapidly absorbed and distributed to various tissues. Following oral administration of S007-867 in the mouse, the concentration was in the order of intestine > liver > kidney > heart > spleen > lungs > brain. Tissue to plasma AUC ratio suggested that the maximum amount of drug was found in the intestine and liver. Half life of S007-867 was found longer in the heart (8.08 hr), spleen (~7.94 hr) and kidney (~15.41 hr) as compared with other tissues. Reaction phenotyping studies were performed using Baculosomes® (CYP1A2, CYP2C9, CYP2C19, CYP3A4, CYP2D6, CYP2E1). The human CYP3A4 and CYP2C19 seemed to be responsible for the metabolism of the S007-867. Permeability study conducted using Caco-2 cell line demonstrated that permeability (Papp) of S007-867 was 108.86 nm/sec and this value is similar to the compounds exhibiting good (> 50%) absorption in human. Metabolism studies were conducted in the human liver microsomes and rabbit liver microsomes. Putative oxidative metabolites (S007-867 + 16) were identified.

6.2.8 Pharmacokineitc study of antihyperlipidemic agent Rohitukine

The oral and intravenous pharmacokinetic of rohitukine was studies in Sprague–Dawley rat at 50 mg/kg and 5 mg/kg dose respectively. The mean peak concentration (Cmax) 4883.33 ± 1843.15 ng/mL was achieved at 1 h after oral administration. The plasma concentration of rohitukine decreased rapidly and was eliminated from plasma with a terminal half-life of 2.18 ± 0.13 h. The clearance (Cl) of rohitukine was found to be 2.63 ± 0.68 L/h/kg and 3.97 ± 1.59 L/h/kg, respectively for post-

oral study and I.V. study. The volume of distribution (Vd) was 8.26 ± 1.92 L/kg and 4.53 ± 1.28 L/kg respectively for post-oral study and I.V. study. Absolute oral bioavailability (% F) of rohitukine was 34.25 ± 2.23%.

6.2.9 *In vivo* pharmacokinetics of novel fracture-healing agent S007-1500

In vivo oral pharmacokinetic study was performed in male SD rats (weight range 200±20 g). The NCE was administered at intravenous dose of 5 mg/kg as solution and oral dose of 10 and 20 mg/kg in 0.25% CMC as suspension, and the analysis was done using LC-MS/MS method to get the plasma concentration-time profile **(Fig. 5).** The mean oral bioavailability of S007-1500 at 10mg/kg and 20 mg/kg was found to be 22.04% and 16.49% respectively. The maximum plasma concentration reached, Cmax, was 213.25 ± 92.80 and 272.67±117.29 ng/mL at 10 and 20 mg/kg respectively and was reached after 30 min in both the cases.

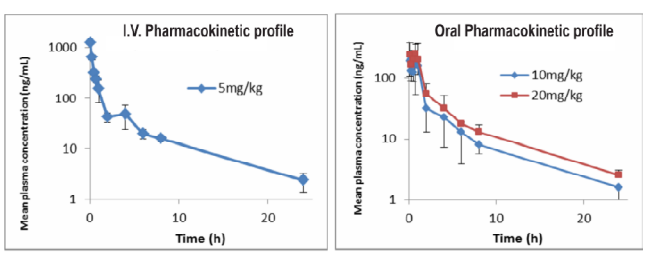


Fig.5: The mean plasma concentration-time profile of Novel fracture-healing agent S007-1500

6.2.10 PK studies of Ashwagandha [NMITLI-118R(T+)]

Protonated parent ion of withanolide-A and IS were observed at m/z 471.22 and 237.08 respectively and then fragmented in collision cell by nitrogen as a collision gas. The fragment was selected at m/z 263.20 as most prominent and stable fragments for withanolide-A **(Fig. 6)**. The within and between batches precision and accuracy of the developed method was assessed by determining QC samples at four different concentration levels, each with three replicates per run, for three consecutive runs. The QC samples were prepared and analyzed together with the calibration samples. The accuracy and precision for withanolide-A within batch (n=3) and between batches (n=9) were analysed and were within the limit of guidelines.

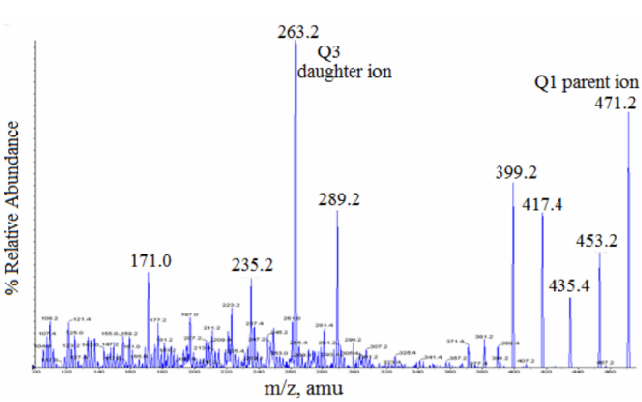


Fig.6: Representation of Withanolide A Q1 and Q3 masses

6.3 Safety Pharmacology

6.3.1 Predictor hERG assay of identified lead molecules

- Anti-osteoporotic compound S007-1500 has no affinity for hERG ion channel up to 33 µM concentration
- Antimalarial compound S011-1793 has no affinity for hERG ion channel up to 10 µM concentrations. However, at Higher concentrations (33 µM) modest binding at hERG ion channel was observed.
- Antithrombotic compound S007-867 has no affinity for hERG ion channel up to 33 µM.

6.4 Regulatory Toxicology

6.4.1 Systemic toxicity studies

6.4.1.1 Anti-thrombotic compound S002-333 - Single Dose Toxicity Study

The compound was administered at the doses of 300,600, 1200, and 2000 mg/kg by oral route in Swiss Albino Mice, and after 14 days of treatment, the compound was found safe.

6.4.1.2 28 Day repeat dose toxicity study on anti-thrombotic compound S007-867

Anti-thrombotic compound, S007-867 was administered at 80,160,640mg/kg/day weight by oral route in rats. The treated rats did not exhibit any adverse effects and the compound is found safe.

6.4.1.3 28 Day repeat dose toxicity study of compound CPL-2009-0031(Phosphate)

Doses of 17.5,70,280 mg/kg body weight of compound CPL-2009-0031(Phosphate) in Rhesus Monkey by Oral Route and found safe.

6.4.1.4 10 Days dose range finding study on Withania NMITLI-118R(T+)

Doses of 250,500,750,1000mg/kg of compound Withania NMITLI-118R(T+) body weight tested in SD Rat and found safe.

6.4.1.5 28 Day repeat dose toxicity study on Withania NMITLI-118R(T+)

Doses of 250,500,1000mg/kg body weight of NMITLI-118R(T+) in SD Rat by oral route and found safe.

6.4.1.6 Exploratory acute study through IP route of MOES-ILS/20

Swiss mice treated with test sample in single dose of 500mg/kg by intraperitoneal route. The treated animals exhibited paralysis, shivering and erected tails. Female mice were more affected than male animals.

6.4.2 Genotoxicity studies

6.4.2.1 *In vitro* Chromosomal aberration assay for NMITLI-118R(T+) using human peripheral lymphocytes

Doses of Withania NMITLI-118R(T+)10µg, 33µg, 100µg, 333µg and 1000µg per culture were found non-clastogenic and non-genotoxic.

6.4.2.2 Mutagenicity evaluation of S007-1500 by *Salmonella* reverse mutation assay (Ames Assay)

Doses of **S007-1500** (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.

6.4.2.3 Mutagenicity evaluation of S011-1793 by *Salmonella* reverse mutation assay (Ames Assay)

S011-1793 tested at 10µg, 33µg, 100µg, 333 µg & 1000 µg/plate using Salmonella tester strains: TA-97a, TA-98, TA-100& TA-102 in spot assay was found non mutagenic. The same concentrations were also tested by Plate Incorporation Assay with and without S9 mix. It is inferred that the compound is non-mutagenic in the concentrations used.

6.4.3 Reproductive toxicity studies of Withania NMITLI-118R(T+)

Male fertility study has been completed in CF strain Rats using 125,250,500 mg/kg of WithaniaNMITLI-118R(T+). The sample is considered safe.

6.4.4 *C. elegans* based model for toxicology studies

For determining the efficiency of gene knockdown, we chose to study visually stark phenotypes of uncoordinated movement, dumpy body morphology and blistered cuticle obtained by knocking down of genes unc-73, dpy-9 and bli-3 respectively, employing the RNAi-by-feeding protocol in model system *C. elegans*. Amongst various methods tested, pre-incubation with eri-1 dsRNA synthesizing bacteria followed by co-incubation with eri-1 and gene-of-interest dsRNA synthesizing bacteria led to the most efficient gene silencing as observed by the analysis of marker phenotypes. This provides an approach for effectively employing RNAi induced gene silencing while working with different genetic backgrounds including transgenic and mutant strains. **(PLoS One. 2014 24:e87635)**

6.5 Clinical Trials

6.5.1 CDR 134 D123 (Anti-diabetic extract)

The compiled Clinical trial data of CDR134D123 incorporating all freshly generated data of Epicarp of the plant *Xylocarpus granatum* were again submitted to AYUSH and has been referred to Extra Ayurvedic Pharmacopia Committee for inclusion.

6.5.2 CDR 134F194 (Anti-hyperglycaemic fraction)

The formulation for Phase-I Single Dose and Multiple Dose Clinical trial is under preparation by a Certified GMP Pharmaceutical Company. The DCGI Permission for Phase-I Clinical Trial is available and the trials would be carried out soon.

6.5.3 CDRI compound 97-78 (Anti-malarial agent)

The Phase-I Multiple dose studies and Single dose Pharmacokinetic Study in healthy volunteers as per revised protocol approved by DCG (I) is to be carried out soon at PGIMER, Chandigarh.

6.5.4 Compound 99-373 (Anti-osteoporotic agent)

The search is on for an industry partner for licensing and funding the clinical trials.

6.5.5 Picroliv (Hepatoprotective agent)

There has been no progress after completion of the Phase III Clinical Trial in patients of Tuberculosis on Multi Drug Therapy (MDT).

6.5.6 Herbal Medicament (Anti-stroke formulation)

The entire compiled data for IND application preparation is under progress.

6.5.7 Clinical Research Studies

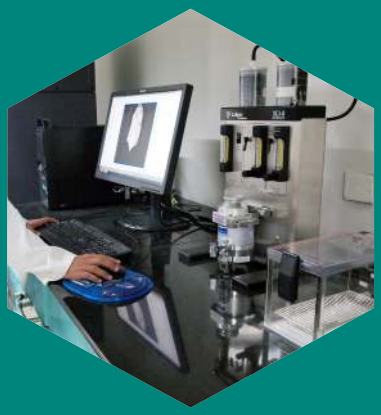
6.5.8.1 Effect of sulphadoxin–pyrimethmine co-administration on pharmacokinetics of αβ Arteether, an anti-malarial agent

The clinical part of study undertaken has been completed and PK data compilation and analysis is under progress.

6.5.8.2 Drug interaction study of Cap Memory Sure with anti-diabetic drugs Metformin and Gliclazide

The study is under progress. The Data on clinical parameters has been compiled and the PK data analysis of the samples is in progress.

Notes



Technical Services & Facilities

CSIR-Central Drug Research Institute, Lucknow

Technical Services & Facilities

Technical Services & Facilities

1 Business Development

The institute continued to explore the business development opportunities for new leads by collaborating with industries, academia, government organizations, funding agencies and foreign bodies in order to have more public-private partnerships at an early stage of the development. The major new contract/assignments signed/undertaken by the CSIR-CDRI during reporting period is as follows:

Details	Client/Collaborator	Signing Date
Sponsored Project		
Genotoxicity of Risugadv in mice	IIT, Kharagpur	18.02.2014
In vitro testing of GSKCH formulation for Osteogenic effect.	GlaxoSmithline Consumer Healthcare Ltd., Gurgaon	12.05.2014
Memorandum of Understanding signed for joint R&D		
Effect of Curcumin on IGF signaling and memory deficit in aging streptozotocin rats	KGMU, Lucknow	24.01.2014
To promote institutional linkage & other possible avenues for collaboration	Lucknow University, Lucknow	27.02.2014
Nanoparticulate drug delivery for poorly soluble drugs	Amity University, Lucknow	25.02.2014
In silico Screening and computational toxicity prediction studies on HIV and SrtA inhibitors	Alagappa University, Karaikudi	11.03.2014
Delineation of Rac1 signaling association with PCOS pathophysiology	KGMU, Lucknow	15.04.2014
Centre of Excellence on Flow Cytometry	Beckman Coulter India Pvt Ltd. Mumbai	22.04.2014
To conduct assay for elucidation of human metabolic pathways using different *in-vitro* and *in-vivo* methodologies.	Advinus Therapeutics Ltd., Bengaluru	29.04.2014
Studies on initial interaction of *Mycobacterium tuberculosis* and its host	CSIR-Institute of Microbial Technology, Chandigarh	06.05.2014
Polymorphisms in CD14 & IL6 genes associated with chronic peridontitis in smokers & non smokers	Babu Banarasi Das College of Dental sciences Lucknow	20.05.2014
Collaborative research program in specific field of mutual interest	BBDU, Lucknow	18.06.2014
Augmentation of effector immune responses using immunomodulators in conjunction with chemotherapy against experimental Visceral Leishmaniasis	KGMU, Lucknow	02.07.2014
Design, synthesis and evaluation of antitubercular compounds	National Jalma Institute of Leprosy & other Mycobacterium Diseases, Agra	11.07.2014
Design, synthesis and anticancer activities of peptide based molecules	IISc, Bangalore	15.07.2014
Mechanistic studies on the anticancer effects of candidate CSIR-CDRI compounds in myleloid leukemia and solid cancers	KGMU, Lucknow	16.07.2014
An indigenous amalgamated/single unit alveolar distractor implant system for oral rehabilitation	KGMU, Lucknow	17.07.2014
Role of p53 codon 72 polymorphism on risk of juvenile nasopharyngeal angiofibroma (JNA)	KGMU, Lucknow	18.07.2014
Phylogenetic studies of Mycobacterium tuberculosis isolates on the basis of insertion sequences, direct repeats and variable number of tandem repeats in pulmonary and extra-pulmonary patients	KGMU, Lucknow	05.08.2014
Non-ionizing radiation induced alteration in molecular signaling of ovulation and embryo implantation in mice model	Banaras Hindu University, Varanasi	08.09.2014
Cybernetics of platelet-rich fibrin (PRF) mediated regulation of human gingival fibroblasts (HGF).	KGMU, Lucknow	16.09.2014

Details	Client/Collaborator	Signing Date
Antimicrobial resistance analysis of gram-negative bacterial isolates from Micro-JNMC	Aligarh Muslim University, Aligarh	23.09.2014
Mesenchymal stem cells with a polymeric scaffold may improve cardiac function in a mouse myocardial model	IIT, Madras, Chennai	08.10.2014
Decoding the ncRNome & Epigenome for Breast Cancer using Big Data analytics on Next Generation Sequencing	IIIT, Allahabad	07.11.2014
Memorandum of Agreement		
Discovery and development of novel bone anabolics agents for accelerated fracture healing	Kemxtree & Enem Norstrum Remedies Pvt. Ltd., Mumbai	23.01.2014
Discovery and development of novel bone anabolics agents for accelerated fracture healing	BCIL, New Delhi & Enem Norstrum Remedies Pvt. Ltd., Mumbai	07.02.2014
CTPL as its "Non Exclusive Technology Commercialization Agency" to find a suitable partner for the commercialization of CSIR-CDRI technologies, products and seriveces	CSIR-Tech Pvt. Ltd. Pune	02-06-2014
Assembly of Iron-Sulphur [Fe-S] Clusters on Critical Proteins of the Plasmodium Apicoplast	DBT, New Delhi	27-08-2014
An approach towards identification and synthesis of antigenic epitopes of potential *L. donovani* Th1 stimulatory proteins for the development of synthetic vaccine against Visceral Leishmaniasis	DBT, New Delhi	14-10-2014
Secrecy Agreement		
Evaluation of data on synthetic compound S007-867 for preventing platelet activation and adhesion in the patients of coronary artery disease and thrombotic cerebral stroke	USV Limited, Mumbai	26.05.2014
Evaluation of Data on anti-osteoporosis (antiresorptive) compound 99/373 for the management of estrogen deficiency including post menopausal osteoporosis	USV Limited, Mumbai	26.05.2014
Phyto extract of plant A-4744/F004 as osteoprotective activity	Daewoong Pharmaceutical Co. Ltd., Korea	22.08.2014
Synthetic compound S007-1235 as antileukemic	Daewoong Pharmaceutical Co. Ltd., Korea	22.08.2014
CSIR-CDRI compound rac-1068 as a selective GLP-1 agonist	Cadila Healthcare Ltd., Ahmedabad	24.09.2014
A CSIR-CDRI formulation inhalable microparticles containing isoniazid and rifabutin	Camus Pharma Pvt. Ltd., Jaipur	13.10.2014
Evaluation License Agreement		
Evaluation agreement of the softwares Gold Suites (Gold 5.2, Goldmine 1.5 and Hermes 1.6)	CCDC Software Limited, Cambridge, UK	09.09.2014
Material Transfer Agreement		
Deconstructing corticostriatal circuit: Implication in executive functions)	Addgene Inc. , Cambridge, UK	11.02.2014
Mycobacterium smegmatis strain for protein over-expression	EMBL, Germany	12.02.2014
Structural and biophysical investigations of the BMAP28 peptides	Universite de Strasbourg & CNRS, France	19.02.2014
BMAP-23,BMAP-28 labeled, BMAP-28 swap, BMAP-28 swap labeled	University of Strasbourg France& National Scientific Research centre, Paris.	19.02.2014
Six Plasmid DNAs(pcDNA3-HtrA2-FLAG,pGP-CMV-GCaMP6s, TrkA-RFP,p75-RFP,TrkC-GFP,PEGFP-N1-TrkB)	Addgene, USA	20.02.2014
Material - Expression construct of dipeptidylcarboxypeptidase of *L.donovani*.	IISER-TVM, Kerala	04.03.2014
Role of chromogranin: A derived peptides in glucose homeostasis	University of California, (San Diago Campus), USA	22.04.2014
Antihypertensive antibody CAT 7	UC San Diego, California	22.04.2014
Brugia malayi genomic DNA	New England Biolabs Inc., USA	02.05.2014
Recombinant *M. smegmatis*, overexpressing a gene of *M. marinum*	CNRS-Universite de Montpellier, France	08.05.2014
Expression construct of dipeptidylcarboxypeptidase of *Leishmania donovani*	Institute of Infectious Disease and Molecular Medicine, University of Cape Town, South Africa	16.07.2014

Details	Client/Collaborator	Signing Date
Recombinant plasmids cloned with HPV-18 E2 (plasmid#10876), HPV-18E7 (plasmid#37886), HPV-18E6 (plasmid#37884), HPV-18E6E7 (plasmid#53459) and HPV-18 E5 (plasmid#37882) genes for expression in mammalian cells	Addgene, Cambridge, MA 02139, USA	26.08.2014
Recombinant plasmids cloned with dominant negative Akt (plasmid#16243), constitutively active Akt (Plasmid#9008), ptfLC3 (Plasmid#21074) and dominant negative AMPK (Plasmid#15992)	Addgene, Cambridge, MA 02139, USA	26.08.2014
Vector Plasmids	Addgene, Cambridge, MA 02139, USA	27.08.2014
Plasmids 13331:pBmm42, 13332:pDR119, 35027:pShuttle-FEN1hWT, 10792:1436pcDNA3 Flag HA & 22893:pcDNA-Flag-RPA2	Addgene, Cambridge, MA 02139, USA	12.09.2014
DTP Plated Compounds: Approved Oncology Drugs Set 10mM Diversity Set 10mM Natural Products Set 1mM Mechanistic Set	NIH/National Cancer Institute, USA	12.09.2014
Bacterial expression plasmid pRsetA (back bone) with a His tag and U1p1, plasmid pET (back bone) with SUMO and His tag (control plasmid)	Addgene, USA	18.09.2014
Cancer cell lines HT-29, Hela, MCF-7, MDA-MB-453, ZR-75-1, ZR-75-30, T47-D.	Curator, Cell Repository, NCCS, Pune	29.09.2014
Plasmids: 42230: pX330-U6-Chimeric_BB-CBh-hSpCas9 and 4810: pSpCas9n(BB)-2A-GFP (PX461)	Addgene, Cambridge, USA	10.10.2014
ParM(His6/I27C/K33A/T174A/T175N/C287A) mutant in pJSC1 vector	MRC National Institute for Medical Research, England	17.10.2014
Plasmid DNA transient transfections in cells: pCMV-Caspase1-flag, mTLR4 flag, mTLR4, hTLR4, MYD88 flag, pCMV-HA-MyD88, pAAV/D374Y-hPCSK9, pCDNA3 flag p38 alpha, pcDNA3-HA-ERK2 WT, GFP-ERK1, pCDNA flag Jnk1a1, pCDNA3 flag Jnk2a1.	Addgene Inc., USA	12.11.2014
mEmerald-plastin-N-10	Addgene Inc, USA	10.12.2014

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 Annual Plan 2015-16
- Vetting of project proposals and processing for approval of the competent authorities
- Revised Estimates & Budget Estimates 2014-15 & 2015-16
- 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

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 international 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 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
- Organize short term courses/workshops on the use and application of various instruments and analytical techniques
- Train technicians for maintenance and operation of sophisticated instruments
- 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

Name of the facility	External Samples	Internal Samples	Total no of samples analyzed
Mass Spectrometry	1253	28072	29325
NMR Spectroscopy	1034	28276	29310
IR & UV-visible Spectroscopy	442	4007	4449
HPLC,GLC & RO	6	2520	2526
Micro analysis	607	807	1414
Flow Cytometry	102	32760	32862

4. Electron Microscopy

Electron microscopy unit is equipped with scanning and transmission electron microscopes and confocal microscope. Analytical services provided during the year of report are as follows:

Instrument	Internal Sample	External Samples	Total No
Electron Microscopy	708	137	845
Confocal Microscopy	2833	04	2837

Apart from providing analytical services, the EM Unit and other SAIF labs are involved in Research & Development activities of the institute with several ongoing projects and a large number of Ph. D. students.

5. National Laboratory Animal Facility

The National Laboratory Animal Center (NLAC) of CSIR-CDRI breeds and maintains different species of laboratory animals required for use in approved biomedical experimentation and 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 the quarantined tested Rhesus and Langoor monkeys obtained from recognized animal supplier for experimental usage in CPCSEA approved research projects. In the facility, the health monitoring of all experimental animals was ensured through employing various laboratory techniques including microbiological, parasitological (ecto- and endoparasites), pathological, radiological, tuberculin testing and post mortem investigations with a view to generate reproducible and consistent research findings of the animal experiments. 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. The facility had also been involved in HRD programme in laboratory animal science through conducting hands-on training modules in animal ethics, care, breeding, management, health monitoring and quality control of laboratory animals including nonhuman primates, nutritional monitoring, animal techniques, and diagnosis and control of laboratory animal diseases. Scientific and technical consultancy services were also extended to other institution for creating and developing Research Animal Facilities.

a) Population status of laboratory animals as on 26.12.2014

Animal Species	Strain(s)	Genotype(s)	Population status (Numbers available)
Mouse	Swiss	Out-bred	4336
	Park's strain (PS)	Out-bred	205
	BALB/C	Inbred	3266
	AKR	-do-	334
	NZB	-do-	63
	AJ	-do-	779
	C57BL/6	-do-	2316
	NOD	-do-	74
	db/db	-do	2852
	Apo e	-do-	97
	DBA/1j	-do-	130
	C3H/Hej	-do-	633
	NCF-1	-do-	131
	NOS-1Tg	-do-	8
	APO'E'	-do-	67
	Lepr(db)\J	-do-	48
	NOS-2	-do-	66
	MK2	-do-	10
	APOE/NOS1	-do-	28
Rat	Sprague Dowley (SD)	Out-bred	5330
	Druckrey(DR)	-do-	44
	Charles Foster (CF)	-do-	1206
	Wistar	Inbred	1404
	SHR	-do-	433
Hamster	Golden hamster (GH)	Out-bred	1655
	Golden Hamster	Inbred	499
	White hamster (Mutant of GH)	-do-	65
Gerbil	Mongolian strain	Out-bred	452
Mastomys	Coucha strain	Out-bred	808
Guinea Pig	English albino	Out-bred	1537
Rabbit	New Zealand White	Out-bred	286
	Belgian	Out-bred	164
Sheep	Farm-bred	(random)	2
Monkey	Rhesus	Wild caught	51

b) Supply of experimental animals for research purposes:

Total 29,978 animals were supplied for research studies. Out of which 2959 costing [1] 27,89,550/- animals were supplied to outside institutions including government establishments, companies and research organizations.

No.	Services Details	Total supplies
A.	Supply of research animals to CDRI in-house projects	22736
B.	Supply of animals to Extramural funded projects in CDRI	4283
C.	Supply of animals to CPCSEA registered institutions for research purposes **1.** Govt. funded **2.** Private sector	 2018 941
Total animal supplies for biomedical research and experimentation:		**29,978**

c) Other technical services rendered:

- Screening of animals for Endo and Ectoparasites : 932 nos.
- Pathological monitoring including gross and post mortem investigations : 71 cases
- Hematological and biochemical examinations : 225 samples
- Nonhuman primates purchased : 42 nos.
- Number of nonhuman primates under rehabilitation : 16 nos.
- Number of CPCSEA approved monkey experiments completed : 2 nos.
- Number of PPD testing conducted : 85 nos.
- Proximate analysis of animal feed : 12 samples
- Production of CDRI laboratory animal feed for in-house and research usage > 650 Qts

6. 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 79) for the session Jan 2014
- Coordinated centralized admission of junior research fellows under JNU for CDRI-Ph.D. program through interview for the batch commencing spring 2015.
- Coordinated centralized admission of SRFs for registration under AcSIR for CDRI-PhD program through interview for the batches commencing fall 2014 and spring 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 65 students registered with JNU New Delhi and 8 students registered with AcSIR at CSIR-CDRI (total-73)
- Coordinated with JNU, AcSIR and other universities for submission of seventy two (72) 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 2013 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
- Two meetings of CSIR-CDRI-JNU academic council were organized at CSIR-CDRI and at JNU, New Delhi
- 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 eight (8) student at CSIR-CDRI
- Formation and Implementation of DAC (Doctoral Advisory Committee) for JNU students of five academic years, 2009-2014
- 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 2015
- Formation of DAC (Doctoral Advisory Committee) for AcSIR students
- Formation of Comprehensive Examination Committee (CEC) for AcSIR students
- Students were nominated for Eli-Lilly best thesis award 2013-2014

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

Computer Division has provided following services during the reporting period:

- Creation of Repository Database for CSIR-CDRI candidate drugs
- MoES database application software was implemented and maintained for online transaction
- Setting up and maintenance of state-of-art LAN/WAN infrastructure for the New CSIR-CDRI Campus, Sitapur Road, Lucknow
- Projects leveraging NKN (National Knowledge Network) infrastructure and services
- Comprehensive ERP implementation and maintenance
- Designing complete layout on internet cabling system using fiber optic and UTP cables
- Implemented antivirus software and firewall to avoid any virus threat to our Network
- Development of R&D databases and portals
- Implementation and maintenance of GLP Computers
- Complete video-conferencing and audio-visual coverage in different national and international seminars, conferences and workshops
- In-house maintenance of Online Store & Purchase Software
- Following new software application developed:
  - a) National Congress of Parasitology (NCP) – Website
  - b) All India Cell Biology Conference (AICBC) 2014 – Web app
  - c) National Symposium for Crystallography (NSC43C) – Web app
  - d) Clinical Research Conference (CLINRESCON) 2014
  - e) Gate pass Management System
  - f) Intranet Portal
  - g) Herbarium Data Collection System
  - h) Bill Tracking System
  - i) G.P.F. Monitoring System

9. Other Lab Services

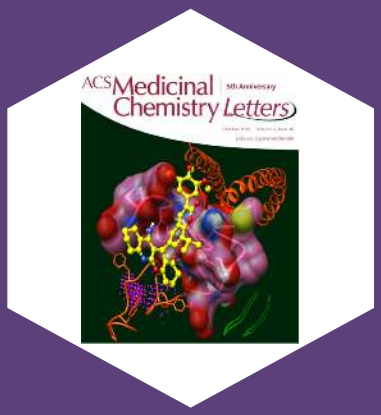
Instrumentation Centre provided efficient and economical repair, maintenance and upkeep of different sophisticated analytical, biomedical, electronics and laboratory equipments in CSIR-CDRI and CDRI-SAIF. Due to non-availability of imported components/spares, equivalent indigenous substitute were used 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:

- Progress monitoring & co-ordination of the New CSIR-CDRI campus being setup at Sitapur Road, Lucknow.
- 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



Research Output

CSIR-Central Drug Research Institute, Lucknow

Research Output

1 Publications

2013

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5. Saini V, Verma AK, Kushwaha V, Joseph SK, Murthy PK and Kohli DV. Humoral and cell mediated immune responses elicited by Poly (DL-lactide) adjuvanted filarial antigen molecules. **Drug Delivery 34(3), 567-595**

6. Srivastava P, Mathur N and Ghatak A. Pharmacokinetics, metabolism and excretion of hypolipidemic drug: 16-Dehydropregnenolone. **Jounal of Drug Metabolism & Toxicology 4(5), 158-168**

7. Varma AK, Mondal P and Srivastava MN. Production of bio-oil from native algae of Solani aquaduct Roorkee. **Green 3 (5&6), 225-234**

8. Verma AK, Verma SK, Kushwaha V, Verma R, Siddiqui WA and Murthy PK. Modulation of host's immune responses and parasite load in *Mastomys coucha* immunized with recombinant mitochondrial HSP60 of human lymphatic filarial parasite *Brugia malayi*. **J. Exp. Appl Ani Sci. 1, 140-151**

2014

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3. Ahmad A, Azmi S, Srivastava S, Kumar A, Tripathi JK, Mishra NN, Shukla PK and Ghosh JK. Design and characterization of short antimicrobial peptides using leucine zipper templates with selectivity towards microorganisms. **Amino Acids 46(11), 2531-43**

4. Ahmad H, Khandelwal K, Pachauri SD and Dwivedi A K. RP-HPLC based validated method for estimation of Withanolide A and its subsequent application for analytical studies on standardized extracts of *Withania somnifera* dunal. **Pharmacognosy Magzine 10(39), 227-233**

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6. Akhter F, Khan MS, Singh S and Ahmed S. An immunohistochemical analysis to validate the rationale behind to enhanced immunogenicity of D-Ribosylated low density protein. **Plos One 9(11), e113144-9**

7. Ali M, Afzal M, Kaushik U, Mishra- Bhattacharya S, Ahmad FJ and Dinda AK. Perceptive solutions to anti-filarial chemotherapy of lymphatic filariasis from the plethora of nanomedical sciences. **J Drug Target 22(1), 1-13**

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383. Vu CU, Siddiqui JA, Wadensweiler P, Gayen JR, Avolio E, Bandyopadhyay GK, Biswas N, Chi NW, O'Connor DT and Mahata SK. Nicotinic acetylcholine receptors in glucose homeostasis: The acute hyperglycemic and chronic insulin-sensitive effects of nicotine suggest dual opposing roles of the receptors in male mice. **Endocrinology 155(10), 3793-3805**

384. Wahajuddin, Raju KS, Singh SP and Taneja I. Investigation of functional role of P-glycoprotein in limiting the oral bioavailability of lumefantrine. **Antimicrobial Agents and Chemotherapy 58(1), 489-494**

385. Wahajuddin, Taneja I, Erukala M, Raju KS and Singh SP. Dried blood spots in bioanalysis of antimalarials: Relevance and challenges in quantitative assessment of antimalarial drugs. **Bioanalysis 5(17), 2171-2186**

386. Yadav GP, Shree S, Maurya R, Rai N, Singh DK, Srivastava KK and Ramachandran R. Characterization of *M. tuberculosis* SerB2, an essential HAD-family phosphatase, reveals novel properties. **Plos One 9(12), e115409**

387. Yadav NK, Shukla P, Omer A, Pareek S and Singh RK. Next generation sequencing: Potential and application in drug discovery. **Scientific World Journal 2014(Article ID 621354), 1-7**

388. Yadav S, Gupta S, Selvaraj C, Doharey P, Verma A, Singh S and Saxena JK. *In silico* and *in vitro* studies on the protein-protein interactions between *Brugia malayi* immunomodulatory protein calreticulin and human C1q. **Plos One 9(9), e106413**

389. Yadav VD, Dighe SU and Batra S. Synthesis of N-alkyl pyrrolesvia decarboxylation/dehydration in neutral ionic liquid under catalyst-free conditions. **RSC Advances 4, 57587-57590**

390. Yaqoob U, Jagavelu K, Shergill U, de Assuncao T, Cao S and Shah VH. FGF21 promotes endothelial cell angiogenesis through a dynamin-2 and Rab5 dependent pathway. **Plos One 9 (5), e98130**

391. Zhang K, Biswas N, Gayen JR, Miramontes-Gonzalez JP, Hightower CM, Mustapic M, Mahata M, Huang CT, Hook VY, Mahata SK, Vaingankar S and O'Connor DT. Chromogranin B: intra- and extra-cellular mechanisms to regulate catecholamine storage and release, in catecholaminergic cells and organisms. **J Neurochem 129(1), 48-59**

Book Chapters

1. Binduja Saraswat, Renu Tripathi, G.P. Dutta (2014). "Failure of fansidar and mefloquine combination to prevent the emergence of mefloquine resistance", Functional biology and biotechnology. **Promise of Biotechnology: Cure & Relieve (Editors; Serajuddin,Tripathi and Arshad) pp. 117-120. ISBN: 978-93-83083-58-9.**

2. Preety Dixit and Rakesh Maurya. "Exploration of Indian Medicinal Plants for Antiosteoporotic Lead Generation" in Conservation, Cultivation and Exploration of Therapeutic potential of Medicinal Plants, **Editors: Abhimanyu Kumar, Madan Mohan Padhi, Narayanam Srikanth Bishnupriya Dhar and Anupam K. Mangal, 2014, pp317-339. Published by Central Council for Research in Ayurvedic Sciences Department of AYUSH, Ministry of Family Welfare, Government of India, New Delhi.**

3. Sripathi R Kulkarni. "Repurposing Strategies: Churning out Research Contemporary management strategies", in intellectual property rights (IPR) relevant to NAM and other developing countries, **Edited by Sarah Norkor Anku, Olufolake Sola Davies and Rungano Karimanzira Publishers: ASTRAL INT., 2014 ISBN-978-93-5124-308-3.**

2 Patents

Patents Granted Abroad

2014

1. **United States Patent No.:** 89215417 **Date of Grant:** 30.12.2014
Title: Method of treating dyslipidemia using naturally occurring diterpene
Inventors: Koneni Venkata Sashidhara, Anju Puri & Jammikuntla Naga Rosaiah
Supporting Staff: Suriya Pratap Singh, Jai Kumar joshi, Noor Jehan, KK Yadav, Devidutt & Ram Jivan

2. **United States Patent No.:** 8815940 **Date of Grant:** 26.08.2014
Title: Coumarin-chalcones as anticancer agents
Inventors: Koneni Venkata Sashidhara, Abdhesh Kumar, Manoj Kumar, Jayanta Sarkar & Sudhir Kumar Sinha
Supporting Staff: Sanjeev Meena

3. **Australian Patent No.:** 2010217238 **Date of Grant:** 19.07.2014
Title: Polymeric nanomatrix associated delivery of Kaempferol in rats to improve its osteogenic action
Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay & Anil Kumar Dwivedi
Supporting Staff: Mahesh Chandra Tiwari & Geet Kumar Nagar

4. **United States Patent No.:** 8686028 **Date of Grant:** 01.04.2014
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
Supporting Staff: Abdul Malik and Avinash Kumar

5. **United States Patent No.:** 8669232 **Date of Grant:** 11.03.2014
Title: Flavonol compounds, a bioactive extract/fraction from *Ulmus wallichiana* and its compounds for prevention for 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
Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt & Amruta Kendurkar

Patents Granted in India

2013 (Not included in earlier Annual Reports)

1. **Indian Patent No.:** 258216 **Date of Grant:** 18.12.2013
Title: Novel alkyl amino substituted naphtho (1, 2-d) oxazole
Inventors: Pervez Ahmad, Preeti Tiwari, Brajendra Kumar Tripathi, Arvind Kumar Srivastava & Atul Kumar

2. **Indian Patent No.:** 258311 **Date of Grant:** 30.12.2013
Title: Composition & methods of nonionic surfactant based vesicular formualtion for improved delivery of cyclosparine
Inventors: Prabhat Ranjan Mishra, Vure Prasad, Amit Kumar Dwivedi & Satyawan Singh

Patents Filed Abroad

2014

1. **United States Application No.** 14/382428 **Date of Filing:** 02.09.2014
Title: NEF-ASK1 interaction inhibitor as novel anti-HIV therapeutics
Inventors: Raj Kamal Tripathi, Balawant Kumar, Ravishankar Ramachandran, Jitendra Kumar Tripathi, Smrati Bhadauria & Jimut Kanti Ghosh

2. **PCT Application No**. PCT/IN2014/000556 **Date of Filing**: 29.08.2014
Title: Novel aryl naphthyl methanone oxime derivatives for the treatment of hematological malignancies and solid tumors
Inventors: Sabyasachi Sanyal, Atul Kumar, Naibedya Chattopadhyay, Jawahar Lal, Arun Kumar Trivedi, Dipak Datta, Srikanta Kumar Rath, Tahseen Akhtar, Shailendra Kumar Dhar Dwivedi, Monisha Yadav, Bandana Chakravarti, Abhishek Kumar Singh, Jay Sharan Mishra, Nidhi Singh & Anil Kumar Tripathi

3. **European Application No**. 13708242.6 **Date of Filing**: 31.07.2014
Title: Novel Substituted 2H-Benzo[e]indazole-9-carboxylates for the treatment of diabetes and related metabolic disorders
Inventors: Atul goel, Gaurav Taneja, Neha Rahuja, Arun Kumar Rawat, Natasha Jaiswal, Akhilesh Kumar Tamrakar & Arvind Kumar Srivastava

4. **United States Application No**. 14/376097 **Date of Filing**: 31.07.2014
Title: Novel Substituted 2H-Benzo[e]indazole-9-carboxylates for the treatment of diabetes and related metabolic disorders
Inventors: Atul goel, Gaurav Taneja, Neha Rahuja, Arun Kumar Rawat, Natasha Jaiswal, Akhilesh Kumar Tamrakar & Arvind Kumar Srivastava

5. **PCT Application No**. PCT/IN2014/000475 **Date of Filing**: 16.07.2014
Title: Proteasomal inhibitors useful for osteogenic activity and pharmaceutical composition thereof[osteoheal]
Inventors: Ritu Trivedi, Prabhat Ranjan Mishra, Neelam Singh Sangwan, Prabodh Trivedi, Divya Singh, Rajendra Singh Sangwan, Priyanka Kushwaha, Vikram Khedgikar, Sulekha Adhikari, Dharmendra Choudhary, Jyoti Swarup, Avinash Kumar, Anirudha Karvande, Ashwni Verma & Shweta Sharma
Supporting Staff: Naseer Ahmed

6. **PCT Application No**. PCT/IN2014/000464 **Date of Filing**: 14.07.2014
Title: Ulmoside-A-derived compound from *Ulmus Wallichiana* Planchon useful for prevention or cure of metabolic diseases
Inventors: Sabyasachi Sanyal, Naibedya Chattopadhyay, Rakesh Maurya, Jiaur Rahman Gayen, Smrati Bhadauria, Arun Kumar Trivedi, Abhishek Kumar Singh, Jay Sharan Mishra,Rashmi Kumari, Kunal Sharan, Mohd. Parvez Khan, Kainat Khan, Nidhi singh, shailendra kumar Dhar Dwivedi, Manisha Yadav, Priti Dixit, Devendra Pratap Mishra, Sharad Sharma & Kamal Ram Arya

7. **PCT Application No**. PCT/IN2014/000458 **Date of Filing**: 09.07.2014
Title: 3,7 Diazabicyclo[3.3.1]nonane carboxamides and process of preparation thereof
Inventors: Dinesh Kumar Dikshit, Anil Kumar Karunakaran Sasikala, Manoj Barthwal, Ankita Mishra & Manish Jain

8. **PCT Application No**. PCT/IN2014/000156 **Date of Filing**: 10.03.2014
Title: Substituted fluoranthene-7-carbonitriles/esters as fluorescent dyes for cell imaging applications
Inventors: Atul Goel, Ashutosh Sharma, Kalyan Mitra, Arindam Bhattacharjee & Manoj Kathuria

9. **PCT Application No**. PCT/IN2014/000131 **Date of Filing**: 28.02.2014
Title: An antileukemic agent useful for inducing differentiation in myeloid leukemia cells
Inventors: Pooja Pal, Savita Lochab, Jitendra Kumar Kanaujia, Sabyasachi Sanyal & Arun Kumar Trivedi

10. **PCT Application No**. PCT/IN2014/000055 **Date of Filing**: 24.01.2014
Title: Antidiabetic and antidyslipidemic activities of pregnane-oximino-aminoalkylethers
Inventors: Prem Chandra Verma, Jyoti Gupta, Dharmendra Pratap Singh, Varsha Gupta, Hari Narayan Kushwaha, Anamika Misra, Neha Rahuja, Rohit Srivastava, Natasha Jaiswal, Ashok Kumar Khanna, Akhilesh Kumar Tamrakar, Shio Kumar Singh, Anil Kumar Dwivedi, Arvind Kumar Srivastava & Ram Pratap

11. **United States Application No**. 14/159213 **Date of Filing**: 20.01.2014
Title: Flavonol compounds, a bioactive extract/fraction from *Ulmus wallichiana* and its compounds for prevention for 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
Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt & Amruta Kendurkar

12. **PCT Application No**. PCT/IN2014/000023 **Date of Filing**: 10.01.2014
Title: Carbodithioates and process for preparation thereof
Inventors: Vishanu Lal Sharma, Nand Lal, Amit Sarswat, Santosh Jangir, Veenu Bala, Lalit Kumar, Tara Rawat, Ashish Jain, Lokesh Kumar, Jagdamba Prasad Maikhuri & Gopal Gupta

2013 (Not included in earlier Annual Reports)

13. **United States Application No**. 14/117415 **Date of Filing**: 13.11.2013
Title: Substituted 4-arylthiazole-2-hydrazone derivative for the treatment of tuberculosis
Inventors: Supriya Singh, Kuldeep Kumar Roy, Sandeep Kumar Sharma, Ranjana Srivastava, Vinita Chaturvedi & Anil kumar Saxena
Supporting Staff: Zahid Ali & Arimardan Singh Kushwaha

Patents Filed in India

2014

1. **Patent Application No.** 3716DEL2014 **Date of Filing**: 16.12.2014
Title: Semicarbazone based chalcones as potent anticancer agents
Inventors: Koneni Venkata Sashidhara, Dipak Datta, Jiaur Rahman Gayen, Avula Srinivasa Rao, Akhilesh Singh, Srikanth Hanumanth Cheruvu, Ravithej Singh, Gopala Reddy Palnati, Shrankhla Maheshwari, Rakesh Kumar Arya & Anup Kumar Singh

2. **Patent Application No**. 2865DEL2014 **Date of Filing**: 08.10.2014 (Provisional)
Title: New Rapamycin conjugates and process for preparation
Inventors: Wahajul Haq & Rafat Ali

3. **Patent Application No**: 2773DEL2014 **Date of Filing**: 29.09.2014
Title : A formulation useful for delivery of neuroprotecting agent
Inventors : Anil Kumar Dwivedi, Hafsa Ahmad, Kiran Kumar Khandelwal, Neelam Singh Sangwan, Jiaur Rahman Gayen, Smrati Bhadauria, Srikanta Kumar Rath, Sharad Sharma, Rakesh Shukla, S P S Gaur, Vivek Vidyadhar Bhosale, Rajender Singh Sangwan & Sarika

4. **Patent Application No**. 2726DEL2014 **Date of Filing**: 23.09.2014
Title: Linear cationic antimicrobial peptides and process for preparation thereof
Inventors: Tushar Kanti Chakraborty, Sudip Pal, Uttam Ghosh, Sudhir Sinha & Sidharth Chopra

5. **Patent Application No**. 2567DEL2013 **Date of filing**: 01.09.2014
Title: Novel aryl naphthyl methanone oxime derivatives for the treatment of hematological malignancies and solid tumors
Inventors: Sabyasachi Sanyal, Atul Kumar, Naibedya Chattopadhyay, Jawahar Lal, Arun Kumar Trivedi, Dipak Datta, Srikanta Kumar Rath, Tahseen Akhtar, Shailendra Kumar Dhar Dwivedi, Manisha Yadav, Bandana Chakravarti, Abhishek Kumar Singh, Jay Sharan Mishra, Nidhi Singh & Anil Kumar Tripathi

6. **Patent Application No.** 2145DEL2013 **Date of filing**: 15.07.2014
Title: Proteasomal inhibitors useful for osteogenic activity and pharmaceutical composition thereof [osteoheal]
Inventors: Ritu Trivedi, P R Mishra, Neelam S Sangwan, Prabodh Trivedi, Divya Singh, Rajendra Singh Sangwan, Priyanka Kushwaha, Vikram Khedgikar, Sulekha Adhikari, Dharmendra Choudhary, Jyoti Swarup, Avinash Kumar, Anirudha Karvande, Ashwni Verma & Shweta Sharma
Supporting Staff: Naseer Ahmed

7. **Patent Application No.** 1983DEL2014 **Date of filing**: 15.07.2014
Title: Novel combination kit for the treatment of Malaria
Inventors: Renu Tripathi, Prabhat Ranjan Mishra, Pankaj Dwivedi, Hemlata Dwivedi, Sunil Kumar Singh, Sunil Kumar Puri & Anil Kumar Dwivedi

8. **Patent Application No.** 1942DEL2014 **Date of filing**: 11.07.2014 (Provisional)
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

9. **Patent Application No.** 1940DEL2014 **Date of filing**: 11.07.2014 (Provisional)
Title: A novel chemically modified bioactive fraction from *Curcuma longa* [NCCL] for management of CVS and CNS disorders
Inventors: Anil Kumar Dwivedi, Arshi Naqvi, Richa Malasoni, Minakshi Rana, Rishi Ranjan Pandey, Akansha Srivastava, Amit Manhas, Isha Taneja, Wahajuddin, Pradeep Kumar Srivastava, Kumaravelu Jagavelu, Manoj Kumar Barthwal & Ram Pratap

10. **Patent Application No.** 1566DEL2014 **Date of filing**: 10.07.2014
Title: Cationic lipid derivatives of cordiarimide A useful as anti cancer agents by targeting Human DNA ligase-I
Inventors: Surendar Reddy Bathula, Durga Rao VKK, Komal Sharma, Prathap Reddy M, Dibyendu Barjee & Deependra Kumar Singh

11. **Patent Application No.** 0942DEL2014 **Date of filing**: 01.04.2014
Title: Cationic Peptide compounds process for preparation and use thereof
Inventors: Tushar Kanti Chakraborty, Sudip Pal, Sudhir Sinha & Shyam Singh

12. **Patent Application No.** 0807DEL2013 **Date of filing**: 19.03.2014
Title: Substituted fluoranthene-7-carbonitriles/esters as fluorescent dyes for cell imaging applications
Inventors: Atul Goel, Ashutosh Sharma, Kalyan Mitra, Arindam Bhattacharjee & Manoj Kathuria

13. **Patent Application No.** 0193DEL2013 **Date of filing**: 24.01.2014
Title: Antidiabetic and antidyslipidemic activities of pregnane-oximino-aminoalkylethers
Inventors: Prem Chandra Verma, Jyoti Gupta, Dharmendra Pratap Singh, Varsha Gupta, Hari Narayan Kushwaha, Anamika Misra, Neha Rahuja, Rohit Srivastava, Natasha Jaiswal, Ashok Kumar Khanna, Akhilesh Kumar Tamrakar, Shio Kumar Singh, Anil Kumar Dwivedi, Arvind Kumar Srivastava & Ram Pratap

3 Papers Presented in Scientific Conventions

2014

27th International Carbohydrate Symposium, IISc, Bengaluru (12-17January)

1. Carbohydrates as Chemotherapeutic agents: Anti-diabetic and Antimalarial activity of C-glycosides, K Kumar, G Ramakrishna, A Tiwari, N Jaiswal, AK Tamrakar, N Rahuja, R Srivastava, AK Srivastava, S Srivastava, Renu Tripathi and Rama P Tripathi

2. Biophysical studies on the structural basis relationship between blood group and the E1 Tor Cholera, PK Mandal and W Bruce Turnbull

SFRR-INDIA-14, Lonawala (27-30 January)

3. GSK3β regulates TLR Ligand induced Monocyte-Macrophage activation and Cytokine production, M Rana, V Singh, SS Reddy, MK Barthwal

4. TLRs, CD36 and ROS mediates Ox-LDL induced IL-1β production and inflammation through PKCδ-IRAK axis, A Singh, V Singh, RL Tiwari, M Rana, AVerma, N Kothari, M Kohli, J Bogra, M Dikshit, MK Barthwal

5. Effect of Gingerol on Rat vascular smooth muscle cell proliferation, P Maurya, M Jain, V Singh, A Singh, SS Reddy, MK Barthwal

6. Nitric oxide induced apoptosis of human neutrophils is mediated by deglutathionylation of pro-caspase 3, M Dubey, AK Singh, D Awasthi, T Chandra, A. Kumar, MK Barthwal and M Dikshit

National Conference on Earth and Environment: Pollution and Prevention, Noida (28-30 January)

7. Environmental Toxicology of commonly used fertilizers in fresh water fishes of River Gomti, Lucknow, Pooja Shukla and RK Singh

Kolkata Neuroscience Conference, Kolkata (31 January)

8. Modulation of Nrf2 in memory improving effect of Donepezil and Ibuprofen, Subhash Dwivedi and Rakesh Shukla

Neurochemistry of Aging Brain, Kolkata (31 January - 1 February)

9. Chronic hyper-tension leads to glial activation and neuro-inflammation in regions associated with memory function, Shahnawaz A Bhat, Rakesh Shukla and Kashif Hanif

International Conference on Reproductive Health: Issues and Strategies under Changing Climate Scenario (ISSRF-2014), IVRI Izatnagar (6-8 February)

10. Recombinant HIV-1 Nef constricts the Blood Test is Barrier in Rat Model, SK Agnihotri, M Kumar, B Kumar, P Singh, P Kar, A Agarwal, A Jain, S Kumar, RK Tripathi & M Sachdev

11. Identification of global miRNA regulators during Folliculogenesis and Oocyte maturation in Mice, A Nath, J Singh, A Agrawal, R Konwar and M Sachdev

27th International Carbohydrate Symposium, Bengaluru (12-17 February)

12. Biophysical studies on the structural basis relationship between blood group and the E1 Tor Cholera, Pintu Kumar Mandal and W Bruce Turnbull

NanoSciTech 2014, Chandigarh (13-15 February)

13. Recent development in Nano-materials for reproductive health, RK Singh and Anil Kumar Meena

6th NIPER (Rbl)- CSIR - CDRI Symposium on Current Scenario in Drug Discovery and Development, Lucknow(20-22 February)

14. UFLC method development and validation of S006-830 and application to pharmacokinetic and bioavailability studies in SD rats, Yeshwant Singh, Mahendra K Hidau, Anamika Misra, Poojari Mounika and SK Singh

15. Pharmacokinetic drug-drug interaction study of CDRI candidate 97/78 with antitubercular drug Rifabutin, Mahendra K. Hidau, Yeshwant Singh, Anamika Misra, Sudhir Shahi and SK Singh.

16. In-*vitro* and *in-vivo* pharmacokinetics of S011-0719, a potent anti-malarial compound K Vaghasiya, N Rangraj, M Shukla, S Jaiswal, A Sharma, S Pandey, PMS Chauhan and J Lal

17. *In-vitro* and *in-vivo* pharmacokinetics of S011-0725: A potent anti-malarial compound, N Rangraj, K Vaghasiya, M Shukla, S Jaiswal, A Sharma, S Pandey, PMS Chauhan and J Lal

18. Quality By Design: Understanding the formulation variables of Docetaxel self- nano emulsifying Drug Delivery System by Mixture Design and Desirability Functions Kandarp Dave, Guru Raghavendra Valicherla and Jiaur R Gayen

19. Functional characterization of Schnurriortholog T05A10.1 in *C. elegans*: Implications for Alzheimer's disease, Rizwanul Haque and Aamir Nazir

20. Curcumin mimic-Dithiocarbamate hybrids as potential Anti-prostate cancer Agents, Subhadra Thakur, M Dhanaraju, Vishal singh, Deepti Pandey, Gopal Gupta, Vishnu L Sharma

Applied Pharmaceutical Analysis- 2014, Ahmedabad (23-26 February)

21. Pharmacokinetics, Metabolism, Enzyme kinetics ,Stability studies and *in vitro-in vivo* correlation (IVIVE) of novel anti-platelet agent S007-867 Hardik Chandasana, Yashpal S Chhonker, Telaprolu K Chaitanya, Anil Kumar, Madhu Dikshit, Dinesh K Dikshit, ,Shio K Singh and Rabi S Bhatta

International Conference on Faunal Diversity and their Conservational Strategies Lucknow (22-23 March)

22. Exercise With Diabetic Medication Improves Glucose Homeostasis Better Than The Drugs Alone In Stz Induced

Diabetic Rats Zakir Hossain, Archana Mishra, Ambrish Singh, Himanshu K Bora, Jiaur R Gayen

DMPK Symposium, NIPER Mohali Chandigarh, (27 February – 1 March)

23. Species profiling of metabolic stability of medicarpin, IshaTaneja, KSR Raju, Muralikrishna Challagundla and Wahajuddin

6th International Symposium on Drug Metabolism and Pharmacokinetics, Mohali (27 February – 2 March)

24. Pharmacokinetics of S011-0725, a potent anti-malarial compound, in male Sprague Dawley rats, S Jaiswal, A Sharma, M Shukla, PMS Chauhan and J Lal

20th ISCB International Conference, Delhi (1-4 March)

25. Pharmacokinetics of S010-269, a potent anti-leishmanial compound, in rats, A Sharma, S Jaiswal, M Sharma, PMS Chauhan and J Lal

National Symposium on Recent Advances in Free Radical Biology and Biochemistry, Aligarh (6 March)

26. Functional characterization of Schnurriortholog T05A10.1 in *C. elegans*: Implications for Alzheimer's disease, Rizwanul Haque and Aamir Nazir

Nation Seminar on Recent Advances in Nanotechnology: Tissue Engineering, Bhopal (7 & 8 March)

27. Recent Developments in Nanotechnology Based Reproductive Biomedicine in India, RK Singh

International Conference on Male Reproductive Health Incorporating XIX Annual Congress of the Society of Andrology, India (13-14 March)

28. Molecular mechanism of Anti-Prostate cancer activity of RISUGadv, Anil Kumar Meena and RK Singh

National Conference on Environmental Constraints, Conservation and Resource Development of Medicinal Plants for Health and Social Benefits, Dehradun, (21-23 March)

29. A molecular approach to ameliorative effects of *Dillenia indica* leaf extract on phenylhydrazine induced hemolytic anaemia in rats. RK Singh and Pooja Shukla

30. Effect of *Hibiscus rosa sinensis* on blood profile of phenylhydrazine treated CF Rats, Anil Kumar Meena and RK Singh

31. *Hibiscus rosa sinensis* phytoconstituents for the development of haemoprotective drugs, Keerti Pandey, Akansha Jain, Anil K Meena, Poonam Singh and RK Singh

32. Pharmacological and acute toxicity study of plant *Saraca indica*. Akansha Jain, Keerti Pandey, Anil K Meena, Poonam Singh and RK Singh

National Symposium on Recent Scenario and Advancement in Cancer Research, Patna (22-23 March)

33. Antileukemic activity of Indian Medicinal Plants, RK Singh, Anil K Meena, Keerti Pandey and Akansha Jain

International Conference on Faunal Diversity and their Conservational Strategies Lucknow University, Lucknow (22-23 March)

34. Exercise with diabetic medication improves glucose homeostasis better than the drugs alone in STZ induced diabetic Rats, Zakir Hossain, Archana Mishra, Ambrish Singh, Himanshu K Bora and Jiaur R Gayen

National Symposium on Frontiers in Modern Biology (Technology Transfer, Knowledge Translation & Social Transformation) with thematic focus on "Innovations in Science and Technology for Inclusive Development", Sagar, (24-25 March)

35. Protective potential of BNR-2 (~85 kDa) derived from the nuclear fraction of adult *Brugia malayi* against the infection in *Mastomys coucha*, Shilpy Shakya and Shailja Misra-Bhattacharya

International Conference on Cellular and Molecular Mechanisms of Disease Processes, Kashmir (13-16 April)

36. SMAD transcription factor, T05A10.1, attunes TGF-β signalling cascade towards modulating Alzheimer's associated outcome: Studies employing transgenic *C. elegans* model, Rizwanul Haque and Aamir Nazir

IXth National Conference on Current Trends and Future Challenges in Environmental Science, Biotechnology, Ayush & Biomedicine for Human Welfare and Sustainable Development, Rewa (26-27 April)

37. Alternative methods for *In vitro* toxicological evaluation of hematopoietic drugs, RK Singh, Anil K Meena, Keerti Pandey and Akansha Jain

International Conference on Host-Pathogen Interactions, Hyderabad (12-15 July)

38. Genetic evidence for the role of *Plasmodium berghei* Ubc13 kinase as a malaria transmission blocking candidate, Jyothi Togiri, Babu S Mastan, Rameswara Reddy Segireddy, Satish Mishra and Kota Arun Kumar

International Symposium on Advances in Biological & Material Sciences, Lucknow (15 July)

39. Synthesis, enantiomeric separation of Cis-Pterocarpans and their Osteogenic activity, Ashutosh Raghuvanshi and Atul Goel

40. Highly fluorescent non-aggregating 1,8-naphthyridines: Design, Synthesis, Photophysical properties, and application in metal sensing, Shahida Umar, Pankaj Nag, Atul Goel

41. Fluoranthene based highly fluorescent dyes for OLEDs and live cell imaging applications, Ajay Kumar Jha, Ashutsoh, Sharma, Vijay Kumar and Atul Goel

UPSS-2014, Sweden (6 August)

42. Population pharmacokinetics of ormeloxifene in female volunteers using NONMEM, A Sharma, S Jaiswal, M Shukla and J Lal

ICOPA-2014, Mexico city, Mexico (10-15August)

43. Feasibility of Th1 stimulatory proteins as potential poly vaccine against visceral Leishmaniasis, Anuradha Dube, Sumit Joshi, Keerti Rawat, Narendra Yadav, Sneha Ratnapriya, Vikash Kumar, MI Siddiqi and Shyam Sundar

National Seminar on Applications of Mass and NMR techniques in Drug Research, Lucknow (24 September)

44. A liquid chromatography - tandem mass spectrometry method development and validation of novel antileishmanial agent, s012-0568, in rat serum and its application to intravenous pharmacokinetic study, M Shukla, A Sharma, S Jaiswal, S Pandey, PMS Chauhan, N Rangraj, K Vaghasiya and J Lal

45. Bioactivity guided isolation of (Calotroposides) from the root bark of *Calotropis gigantea* (purple) as potent anticancer agents, Rohit Mahar, Trapti Joshi, Shivani Dixit, Sanjeev Kanojiya, Rituraj Konwar, Dipak K Mishra and Sanjeev K Shukla

46. Structural characterisation of Carbazole alkaloids and their tissue specific distribution in *Murraya Koenigii*, Trapti Joshi, Sumit K Singh, Dipak K Mishra and Sanjeev Kanojiya

XXXII-Indian academy of neuroscience conference Bengaluru (1-3 October)

47. Sustained kappa opioid receptor activation causes epigenetic changes in various regions of brain, Shalini Dogra and Prem N Yadav

12th Transgenic Technology meeting, Edinburgh, Scotland, UK (6-8 October)

48. An Egg Metalloprotease plays a key role during Fertilization in Mammals, M Sachdev, A Mandal, L Digilio, C Flickinger and J Herr

X Joint Annual Conference of Indian Society of Malaria and Other Communicable Diseases & Indian Association of Epidemiologists (ISMOCD & IAE) Panaji, Goa (10-12 October)

49. Interaction of Wolbachia Transcription elongation factor with$\alpha 2\beta\beta'\sigma$ subunitsof RNA polymerase through Its Dimeric C-Terminal Domain, D Chahar, JK Nag, R Jha, M Gangwar, A Chawla and SM Bhattacharya

50. Characterization of UDP-N-acetylglucosamine enolpyruvyl transferase (MurA: A drug target) from Wolbachia Endosymbiont of Human Lymphatic Filarial Parasite Brugia malayi, M Shahab, M Verma, M Pathak, S Misra, SM Bhattacharya

51. Oral immunization with nanoencapsulated Brugiamalayi recombinant Trehalose-6-phosphate phosphatase(Bm-TPP) elicited profound humoral and cellular immune responses in mice, M Gangwar, VT Banala, D Chahar, R Jha, PR Mishra and SM Bhattacharya

52. Sero-reactivity of Brugia malayi and Wolbachia recombinant proteins in different clinical groups of human bancroftian filariasis, R Jha, D Chahar, M Gangwar and S Misra-Bhattacharya

53. Quantitiating liver stage parasite burden in sporozoite induced *Plasmodium yoelii* infections, Arif J Siddiqui, Jyoti Bhardwaj, Manish Goyal, SK Puri

54. High pro-inflammatory cytokines correlate to protection against non lethal murine malaria infection, Jyoti Bhardwaj, Arif J Siddiqui and SK Puri

55. Murine lungs exhibit altered gene expression profile during filarial manifestation of Tropical Pulmonary Eosinophilia, P Sharma, A Sharma and M Srivastava

56. Investigating the role of *Brugia malayi* Macrophage migration Inhibitory Factor (Bm-MIF) in inducing alternative activation of host macrophages, A Sharma, P Sharma and M Srivastava

57. Isolation and functional characterization of murine splenic dendritic cell subtypes in experimental visceral leishmaniasis, PK Yadav, P Vishwakarma, N Parmar, P Chandrakar and S Kar

58. Leishmania donovani exploits Tollip for negative regulation of early TLR signalling during experimental visceral leishmaniasis, N Parmar, P Vishwakarma, PK, Yadav P Chandrakar and S Kar

25th National Congress of Parasitology: Global Challenges in the Management of Parasitic Diseases, Lucknow (16-18 October)

59. Synthesis of functionalized quinoline-4-ones and their activity against experimental visceral leishmaniasis, M Ravi, N Parmar, S. Kar and Prem P Yadav

60. Design and synthesis of 3,6-epoxy[1,5]dioxocines-imidazole conjugates as antileishmanial agents, Ravithej Singh, Anil jaiswal, Anuradha Dubay, Koneni V Sashidhara

61. Discovery of Chalconethiazolyl-Hydrazones as a new class of Antileishmanial agents, Pragati Kushwaha, K Bhaskar Rao, Anil Jaiswal, Anuradha Dube, Koneni V Sashidhara

62. Th1 stimulatory proteins of Leishmania donovani: Comparative cellular and protective responses of rTriose phosphate isomerase, rProtein disulfide isomera and rElongation factor-2 in combination with rHSP70 against visceral leishmaniasis, Anil Kumar Jaiswal, Prashant Khare, Sumit Joshi, Pramod K Kushawaha, Shyam Sundar and Anuradha Dube

63. Long term *in vitro* culture of *Leishmania donovani* promastigotes shows Leptomonas like forms as revealed by restriction fragment length polymorphism (RFLP) pattern, Keerti Rawat, Narendra K Yadav, Sumit Joshi and Anuradha Dube

64. Molecular characterization of the delta subunit of T-complex protein-1 from *Leishmania donovani,* Narendra K Yadav, Keerti Rawat, Sumit Joshi, Prashant Khare, Anil K Jaiswal and Anuradha Dube

65. Evaluation of protective efficacy of Centrin KO (LdCen1-/-) live attenuated Leishmania vaccine against *Leishmania donovani* challenge in Indian langur monkeys (*Presbytis entellus*), Sumit Joshi, Rati Tandon, Narendra K Yadav, Keerti Rawat, Ranadhir Dey, Poonam Salotra, Angamuthu Selvapandiyan, Hira L Nakhasi and Anuradha Dube

66. The immunoprophylactic efficacy of Brugia malayi adult female heavy chain Myosin (BmAF-Myo) as a DNA and heterologous prime boost vaccine in a rodent model, Jyoti Gupta, Manisha Pathak, Shailja Misra-Bhattacharya

67. Fosfomycin targets lymphatic filarial parasite, Brugia malayi by inhibiting MurA of *Wolbachia* endosymbiont, Mohd Shahab, Meenakshi Verma and Shailja Misra-Bhattacharya

68. Transcription elongation factor GreA of *Wolbachia*, an endosymbiont of *Brugia malayi*: Characterization and interaction study with $\alpha 2\beta\beta'\sigma$ subunits of RNA Polymerase, D Chahar, JK Nag, M Gangwar, J Jha., A Chawla and S Misra-Bhattacharya

69. Functional genomic analysis of vital *Brugia malayi* genes using *Caenorhabditis elegans* as model organism, Sushila Bhattacharya, Amir Nazir, Shailja Misra-Bhattacharya

70. Nanoreservoir carrying Brugia malayi recombinant proteins for oral immunoprophylaxis against infective larval challenge, M Gangwar, VT Banala, D Chahar, R Jha, PR Mishra and S Misra-Bhattacharya

71. *Wolbachia* endosymbiont of *Brugia malayi* elicits Th-17 mediated pro inflammatory immune response through surface protein, Manisha Pathak, Meenakshi Verma, Mrigank Srivastava and Shailja Misra-Bhattacharya

72. Cloning, Expression, Purification of Brugia malayi UDP-galactopyranose mutase (UGM) and its immune reactivity with bancroftian human sera, Sweta Misra and Shailja Misra-Bhattacharya

73. Moxidectin alone and in combination with Doxycycline exerts macrofilaricidal activity accompanied with marked reduction in *Wolbachia* density from human lymphatic filaria, *Brugia malayi*, M Verma, M Pathak, K Mitra. S Misra-Bhattacharya

74. Antimalarial therapeutic interventions using various combinations of standard antimalarials and antibiotics against *in vitro* laboratory maintained strains of *Plasmodium falciparum*, P Agarwal, RK Srivastava, SK Puri and K Srivastava

75. Possible role of Heme detoxification protein in Arteether resistance, Awakash Soni, Manish Goyal, Kirtika Prakash and SK Puri

76. Molecular and biochemical characterization of mitochondrial co-chaperon PfCPN10 in human malaria parasite *P. falciparun*, Manish Goyal, Kirtika Prakash, Awakash Soni, and SK Puri

77. Molecular cloning and biochemical characterization of iron superoxide dismutase from the rodent malaria parasite *Plasmodium vinckei*, Prakash, Manish Goyal and S K Puri

78. Apoptosis in the malaria protozoan, *Plasmodium falciparum*: a possible action mechanism of chloroquine, Sarika Gunjan, and Renu Tripathi

79. Antitrypanosom-al agents of marine origin, Hemlata Dwivedi, AK Siddhanta, Y Venkateswarlu, Brijesh Kumar and Renu Tripathi

80. Altered level of Histamine and expression of its receptors in cerebral malaria model and their response to antimalarials, Sunil Kumar Singh and Renu Tripathi

81. Soluble factors and their role in pathology during Malaria infection in mice, Bhavana Singh Chauhan, Yeshveer Singh and Renu Tripathi

82. Tropical pulmonary eosinophilia in murine lung is characterized by altered expression patterns of different cytokines, P Sharma, A Sharma and M Srivastava

83. Investigating macrophage polarisation at early host-parasite interface during lymphatic filariasis, A Sharma, P Sharma and M Srivastava

84. 15d-PgJ2 dependent caspase-3 activation leads to programmed cell death of *Leishmania donovani* parasites in experimental visceral leishmaniasis, Preeti Vishwakarma, Pawan Kumar Yadav, Naveen Parmar and Susanta Kar

7th Annual Conference of the Cytometry Society, New Delhi (25-27 October)

85. Interaction of inducible Nitric Oxide Synthase with Rac2 Regulates Reactive Oxygen and Nitrogen species generation in the human Neutrophil phagosomes: Implication in microbial killing, A Jyoti, AK Singh, M Dubey, S Kumar, R Saluja, RS Keshari, A Verma, T Chandra, A Kumar, VK Bajpai, MK Barthwal and M Dikshit

Indo-US Symposium on contemporary issues in cell kinetics, Babasaheb Bhimrao Ambedkar University, Lucknow (29-30 October)

86. A novel zinc complexed dithiocarbamate derivative corrects misregulated proteasomal pathway to salvage anti-tumor ER-beta and E-cadherin proteins from degradation in prostate cancer PC-3 cells, Vishal Singh, Vikas Verma, Vikas Sharma, Dhanaraju Mandalapu, Bhavana Kushwaha, Aastha Pandey, JP Maikhuri, Vishnu L Sharma and Gopal Gupta

XXXII Annual Conference of the Indian Academy of Neurosciences IAN, 2014 Bengaluru (01-03 November)

87. Protective effects of memantine in streptozotocin induced insulin receptor dysfunction and neuroinflammation in astrocytes, N Rajasekar, Chandishwar Nath, Kashif Hanif and Rakesh Shukla

88. Role of NMDA receptor mediated CREB phosphorylation in Streptozotocin (STZ) induced Astroglial activation, Shivika Rai, Chandishwar Nath and Rakesh Shukla

89. A comparative study on neuroinflammatory response and memory functions in lipopolysaccharide (ICV) treated spontaneously hypertensive and normotensive rats, Ruby Goel, Kashif Hanif, Chandishwar Nath and Rakesh Shukla

Asian Plant Science Conference, Bhairahawa (Lumbini), Nepal (1-3 November)

90. Osteoprotective activity from *Coelogyne cristata* Lindley (Orchidaceae): A traditional plant used for bone healing in Uttarakhand, India, C Sharma, KR Arya, D Singh and T Narender

AAPS 2014- Annual Meeting and Exposition San Diego, USA (02-06 November)

91. Natamycin laden Nanoparticles as Sustained Ocular Delivery Vehicles: Development, *In vitro – In Vivo* Characterization and PK/PD Indices, Hardik Chandasana, Yarra Durga Prasad, Yashpal S Chhonker, Kalyan Mitra, Praveen K Shukla and Rabi S Bhatta

27th Annual National Conference and International CME on Innovations in Atherosclerosis and Cardiac Diseases of Indian Society of Atherosclerosis Research, India, Lucknow (25-27 November)

92. CDR-267-F018 Ameliorates fructose rich diet induced insulin resistance and vascular dysfunction in Rats, S S Reddy, V Singh, P Pathak, M N Srivastava, T Narender, AK. Dwivedi, M Dikshit and MK Barthwal.

93. Histological and functional characterization of atherosclerosis progression in rabbit iliac atery, JS Kanshana, V Khanna, V Singh, M Jain, M Farooqui, A Misra, MK Barthwal and M Dikshit

94. Modulation of hepatic collagen content in the high fat diet fed mice, SC Rebello, JS Kanshana, K Nageswararao, P Pathak, S Sharma and M Dikshit

95. Time dependent changes in the neutrophil accumulation and hepatic redox status following high fat diet feeding in mice, K Nageswararao, SC Rebello, JS Kanshana, P Pathak, D Awasthi, S Nagarkoti and M Diskhit

96. Protective effect of CDR-267-F018 against Dyslipidemia induced endothelial dysfunction in the Guinea Pig and Rabbit, P. Pathak, J.S. Kanshana, V. Srivastava, V Khanna, V Singh, MN Srivastava, T Narender, AK Dwivedi, MK Barthwal and M Dikshit

Third Global Sustainable Biotech Congress 2014, North Maharastra University Jalgaon (1-5 December)

97. Haematopoietic assays as substitute of *in-vitro* hematotoxicity for new drug, Rama K Singh

National Symposium on Clinical Research, Good Clinical practice, Pharmacovigilance, Newer issues in Ethics, Regulatory Requirement in New Drug Applications and Clinical Trials, Lucknow, (3 to 4 December)

98. Changes in Posthoc tests on Nitric Oxide and Lipid peroxidation with severity of Diabetic Retinopathy, C Singh, M Srivastava and M Dikshit

10th NOST Conference for Research Scholars (J-NOST 2014), Madras (4-6 December)

99. Donor-Acceptor Fluoranthene and Benzo[a]acridine based fluorescent dyes as Bioprobes and organic electronic materials, Ashutosh Sharma and Atul Goel

56th Annual meeting of American Society of Hematology San Francisco, CA, USA (6-9 December)

100. Glutathionylation of NF-kB regulates inducible nitric oxide synthase expression in chronic myeloid leukemia cells, AK Singh, D Awasthi, M Dubey, T Chandra, A Kumar, MK Barthwal, AK Tripathi and M Dikshit

6th Annual Meeting of Proteomics Society of India (PSI) and International Conference on Proteomics from Discovery to Function, Bombay, (7-9 December)

101. Comparative proteome analysis of pathogenic and non-pathogenic mycobacterium ΔsigF mutant and isogenic wild type strains, Vishal Srivastava, Debashis Dutta and Bhupendra N Singh

XXXVIII All India Cell Biology Conference and International Symposium on Cellular Response to Drugs, Lucknow (10-12 December)

102. Damage-associated molecular protein HMGB-1 sumoylation stimulates endothelial cell induced inflammation, Dipika Goyal and Kumaravelu Jagavelu

103. Cloning, expression and purification studies with MRA_1916, a putative D-amino acid oxidase of *Mycobacterium tuberculosis* H37Ra, Kumar Sachin Singh and Sudheer Kumar Singh

104. Cloning, expression and purification studies with MRA_1571, a putative gene for isoleucine biosynthesis in *Mycobacterium tuberculosis* H37Ra, Rishabh Sharma and Sudheer Kumar Singh

105. Cloning, expression and purification studies with MSMEG_5684, a putative Phosphoserine aminotransferase of *Mycobacterium smegmatis* mc2, Deepa Keshari and Sudheer Kumar Singh

106. Characterization of Multi Drug- resistant *Mycobacterium tuberculosis* genotypes originated from Beijing, Kanchan Srivastava, Dinesh K Tripathi, Kishore K Srivastava and Surya Kant

107. Assessment of functional efficacies of tyrosine phosphatases from pathogenic and non-pathogenic Mycobacteria and identification of specific inhibitors, Aditi Chatterjee, Sapna Pandey, Pramod K Singh, Navendu Prakash Pathak, Niyati Rai, Ravishankar Ramachandran, Rama Pati Tripathi and Kishore K Srivastava

108. Post-translationally modified EspJ protein is important in growth and in intra-cellular survival of Mycobacteria, Pramod K Singh, Richa Saxena, Sameer Tiwari, Susmita K Singh, Ruma Kumari and Kishore K Srivastava

109. Overexpression of SigF antagonist in *Mycobacterium smegmatis* mimics sigF mutant phenotype, loss of pigmentation and sensitivity to oxidative stress, Vandana Singh and Bhupendra N Singh

110. Insulin modulates the outcome of alpha Synuclein aggregation via Daf-2/Daf-16 signalling pathway in transgenic *C. elegans* model of Parkinson's Disease, Rizwanul Haque, Lalit Kumar, Shamsuzzama, Soobiya Fatima, Pooja Jadiya and Aamir Nazir

111. Validation, Sequencing and Functional Analysis of Circular RNA Molecule, cRNA 4, in *C. elegans* Model, Lalit Kumar, Shamsuzzama and Aamir Nazir

112. Studies on Let-7 microRNA employing genetic model system *Caenorhabditis elegans*: Implication for Age Associated Neurodegenerative Diseases, Shamsuzzama, Lalit Kumar and Aamir Nazir

113. Mammalian diabetes autoantigen IA-2 exhibits Neuroprotective activity: Studies employing transgenic *C. elegans* models of neurodegenerative disease, Soobiya Fatima, Rizwanul Haque, Lalit Kumar, Shamsuzzama, Pooja Jadiya and Aamir Nazir

2015

Symposium on Drug Discovery in India, Past, Present and Future, Lucknow (01January 2015)

1. Cloning, expression and purification studies with MRA_1104, a putative serine hydroxymethyl transferase of *Mycobacterium tuberculosis* H37Ra, Kumar Sachin Singh and Sudheer Kumar Singh

2. Effect of carbon source and oxygen availability on expression of MRA_1571 during *Mycobacterium tuberculosis* H37Ra growth, Rishabh Sharma and Sudheer Kumar Singh

4 Networks and Linkages

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

Code No.	Acronym	Project Title	Nodal Officer (CSIR-CDRI)
BSC0201	ASTHI	Anabolic Skeletal Targets in Health and Illness (CSIR-CDRI, Nodal lab)	Dr. Naibedya Chattopadhyay
BSC0101	PROGRAM	Factors Governing Competent Gamete Production and Reproductive Dysfunction (CSIR-CDRI, Nodal lab)	Dr. Rajender Singh
BSC0102	THUNDER	Towards Holistic Understanding of Complex Diseases: Unravelling the Threads of Complex Diseases (CSIR-CDRI, Nodal lab)	Dr. Madhu Dikshit
BSC0103	UNDO	New Approaches Towards Understanding of Disease Dynamics and to Accelerate Drug Discovery (CSIR-CDRI, Nodal lab)	Dr. S.K. Rath
BSC0104	SplenDID	Emerging and Re-Emerging Challenges In Infectious Disease: System Based Drug Design for Infectious Diseases (CSIR-CDRI, Nodal lab)	Dr. R. Ravishankar
BSC0106	BioprosPR	Bio-prospection of Plant Resources and other Natural Products (CSIR-NBRI, Nodal lab)	Dr. Dipak Dutta
BSC0108	MEDCHEM	Medicinal Chemistry for Stem Cell Biology and Regenerative Medicines (CSIR-IIIM, Nodal lab)	Dr. Atul Kumar
BSC0111	INDEPTH	Integrated NextGen Approaches in Health, Disease and Environmental Toxicity (CSIR-IITR, Nodal lab)	Dr. B.N. Singh
BSC0112	NanoSHE	Nano-materials: Applications and Impact on Safety, Health and Environment (CSIR-IITR, Nodal lab)	Dr. Amit Misra
BSC0113	UNSEEN	Understanding Supra Molecular Ensembles and Machines (CSIR-IICB, Nodal lab)	Dr. Ashish Arora
BSC0114	HOPE	Understanding the Role of Host molecules in Parasitic Infection (CSIR-IICB, Nodal lab)	Dr. Anuradha Dube
BSC0115	miND	Neurodegenerative Disease: Cause and Corrections (CSIR-IICB, Nodal lab)	Dr. Shubha Shukla
BSC0118	EpiHeD	Epigenetic in Health and Disease (CSIR-CCMB, Nodal lab)	Dr. Aamir Nazir
BSC0119	HUM	Understanding the Human Microbiome (CSIR-IMTECH, Nodal lab)	Dr. Arunava Dasgupta
BSC0120	Biodiscovery	Centre for Bio-therapeutic Molecule Discovery (CSIR-IMTECH, Nodal lab)	Dr. J. K. Ghosh
BSC0121	GENESIS	Genomics and Informatics Solutions for Integrating Biology (CSIR-IMTECH, Nodal lab)	Dr. M. I. Siddiqui
BSC0123	GenCODE	Genome Dynamics in Cellular Organization, Differentiation and Enantiostasis (CSIR-IGIB, Nodal lab)	Dr. W. Haq
CSC0302	ADD	Advance Drug Delivery System (CSIR-IICT, Nodal lab)	Dr. Manish Kumar Chourasia
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. P.R. Mishra
ISC0102	KNOWGATE	CSIR Knowledge Gateway and Open Source Private Cloud Infrastructure (CSIR-NISCAIR, Nodal lab)	Mr. Suman Mallik
PSC0111	MISTIQUE	Measurement for Innovation in Science and Technology for Improvement of Quality & Economy of Life (CSIR-NPL, Nodal lab)	Dr. A.K. Dwivedi

2. Grant in Aid Projects

Title	PI	Date of Start	Expected Date of Completion
Department of Biotechnology			
Structural analysis of bacterial Peptidyl-tRNA Hydrolase enzymes & design of high - affinity binders	Dr. Ashish Arora	13/08/2010	12/08/2014
Crystallographic and biochemical studies on Feast / Famine regulatory proteins from mycobacteria	Dr. Ravishankar R.	01/05/2011	30/04/2014
Investigation of effect of polysaccharide in modifying leishmanicidal potential of nanoparticular system bearing chemotherapeutics agent	Dr. Manish K Chourasia	01/10/2011	30/09/2014
Functional Characterization of CRN12 in Leishmania parasites	Dr. Amogh A. Sahasrabuddhe	01/11/2011	31/10/2014
Discovering antimalarials from marine organisms (Phase III): Bulk recollection of promising marine organisms – isolation, purification, characterization and chemical synthesis of marine derived antimalarial.	Dr. A. K. Sinha	01/04/2012	31/03/2015
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	24/04/2015
Enhancing functional repertoire of RNAPII in normal and cancer cell	Dr. Md. Sohail Akhtar	01/05/2012	30/04/2015
Identification of urinary biomarkers for diagnosis, prognosis and follow up of patients with SLE nephritis	Dr. S.K. Sinha	01/05/2012	30/04/2015
Antioxidant capacity of astrocytes and neurotrophic factor in aging: Age and gender based analysis (National Initiative on Glial Cell Research in Health and Disease)	Dr. Sarika Singh	07/05/2012	06/05/2015
Validation of the cancer testis biomarker CABYR in cervical squamous cell carcinomas	Dr. Monika Sachdev	01/06/2012	31/05/2014
Solution structure and dynamics of Unc-60 ADF/Confilin proteins of *Caenorhadbitis elegans*	Dr. Ashish Arora	24/08/2012	23/08/2015
Drugs against central body fatness and insulin resistance (high peri/post-menopausal prevalence) RGYI	Dr. J.R. Gayen	12/09/2012	11/09/2015
Molecular characterization and epidemiological modelling 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 approaches towards identification and synthesis of antigenic epitopes of potential *L. donavani* Th1 stimulatory proteins for the development of synthetic vaccine against Visceral Leishmanisis	Dr. Anuradha Dube	20/06/2013	19/06/2016
Elucidating the role of P53 and DNA damage response pathway in anti-cancer activity of a novel coumarinchalcone hybrid	Dr. Jayanta Sarkar	20/06/2013	19/12/2014
Studies on effect of different herbal preparation on wound healing and angiogenesis	Dr. Syed Musthapa M	15/07/2013	14/07/2016
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
Assembly of Iron-Sulphur [Fe-S] Clusters on critical proteins of the plasmodium apicoplast	Dr. Saman Habib	11/10/2013	10/10/2018
Investigating the extra-ribosomal functions of ribosomal proteins during stress and infection	Dr. Niti Kumar	13/11/2013	12/11/2018
Discovery and development of novel bone anabolic agents for accelerated fracture healing	Dr. Naibedya Chattopadhyay	21/02/2014	21/02/2016

Title	PI	Date of Start	Expected Date of Completion
Identification and functional characterization of novel microRNA candidates altered byphytoestrogen medicarpin: Role in the pathogenesis of osteoporosis.	Dr. Divya Singh	01/08/2014	31/07/2017
miRNA in the regulation of sclerostin, a therapeutic approach for osteoporosis. (Women Scientist Scheme)	Dr. Sharmishtha Bhattacharya & Dr. N. Chattopadhyay	26/09/2014	25/09/2017
Studies on the interactions between mycobacteria and host defence peptides.	Dr. Mukesh Pasupuleti	01/10/2014	30/09/2017
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
Department of Science & Technology			
Sophisticated Analytical Instrument Facility (SAIF)	Director	01/04/1975	Long term
Antimalarial principles from plants belonging to the genus Vernonia endemic to the western ghats	Dr. A.K. Bhattacharya, NCL & Dr. Kumkum Srivastava	01/09/2011	31/08/2014
To study immunoprotective roles of methoxyisoflavones in estrogen - deficiency induced bone loss	Dr. Divya Singh	10/10/2011	09/10/2014
Investigation on immunomodulation mediated by *Mycobacterium tuberculosis* during persistent infection	Dr. Y.K. Manju	01/11/2011	31/10/2014
Circadian modification in cancer progression	Dr. D.P. Mishra	02/01/2012	01/01/2014
Protein translation in organelles of *Plasmodium falciparum* (Indo- Spain Research Project)	Dr. Saman Habib	04/04/2012	03/04/2015
Role of innate immune components in inflammation induced insulin resistance	Dr. Akhilesh Tamrakar	01/06/2012	31/05/2015
Isolation and characterization of antifungal peptides from natural sources	Dr. Vineeta Singh	01/06/2012	31/05/2015
Regulation of pancreastatin: A novel approaches to control diabetes	Dr. J.R. Gayen	12/06/2012	11/06/2015
Pharmacokinetic, metabolic and biopharmaceutic assessment of antimalarial Lumefantrine and its active & more potent metabolic	Dr. Wahajuddin	18/06/2012	17/06/2015
Novel genetic and epigenetic targets for breast cancer prevention and therapy: A mechanistic approach with bioactive dietary supplements	Dr. Syed Musthapa M	18/06/2012	17/06/2015
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. J.R. 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. T.S. 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 signalling in the endometrial epithelial cell physiology during uterine tissue remodelling 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
Biotechnological intervention for pharmaceutically valuable compounds from forest resins	Dr. Rakesh Shukla	01/05/2013	30/04/2016
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
An approach towards novel steroidomimetics - design and synthesis of structurally diverse steroid sugar - hybrides and azasteroids	Dr. Preeti Gupta Dr. Gautam Panda	07/10/2013	06/10/2018

Title	PI	Date of Start	Expected Date of Completion
Clonal multiplication of Indian traditional plant *Ulmus wallichiana* Planchon: An endangered tree for healing fracture	Dr. K.R. 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
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
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 helicobactor pylori using dual-tagged carbohydrates	Dr. Pintu Kumar Mandal	01/03/2014	28/02/2017
Development of novel strategies towards the synthesis of N-heterocycles using isocyanide based multicomponent reactions	Dr. PMS. Chauhan	15/05/2014	14/05/2017
Target oriented delivery of chemotherapeutic agent in leishmaniasis 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
Molecular and functional characterization of MAP Kinase1 homologue of *Leishmania donovani*	Dr. Neena Goyal	01/01/2015	31/12/2017
Indian Council of Medical Research			
Delivery system for the management of Septic Shock: Rational approach towards lipopolysaccharide (lps) neutralization and detoxification	Dr. P.R. Mishra	01/08/2011	31/07/2014
Nucleosomal Histone Proteins of *Leishmania donovani*: Molecular and immunobiochemical characterization for its potential as vaccine target against Visceral Leishmaniasis	Dr. Anuradha Dube	01/09/2011	31/08/2014
Impact of Adipokine and Chemokine gene polymorphism and its protein expression in metabolic syndrome	Dr. Ashim Ghatak & Dr. Ritu Raj Konwar	01/09/2011	31/08/2014
Preclinical studies of a novel Phytoestrogen-Like compound for the management of postmenopausal osteoporosis	Dr. N. Chattopadhyay	10/01/2012	09/01/2015
Neuroinflammation and memory impairment in hypertension: Role of the Central Rennin Angiotensin System	Dr. Rakesh Shukla	01/02/2012	31/01/2015
Nanoreservoirs carrying *Brugia malayi* recombinant proteins as potential vaccine against experimental Lymphatic Filariasis	Dr. Shailja Bhattacharya	01/02/2012	31/01/2015
Identification and characterization of cross-reactive, Molecules of Filarial and Leishmanial parasites and their possible prophylactic potential against either infection	Dr. P. Kalpana Murthy Dr. Sharad Sharma	01/02/2012	31/01/2015
Elucidation of inflammatory pathways involved in Septic Shock	Dr. Madhu Dikshit	01/02/2012	31/01/2015
Natural modulators of GLUT-4 translation for the treatment of insulin resistance	Dr. Akhilesh K. Tamrakar	02/04/2012	01/04/2015
Development of anti-dyslipidemic agents from *Aegle marmelos* (BAEL) and *Trigonella foenumgraecum* (METHI)	Dr. T. Narender	09/05/2012	08/05/2015
Designed synthesis and biological evaluation of novel agents for managements design Prostatic Hyperplasia	Dr. V.L. Sharma	01/12/2012	30/11/2015

Title	PI	Date of Start	Expected Date of Completion
Evaluation of Ply - ADP - Ribose polymerase -2 (PARP-2) and Caspace - 8 signalling mechanism role during uterine tissue remodelling	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
Designed synthesis, evaluation and identification of novel dually effective spermicidal agents with anti-trichominal activity for prophylactic contraception	Dr. Gopal Gupta	15/06/2014	14/06/2017
Validation of wnt pathway modulation and efficacy study in primary osteoporosis, fracture healing and secondary osteoporosis models for repositioning of clofazimine	Dr. N. Chattopadhyay	15/06/2014	14/06/2017
Studies on the effects of obesogens in male germ cells an exploratory study	Dr. D.P. Mishra	15/06/2014	14/06/2017
Preclinical development of Kaempferol with enhanced drug delivery for superior osteogenic activity	Dr. Ritu Trivedi	15/06/2014	14/06/2017
Lead identification of non steroidal molecule with anti-proliferative activity for management of endometrial hyperplasia	Dr. Anila Dwivedi	15/06/2014	14/06/2017
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 *Mucuma 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 affct 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
Search for novel antimicrobial and anticancer metabolites from marine bacteria	Dr. Prem Prakash Yadav	01/08/2013	31/07/2016
AYUSH			
Exploration, identification and isolation of bone fracture healing agents from Indian folk traditional plants *Pholidota articulate* and *Coelogyn cristata* (Orchidaceae)	Dr. K.R. Arya	31/12/2014	31/12/2017
Emeritus Scientist			
Integrated 3D molecular modeling, design and synthesis of novel chemical entities (NCEs) as potential agents for the treatment of Alzheimer disease.	Dr. A.K. Saxena	01/05/2014	30/04/2017

3. Sponsored Projects

Project Title	Funding Agency	Principal Investigator	Duration
Genotoxicity & Molecular mechanism of RISUGadv	IIT, Kharagpur	Dr. R.K. Singh	2014-16
In vitro testing of GSKCH formulation for osteogenic effect	GSKCH, Gurgaon	Dr. N. Chattopadhyay	2014-15 (12month)

4. NMITLI Projects

Project Title	Principal Investigator
Lead based drug development and genetic improvement of Ashwagandha (*Withania somnifera*)	Dr. Shailja Bhattacharya
Novel DPP IV inhibitor for the treatment of diabetes	Dr. SK Rath/Dr. S Sanyal

5. CSIR Young Scientist Award Projects

Project Title	Principal Investigator	Duration
Identification of Kinase and phosphatase specific to CTD serine7 of RNA Polymerase II	Dr. Sohail Akhtar	2011-16
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

6. CSIR EMPOWER Project

Project Title	Principal Investigator	Duration
Macrophage assisted invadosome biogenesis: Unravelling the hidden trails to cancer metastasis	Dr. Smrati Bhadauria	2010-14

5 Human Resource Development

1 Ph.D. Theses submitted

S. No.	Name of Student	Title	Name of Supervisor
Jawaharlal Nehru University, New Delhi			
1.	Subhendu Bhowmik	Synthesis of heterocyclic scaffolds and natural product mimics using Morita-Baylis-Hillman Chemistry	Dr. Sanjay Batra
2.	Subhasish Biswas	Synthesis of possible antimalarial agents and annulated heterocyclic framework	Dr. Sanjay Batra
3.	Avula Srinivas Rao	Design and synthesis of novel heterocyclic compounds as potential biodynamic agents	Dr. KV Sashidhara
4.	Chandra Sourabh Azad	Synthesis of carbohydrate derived scaffolds and glycosylated quinoline derivatives as potential bioactive agents	Dr. AK Saxena
5.	Richa Verma	Studies on immunoprophylatctic potential of cross-reactive molecules of filarial and Leismanial parasites	Dr. PK Murthy
6.	Rohit Srivastava	Systematic evaluation and mechanistic studies on selected anti diabetic plants	Dr. Arvind K Srivastava
7.	Vinay Kumar Singh	Synthesis and chemical transformations of plants secondary metabolites of biological importance	Dr.T Narender
8.	Sauarav Bera	Quest for target and diversity oriented synthesis of medicinally important natural product and natural product-like molecules from amino acids	Dr.Gautam Panda
9.	Amit Kumar Jana	Synthetic approach towards alkaloids using amino acids as building blocks	Dr.Gautam Panda
10.	Sudipta Kumar Manna	Synthetic approach towards amino acids and benzopyran based tetracyclic architectures of biological importance	Dr. Gautam Panda
11.	Mohammad Kamil Hussain	Design and synthesis of novel non-steroidal ligands as potential estrogen receptor modulators	Dr. Kanchan Hajela
12.	Anil Kumar Jaiswal	Evaluation of stress proteins of *Leishmaniadonovani*promastigotes and amastigotes – identified through proteomics as TH1stimulatory proteins – for their prophylactic potential against experimental visceral leishmaniasis	Dr. Anuradha Dube
13.	Sahaj Gupta	Design and synthesis of privileged structure based annulated polyheterocycle	Dr. Bijoy Kundu
14.	Balawant Kumar	Molecular characterization of interaction of HIV-1Nef with host proteins involved in apoptotic pathways	Dr. RK Tripathi
15.	Santosh Jangir	Search of novel double-edged spermicides and antispermatogenic agents.	Dr. VL Sharma
16.	Muheeb Beg	Identification of novel targets for therapeutic intervention in insulin resistance through integrated approaches of proteomic, differential gene expression and high content biology	Dr. Anil N Gaikwad
17.	Deepak Kumar Singh	Characterization of a putative actin related protein in *Leishmania*parasite	Dr. Amogh Sahasrabuddhe
18.	Lalit Prakash Gupta	Design and synthesis of novel indole and quinolinebased derivatives as anticancer &antidislipidemic agent	Dr. Atul Kumar
19.	Abhishek Dey	Structural studies on transcriptional regulatory protein from mycobacteria	Dr. R Ravishankar
20.	Priyanka Gupta	Endoplasmic reticulum regulation of cell death pathways in glioblastoma	Dr. DP Mishra
21.	Vikram Khedgikar	Functional proteome of serum/tissue to distinguish anabolic responsive proteins in an estrogen deficiency model of osteoporosis by treatment with anabolic agent	Dr. Ritu Trivedi
22.	Namrata Rastogi	Proteomic profiling of drug apoptosis in cancer cells	Dr. DP Mishra

S. No.	Name of Student	Title	Name of Supervisor
23.	Rachna Trivedi	Proteomic profiling of acute myeloid leukemia in chemotherapy and chemoresistance	Dr. DP Mishra
24.	Heikham Kajal Devi	Natural polymer nanoparticle for oral immunization and drug delivery	Dr. Amit Misra
25.	Amit Gaur	Structural and functional studies of protein(s) involved in secretion pathways of mycobacteria	Dr. R Ravishankar
26.	Pankaj Nag	Synthesis of benzannulatedpyranones and their nucleophile induced ring transformed products	Dr. AtulGoel
27.	Mradul Mohan	RNA interference studies on suppressors of cytokine signaling to investigate interaction between mycobacterium tuberculosis and the human macrophage	Dr. Amit Misra
28.	Sudhir Kumar Singh	Structural and functional characterization of Hylp-type bacteriophage encoded hyaluronatelyases	Dr. Sohail Akhtar
29.	Natasha Jaiswal	Nutritional modification induced insulin resistance: Tissue specific role of inflammation and oxidative stress	Dr. Akhilesh Kumar Tamrakar
30.	Arun Kumar Rawat	Effect of selected antidiabetic agents on mitochondrial functions in experimental type 2 *Diabetes mellitus*	Dr. Arvind K Srivastava
31.	Pramod Kumar Singh	Investigation of post-translation modification in RD1-encoded proteins of mycobacteria with particular reference to Rv3878 by serine threonine kinases	Dr. Kishore K Srivastava
32.	Poonam Singh	Identification of interacting partners with HIV-1nef: *C.elegans* to human	Dr. RKTripathi
33.	Lakshmi Shukla	Design and synthesis of nitrogenous heterocylces and polymethylene linker based flexible models for the study of non-covalent interactions and biological activity studies	Dr. W Haq
34.	Debashis Dutta	Heterologous complementation of mycobacterium bovis sigF mutant and its effect on mycobacterial pathogenesis	Dr. BN Singh
35.	Shashi Pandey	Design and synthesis of novel heterocycles as anti-inefective agents	Dr. PMS Chauhan
36.	Pramod Kumar Gupta	Nano-engineered systems for improved drug delivery of chemotherapeutic agents	Dr. PR Mishra
37.	Ram Niwas	Production, purification and characterization of biologically active from enzymes from microbial sources	Dr. PK Shukla
38.	Nishi Gupta	Identification of autosome related factors contributing to the etiology of male infertility	Dr. Rajender Singh
39.	KiranKhandelwal	Preformulation and formulation development of some antimalarial, antithrombotic and antidiabetic candidate drugs	Dr. AK Dwivedi
40.	Vivek Kumar	Engineered nanocarrier for improved delivery of poorly water soluble bioactive	Dr. AK Dwivedi
41.	Sudeep Gautam	Identification of molecular mechanism(s) for antihyperglycemic and antidyslipidemic effects of selected synthetic and natural compounds	Dr. Arvind K Srivastava
42.	Prashant Shukla	Novel drug delivery systems for therapeutic intervention of sepsis and septic shock	Dr. PR Mishra
43.	Ram Kumar Modukuri	A Synthetic approach towards the development of novel bioactive oxygen heterocycles	Dr. KV Sashidhara
44.	Abhishek Kumar Singh	Therapeutic effect of ulmosides on muscle atrophy and metabolic disorder	Dr. Sabyasachi Sanyal
45.	Arvind Mishra	Late stage complications in streptozotocin induced diabetes mellitus in rats and mice and their prevention by nature identicals	Dr. Arvind K Srivastava Biochemistry
46.	Mansi Garg	Characterization of protein kinase(s) homologoue of *Leishmaniadonovani* and exploration of its possible role in antimony resistance in clinical isolates	Dr. Neena Goyal
47.	Akhand Pratap Singh	Identification of pro-male fertility activity and mechanism of action of selected medicinal plants	Dr. Rajender Singh
48.	Afreen Haider	Analysis of putative nuclear-encoded proteins involved in translation initiation in *Plasmodium falciparum* organelles	Dr. Saman Habib
49.	Ram Najar Kushwaha	Design and synthesis of dipeptidyl peptidase-IV inhibitors as potential antidiabatic agent	Dr. SB Katti
50.	Ajeet Kumar Verma	Study of Isoniazid and Pyrazinamide included apoptosis and role of Nrf2 in hepatocellular carcinoma	Dr. SK Rath
51.	Shreesh Raj Sammi	A systematic screen towards validating and identifying genetic and extrinsic epigenetic modulators of Alzheimer's disease: Studies employing transgenic *C. elegans* model	Dr. AamirNazir

S. No.	Name of Student	Title	Name of Supervisor
52.	Savita Pal	Identification of the targets for the action of antibiotic fractions of terrestrial medicinal plants	Dr. Arvind K Srivastava
53.	Arjun Kumar Mishra	Structural and functional of nucleoside diphosphate kinase and proteins of trypanothione biosynthesis pathway from Leishmania sp.	Dr. JV Pratap
54.	Taran Khanam	Structural and functional studies on protein(s) from human pathogens involved in nucleic acid metabolism	Dr. R Ravishankar
Academy of Scientific & Innovative Research			
55.	Avinash Kumar	To study the osteogenic potential of polymeric nano matrix associated kaempferol in rat model of osteoporosis	Dr. Ritu Trivedi
56.	Kamini Srivastva	Identification and evaluation of osteogenic effect of methoxyisoflavones in estrogen deficient condition	Dr. Divya Singh
57.	Kanika Kanchan	Analysis of genetic variations in selected human genes and their association with susceptibility/resistance to *Plasmodium falciparum* malaria in Indian populations	Dr. Saman Habib
58.	Veenu Bala	Design, synthesis and biological evaluation of novel dual-function spermicidal agents	Dr. VL Sharma
59.	Pooja Jadiya	Functional genomics and extrinsic epigenetic interventions in Parkinson's disease: Studies employing transgenic *Caenorhabditiselegans*	Dr. AamirNazir
60.	Yashpal Singh Chhonker	Pharmacokinetic and metabolism studies of Guggulsterone and Rohitukine and clinical drug interaction studies of Arteether	Dr. Rabi S. Bhatta
61.	Meenakshi Verma	The antifilarial efficacy of endectocidemoxidectin (milbemycin) in various drug combinations against experimental *Brugia malayi* infection	Dr. Shailja Bhattacharya
62.	Mohd. Shahab	Cloning, expression and molecular characterization of UDP-N-acetyl glucosamine enolpyruvyl transferase (MurA) of endosymbiont *Wolbachia*of humanlymphatic filarial parasite *Burgiamalayi*	Dr. Shailja Bhattacharya
Dr. B R AmbedkarUniversity, Agra			
63.	Rashmi Sharma	Design and synthesis of novel heterocycles as active molecules	Dr. PMS Chauhan
JamiaHamdard University, New Delhi			
64.	Pratibha Mishra	*In vitro* and *In vivo* studies of cardiotoxic effect rosiglitazone in murine models	Dr. SK Rath
65.	Neetu Singh	Studies on anticancer activity of coumarin-chalcone hybrid in human cervical cancer cells	Dr. Sudhir Sinha
66.	Rizwan Ahmed	Monoclonal antibody as a diagnostic and/or therapeutic tool against murine pulmonary aspergillosis	Dr. PK Shukla
67.	Amit Kumar Tripathi	Studies on neuroprotective action of phytochemical intransient focal cerebral ischemia in rat	Dr. DP Mishra
68.	Neha Rahuja	Biochemical and molecular mechanism [s] of action of potent antidiabatic agents	Dr. Arvind K Srivastava
Integral University, Lucknow			
69.	Manish Jain	Elucidation of novel inflammatory mechanism in experimental models of atherosclerosis	Dr. Manoj Kumar Barthwal
70.	Shishir Srivastava	Studies in anti-cancer activity of compounds derived from selected medicinal plants	Dr. AK Saxena
Lucknow University, Lucknow			
71.	Kanika	Design, synthesis, biological evaluation of nitrogen and /or sulphur containing hetrocylclic compounds and biosynthesis of biologically active alkaloid	Dr. AK Saxena
Banasthali University, Rajasthan			
72.	Pankaj Dwivedi	Engineered nano-carrier's bearing Arteether for the effective management of malaria	Dr. PR Mishra

2. Sponsored training provided to external aspirants

Under the above program, the institute imparted training to the post-graduate students, fellows from foreign countries and aspirants from academia and industries across the India in the area of drug & pharmaceutical research, techniques in laboratory animals, tissue & cell culture, instrumentation, sophisticated analytical instruments and other laboratory techniques as given below:

2.1 Training to Post Graduate Students

During the calendar year, a total one hundred twenty eight (128) Post-graduate students from 41 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 4-10 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, 03 INSA & NASI fellows and 02 INSPIRE Fellows from different institutes were provided training in different aspects of biomedical research.

2.4 International training under bilateral cooperation

Short term training (two weeks) was provided to the 12 research personnel from Nepal.

Long term (3 months-12 months) training was imparted to following trainee from abroad:

Name and Address of Trainee	Fellowship/ Programme	Supervisor	Duration
Oluyori Abimbola Peter University of Ilorin, Nigeria	TWAS Sandwich Postgraduate Fellowship	Dr A.K. Shaw	30 July 2014 to 09 February 2015

3. Training program attended by CSIR-CDRI staff

In the reporting year following Scientist/Technical staff from CSIR-CDRI attended various training programs and workshops for updating their knowledge and expertise in different disciplines.

Name of the Staff	Title of the Programme	Place	Date
Dr. Prem N. Yadav	Leadership Capacity Building Program Module -IV	CSIR-HRDC, Ghaziabad	20-23 April, 2014
Dr. Sripathi Kulkarni	Eight Annual Transatlanttic Intellectual Property Summer Academy	CWRU, School of Law Cleveland, OH, USA	02-06 June, 2014
Dr. Monika Sachdev	Pluripotent Stem Cells in Adult Mammalian Gonads	ICMR workshop	13 September, 2014

6 Honours and Awards

Dr. Anuradha Dube

- Elected Fellow of the Indian Academy of Sciences, Bengaluru 2015

Dr. RP Tripathi

- Elected Fellow of the Association of Carbohydrate Chemists & Technologists (India) 2014

Dr. Arun Kumar Sinha

- Elected Fellow of the National Academy of Sciences, India, Allahabad 2014

Dr. PMS Chauhan

- Prof. SP Hiremath Award 2014, Indian Council of Chemists

Dr. Rajender Singh

- CSIR Young Scientist Award- 2014

Dr. MN Srivastava

- Dr. BN Prasad Medal 2013-14, Association of Plant Taxonomy, Dehradun

Dr. Madhu Dikshit

- VASVIK Smt. Chandaben Mohanbhai Patel Industrial Research Award for Women Scientists – 2012
- GJS Rao Memorial Lecture Award - 2014 Biochemistry Department, Indian Institute of Sciences, Bengaluru

Dr. Jiaur R. Gayen

- ICMR International Fellow 2014-15, ICMR, India

Dr. Atul Kumar

- Vigyan Ratana Samman, Uttar Pradesh Council of Science and Technology

Dr. Wahajuddin

- DEF Young Scientist Award Academy of Environmental Biology

Dr. Arun Kumar Trivedi

- Yuva Vaigyanik Samman, Uttar Pradesh Council of Science & Technology

Dr. Rajesh Kumar Jha

- International Best Abstract Award at Annual meeting/Conference of Society of Study in Reproduction, USA

Dr. Rabi Sankar Bhatta

- Selected for INSA International Collaboration / Exchange Programme 2014-15

Ms. Priyanka Kushwaha (Student of Dr. Ritu Trivedi)

- Young Investigator Award by American Society for Bone and Mineral Research, USA

Dr. C. Nath

- Prof KP Bhargava Oration Award -2014 by KG Medical University, Lucknow

Mr. Saurabh Agnihotri (Student of Dr. Monika Sachdev)

- 3rd Prize in Best Poster Award by Indian Society for the Study of Reproduction & Fertility -2014

Dr. Sripathi R. Kulkarni

- Spangenberg Fellow for Law & Technology for the year 2015-16 by School of Law, Case Western Reserve University, Cleveland, Ohio, USA

Mr. Abhishek K Singh (Student of Dr. Madhu Dikshit)

- TCS-BC Award, 2014 The Cytometry Society India

Mr. Karunesh Rai

- Dr. K.R. Bhardwaj Award 2013- 14 by Laboratory Animal Science Association of India

Mr. Sanjay C Rebello (Student of Dr. Madhu Dikshit)

- Lord Sreenivasa of Seven Hills Gold Medal for Best Original Paper 2014, Indian Society for Atherosclerosis Research

Mr. Ajay Kumar Jha (Student of Dr. Atul Goel)

- Best Poster Award Presented at Humboldt Academy of Lucknow

Mr. Subhash Dwivedi (Student of Dr. Rakesh Shukla)

- 2nd Best Oral Presentation Award Kolkata Neuroscience Conference 2014, IICB, Kolkata

Mr. Vikram Khedgikar (Student of Dr. Ritu Trivedi)

- Young Investigator Award by International Osteoporosis Foundation, USA

Mr. Manish Charan (Student of Dr. Saman Habib)

- 2nd Prize for Best Poster Presentation in X Joint Annual Conference of ISMOCD and IAE, Goa

Ms. Jyoti Kureel (Student of Dr. Divya Singh)

- Young Investigator Award by International Osteoporosis Foundation (IOF), Orlando, USA

Ms. Sarika Gunjan (Student of Dr. Renu Tripathi)

- Best Poster Presentation Award in 25th National Congress of Parasitology 2014, CSIR-CDRI, Lucknow

Mr. Abdul Malik Tyagi (Student of Dr. Divya Singh)

- Dr. MM Dhar Memorial Award for Best Thesis- 2014

Mr. Vineet Kumar Maurya (Student of Dr. Rajesh K Jha)

- Best poster presentation award, 24th annual meeting of Indian Society for the Study of Reproduction and Fertility-2014.

Ms. Isha Kapoor (Student of Dr. Arun Kumar Trivedi)

- Best Poster Award at International conference in cancer and Stem cells 2014

Ms. Renu Pandey (Student of Dr Brijesh Kumar)

- 1st Best Poster Award, National Seminar on "Applications of Mass and NMR Techniques in Drug Research" 2014, Lucknow

Ms. Hafsa Ahmad (Student of Dr. A. K. Dwivedi)

- Selected as National student in the 1st IBRO/APRC, Panjab University, Chandigarh
- Best oral presentation award, in National Conference on Drug Carriers in Medicine and Biology – 2015, Erode, Tamil Nadu.

Ms. Preeti Chandra (Student of Dr Brijesh Kumar)

- 2nd Best Poster Award National Seminar on "Applications of Mass and NMR Techniques in Drug Research" 2014, Lucknow

Ms. Akansha Srivastava (Student of Dr. A. K. Dwivedi)

- Second best poster award in Future Prospects of Advancements in Biological Sciences, Health issues and Environmental protection 2014

Ms Tripti Joshi (Student of Dr Sanjeev Kanojiya)

- 3rd Best Poster Award "Applications of Mass and NMR Techniques in Drug Research" 2014, Lucknow

Ms. Shubhra Singh (Student of Dr. Vinita Chaturvedi)

- Fellowship of the Raman Charpak under the Indo-French collaboration for the promotion of Advanced Research.

Mr. Hardik Chandasana (Student of Dr. Rabi S. Bhatta)

- 2nd Best Poster Award at Applied Pharmaceutical Analysis Conference 2014, Ahmedabad.

Ms. Pooja Jadiya (Student of Dr. Aamir Nazir)

- 63th Meeting of Nobel Laureates & Students at Lindau 2014, Germany
- Dr. JM Khanna Memorial Early Career Achievement Award 2014

Ms. Shalini Asthana (Student of Dr. Manish Chourasia)

- Dr. JM Khanna Memorial Distinguished Career Achievement Award (Pre-clinical & Clinical Science) 2014

Mr. Rizwanul Haque (Student of Dr. Aamir Nazir)

- Best poster presentation award in Current Scenario in Drug Discovery & Development in NIPER, Raebareli

Ms. Kainat Khan (Student of Dr. N. Chattopadhyay)

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

Ms. Moni Sharma (Student of Dr. PMS Chauhan)

- Dr. MM Dhar Memorial Distinguished Career Achievement Award (Chemical Science) 2014

Mr. Pawan Kumar Yadav (Student of Dr. Susanta Kar)

- Best Poster Award in X Joint Annual Conference of ISMOCD & IAE

Ms Manisha Pathak (Student of Dr. Shailja Bhattacharya)

- Best Poster Award in 25th National Congress of Parasitology, 2014, CSIR-CDRI, Lucknow

Ms. Preeti Vishwakarma (Student of Dr. Susanta Kar)

- Best Poster award in 25th National Congress of Parasitology, 2014, CSIR-CDRI, Lucknow

Other Activities

CSIR-Central Drug Research Institute, Lucknow

Other Activities

1 Major Events Organized

Workshop on the Application of LC-QTOF-MS/MS and NMR Technique

Mass spectrometry (MS) is amongst the most important analytical tools as well as a fast developing research area in chemical and biological sciences. The versatility of HRMS technique in addressing divergent issues has attracted the researcher's attention in the recent past. There is a need to increase awareness among the prospective users of this technique. SAIF, CDRI has organized a Workshop on the applications of **LC-QTOF-MS/MS and NMR** techniques from 10th -12th February 2014. Sixteen (16) participants from different parts of India came to attend the workshop.

CSIR-CDRI Annual Day Celebrations 2014

CSIR-CDRI celebrated its 63rd Annual Day on the 17th February, 2014. During the morning session, the 39th Mellanby Memorial Lecture was delivered by Padmashri Prof. K. VijayRaghavan, Secretary, Department of Biotechnology, Govt. of India, in the memory of Institute's Founder Director Sir Edward Mellanby. The topic of his lecture was "Tense Situation: India is (was) the disease capital of the world". In his lecture, Prof. VijayRaghawan expressed his concern about increase in number of diabetic people and other group of diseases in India. He drew the attention of those involved with health sector to work together to see the notion about India gets wiped out these diseases as early as possible.

The Annual day's main programme was organized in afternoon with the graceful presence of Padmashri Prof. K. VijayRaghavan, as the Chief Guest and Dr. Dr. V.P. Kamboj, Former Director, CSIR-CDRI president of function. Dr. Sunil K. Puri, Acting 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.

Later, the Annual Report - 2013-14 was released by the distinguished guests on the dais, along with the distribution of Annual Awards for the best performing employees and students. On this occasion the prestigious CDRI Awards 2014 for Excellence in Drug Research has been declared. Dr. Sathees C. Raghavan, Associate Professor, IISc Bangalore, was awarded in Life Sciences category and Dr. Srinivas Hotha, Associate Professor, IISER Pune, was awarded in the Chemical Sciences category.

Dr. M.M. Dhar Best PhD Theses were awarded to Ms Moni Sharma for Chemical Sciences and Mr Abdul M Tyagi for Biological Sciences. Dr. Swarn Nityanand Award for women researchers Ms. Kainat Khan. Dr M.M. Khanna Memorial distinguished career achievement award-2014 for Pre-clinical & clinical Sciences to Ms Shalini Asthana and Dr M.M. Khanna Memorial early career achievement award to Ms. Pooja Jadia. Further, Excellence awards to the publications with impact factor greater than 5, patents that were granted abroad and best technology award were also awarded. Furthermore, the institute felicitated its employees completing 25 years of service.

Dr. V.P. Kamboj, in his presidential remarks praised the efforts made by the institute. He was delighted to visit this new campus and vested expectations on the shoulders 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 coming research teams. Mr Vinay Tripathi proposed vote of thanks and concluded the programme.

6th NIPER (RBL)-CSIR-CDRI Symposium on 'Current Scenario in Drug Discovery & Development'

NIPER (RBL) and CSIR-CDRI organized 6th Symposium on "Current Scenario in Drug Discovery & Development" from 20th-22nd February, 2014 The Chief Guest Prof. Y.K. Gupta, M.D., Professor and Head, Department of Pharmacology, All India Institute of Medical Sciences (AIIMS), New Delhi, inaugurated the function and delivered the inaugural lecture on "Challenges in Clinical Trials in India".Guest of Honour of the function was Prof. B.N. Dhawan, Former Director, CSIR-Central Drug Research Insititute, Lucknow. Scientific sessions during event were on Pharmaceutics, Clinical Pharmacology, Experimental Pharmacology, Pharmaceutical and Medicinal Chemistry and Current trends in disease research. Many scientists and researcher delivered the lectures. Students presented the posters.

One Day Mini Symposium on "Crystallography in Physics, Chemistry & Biology"

X-ray crystallography is a cutting edge technique to solve the 3D structures of macromolecules like proteins and also of small molecules and drugs. To Celebrate the International Year of Crystallography 2014 (Declared by The United Nations) CSIR-CDRI organized One Day Mini Symposium on "Crystallography in Physics, Chemistry & Biology" on 3rd March 2014. Prof. Dr. Robert Huber, Nobel Laureate from Max Planck Institute for Biochemistry, Germany was the Distinguished Guest of Honour. Dr S.K. Puri, Director CSIR-CDRI welcomed the guest. Presidential remarks were given by Dr. C M Gupta, former director, CSIR-CDRI. During the symposium, Dr. A.K. Shaw delivered a lecture on "Applications of X-ray crystallography in Medicinal chemistry: A CSIR-CDRI perspective," Dr. R. Ravishankar, on "Mycobacterial DNA Base-Excision-Repair pathway and New inhibitor discovery strategies" and Dr. Tejander Thakur, on "Crystal Structure Prediction of the Anhydrous form of Levofloxacin".

Study Tour Programme of Nepalese Delegation

A 12 member delegation from Department of Plant Resources, Thapathali, Kathmandu, Nepal visited CSIR-CDRI, Lucknow for two weeks study tour from March 03, 2014 to March 14, 2014. The objective of the study tour was to get acquainted with facilities available in various R & D divisions of CSIR-CDRI and interaction with scientists for training in the area of Identification, collection, processing and marketing of medicinal plants, Isolation of natural products including purification techniques, QA and stability and isolation techniques, Biological screening of plant extracts in laboratory animals, Drug delivery, Antimicrobial, antiviral and antimalarial drug evaluation, Breeding of laboratory animals, their care, management/genetic characterization of laboratory animals and genetic quality control of inbred strains etc.

Director, CSIR-CDRI, Lucknow, Dr S.K. Puri apprised them about the Institute's facilities and activities. Dr. D. N. Upadhyay, Senior Principal Scientist, Division of Science & Technology Management, coordinated the training program of the delegates. All delegates were overwhelmed with the hospitality and successful completion of their visit/training training at Institute.

Second Convocation of National Institute of Pharmaceutical Education and Research (NIPER), Raebareli

The second convocation of NIPER Raebareli was held on Monday 7th April, 2014 at its mentor Institute, CSIR-CDRI, Lucknow. The occasion was graced by the eminent Scientist Professor

Goverdhan Mehta, Padma Shri, FRS, FNA, FASc, FNASc, FTWAS, National Research Professor, School of Chemistry, University of Hyderabad, as the Chief Guest and Ms. Aradhana Johri, IAS, Secretary, Department of Pharmaceuticals, Ministry of Chemical & Fertilizers, Government of India presided over the function. Academic excellence of students was rewarded with Gold & Silver medals. Chief Guest Professor Goverdhan Mehta delivered the key note address and Ms. Aradhana Johri delivered an inspiring speech with emphasis on proper employment of the pass out students. Project Director Dr. P.K. Shukla presented the annual progress report of NIPER Raebareli.

World Laboratory Animal Day

The National Laboratory Animal Centre of CSIR-Central Drug Research Institute, Lucknow in collaboration with Laboratory Animal Science Association of India (LASAI) celebrated the World Laboratory Animal Day on April 24, 2014 to commemorate the great sacrifices of

the laboratory animal lives for the cause of mankind. The various lectures were delivered on Ethics, Welfare, Care & Use of laboratory animals for the education and Research, Science & Technology for human as well as animal welfare.

National Technology Day Celebrations

To commemorate the Technology Day, CSIR-Central Drug Research Institute, Lucknow invited Padmashri Dr. Lalji Singh, Eminent Scientist and Vice-Chancellor, Banaras Hindu University to deliver a talk and to share his vast experiences with science & technology with youngsters on May 13, 2014. Dr. Singh delivered a talk on What makes us Human? In his address he discussed about, our primate relatives, which split from our common ancestors millions of years ago, how their genomes could help us to solve mysteries about our

own evolution and medical problems. Genome of the chimpanzees, our closest living relatives, and our genome are 98.8% identical. The differences between the sequences will reveal the genetic basis for our mental and linguistic capacities and explain why we are susceptible to some diseases that do not affect the great apes. Thus, the story of what makes us special is written in our DNA, but not necessarily in our genes.

The dignitaries on the dais released the CSIR-CDRI Newsletter vol 5 no. 2 on this occasion also. After lecture an interactive session with the students, researchers and scientists were organized. Students from various schools and colleges from Lucknow visited the labs and interacted with scientist and witnessed how the technology develops in the field of drug discovery and how the new drug come from a long term research program. The program was concluded with vote of thanks by Mr. Vinay Tripathi.

CSIR-CDRI-BC Centre of Excellence in Flow Cytometry: Workshop on Flow Cytometry based Apoptosis and Cell cycle analysis

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 3rd-6th June, 2014. 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. A total of 12 shortlisted students 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 Paul- Product 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 participants by Dr. S.K. Puri (Director, CSIR-CDRI) and Ms. Jyoti Bhardwaj (student of Dr. SK Puri) received the first prize in Flow cytometry quiz competition

13th Dr. B. Mukerji Memorial Lecture

CSIR-CDRI, Lucknow organized 13th 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, June 24, 2014. On this occasion, Padma Bhushan Prof. G Padmanaban delivered the lecture on “From Basic Biology to Potential Therapeutic Leads in Malaria”. He said, recent estimates of malaria indicate that around 250 million people in the globe are infected. Mortality is estimated to be around 700,000. No vaccine is available, the parasite has become resistant to front-line antimalarials and resistance to artemisinin derivatives is around the corner. Renewed efforts are required to develop vaccines and new antimalarials/combination therapies.

After the lecture, CDRI Scientists Dr Atul Kumar and Dr Arun K Trivedi were felicitated for receiving the prestigious UPCST Awards “Vigyan Ratana” and “Yuva Vaigyanik”, respectively for their outstanding scientific work. The program was concluded with the vote of thanks by Shri Vinay Tripathi.

One Day Interaction Programme on Liquid Chromatography

Sophisticated Analytical Instrument Facility, CSIR-CDRI in collaboration with Waters India has organized a One Day Interaction

Programme on Liquid Chromatography on July 16, 2014 for the interested users from various labs of Institute. The main topic of discussion during the programme were, Introduction - Current analytical techniques updates, Basics of Column Chemistry- Critical parameters, Column selection - Meeting current challenges, Efficient method development approach and Column care & troubleshooting. After the programme in question answer session participants cleared their doubts about techniques.

Study Tour Programme of Ethiopian Delegation

A sixteen member high level delegation lead by Mr. Getachew Melese Belay, Chairperson, Science, Communication & Technology, Standing Committee of Federal Parliament, Ministry of Science & Technology, Ethiopia has visited the Institute on July 24, 2014. In this study tour, National Quality Infrastructure Program Advisor, Ms. Kristina Beck, Minister's Technology Advisor, Mr. Abdissa Yilma Tiky and Directors from Audit Service Directorate, PR & Communication, Supply & Procurement Administration Service, Institution's & Regional State's Support & Coordination Directorate along with some Technology Transfer Experts, Capacity Building Experts, Planning Experts and Policy Experts have participated. The objective of study tour was to learn the basic know-how required to establish a state-of-art Drug Research & Development Institute. Delegates were welcomed by Director CSIR-CDRI, Dr SK Puri and Dr Rajendra Prasad, Head, Business Development Division, shed light on achievements of CSIR-CDRI. After the detailed discussion with experts from different divisions, delegates visited the various facilities of Institute and get acquainted with the deep intricacies needed for a state-of-art laboratory. The study tour was completed with the departing remark from Mr. Vinay Tripathi Head S&T Management Unit.

Independence Day Celebration

Institute celebrated the Nations 68th Independence Day, with great enthusiasm and national pride. Dr. SK Puri, Director hoisted the national flag followed by the national anthem. He congratulated all the staff. students & family members of the Institute, and emphasized that the best way to pay homage to those brave sons of our nation, who fought for our independence, would be our dedication and commitment towards the progress of the nation. He added that since independence, India has made strident progress in all fronts. Today, our nation is a Polio free country; we are launching the satellites of other countries. CSIR is also contributing significantly in the growth of the nation. CSIR-CMMACS supercomputer launched in 2013 is the no. 1 in India, CSIR-NAL received Best Laboratory Award 2014 for successfully carrying out the drop tests of BRAHMOS-A from Su-30 MKI model. Similarly, CSIR-CDRI has also significant contributions in the growth of the Nation since inception. Institute played pivotal role in rejuvenation of the Indian Pharmaceutical Industries with much

economical and innovative process technologies and also made the essential and life saving drugs affordable for many. He hoped sustained contributions of Institute in the growth of Nation in coming years as well. Program concluded with Sweet distribution to all.

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 CSIR-Central Drug Research Institute, Lucknow observance of Sadbhawna 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.

Workshop on Plagiarism

CSIR-CDRI organized a workshop on Plagiarism on August 21, 2014. Dr. Ramesh C. Gaur, University Librarian, Jawaharlal Nehru University (JNU) New Delhi was the speaker on this occasion. In first session he explained what is Plagiarism, how to detect and avoid it? And in second session was Orientation session on TURNITIN: Anti-plagiarism software. During the workshop Dr. Gaur trained the participants about anti-plagiarism software TRUNITIN step-wise-step from, How to get an account and activate it, then Setting up your first course using the class setup wizard, then Setting up your first assignment using the assignment setup wizard, then Setting up student account using the student tab and finally Reviewing the received assignments.

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 9th-12th Sept, 2014. 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 11 students were shortlisted for the four 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. On the last day of the workshop Dr. Hemant Agarwal (Director, Flow Sols and Consultant FCS Express

Software) delivered his lecture on Flow cytometry data analysis and demonstrated the same using a third party software (FCS Express). The workshop was jointly conducted by Dr. Ritesh Kumar- Application Specialist and Mrs. Sakshi Paul- Product 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 participants by Dr. S.K. Puri (Director, CSIR-CDRI) and Mr. Yuvraj Singh (student of Dr. Manish Chaurasia) received the first prize in Flow cytometry quiz competition

Hindi Saptah

CSIR-CDRI celebrated "Hindi Saptah" from September 08-15, 2014. Various programs and competitions were organized during a weeklong celebration such as Hindi assay writing, Hindi translation, Hindi writing and noting, Hindi stenography, Hindi Debate, Rajbhasha quiz and Hindi poetry competitions, etc. The "Hindi Saptah" celebration was concluded with a grand "Kavi Sammelan" and prize distribution to the winners. Senior Hindi officer Mr. V. N. Tiwari proposed the vote of thanks to the participants.

Workshop on Mass Spectrometry and NMR techniques from 22nd -23rd Sep-2014

SAIF, CDRI has organized a Workshop on the applications of Mass and NMR techniques from September 22 -23 2014. Total 32 participants from different parts of India came to attend the workshop. The speakers and application people were all experts and had delivered the current state of art mass spectrometry techniques with the highlights of hot topics and potential future course of advances in mass spectrometry. The workshop provided a golden opportunity to experience the state of the art mass and NMR techniques.

CSIR Foundation Day Celebrations

CSIR-Central Drug Research Institute celebrated the 72nd CSIR Foundation Day on September 24, 2014. **Padmashri Prof. Vinod Kumar Singh,** Director, Indian Institute of Science Education & Research (IISER), Bhopal graced the occasion as Chief Guest and presented his distinguished work entitled "Organic Synthesis: From Creativity to Sustainability and Human Well-being". Further mementoes were given to colleagues completing 25 years of service in CSIR and to colleagues superannuated during Sep 2013 Aug 2014. Thereafter Prof. Vinod Kumar Singh along with other dignitaries on dais released CSIR-CDRI Newsletter (Vol.6 No.1, April to September, 2014). Prizes were awarded to the children of CSIR employees who secured more than 90% marks in Science subjects during inter mediate board exams. The prizes were also given to the winners of essay competition organised during the foundation day celebration.

Prestigious CSIR-CDRI Awards 2014 were bestowed to the selected winners after their award oration. Under Chemical Sciences the award was conferred to **Dr. Srinivas Hotha IISER, Pune.** Dr.

Hotha delivered award oration entitled "*Glycochemical Synthesis and its Significance in Mycobacteriology." For* Biological Sciences the award was conferred to **Dr. Sathees C. Raghavan, IISc, Bengaluru.** Dr. Raghwan delivered award oration entitled "*An Inhibitor of Nonhomologous DNA End Joining blocks Tumor Progression in Mice, and may Reduce Dose of Radiotherapy".*

The Foundation Day Celebration function ended with the vote of thanks by Mr. Vinay Tripathi.

One day Seminar on "Mass and NMR Techniques in Drug Research" 24th September- 2014

Sophisticated Analytical Instrument Facility (SAIF), CDRI has taken initiative to organize one day seminar cover organic chemistry, natural products/herbals/ayurveda/plant metabolomics, instrumentation/ quantitative analysis, drug metabolism and pharmacokinetics applications. There is a need to increase awareness among the prospective users of the mass and NMR technique. Total 55 participants from different universities/institution attended the seminar. The invited speakers Dr. K.P. Madhusudnan, Dr. R. Srinivas IICT, Hyderabad, Dr Raja Roy CBMRI, Lucknow and Dr Gopal vaidyanathan Waters India are all international experts in their respective areas and delivered talks on the current state of mass spectrometry and NMR techniques with the highlights of hot topics and potential future course of advances this area. This knowledge sharing session will definitely be beneficial for researches and may provide a new platform for them.

25th National Congress of Parasitology on "Global Challenges in the Management of Parasitic Diseases"

CSIR- Central Drug Research Institute, Lucknow and The Indian Society for Parasitology jointly organized 25th National Congress of Parasitology on **"Global Challenges in the Management of Parasitic Diseases"** from 16-18 October, 2014. Director CSIR-CDRI, Dr. S.K. Puri welcomed the guest and briefed about the three day's National Congress of Parasitology. Padma Bhushan Dr. Vinod P. Sharma, Founder Director, National Institute of Malaria Research and Additional Director General, Indian Council of Medical Research was the Chief Guest of this function. In his address he discussed the Research and Development of parasitic diseases in India. He told many parasitic diseases which have been eradicated from country due to the efforts of Parasitologists of India but many more are still need to be eradicated. He appreciated the contribution made by CDRI Scientists for developing low cost medicine to cure Malaria.

During the Inaugural program the Guest of Honour Dr. P. S. Ahuja, Director General, Council of Scientific & Industrial Research, showed his concern for making our country free from infectious

and parasitic diseases. In his address to the participants he urged to the young researcher to do the targeted research for making India a parasitic disease free country. At this occasion, the President of Indian Society of Parasitology, Dr. S. L. Hoti, briefed the mandate of society and appreciated the efforts made by CDRI team for organizing this congress.

The conference was attended by more than two hundred distinguished delegates from all over the country. The conference was concluded with the plenary talk of chief guest of Valedictory Session, Dr. V. M. Katoch, Secretary to Govt. of India (DHR), Ministry of Health and Family Welfare and DG, ICMR, New Delhi. In his talk he emphasized that parasitic research should be more practical rather it remain in books only. The ignorance towards occurrence of parasitic diseases cases must be avoided. After his talk, he conferred the awards for BN Singh oration award, Dr. BP Pandey memorial lecture award and Young Scientists awards for best scientific research in Parasitology, best poster awards for young researchers and Dr. MB Mirza award for best publication in Parasitology. The conference was brought to a close after a vote of thanks by the organizing secretary, Dr. JK Srivastava.

43rd National Seminar on Crystallography

Year 2014 has been declared as the 'International Year of Crystallography' by the United Nations because of the invaluable role played by the discipline in many areas of human endeavor. The 43rd National Seminar on Crystallography (NSC43c) was held under the aegis of the Indian Crystallographic Association (ICA) at the CSIR-Central Drug Research Institute, Lucknow during 12 – 14 November 2014.

Dr. Girish Sahni, Director, CSIR–Institute of Microbial Technology was the Chief Guest for the Inaugural event. Dr. Girish

Sahni delivered Inaugural Address entitled 'Tweaking Mechanistic Insights from Crystallography Using Complementary Approaches'. Prof. Tej P. Singh from All India Institute of Medical Sciences, New Delhi delivered a plenary lecture on Structure based evidence of antibiotic action of innate immunity proteins and their therapeutic applications at inauguration day.

The 43rd National Seminar on Crystallography witnessed various sessions of intense deliberations on Molecular structural biology and Crystallography. About 50, eminent scientists/researcher from the premier Institutes of country delivered their talks during various sessions. Dr Ravishankar proposed the vote of thanks for contributors for successful organization of event during the valedictory function.

Clinrescon 2014

A National Symposium on clinical trials and adverse drug reaction "**Clinrescon 2014**" was inaugurated by Dr. Raj Malhotra, Acting Vice Chancellor and Dean, King George Medical University, Lucknow. Dr. Ram Vishwakarma, Director CDRI emphasized the

importance of monitoring adverse drug reaction. Dr. Ashim Ghatak, Chairman, Organizing Committee, welcomed all guests and appraised the importance of this symposium. The symposium was graced with guest of honor Prof. Y. K. Gupta, Head, Department of Pharmacology, All India Institute of Medical Sciences (AIIMS), New Delhi; Dr. Nilima Kshirsagar, National Chair in Clinical Pharmacology, Indian Council of Medical Research (ICMR), Govt. of India, New Delhi and Dean ESI-PGIMSR MGM Hospital, Mumbai; Ms. Annam Visala, Deputy Drug Controller General India CDSCO, New Delhi and Dr. Sarala Balachandran, Project Director, OSDD Unit, CSIR, New Delhi.

Dr. Vivek Bhosale, Secretary, Organizing Committee, proposed vote of thanks and announced that the Centre for Adverse Drug Reaction Monitoring is functional at the Institute and requested all healthcare professionals and consumers to send information to CSIR-CDRI.

XXXVIII All India Cell Biology Conference & International Symposium on Cellular Response to Drugs

38Th All India Cell Biology Conference and International Symposium on "Cellular Response to Drugs" were organized from December 10-12 2014 at CSIR-Central Drug Research Institute, Lucknow. The symposium was inaugurated with the Presidential Address of Prof. B.N. Singh, President of Indian Society of Cell Biology. He gave brief introduction to Cell Biology and its development in the last decade and briefed about the chromosome studies, autoradiography and gene expression studies, its importance in the development of molecular biology. He added that isolation of macromolecules like DNA, RNA and proteins given opportunity to study the mechanisms and leads to new developments. The inaugural lecture was delivered by Prof S.C. Lakhotia, BHU, Varanasi and emphasised on understanding of cell biological basis of *Ayurveda Rasayana* formulations using scientific basis. Ayurveda, the age-old traditional health-care system in India has suffered in recent times because of absence of in-depth rigorous scientific studies on modes of actions of its practices and formulations. For the first time, his studies suggested potential therapeutic applications of *Ayurvedic Rasayans* and *Ras-sindoors* in providing holistic relief from the increasing societal burden of neurodegenerative disorders.

The three day symposium witnessed various sessions of intense deliberations on different aspects of Cell biology. More than hundred, eminent scientists/researcher from the premier Institutes of country delivered their talks and presented posters during various sessions. Dr B.N. Singh and Dr. S.K. Rath proposed the vote of thanks for contributors for successful organization of event during the valedictory function.

One Day Symposium on "Drug Discovery in India: Past, Present and Future" on 90th Birth Anniversary of Padmashri Dr . Nitya Anand

CSIR-Central Drug Research Institute, Lucknow organized a One Day Symposium on "Drug Discovery in India: Past, Present and Future" on 90th Birth Anniversary of Padmashri Dr. Nitya Anand on January,1 2015. He is a legendary figure in the field of Drug Discovery & Development. On this occasion, many renowned personalities from the field of Drug Discovery and Development assembled in this symposium to honour the legend. Director CSIR-CDRI Dr. RA Vishwakarma welcomed Dr Nitya Anand and other guests. In first session of symposium, Padma Bhushan Prof. G.P. Talwar discussed about the development of vaccines for fertility control. The vaccines were found therapeutic application against Prostate and Breast cancer and other type of cancers. His vaccines are developed in India and are ready to launch for human uses. Dr K. Nagrajan, Corporate Advisor, Hikel R&D Centre Bangaluru, briefed about Drug Discovery in India. He discussed some requirements for successful New Drug development and emphasized upon advancement of bio therapeutics in India. Dr. B.N. Dhawan, Ex-Director, CSIR-CDRI, chaired this session.

In the second session, more than 50 research scholars presented their research work in poster form related to recent advances in Drug Discovery. In third session, Dr. V.P. Kamboj, Ex-Director, CSIR-CDRI chaired the session and Dr A.V. Ramarao, Chairman & Managing Director, Avra Laboratories Pvt. Ltd., Hyderabad delivered a talk on Drug Discovery In India: Past Present and Future and shared his experiences of commercialization, R&D activities in his own venture named Avra. He also discussed his reminiscences with Dr. Nitya Anand. Many other colleagues and students of Dr. Nitya Anand shared their reminiscences on this occasion. Dr. Nitya Anand shared his vast experiences since hid joining to this institute. Dr. R.A. Vishwakarma, Director, CSIR-CDRI, felicitated Dr. Nitya Anand at the closing of Symposium.

2 Distinguished Visitors

Distinguished Visitors

Mr. Jorge Cardenas Robles
Ambassador of Bolivia
Visited Institute to explore the opportunities for bilateral research collaborations on 31.10.2014

Other Visitors & Lectures

Name and Address	Topic	Date
Dr. Anupam Hazra Thomas Jefferson University Philadelphia, USA	β-adrenergic modulation of epileptiform dynamics *in vitro*: molecular, cellular and circuit mechanisms	24.01. 2014
Prof. T. Punniyamurthy Indian Institute of Technology, Guwahati	Development of small novel molecules of medicinal and biological interest	10.04.2014
Mr. Amitabh Shrivastava CEO, CSIR-Tech Pvt. Ltd. (CTPL) Pune	Catalyzing Lab to Market Journeys	15.04.2014
Dr. Sanjeeva Srivastava Indian Institute of Technology, Bombay	Proteomics and Systems level tools for translational research	28.05.2014
Dr. Amit Gupta Forest & Environment Dept. Govt. of India	Sustaining environment in one's daily life	16.07.2014
Dr. Deepak Modi National Institute for Research in Reproductive Health (ICMR), Mumbai	Decidual control of trophoblast invasion requires HOX-STAT cross talk	04.08.2014
Dr. Kelly Lundsten BioLegend, Inc. California, USA	Multicolor Flow Cytometry: Intercellular and transcription factor staining in T helper subsets	27.08.2014
Dr. Akash Guliyani, National Centre for Biological Sciences, Bangaluru	Let there be light: Optical methods and biosensors for cellular and organismal dynamics	27.08.2014

Student Delegations

Sl. No.	Student Delegation	No. of Members	Date
1	SN (PG) College, Azamagarh	27	24.01.2014
2	Department of Zoology, Aligarh Muslim University, Aligarh	07	24.03.2014
3	Delhi Public School, Jankipuram Lucknow	30	26.09.2014
4	Kendriya Vidyalaya, Bakshi ka Talab Lucknow	30	26.09.2014
5	Central Academy, Lucknow	30	26.09.2014
6	Allahabad University, Allahabad	35	26.09.2014
7	Lucknow University, Lucknow	20	26.09.2014
8	Saraswati Dental College, Lucknow	50	26.09.2014
9	Department of Botany, Gauhati University, Assam	39	05.11.2014
10	Saaii College of Medical Science & Technology, Kanpur	15	07.11.2014
11	Air Force School Bamrauli, Allahabad	15	26.11.2014

3 Invited Lectures Delivered by Institute Scientists

Dr. B. Kundu

- Drug discovery: the search for a needle in haystack, Amrita Pharmaceutical Conference 2014, Amrita Vishawa Vidyapeetham, Kochi, Kerala, 29 August, 2014

Dr. M. Dikshit

- Potential anti-thrombotic efficacy and inhibition of collagen mediated platelet activation by CDRI compound S007-867, Delhi Institute of Pharmaceutical Sciences & Research, New Delhi, 01 February, 2014
- Nitric oxide, Nitric oxide synthases and Neutrophils, Biochemistry department, Indian Institute of Sciences, Bengaluru, 24 March, 2014
- Importance of inducible nitric oxide synthase (iNOS) in microbial killing and apoptosis of human neutrophils, CCMB, Hyderabad, 25 April, 2014
- Involvement of L-plastin and â-actin glutathionylation in the reduced chemotaxis of human neutrophils: Implication in the impaired neutrophil functions in the diabetic subjects, Paris, France, 26 May, 2014
- An overview of diabetes research in India, DBT-Danish Innovation Foundation meeting at Copenhagen, 05 September, 2014
- Initial plaque instability and subsequent regression of accelerated iliac artery atherosclerosis in rabbits following cholesterol diet withdrawal, K.G. Medical University, Lucknow, 26 November, 2014
- The regulatory role of inducible nitric oxide synthase in microbial killing and neutrophil apoptosis, 38th All India Cell Biology Conference at CDRI Lucknow, 10 December, 2014

Dr. Anuradha Dube

- Reporter gene tagged Leishmania parasite and its relevance to Experimental Biology particularly for drug discovery, School of Life Sciences, JNU, New Delhi, 28 March, 2014
- Approaches for identification and development of potential drug and effective vaccine against visceral Leishmaniasis, Department of Biomaterials, IICT, Hyderabad, 30 July, 2014

Dr. Rakesh Shukla

- Contribution of astroglial cells to the development of Alzheimer's disease pathology, Department of Neurophysiology, NIMHANS, Bengaluru,02 November, 2014
- Concept of Safety Pharmacological Studies, Amity Institute of Pharmacy, Amity University, Lucknow, 15 September, 2014

Dr. A.K. Sinha

- Green Chemistry Approaches for Organic Synthesis and Natural Product Chemistry: A Step-economic Process for Bioactive Phenolics, Amalgamation of Academic and Industrial Green Chemistry, Amity University, Lucknow, 13 January, 2014
- Green Chemistry Approaches for Organic Synthesis and Natural Product Chemistry: A Step-economic Process for Bioactive Phenolics, Department of Chemistry, University of Delhi, Delhi, 02 March, 2014
- Strategies Towards Step Economic and protection-group-free Synthesis of Some Natural and Non-natural Bioactive Polyphenolic Compounds, Nature Inspired Initiatives in Chemical Trends (NIICT), Hyderabad, 04 March, 2014
- Nature Inspired Green Protocols Towards Synthesis of Some Bioactive Polyphenolic Compounds, NIPER, Mohali, 08 September, 2014
- Nature Inspired Green Protocols Towards Synthesis of Some Bioactive Polyphenolic Compounds: Strategic Application of Classical Name Reactions in One Pot, IISc, Bengaluru, 17 December, 2014

Dr. R. K. Singh

- Environmental toxicology of commonly used fertilizers in Fresh Water Fishes of River Gomti, Lucknow Amity University, Noida, 28 January, 2014
- Recent development in Nano-materials for Reproductive Health, Chandrigarh,13 February, 2014
- Recent developments in Nanotechnology based Reproductive Biomedicine in India TIT College of Pharmacy, Bhopal, 7 March 2014
- Molecular Mechanism of Anti-Prostate Cancer Activity of RISUGadv, Amity University, Noida, 13 March, 2014
- A Molecular Approach to ameliorative effects of *Dillenia indica* leaf extract on Phenylhydrazine induced hemolytic anaemia in rats, Dehradun, 21 March 2014.
- Alternative Methods for *In vitro* Toxicological Evaluation of Hematopoietic Drugs, Govt. New Science College, Rewa, 26 April, 2014
- Haematopoietic assays as substitute of *in-vitro* hematotoxicity for new drug, North Maharastra University Jalgaon,1 December, 2014

Dr. D. S. Upadhyay

- Laboratory animal health monitoring, as pre-requisite to characterize animal test-system in biomedical research and testing programmes,Banaras Hindu University, Varanasi, 17 February, 2014
- Zoonotic and public health hazards associated with nonhuman primates maintained under captive laboratory conditions and precautions to avoid such problems, PUSA, New Delhi, 25 November, 2014

Dr. Atul Kumar

- Molecular Design, Synthesis of newer Anti-cancer Agents, DDU Gorakhpur University, 02 March, 2014

Dr. Sanjay Batra

- Decarboxylative reaction as a new alternative for coupling, Gorakhpur University, Gorakhpur, 08 August, 2014
- Repositioning of Drugs-Structure-based approach towards finding new leads as anti-leishmanial agents, NIPER, Mohali, 09 September, 2014
- Repositioning of Drugs-Structure-based approach towards finding new leads as anti-leishmanial agents, Mumbai, 12 September, 2014
- Cooperative catalysis orchestrated enantioselective synthesis of Canthin-4-ones, NIIST Trivandrum, 09 October, 2014
- Drug Repositioning as an innovative strategy to boost drug discovery efforts Recent Advances in Medicinal Chemistry, Christian College, Lucknow, 07 November, 2014
- Isonitrile-insertion as a novel route to 1,3-benzothiazines and prolinamides with potent antithrombotic activity, Puducherry, 10 November, 2014
- Palladium-catalysed regioselective oxidative dimerization or hydroxylation in N-arylpyrazoles via Aryl C-H activation, New Directions in Chemical Synthesis, IIT Bombay, Mumbai, 09 December, 2014

Dr. T. Narender

- Lead molecules from Indian Medicinal Plants for Metabolic and Infectious diseases, Department of Chemistry, University of Delhi, Delhi, India, 03 March 2014
- Application of Biotechnology in Natural Products Drug Discovery, Tumkur University, 27 September, 2014
- Isolation of Antihyperlipidemic and Anticancer compounds from the Indian Medicinal Plants and their Chemical Transformations, Bundelkhand University, Jhansi, 14 November, 2014
- Bioactive Compounds from the Indian Medicinal Plants for Metabolic and Cancer disease, NIPER, Mohali, 20 November, 2014
- Isolation of Antihyperlipidemic compounds from the Indian Medicinal plants and their Chemical transformations, KGMU, Lucknow, 26 November, 2014
- Isolation of Bioactive compounds from Indian Medicinal Plants for Metabolic Diseases, Dr. Bhanuben Nanavati College of Pharmacy, SVKM Campus, Mumbai, 22 December, 2014

Dr. B.N. Singh

- Drug-resistance in Tuberculosis and Anti-tuberculosis drug development, NIPER, Raebareli, 19 September, 2014
- Genetics and Human Health" Lucknow University, 20 September, 2014

Dr. Manoj Kumar Barthwal

- TLR signalling and Vascular inflammation: Potential Therapeutic Targets in Atherosclerosis, KGMU Lucknow, 25 November, 2014

Dr. Monika Sachdev

- An Egg Metalloprotease plays a key role during Fertilization in Mammals, IVRI, Izatnagar, Bareilly, 08 February, 2014

Dr. Kashif Hanif

- Right ventricle dysfunction in pulmonary hypertension: Role of Poly (ADP-Ribose) Polymearse-1, Leh, Ladhakh, Jammu and Kashmir, 19 September, 2014
- Role of Poly (ADP-Ribose) Polymearse-1 in pulmonary hypertension, KGMU Lucknow, 27 November, 2014

Dr. Prem Prakash Yadav

- Heterocyclic organic compounds in chemotherapy of malaria, DDU Gorakhpur University, 02 March, 2014

Dr. Wahajuddin

- Exploring Bio-analytical Chemistry Approaches for Analytical Toxicology Applications, GB Pant University of Agriculture & Technology, Pantnagar, 10 October, 2014
- Role of Pharmacist in Health Care, Department of Pharmaceutical Sciences, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, 21 November, 2014

Dr. Vivek V. Bhosale

- Design & Review of Clinical trial protocol (including method of randomization) and Clinical trial report, New Delhi, 22 January, 2014
- Recent Changes in Regulation of Clinical trials and Compensation for research related injury and GCP-Good Clinical Practice Guidelines, Srinagar, Pauri Garhwal, Uttarakhand, 03 June, 2014
- Overview of some newer drugs under clinical trials for treatment of diabetes mellitus, CDRI Lucknow, 21 February, 2014

4 Visits & Deputations Abroad

Scientist/Technical Officer	Country of Visit	Purpose of Visit (Period of Deputation)
Dr. Madhu Dikshit	France	To attend the meeting (26 May 2014)
	Denmark	To participate in workshop on Challenges in Health Research, Indo-Danish Research Collaboration (4 to 5 September 2014)
Dr. Prem Man Singh Chauhan	Germany	For discussion on joint DST-DFG Research Project (24 November to 3 December 2014)
Dr. Neeloo Singh	Turkey	For INSA-Turkish academy of Science (TUBA) Exchange of Scientist Programme (09th to 13th June 2014)
	Mexico	Invited to deliver a talk in 13th International Congress of Parasitology (10 to 15 August, 2014)
Dr. Srikanta Kumar Rath	USA	Invited to undertake training in the Phase-II, Safety Risk Assessment of foods Derived from Genetically Engineered Plants (15 to 19 September 2014)
Dr. Amit Mishra	Australia	To attend the 5th FIP Pharmaceutical Sciences World Congress (13 to 16 April 2014)
	Japan	To attend the 5th Indo- Japanese International Joint Symposium on Overcoming Intractable Infectious Diseases Prevalent in Asian Countries (16 to17 September2014)
	Norway	To attend the meeting and preparing a collaborative grant application (6 to 9 January 2015)
Dr. J. Venktesh Pratap	France	To collect the data on BM14 Beamline at Eurapian Synchroton facility (12 to 18 February 2014)
Dr. Kalyan Mitra	Japan	For advanced applications training for JEOL JEM-1400 Electron Microscope (12 to 23 May 2014)
Dr. Ravishanker Ampapati	USA	For VNMRS hardware maintenance training (18 to 27 February 2014)
Dr. Kumaravelu Jagavelu	UK	To attend seminar on Novel Therapeutics in Vascular Disorder (10 to 12 December 2014)
Dr. Sajeev K. Shukla	Switzerland	For NMR advance training (31 March to 4 April 2014)
Dr. Sripathi R. Kulkarni	USA	Invited as visiting Professor in the Centre of Law, Technology and Arts (January 2014 to January 2015)
Dr. Sarika	USA	For advance research at South-West Medical Center Texas University (30 October to 29 October 2014)
Dr. Namrata Rastogi	Germany	For INSA-DFG academy of Science Exchange of Scientist Programme (03 July to 30 September 2014)
Dr. Rajesh Kumar Jha	USA	For Participation in the 47th Annual Meeting of the Society for the Study of Reproduction (19 to 23 July 2014)
Dr. Tejender Singh Thakur	Germany	To attend a workshop on the application of SAXS and synchrotron facility (09 to 20 September 2014)
Dr. Jiaur Rahaman Gayen	Germany	Invited to conduct his research project with Prof. Dr. Michael Roden, Director German Diabetes Centre (01 November 2014 to 30 April 2015)
Mr. Vinod Sav	Switzerland	For NMR advance training (31 March to 4 April 2014)
Mr. Anil K. Kalasadan	USA	For NMR advance training (12 to 21 March 2014)

5 Membership of Distinguished Committees / Boards

Dr. Ram A Vishwakarma

Chairman, Expert Group on Translational Research for Products and Processes from Medicinal and Aromatic Plants of the Department of Biotechnology (Govt. of India)

Member, (1) Task Force of "Public Health including Food and Nutritional Interventions", Department of Biotechnology (Govt. of India); (2) Expert Committee on Drugs & Pharmaceuticals Research Program, Department of Science and Technology (Govt. of India); (3) Research Council, CSIR - Institute of Himalayan Bio-Resources and Technology, Palampur; (4) Court of the Central University of Jammu; (5) Executive Committee, Central University of Kashmir; (1) American Chemical Society, USA; (6) Royal Society of Chemistry (UK); and (7) Finance Committee of the Central University of Kashmir.

Editorial Board Member, (1) *Journal of Chemical Sciences"* (published by the Indian Academy of Sciences, Bangalore; (2)"*Proc. Natl. Acad. Sci. India"* (published by the Indian National Science Academy (INSA), New Delhi.

Grant-Reviewer, (1) American (NSF), (2) British (Welcome-Trust) and (3) Indian (DBT, DST and CSIR) national funding agencies

Dr. SK Puri

Member, (1) Scientific Advisory Committee**,** Vector Control Research Centre, Puducherry; (2) Institutional Animal Ethics Committee, Indian Animal Supplier, Lucknow (3) Drugs Technical Advisory Board, Directorate General of Health Services

Vice President, Indian Society for Parasitology

Dr. C Nath

Life Member, (1) International Brain Research Organization; (2) National Academy of Medical Sciences

Member, (1) Research Council (DG nominee), CSIR-Indian Institute of Toxicological Research; (2) Expert Committee for Biotherapeutic Products, Drug Controller General of India, Ministry of Health, Government of India; (3) Academic Council, JNU, New Delhi; (4) Advisory Committee for IND permission, Drug Controller General of India; (5) Institutional Ethics Committee, SG Post Graduate Institute of Medical Sciences, Lucknow; (6) Institutional Animal Ethics Committee, K G Medical University, Lucknow

Dr. Madhu Dikshit

Member, (1) Indian Council of Medical Research (Project Advisory Committee of Basic Medical sciences); (2) Council of Scientific Industrial Research (Organic & Medicinal Chemistry and Chemical Technology Res Committee); (3) Fellow Selection Committee Indian Academy of Sciences; (4) Ethics Committee, Center of Biomedical Research, Lucknow; (5) DBT RCGM committee; (6) Ethics Committee, King George's Medical University, Lucknow

Member, Editorial Board, (1) Indian J. Pharmacology, (2) Proceedings of the National Academy Sciences India (Sec B)

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 Councillor, Executive Committee of South Asian Chapter of American College of Clinical Pharmacology, Mumbai, India

Dr. Anuradha Dube

Member, **Editorial Board**, (1) Journal of Biomedical Research; (2) BioMed Central, Infectious Diseases (Open Access)

Dr. JK Saxena

Secretary, Indian Society for Parasitology

Vice President, Society of Biologists and Chemists

Member, (1) Editorial Board, Asian Pacific Journal of Tropical Medicine; (2) Expert committee for Chemical and Pharmaceutical Sciences, UPCST, Lucknow

Dr. RP Tripathi

Editorial Board Member, (1) ARKIVOC; (2) Journal of Organic Biological Chemistry

Dr. Neeraj Sinha

Life Member, (1) National Academy of Sciences, Allahabad

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 Sub-Committee 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. VL Sharma

Member, Research & Development Committee, Department of Pharmacy, Integral 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, Government of India

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

Dr. R Ravishankar

Member, Working group on new TB drugs (WGND),

Dr. Srikanta Kumar Rath

Member, **Editorial Board**, Toxicology International

Dr. Amit Misra

Member, Expert Committee on Tuberculosis, Department of Biotechnology

Vice-President, Asian Federation for Pharmaceutical Sciences

Dr. Sanjay Batra

Member, (1) Council of NOST, India (2011-2014); (2) 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, National Academy of Sciences, Allahabad, India

Dr. KR Arya

Joint Secretary, Society of Ethnobotanists (2014-2017), National Botanical Research Institute (NBRI), Lucknow

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

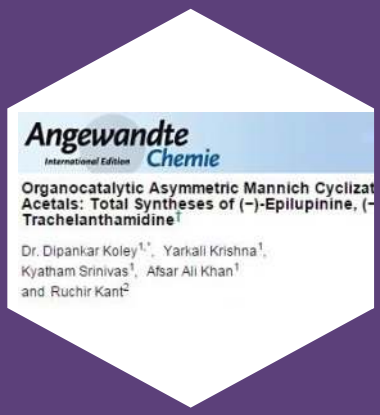
Dr. Wahajuddin

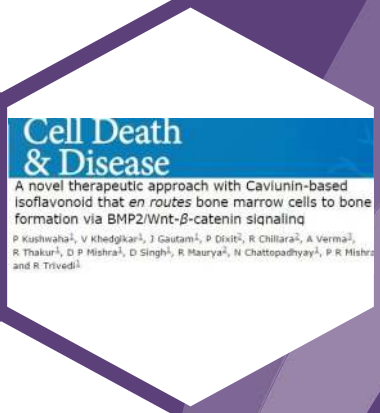
Member, **Editorial Board**, (1) Journal of Bioequivalence & Bioavailability; (2) Analytica Pharmaceutica Acta; (3) Pharmaceutical Regulatory Affairs

Life Member, National Academy of Sciences (India)

Dr. HK Bora

Member, Assam Veterinary Council, Constitute under Veterinary Council India





अनुसंधान उपलब्धियाँ

CSIR-Central Drug Research Institute, Lucknow

अनुसंधान उपलब्धियाँ

1 पेटेण्ट्स

विदेशों मे स्वीकृत पेटेण्ट्स

2014

1. **यूएस पेटेण्ट संख्याः** 89215417 **आवंटन की तिथिः** 30.12.2014
शीर्षकः मेथड ऑफ ट्रीटिंग डिस्लिपिडिमिया यूजिंग नेच्युरली अकरिंग डाइटरपीन्स
अन्वेषकः कोनेनि व्यंकट शशिधरा, अन्जु पुरी, एवं जम्मीकुन्तला नागा रोसैया
सहायक सदस्यः सूर्य प्रताप सिंह, जय कुमार जोशी, नूर जहां, के.के. यादव, देवदत्त एवं राम जीवन

2. **यूएस पेटेण्ट संख्याः** 8815940 **आवंटन की तिथिः** 26.08.2014
शीर्षकः कौमारिन–चाल्कोन्स एज एण्टिकैन्सर एजेन्ट्स
अन्वेषकः कोनेनि व्यंकट शशिधरा, अबधेश कुमार, मनोज कुमार, जयन्त सरकार एवं सुधीर कुमार सिन्हा
सहायक सदस्यः संजीव मीना

3. **आस्ट्रेलियाई पेटेण्ट संख्याः** 2010217238 **आवंटन की तिथिः** 19.07.2014
शीर्षकः पॉलीमेरिक नैनोमैट्रिक्स एसोसिएटेड डिलीवरी ऑफ़ कैम्पफेरोल इन रैट्स टू इम्प्रूव इट्स ओस्टियोजेनिक एक्शन
अन्वेषकः प्रभात रंजन मिश्रा, रितु त्रिवेदी, गिरीश कुमार गुप्ता, अविनाश कुमार, वर्षा गुप्ता, श्रीकांत कुमार रथ, कामिनी श्रीवास्तव, नैबेद्य चट्टोपाध्याय एवं अनिल कुमार द्विवेदी
सहायक सदस्यः महेश चन्द्र तिवारी एवं गीत कुमार नागर

4. **यूएस पेटेण्ट संख्याः** 8686028 **आवंटन की तिथिः** 01.04.2014
शीर्षकः सब्स्टिट्यूटेड बेन्जफयूरोक्रोमीन्स् एण्ड रिलेटेड कम्पाउण्ड्स फॉर द प्रिवेंशन एण्ड ट्रीटमेंट ऑफ बोन रिलेटेड डिस्आर्डर्स
अन्वेषकः अतुल गोयल, अमित कुमार, सुमित चौरसिया, दिव्या सिंह, अबनीश कुमार गौतम, रश्मि पाण्डेय, ऋतु त्रिवेदी, मनमोहन सिंह, नैबेद्य चट्टोपाध्याय, लक्ष्मी मणिकावासगम, गिरीश कुमार जैन एवं अनिल कुमार द्विवेदी
सहायक सदस्यः अब्दुल मलिक एवं अविनाश कुमार

5. **यूएस पेटेण्ट संख्याः** 8669232 **आवंटन की तिथिः** 11.03.2014
शीर्षकः फलावोनोल कम्पाउण्ड्स, ए बायोएक्टिव एक्स्ट्रैक्ट/फ्रैक्शन फ्रॉम *अल्मस वल्लिचियाना* एण्ड इट्स कम्पाउण्ड्स फॉर प्रिवेंशन एण्ड ट्रीटमेन्ट ऑफ ओस्टियो–हेल्थ रिलेटेड डिस्आर्डर्स
अन्वेषकः राकेश मौर्या, प्रीति रावत, कुणाल शरण, जावेद अख्तर सिद्दिकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मणिकावासगम, गिरीश कुमार जैन, कमल राम आर्या एवं नैबेद्य चट्टोपाध्याय
सहायक सदस्यः सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त एवं अमृता केन्दुरकर

भारत मे स्वीकृत पेटेण्ट्स

2013 (पूर्व वार्षिक प्रतिवेदन में सम्मिलित नहीं)

1. **इंडियन पेटेन्ट नंः** 258216 **आवंटन की तिथिः** 18.12.2013
शीर्षकः नॉवेल एल्काइल अमीनो सब्सट्यूटेड नेफ्थो (1, 2–डी) ऑक्जोल
अन्वेषकः परवेज अहमद, प्रीति तिवारी, बृजेन्द्र कुमार त्रिपाठी, अरविन्द कुमार श्रीवास्तव एवं अतुल कुमार

2. **इंडियन पेटेन्ट नंः** 258311 **आवंटन की तिथिः** 30.12.2013
शीर्षकः कंपोजीशन एण्ड मेथड्स ऑफ नॉनआयनक सर्फेक्टेन्ट बेस्ड बेसिकुलर फॉर्मुलेशन फॉर इम्प्रूण्ड डिलेवरी ऑफ सायक्लोस्पोरिन
अन्वेषकः प्रभात रंजन मिश्रा, ब्यूर प्रसाद, अनिल कुमार द्विवेदी एवं सत्यवान सिंह

विदेशों में आवेदित पेटेण्ट

2014

1. **यूएस आवेदन सं:** 14/382428 **आवेदन की तिथि:** 02.09.2014
शीर्षक: एनईएफ–एएसके1 इन्टरैक्शन इन्हिविटर एज नोवेल एण्टि–एचआइवी थेरेप्यूटिक्स
अन्वेषक: राज कमल त्रिपाठी, बलवंत कुमार, रविशंकर रामचंद्रन, जितेंद्र कुमार त्रिपाठी, स्मृति भदौरिया एवं जिमुत कांति घोष

2. **पीसीटी आवेदन सं.:** पीसीटी/आईएन2014/000556 **आवेदन की तिथि:** 29.08.2014
शीर्षक: नोवेल एरिल नेथिल मीथेनोन ऑक्जिम डेरिवेटिव्स फॉर द ट्रीटमेंन्ट ऑफ हिमेटोलॉजिकल मेलिग्नेन्सीज एण्ड सोलिड ट्यूमर्स
अन्वेषक: साब्यसाची सान्याल, अतुल कुमार, नैबेद्य चट्टोपाध्याय, जवाहर लाल, अरूण कुमार त्रिवेदी, दीपक दत्ता, श्रीकान्त कुमार रथ, तहसीन अख्तर, शैलेन्द्र कुमार धर द्विवेदी, मनीषा यादव, बन्दना चक्रवर्ती, अभिषेक कुमार सिंह, जयशरण मिश्रा, निधि सिंह एवं अनिल कुमार त्रिपाठी

3. **यूरोप आवेदन सं.:** 13708242.6 **आवेदन की तिथि:** 31.07.2014
शीर्षक: नॉवेल सब्स्टिट्युटेड 2एच–बेंजो(इ)ईन्डाजोल–9–कार्बोक्सिलेट्स फॉर द ट्रीटमेन्ट ऑफ़ डायबिटीज़ एण्ड रिलेटेड मेटोबोलिक डिस्आर्डर्स
अन्वेषक: अतुल गोयल, गौरव तनेजा, नेहा राहुजा, अरूण कुमार रावत, नताशा जायसवाल, अखिलेश कुमार ताम्रकार एवं अरविन्द कुमार श्रीवास्तव

4. **यूएस आवेदन सं:** 14/376097 **आवेदन की तिथि:** 31.07.2014
शीर्षक: नॉवेल सब्स्टिट्युटेड 2एच–बेंजो(इ)ईन्डाजोल–9–कार्बोक्सिलेट्स फॉर द ट्रीटमेन्ट ऑफ़ डायबिटीज़ एण्ड रिलेटेड मेटोबोलिक डिस्आर्डर्स
अन्वेषक: अतुल गोयल, गौरव तनेजा, नेहा राहुजा, अरूण कुमार रावत, नताशा जायसवाल, अखिलेश कुमार ताम्रकार एवं अरविन्द कुमार श्रीवास्तव

5. **पीसीटी आवेदन सं.:** पीसीटी/आईएन2014/000475 **आवेदन की तिथि:** 16.07.2014
शीर्षक: प्रोटिआज़ोमल इन्हिबिटर्स यूज़फुल फॉर ओस्टियोजेनिक एक्टिविटी एण्ड फार्मास्युटिकल कम्पोजीशन देअर ऑफ़ (ओस्टियोहील)
अन्वेषक: रितु त्रिवेदी, प्रभात रंजन मिश्रा, नीलम सिंह सांगवान, प्रबोध त्रिवेदी, दिव्या सिंह, राजेन्द्र सिंह सांगवान, प्रियंका कुशवाहा, विक्रम खेड्गिकर, सुलेखा अधिकारी, धर्मेन्द्र चौधरी, ज्योति स्वरूप, अविनाश कुमार, अनिरूद्ध करवन्दे, अश्विनी वर्मा एवं श्वेता शर्मा
सहायक सदस्य: नसीर अहमद

6. **पीसीटी आवेदन सं.:** पीसीटी/आईएन2014/000464 **आवेदन की तिथि:** 14.07.2014
शीर्षक: अल्मोसाइड–ए–डिराइब्ड कम्पाउण्ड फ्रॉम *अल्मस वल्लिचियाना* प्लॉनकॉन यूज़फुल फॉर प्रिवेंशन ऑर क्योर ऑफ मेटाबालिक डिज़ीज़ेस
अन्वेषक: साब्यासाची सान्याल, नैबेद्य चट्टोपाध्याय, राकेश मौर्या, जियाउर रहमान गाइन, स्मृति भदौरिया, अरुण कुमार त्रिवेदी, अभिषेक कुमार सिंह, जय शरण मिश्रा, रश्मि कुमारी, कुनाल शरण, मोहम्मद परवेज खान, कायनात खान, निधि सिंह, शैलेन्द्र कुमार धर द्विवेदी, मनीषा यादव, प्रीति दीक्षित, देवेन्द्र प्रताप मिश्रा, शरद शर्मा एवं कमल राम आर्या

7. **पीसीटी आवेदन संख्या:** पीसीटी/आईएन2014/000458 **आवेदन की तिथि:** 09.07.2014
शीर्षक: 3,7 डाईएजाबाईसाइक्लो (3.3.1) नोनेन कार्बोक्सामाइडस् एण्ड प्रॉसेस ऑफ प्रिपरेशन देअरऑफ
अन्वेषक: दिनेश कुमार दीक्षित, अनिल कुमार करूणाकरन, शशिकला, मनोज बर्थवाल, अंकिता मिश्रा एवं मनीष जैन

8. **पीसीटी आवेदन संख्या:** पीसीटी/आईएन2014/000156 **आवेदन की तिथि:** 10.03.2014
शीर्षक: सस्ट्यिूटेड फ्लुओरेन्थीन–7–कार्बोनाइट्राइल्स/एस्टर्स एज़ फ्लोरोसेन्ट डाइज़ फॉर सेल इमेजिंग एप्लिकेशन्स
अन्वेषक: अतुल गोयल, आशुतोष शर्मा, कल्याण मित्रा, अरिन्दम् भट्टाचार्जी एवं मनोज कथूरिया

9. **पीसीटी आवेदन संख्याः** पीसीटी/आईएन2014/000131 **आवेदन की तिथिः** 28.02.2014
शीर्षकः एन एण्टील्युकेमिक एजेण्ट यूज़फुल फॉर इन्ड्यूसिंग डिफ्रेरिऐशन इन माइलियोड ल्युकीमिया सेल्स
अन्वेषकः पूजा पाल, सविता लोचब, जितेन्द्र कुमार कनौजिया, साब्यासाची सान्याल एवं अरूण कुमार त्रिवेदी

10. **पीसीटी आवेदन संख्याः** पीसीटी/आईएन2014/000055 **आवेदन की तिथिः** 24.01.2014
शीर्षकः ऐण्टीडायबेटिक एण्ड एण्टीडिस्लिपिडिमिक ऐक्टीविटीज़ आफॅ प्रेग्नेन–आक्सीमिनो–अमिनोअल्काइलीथर्स
अन्वेषकः प्रेम चन्द्र वर्मा, ज्योति गुप्ता, धर्मेन्द्र प्रताप सिंह, वर्षा गुप्ता, हरि नारायण कुशवाहा, अनमिका मिश्रा, नेहा राहुजा, रोहित श्रीवास्तव, नताशा जायसवाल, अशोक कुमार खन्ना, अखिलेश कुमार ताम्रकार, शियो कुमार सिंह, अनिल कुमार द्विवेदी, अरविन्द कुमार श्रीवास्तव एवं राम प्रताप

11. **यूएस आवेदन संख्याः** 14/159213 **आवेदन की तिथिः** 20.01.2014
शीर्षकः फ्लेनोवॉल कम्पाण्डस्, ए बायोऐक्टिव एक्स्ट्रैक्ट/फ्रैक्शन फ्रॉम *अल्मस वल्लिचियाना* एण्ड इट्स् कम्पाउण्डस् फॉर प्रिवेंशन फॉर ट्रीटमेन्ट ऑफ ओस्टियो–हेल्थ रिलेटेड डिस्आर्डर्स
अन्वेषकः राकेश मौर्या, प्रीति रावत, कुनाल शरण, जावेद अख्तर सिद्दिकी, गौरव स्वर्णकार, गीतांजलि मिश्रा, लक्ष्मी मणिकावासगम, गिरीश कुमार जैन, कमल राम आर्या एवं नैबेद्य चट्टोपाध्याय
सहायक सदस्यः सतीश चन्द्र तिवारी, अब्दुल मलिक त्यागी, देवी दत्त एवं अमृता केन्दुरकर

12. **पीसीटी आवेदन संख्याः** पीसीटी/आईएन2014/000023 **आवेदन की तिथिः** 10.01.2014
शीर्षकः कार्बोडायथायोएट्स एण्ड प्रोसेस फॉर प्रिपरेशन देअरऑफ
अन्वेषकः विष्णु लाल शर्मा, नंद लाल, अमित सारस्वत, संतोष जांगीड़, वीनूबाला, ललित कुमार, तारा रावत, आशीष जैन, लोकेश कुमार, जगदम्बा प्रसाद मैखुरी एवं गोपाल गुप्ता

2013 (पूर्व वार्षिक प्रतिवेदन में सम्मिलित नहीं)

13. **यूएस आवेदन संख्याः** 14/117415 **आवेदन की तिथिः** 13.11.2013
शीर्षकः सब्सिट्यूटेड 4–एरिलथायोजॉल–2–हायड्राजोन डेरिवेटिव फॉर द ट्रीटमेंट ऑफ ट्यूबरकुलोसिस
अन्वेषकः सुप्रिया सिंह, कुलदीप कुमार रॉय, संदीप कुमार शर्मा, रंजना श्रीवास्तव, विनीता चतुर्वेदी एवं अनिल कुमार सक्सेना
सहायक सदस्यः ज़ाहिद अली एवं अरिमर्दन सिंह कुशवाहा

भारत में आवेदित पेटेण्ट

2014

1. **पेटेण्ट आवेदन संख्याः** 3716डीईएल2014 **आवेदन की तिथिः**16.12.2014
शीर्षकः सेमिकार्बाजोन बेस्ड चाल्कोन्स एज पोटेन्ट एण्टि कैन्सर एजेन्ट्स
अन्वेषकः कोनेनि व्यंकट शशिधरा, दीपक दत्ता, जियाउर रहमान गाइन, अवुला श्रीनिवास राव, अखिलेश सिंह, श्रीकांत हनुमन्त चेरूवु, रवितेज सिंह, गोपाला रेड्डि पलन्ति, श्रृंखला महेश्वरी, राकेश कुमार आर्या एवं अनूप कुमार सिंह

2. **पेटेण्ट आवेदन संख्याः** 2865डीईएल2014 **आवेदन की तिथिः** 08.10.2014(अनंतिम)
शीर्षकः न्यू रापामायसिन कंजुगेट्स एण्ड प्रोसेस फॉर प्रिपेरेशन
अन्वेषकः वहाजुल हक़ एवं रफ़त अली

3. **पेटेण्ट आवेदन संख्याः** 2773डीईएल2014 **आवेदन की तिथिः** 29.09.2014
शीर्षकः ए फार्मुलेशन यूजफुल फॉर डिलेवरी ऑफ न्यूरोप्रोटेक्टिंग एजेंट
अन्वेषकः अनिल कुमार द्विवेदी, हफसा अहमद, किरन कुमार खण्डेलवाल, नीलम सिंह सांगवान, जियाउर रहमान गाइन, स्मृति भदौरिया, श्रीकान्त कुमार रथ, शरद शर्मा, राकेश शुक्ला, एसपीएस गौर, विवेक विद्याधर भोसले, राजेन्द्र सिंह सांगवान एवं सारिका

4. **पेटेण्ट आवेदन संख्याः** 2726डीईएल2014 **आवेदन की तिथिः** 23.09.2014
शीर्षकः लीनियर कैटायनिक एण्टिमाइक्रोबियल पेप्टाइड्स एण्ड प्रोसेस फॉर प्रिपेरेशन देअरऑफ
अन्वेषकः तुषारकांति चक्रवर्ती, सुदीप पाल, उत्तम घोष, सुधीर सिन्हा एवं सिद्धार्थ चोपडा

5. **पेटेण्ट आवेदन संख्याः** 2567डीईएल2013 **आवेदन की तिथिः** 01.09.2014
शीर्षकः नोवेल एरिल नेथिल मीथेनोन ऑक्जिम डेरिवेटिव्स फॉर द ट्रीटमेंन्ट ऑफ हिमेटोलॉजिकल मेलिग्नेन्सीज एण्ड सोलिड ट्यूमर्स
अन्वेषकः साब्यासाची सान्याल, अतुल कुमार, नैबेद्य चट्टोपाध्याय, जवाहर लाल, अरूण कुमार त्रिवेदी, दीपक दत्ता, श्रीकान्त कुमार रथ, तहसीन अख्तर, शैलेन्द्र कुमार धर द्विवेदी, मनीषा यादव, बन्दना चक्रवर्ती, अभिषेक कुमार सिंह, जय शरन मिश्रा, निधि सिंह, एवं अनिल कुमार त्रिपाठी

6. **पेटेण्ट आवेदन संख्याः** 2145डीईएल2013 **आवेदन की तिथिः** 15.07.2014
शीर्षकः प्रोटिआज़ोमल इन्हिबिटर्स यूज़फुल फॉर ओस्टियोजेनिक एक्टिविटी एण्ड फार्मास्युटिकल कम्पोजीशन देअरऑफ़ (ओस्टियोहील)
अन्वेषकः रितु त्रिवेदी, प्रभात रंजन मिश्रा, नीलम सिंह सांगवान, प्रबोध त्रिवेदी, दिव्या सिंह, राजेन्द्र सिंह. सांगवान, प्रियंका कुशवाहा, विक्रम खेड़िगकर, सुलेखा अधिकारी, धर्मेन्द्र चौधरी, ज्योति स्वरूप, अविनाश कुमार, अनिरूद्ध करवन्दे, अश्विनी वर्मा एवं श्वेता शर्मा
सहायक सदस्यः नसीर अहमद

7. **पेटेण्ट आवेदन संख्याः** 1983डीईएल2014 **आवेदन की तिथिः** 15.07.2014
शीर्षकः नोवल काम्बिनेशन किट फॉर द ट्रीटमेन्ट ऑफ मलेरिया
अन्वेषकः रेणु त्रिपाठी, प्रभात रंजन मिश्रा, पंकज द्विवेदी, हेमलता द्विवेदी, सुनील कुमार सिंह, सुनील कुमार पुरी, अनिल कुमार द्विवेदी

8. **पेटेण्ट आवेदन संख्याः** 1942डीईएल2014 **आवेदन की तिथिः**11.07.2014
शीर्षकः सब्स्टिट्युटेड नेप्थॉल(2,1–बी)(1,10)फेनान्थ्रोलीन–बेस्ड फ्लोरिसेन्ट डाइज़ एण्ड एप्लिकेशन देअरऑफ
अन्वेषकः अतुल गोयल, शहिदा उमर, पंकज नाग, आमिर नाज़िर, ललित कुमार, शम्सुज्ज़मा, जियाउर रहमान गाइन एवं ज़ाकिर हुसैन

9. **पेटेण्ट आवेदन संख्याः** 1940डीईएल2014 **आवेदन की तिथिः**11.07.2014
शीर्षकः ए नॉवेल केमिकली मोडिफाइड बायोएक्टिव फ्रैक्शन फ्रॉम *कुरक्युमा लोंगा* [NCCL] फॉर मैनेजमेण्ट ऑफ सीवीएस एण्ड सीएनएस डिस्आर्डर्स
अन्वेषकः अनिल कुमार द्विवेदी, आर्शी नकवी, रिचा मालासोनी, मीनाक्षी राणा, ऋषि रंजन पाण्डेय, अकांक्षा श्रीवास्तव, अमित मन्हास, ईशा तनेजा, वहाजुद्दीन, प्रदीप कुमार श्रीवास्तव, कुमारवेलु जगवेलु, मनोज कुमार बर्थवाल एवं राम प्रताप

10. **पेटेण्ट आवेदन संख्याः** 1566डीईएल2014 **आवेदन की तिथिः** 10.07.2014
शीर्षकः कैटायोनिक लिपिड डेरीवेटिव्स ऑफ कर्डियारिमाइडः ए यूज़फुल एज़ एण्टी कैंसर एजेण्ट्स बाय टार्गेटिंग ह्यूमन डीएनए लाइगेज़–1
अन्वेषकः सुरेन्द्र रेड्डी बथुला, दुर्गा राव वीकेके, कोमल शर्मा, प्रताप रेड्डी एम, दिब्येन्दु बेनर्जी एवं दीपेन्द्र कुमार सिंह

11. **पेटेण्ट आवेदन संख्याः** 0942डीईएल2014 **आवेदन की तिथिः** 01.04.2014
शीर्षकः कैटायोनिक पेप्टाइड कंम्पाउण्ड्स प्रोसेस फॉर प्रिपेरेशन एण्ड यूज़ देअरआफ
अन्वेषकः तुषार कान्ति चक्रवर्ती, सुदीप पाल, सुधीर सिन्हा एवं श्याम सिंह

12. **पेटेण्ट एप्लिकेशन नं.:** 0807डीईएल2013 **आवेदन की तिथिः** 19.03.2014
शीर्षक : सब्स्टीट्यूटेड फलूओरोथीन–7–कार्बोनोटाइल्स/एस्टर्स एज़ फलोरोसेंट डाइज फॉर सेल इमेजिंग एप्लिकेशन्स
अन्वेषक : अतुल गोयल, आशुतोष शर्मा, कल्याण मित्रा, अरिन्दम भट्टाचार्जी और मनोज कथूरिया

13. **पेटेण्ट एप्लिकेशन नं.:** 0193डीईएल2013 **आवेदन की तिथिः** 24.01.2014
शीर्षक : एण्टीडायबेटिक एण्ड एण्टीडिस्लिपिडिमिक ऐक्टीविटीज़ ऑफ प्रेग्नेन–आक्सीमिनो–अमिनोअल्काइलीथर्स
अन्वेषकः प्रेम चन्द्र वर्मा, ज्योति गुप्ता, धर्मेन्द्र प्रताप सिंह, वर्षा गुप्ता, हरि नारायण कुशवाहा, अनामिका मिश्रा, नेहा राहुजा, रोहित श्रीवास्तव, नताशा जायसवाल, अशोक कुमार खन्ना, अखिलेश कुमार ताम्रकार, शियो कुमार सिंह, अनिल कुमार द्विवेदी एवं अरविन्द कुमार श्रीवास्तव

2 वैज्ञानिक सम्मेलनों में प्रस्तुत शोध पत्र

2014

27वीं अन्तर्राष्ट्रीय कार्बोहाइड्रेट संगोष्ठी, आईआईएससी, बंगलौर (12–17 जनवरी)

1. कार्बोहाइड्रेट्स ऐज़ केमोथेराप्यूटिक एजेण्ट्सः ऐण्टीडायबिटिक एण्ड ऐण्टीमलेरियल ऐक्टिविटी ऑफ सी – ग्लाइकोसाइड्स; के. कुमार जी. रामकृष्णन, ए. तिवारी, एन. जैसवाल, ए.के. ताम्रकार, एन. राहुजा, आर. श्रीवास्तव, ए.के. श्रीवास्तव, एस श्रीवास्तव, रेनु त्रिपाठी और रामा पी. त्रिपाठी
2. बायोफ़िजिकल स्ट्डीज ऑन द स्ट्रक्चरल बेसिस रिलेशनशिप बिटवीन ब्लड ग्रुप एण्ड द ई1 टॉर कॉलरा, पिन्टू कुमार मण्डल और डब्ल्यू. ब्रूस टर्नबुल।

एसएफआरआर (द सोसाइटी ऑफ़ फ्री रैडिकल रिसर्च) इण्डिया–14, लोनावाला (27–30 जरवरी)

3. जीएसके3β रेगुलेट्स टीएलआर लिगैण्ड इन्ड्यूज़्ड मोनोसाइट–मैक्रोफ़ेज ऐक्टिवेशन एण्ड साइटोकाइन प्रोडक्शन; एम. राना, वी. सिंह, एस.एस. रेड्डी, एम.के. बर्थवाल
4. टीएलआर एस सीडी36 एण्ड आरओएस मीडिएट्स ओएक्स–एलडीएल इन्ड्यूज़्ड आईएल–1β प्रोडक्शन एण्ड इन्फ्लमेशन थ्रू पीकेसी–आईआरएके ऐक्सिस; ए. सिंह, वी. सिंह, आर.एल. तिवारी, एम. राना, ए. वर्मा, एन. कोठारी, एम. कोहली, जे. बोगरा, एम. दीक्षित, एम.के. बर्थवाल
5. इफ़ेक्ट आफ ज़िंजरॉल ऑन रैट वैस्कुलर स्मूद मसल सेल प्रॉलिफ़रेशन; पी मौर्या, एम. जैन, वी. सिंह. ए. सिंह, एस.एस. रेड्डी, एम.के. बर्थवाल
6. नाइट्रिक ऑक्साइड इन्ड्यूज्ड ऐपॉपटॉसिस ऑफ़ ह्यूमन न्यूट्रोफ़िल्स इज़ मीडिएटेड बाइ डिग्लूट थायोनाइलेशन ऑफ़ प्रो–कैसपेस3, एम. दुबे, ए.के. सिंह, डी अवस्थी, टी. चन्द्रा, ए. कुमार, एम.के. बर्थवाल और एम. दीक्षित

नेशनल कांफ्रेंस ऑन अर्थ एण्ड एनवायरनमेन्टः पोल्यूशन एण्ड प्रिवेन्शन, नोएडा (28–30 जनवरी)

7. एनवायरनमेन्टल टॉक्सीकोलॉजी ऑफ़ कॉमनली यूज़्ड फ़र्टिलाइजर्स इन फ्रेश वॉटर फ्रिशेज़ ऑफ रिवर गोमती, लखनऊ; पूजा शुक्ला और आर.के. सिंह

कोलकाता–न्यूरोसाइन्स सम्मेलन–2014 कोलकाता (31 जनवरी)

8. मॉड्युलेशन ऑफ़ Nrf2 इन मेमोरी इम्प्रूविंग इफ़ेक्ट ऑफ डोनपेज़िल एण्ड इब्यूप्रूफेन; सुभाष द्विवेदी और राकेश शुक्ला

न्यूरोकेमिस्ट्री ऑफ़ एजिंग ब्रेन, कोलकाता (31 जनवरी – 1फरवरी)

9. क्रोनिक हाइपरटेन्शन लीड्स टु ग्लायल एक्टिवेशन एण्ड न्यूरो–इन्फ्लमेशन इन रीजन्स एसोशिएटेड विद मेमोरी फ़ंक्शन; शाहनवाज़ ए. भट, राकेश शुक्ला और काशिफ हनीफ़

इण्टरनेशनल कांफ्रेंस ऑन रिप्रोडक्टिव हेल्थः इश्यूज़ एण्ड स्ट्रैटजीज़ अण्डर चेंजिंग क्लाइमेट सीनेरियो (आईएसएसआरएफ–2014), आईवीरआरआई, इज्जतनगर (6–8 फरवरी)

10. रीन्कॉम्बीनेन्ट एचआईवी–1 नेफ़ कॉन्सट्रिक्ट्स द ब्लड टेस्टइज़ बैरियर इन रैट मॉडल; एस.के. अग्निहोत्री, एम. कुमार, बी. कुमार, पी. सिंह, पी. कार, ए. अग्रवाल, ए जैन, एस. कुमार, आर.के. त्रिपाठी और एम. सचदेव
11. आईडेन्टीफ़िकेशन ऑफ़ ग्लोबल miRNA रेगुलेटर्स ड्यूरिंग फ़ॉलीकुलोजेनेसिस एण्ड ऊसाइट मैच्योरेशन इन मॉइस; ए. नाथ, जे. सिंह, ए. अग्रवाल, आर. कोनवर और एम. सचदेव

27वीं अन्तर्राष्ट्रीय कार्बोहाइड्रेट सिम्पोज़ियम, बंगलौर (12–17 फरवरी)

12. बायोफ़िजिकल स्ट्डीज़ ऑन द स्ट्रक्चरल बेसिस रिलेशनशिप विटवीन ब्लड ग्रुप एण्ड द ई1 टॉर कॉलरा, पिन्टू कुमार मण्डल और डब्ल्यू. ब्रूस टर्नबुल

नैनो साइटेक 2014, चण्डीगढ़ (13–15 फरवरी)

13. रीसेन्ट डिवेलपमेन्ट इन नैनो मैटीरियल्स फ़ॉर रिप्रोडक्टिव हेल्थ; आर.के. सिंह और अनिल कुमार मीना

औषधि खोज और विकास में वर्तमान परिदृश्य पर छठा नाइपर (रायबरेली) सीएसआईआर–सीडीआरआई संगोष्ठी, लखनऊ (20–22 फरवरी)

14. यूएफएलसी मेथड डेवलपमेन्ट एण्ड वैलिडेशन ऑफ़ S006-830 एण्ड ऐप्लिकेशन टु फार्माकोकाइनेटिक एण्ड बायोअवेलिबिलिटी स्ट्डीज़ इन एसडी रैट्स; यशवन्त सिंह, महेन्द्र के. हिडाउ, अनामिका मिश्रा, पुजारी मोनिका और एस.के. सिंह
15. फ़ार्माकोकाइनेटिक ड्रग–ड्रग इण्टरैक्शन स्टडी ऑफ़ सीडीआरआई कैण्डीडेट 97/78 विद ऐण्टी ट्युबर कुलर ड्रग रिफ़ाब्युटिन; महेन्द्र के हिडाउ, यशवन्त सिंह, अनामिका मिश्रा, सुधीर शाही और एस.के. सिंह

16. *इन विट्रो* एण्ड *इन वीवो* फ़ार्माकोकाइनेटिक्स ऑफ़ S011–0719, ए पोटेण्ट ऐण्टी मलेरियल कम्पाउण्ड; के. वेगासिया, एन. रंगराज, एम. शुक्ला, एस. जैसवाल, ए. शर्मा, एस. पाण्डे, पी.एम.एस. चौहान और जे. लाल

17. *इन विट्रो* एण्ड *इन वीवो* फ़ार्माकोकाइनेटिक्स ऑफ़ S011–0725, ए पोटेण्ट ऐण्टी मलेरियल कम्पाउण्ड; एन. रंगराज, के. वेगासिया, एम. शुक्ला, एस. जैसवाल, ए. शर्मा, एस. पाण्डे, पी.एम.एस. चौहान और जे. लाल

18. क्वालिटी बाई डिज़ाइनः अण्डरस्टैडिंग द फ़ार्मुलेशन वैरिएबल्स ऑफ़ डॉसिटैक्सेल सेल्फ़ नैनो इमल्सीफाइंग ड्रग डिलीवरी सिस्टम – मिक्सचर डिज़ाइन एण्ड डिज़ायरेबिलिटी फ़ंक्शन्स; कन्दर्प दवे, गुरू राघवेन्द्र वैलिचेरला और जियाउर आर. गाइन

19. फंक्शनल कैरेक्टराइज़ेशन ऑफ़ श्नूरिओर्थोलॉग T05A10.1 इन *सी. एलैगन्स* : इम्पलिकेशन्स फॉर अल्ज़ाइमर्स डिज़ीज़ेज़; रिजवानुल हक और आमिर नाज़िर

20. करक्युमिन मिमिक–डाइथियोकार्बामेट हाइब्रिड्स एज़ पोटेन्शियल ऐण्टी–प्रोस्टेट कैन्सर एजेण्ट्स; सुभद्रा ठाकुर, एम. धनराजू, विशाल सिंह, दीप्ति पाण्डे, गोपाल गुप्ता और विष्णु एल. शर्मा

ऐप्लाइड फार्मस्युटिकल एनालिसिस–2014, अहमदाबाद (23–26 फरवरी)

21. फार्माकोकाइनेटिक्स, मेटाबोलिज़्म, एन्ज़ाइम काइनेटिक्स, स्टैबिलिटी स्टडीज़ एण्ड *इन विट्रो इन वीवो* कोरिलेशन (IVIVE) ऑफ़ नॉवेल ऐण्टीप्लेटलेट एजेण्ट S007–867, हार्दिक चन्दासना, यशपाल एस. छोनकर, टेलाप्रोलु के. चैतन्य, अनिल कुमार, मधु दीक्षित, दिनेश के. दीक्षित, शिओ के. सिंह, रवि एस. भट्टा

इण्टरनेशनल कांफ्रेंस ऑन फॉनल डाइवर्सिटी एण्ड देयर कन्ज़रवेशनल स्ट्रैटजीज़, लखनऊ (22–23 मार्च)

22. एक्ससाइज़ विद डायबिटिक मेडिकेशन इम्प्रूब्स ग्लूकोज होम्योस्टैटिस बेटर दैन द ड्रग्स एलोन इन एसटीजेड इन्ड्यूज्ड डायबिटिक रैट्स; ज़ाकिर हुसैन, अर्चना मिश्रा, अम्बरीश सिंह, हिमांशु के बोरा, जियाउर आर. गाइन

डीएमपीके सिम्पोज़ियम, नाइपर, मोहाली (27फरवरी–1 मार्च)

23. स्पीशीज़ प्रोफाइलिंग ऑफ़ मेटाबोलिक स्टैबिलिटी ऑफ़ मेडीकार्पिन; ईशा तनेजा, के.एस.आर. राजू, मुरली कृष्ण

ड्रग मेटाबोलिज़्म और औषधि प्रभाव गति पर छठा अन्तर्राष्ट्रीय संगोष्ठी (27 फरवरी – 2 मार्च)

24. फ़ार्माकोइनेटिक्स ऑफ़ S011–0725, ए पोटेण्ट ऐण्टीमलेरियल कम्पाउण्ड, इन मेल स्प्रेग डॉली रैटस; एस जायसवाल, ए शर्मा, एम शुक्ला, पी.एम.एस. चौहान, जे. लाल

20वां आईएससीबी अन्तर्राष्ट्रीय सम्मेलन, दिल्ली (1–4 मार्च)

25. फ़ार्माकोकाइनेटिक्स ऑफ़ S010–269, ए पोटेण्ट एण्टी लीशमैनियल कम्पाउण्ड इन रैट्स, ए. शर्मा, एस जैसवाल, एम. शर्मा, पी.एम.एस. चौहान, जे. लाल

नैशनल सिम्पोज़ियम ऑन रिसेन्ट एडवांसेज़ इन फ्री रैडिकल बायोलॉजी एण्ड बायोकैमिस्ट्री, अलीगढ़ (6 मार्च)

26. फंक्शनल कैरेक्टराइज़ेशन ऑफ़ श्नूरिओर्थोलॉग T05A10.1 इन *सी. ऐलेगन्स* : इम्पलिकेशन्स फॉर अल्ज़ाइमर्स डिज़ीज; रिजवानुल हक और आमिर नाज़िर

नैनो टेक्नोलॉजी में हाल की प्रगति पर नेशनल सेमिनार टिश्यू एनजीनियरिंग, भोपाल (7–8 मार्च)

27. रीसेन्ट डिवेलपमेन्ट्स इन नैनोटेक्नोलॉजी बेस्ड रिप्रोडक्टिव बायोमेडिसिन इन इण्डिया; पी.के. सिंह

पुरुष प्रजनन स्वास्थ्य पर अन्तर्राष्ट्रीय सम्मेलन सहित द सोसाइटी ऑफ़ एण्ड्रोलॉजी इण्डिया, का 19वां वार्षिक सम्मेलन (13–14 मार्च)

28. मॉलीक्युलर मेकैनिज़्म ऑफ़ ऐण्टी–प्रॉस्टेट कैन्सर ऐक्टिविटी ऑफ़ RISUGadv, अनिल कुमार मीना और आर.के. सिंह

स्वास्थ्य और सामाजिक लाभ के लिये औषधीय पौधों के पर्यावरणीय दबाव, संरक्षण और संसाधन विकास पर राष्ट्रीय सम्मेलन, देहरादून (21–23मार्च)

29. ए मॉलीक्युलर एप्रोच टु ऐमिलियोरेटिव इफ़ेक्ट्स ऑफ़ *डिलेनिया इण्डिका* लीफ़ एक्सट्रैक्ट ऑन फ़ेनिलहाइड्रेज़िन इन्ड्यूज्ड हेमोलिटिक एनीमिया इन रैट्स; आर.के. सिंह और पूजा शुक्ला

30. इफैक्ट ऑफ़ *हिबिस्कस रोज़ा साइनेनसिस* ऑन ब्लड प्रोफ़ाइल ऑफ़ फेनिलहाइड्रेज़िन ट्रीटेड सीएफ रैट्स; अनिल कुमार मीना और आर.के. सिंह

31. *हिबिस्कस रोज़ा साइनेनसिस* फ़ाइटोकॉन्स्टीटुएंट्स फॉर द डिवेलपमेन्ट ऑफ़ हेमोप्रोटेक्टिव ड्रग्स; कीर्ति पाण्डे, आकांक्षा जैन, अनिल के. मीना, पूनम सिंह और आर.के. सिंह

32. फार्माकोलॉजिक़ल एण्ड ऐक्यूट ऑक्सिसिटी स्टडी ऑफ़ प्लाण्ट *सैरेका इण्डिका*; आकांक्षा जैन, कीर्ति पाण्डे, अनिल के. मीना, पूनम सिंह और आर.के. सिंह

नेशनल सिम्पोज़ियम ऑन रीसेन्ट सीनेरियो एण्ड ऐडवान्समेन्ट इन कैन्सर रिसर्च एसएस हॉस्पिटल एण्ड रिसर्च सेन्टर, पटना (22–23 मार्च)

33. एण्टील्युकीमिक एक्टिविटी ऑफ़ इण्डियन मेडिसिनल प्लाण्ट्स; आर.के. सिंह, अनिल के. मीना, कीर्ति पाण्डेय और आकांक्षा जैन

फॉनल डाइवर्सिटी और उनके संरक्षण संबंधी रणनीतियों पर अन्तर्राष्ट्रीय सम्मेलन, लखनऊ (22–23 मार्च)

34. एक्सरसाइज़ विद डायबिटिक मेडिकेशन इम्प्रूव्स ग्लूकोज होम्योस्टैटिस बेटर दैन द ड्रग्स एलोन इन एसटीजेड इन्ड्यूज्ड डायबिटिक रैट्स; ज़ाकिर हुसैन, अर्चना मिश्रा, अम्बरीश सिंह, हिमांशु के बोरा, जियाउर आर. गाइन

फ्रन्टियर्स इन मॉर्डन बायोलॉजी पर राष्ट्रीय संगोष्ठी (टेक्नोलॉजी ट्रांसफ़र, नॉलेज़ ट्रांसलेशन एण्ड सोशल ट्रांन्सफ़ार्मामेंशन) विद थीमैटिक फोकस ऑन "इनोवेशन्स इन साइंस एण्ड टेक्नोलॉजी फॉर इन्क्लूसिव डिवेलपमेन्ट", सागर (24–25 मार्च)

35. प्रोटेक्टिव पोटेन्शियल ऑफ़ BNR-2 (~85kDa) डिराइव्ड फ्रॉम द न्यूक्लियर फ्रैक्शन ऑफ़ एडल्ट *ब्रूज़िया मलाई* अगेन्स्ट द इनफ़ेक्शन इन मैस्टोमीज़ काउचा; शिल्पी शाक्य और शैलेजा मिश्रा भट्टाचार्या

इण्टरनैशनल कांफ्रेंस ऑन सेल्युलर एण्ड मॉलीक्युलर मैकेनीज़्म्स ऑफ डिज़ीज़ प्रॉसेसेज़, कश्मीर (13–16 अप्रैल)

36. एसएमएडी ट्रांसक्रिप्शन फैक्टर, T05A10.1, अट्ट्यूनेस टीजीएफ–बीटा सिग्नलिंग कैसकड टुवर्ड्स मॉडॅयूलेटिंग अल्ज़ाइमर्स एसोशिएटेड आउटकमः स्ट्डीज़ इम्प्लायिंग ट्रांसजेनिक *सी. ऐलेगन्स* मॉडल, रिजवानुल हक और आमिर नाज़िर

करेण्ट ट्रेण्ड्स एण्ड फ्यूचर चैलेन्जेज़ इन एनवायरनमेन्टल साइन्स, बायोटेक्नोलॉजी, आयुष एण्ड बायोमेडिसिन फ़ॉर ह्यूमन वेलफेयर एण्ड सस्टेनेबल डिवेलपमेन्ट पर 9वां राष्ट्रीय सम्मेलन, रीवा (26–27 अप्रैल)

37. आलटरनेटिव मेथड्स फॉर *इन विट्रो* टॉक्सीकॉलोजिकल इवैल्युएशन ऑफ़ हेमाटोपाइटिक ड्रग्स; आर.के. सिंह, अनिल के. मीना, कीर्ति पाण्डे और आकांक्षा जैन

होस्ट–पैथॉजन इण्टरैक्शन्स पर अन्तर्राष्ट्रीय सम्मेलन, हैदराबाद (12–15 जुलाई)

38. जेनेटिक एविडेन्स फॉर द रोल ऑफ़ *प्लाज़्मोडियम बर्गेई* यूबीसी13 काइनेज़ ऐज़ ए मलेरिया ट्रांसमिशन ब्लॉकिंग कैण्डीडेट; ज्योति टोगिरी, बाबू एस. मस्तान, रामेश्वर रेड्डी सेजिरेड्डी, सतीश मिश्रा और कोटा अरुण कुमार

एडवांसेज इन बायोलॉजिकल एण्ड मैटीरियल साइंसेज़ पर अन्तर्राष्ट्रीय संगोष्ठी, लखनऊ (15 जुलाई)

39. सिन्थिसिज़, इनैन्शियोमेरिक सेपरेशन ऑफ़ सिस–टेरोकार्पन्स एण्ड देयर ओस्टियोजेनिक ऐक्टिविटी; आशुतोष रघुवंशी और अतुल गोयल

40. हाइली फ़्लोरेसेन्ट नॉन ऐग्रीगेटिंग 1,8– नैपथीराइडिन्सः डिज़ाइन, सिन्थिसिज़ फोटोफ़िजिकल प्रापर्टीज़ एण्ड ऐप्लिकेशन इन मेटल सेन्सिंग; शहिदा उमर, पंकज नाग, अतुल गोयल

41. फ्लोरेन्थीन बेस्ड हाइली फ़्लोरेसेन्ट डाइज़ फ़ॉर ओएलइडीएस एण्ड लाइव सेल इमेजिंग ऐप्लिकेशन्स; अजय कुमार झा, आशुतोष शर्मा, विजय कुमार और अतुल गोयल

यूपीएसएस–2014 स्वीडन (6 अगस्त)

42. पॉपुलेशन फ़ार्माकोकाइनेटिक्स ऑफ़ आरमेलोक्ज़ीफीन इन फीमेल वॉलंटियर्स यूजिंग NONMEM; ए. शर्मा, एस. जैसवाल, एम. शुक्ला, जे. लाल

ICOPA-2014, मेक्सिको सिटी, मेक्सिको (10–15 अगस्त)

43. फ़ीज़िबिलिटी टीएच1 स्टिम्युलेटरी प्रोटीन्स एज़ पोटेन्शियल पॉली वैक्सीन अगेन्स्ट विसरल लीशमैनियासिस; अनुराधा दुबे, सुमित जोशी, कीर्ति रावत, नरेन्द्र यादव, स्नेहा रत्नप्रिया, विकास कुमार, एम.आई. सिद्दीकी और श्याम सुन्दर

एप्लिकेशन्स ऑफ़ मॉस एण्ड एनएमआर टेक्नीक्स इन ड्रग रिसर्च पर राष्ट्रीय सेमिनार, लखनऊ (24 सितम्बर)

44. ए लिक्विड क्रोमैटोग्राफी–टैन्डम मास स्पेक्टोमीट्री मेथड डिवेलपमेन्ट एण्ड वैलिडेशन ऑफ़ नॉवेल ऐण्टीलीशमैनियल एजेण्ट, s012–0568 इन रैट सीरम एण्ड इट्स ऐप्लिकेशन टु इन्ट्रावेनस फ़ार्माकोकाइनेटिक स्ट्डी; एम शुक्ला, ए. शर्मा, एस जायसवाल, एस. पाण्डे, पी.एम.एस. चौहान, एन रंगराज, के. वेगेसिया, जे. लाल

45. बायोऐक्टिविटी गाइडेड आइसोलेशन ऑफ़ (कैलोट्रोपोसाइड्स) फ्रॉम द रूट बार्क ऑफ़ *कैलोट्रोपिस जाइगेन्श्या* (पर्पल) एज़ पोटेण्ट ऐण्टी कैन्सर एजेण्ट्स; रोहित महर, तृप्ति जोशी, शिवानी दीक्षित, संजीव कनौजिया, ऋतुराज कोनवर, दीपक के. मिश्रा, संजीव के. शुक्ला

46. स्ट्रक्चरल कैरेक्टराइजेशन ऑफ़ कार्बाज़ोल अल्कलॉइड्स एण्ड देयर टिश्यू स्पेसिफिक डिस्ट्रीब्यूशन इन *मुराया कायोनिगी*; तृप्ति जोशी, सुमित के. सिंह, दीपके के. मिश्रा, संजीव कनोजिया

इण्डियन एकैडमी ऑफ़ न्यूरोसाइन्स को 32वां सम्मेलन, बंगलौर (1–3 अक्टूबर)

47. सस्टेण्ड कप्पा ओपिआइड रिसेप्टर ऐक्टिवेशन कॉज़ेज एपिजेनिक चेन्ज़ेज इन वेरिअस रीजन्स ऑफ़ ब्रेन; शालिनी डोगरा और प्रेम एन. यादव

12वीं ट्रांसजेनिक टेक्नोलॉजी मीटिंग, एडिनबर्ग, स्कॉटलैण्ड, यू.के. (6–8 अक्टूबर)

48. एन एग मेटैलोप्रोटिएज़ प्लेज़ ए की रोल ड्यूरिंग फ़र्टिलाइज़ेशन इन मैमल्स; एम. सचदेव, ए. मण्डल, एल. डिजिलिओ, सी. पिंलकिंगर और जे. हर

इण्डियन सोसाइटी ऑफ़ मलेरिया एण्ड अदर कम्युनिकेबल डिज़ीज़ेज एण्ड इण्डियन एसोसिएशन ऑफ़ एपिडेमियॉलोजिस्ट्स का दसवां संयुक्त वार्षिक सम्मेलन, पणजी, गोवा (10–12 अक्टूबर)

49. इण्टरैक्शन ऑफ़ वॉलबैशिया ट्रांसक्रिप्शन एलोंनगेशन फैक्टर विद α2ββσ सबयूनिट्स RNA ऑफ़ पॉलीमरेज़ थ्रू इट्स डाइमरिक सी–टर्मिनल डोमेन; डी. चहार, जे.के. नाग, आर. झा, एम. गंगवार, ए. चावला और ए.एम. भट्टाचार्या

50. कैरेक्टराइजेशन ऑफ़ यूडीपी–एन–ऐसिटिलग्लूकोसैमाइन एनॉल पाइरुविल ट्रांसफरेज़ (मुरए: ए ड्रग टार्गेट) फ्रॉम वालबैशिया एन्डोसिमबॉएन्ट ऑफ़ ह्यूमन लिम्फ़ैटिक फ़ाइलेरियल पैरासाइट *ब्रूज़िया मलाई*, एम. शहाब, एम. वर्मा, एम. पाठक, एस. मिश्रा, एस.एम. भट्टाचार्या

51. ओरल इम्यूनाइज़ेशन विद नैनोकैपसुलेटेड *ब्रूज़िया मलाई* रिकॉम्बीनेन्ट ट्रेहैलोज़–6–फ़ॉस्फेट फ़ॉस्फटेज (Bm-TPP) इलिसिटेड प्रोफाउण्ड ह्यूमॉरल एण्ड सेल्युलर इम्यून रिस्पॉन्सेज़ इन मॉइस; एम. गंगवार, वी.टी. बनला, डी. चहार, आर. झा, पी.आर. मिश्रा और एस.एम. भट्टाचार्य

52. सेरो–रिऐक्टिविटी ऑफ़ *ब्रूज़िया मलाई* एण्ड वॉलवैशिया रिकॉम्बीनेट प्रोटीन्स इन डिफरेन्ट क्लीनिकल ग्रुप्स ऑफ़ ह्यूमन बैन्क्रॉफ्टियन फाइलेरियासिस; आर. झा, डी. चहार, एम. गंगवार और एस. मिश्रा भट्टाचार्य

53. क्वॉनटीशिएटिंग लिवर स्टेज पैरासाइट बर्डन इन स्पॉरोज़ॉइट इन्ड्यूज्ड *प्लाज़मोडियम योएली* इन्फेक्शन्स आरिफ़; जे. सिद्दीकी, ज्योति भारद्वाज, मनीष गोयल, एस.के. पुरी

54. हाई प्रो इन्फ्लेमेटरी साइटोकाइन्स कोरिलेट टु प्रोटेक्शन अगेन्स्ट नॉन लीथल म्यूरिन मलेरिया इन्फ़ेक्शन; ज्योति भारद्वाज, आरिफ़ जे. सिद्दीकी और एस.के. पुरी

55. म्यूरिन लंग्स एक्ज़िबिट आलटर्ड जीन एक्सप्रेशन प्रोफाइल ड्यूरिंग फाइलेरियल मैनिफ़ेस्टेशन ऑफ़ ट्रॉपिकल पल्मोनरी सिनोफ़ीलिया; पी. शर्मा, ए. शर्मा, एम. श्रीवास्तव

56. इन्वेस्टीगेटिंग द रोल ऑफ़ *ब्रूज़िया मलाई* मैक्रोफ़ेज माइग्रेशन इनहिबिटरी फैक्टर (Bm-MIF) इन इन्ड्यूसिंग आलटरनेटिव ऐक्टिवेशन ऑफ़ होस्ट मैक्रोफ़ेजेज़; ए. शर्मा, पी. शर्मा, एम. श्रीवास्तव

57. आइसोलेशन एण्ड फ़ंक्शनल कैरेक्टराइज़ेशन ऑफ़ म्यूरिन स्प्लेनिक डेन्ड्रिटिक सेल सबटाइप्स इन एक्सपेरीमेन्टल विसरल लीशमैनियासिस; पी.के. यादव, पी. विश्वकर्मा, एन. परमार, पी. चन्द्राकर, एस. कार

58. *लीशमैनिया डोनोवनी* एक्सप्लाइट्स टॉलिप फ़ॉर नेगेटिव रेगुलेशन ऑफ़ अर्ली टीएलआर सिग्नलिंग ड्यूरिंग एक्सपेरीमेन्टल विसरल लीशमैनियासिस; एन. परमार, पी. विश्वकर्मा, पी.के. यादव, पी. चन्द्राकर, एस. कार

पैरासिटालॉजी पर 25वीं नेशनल कांग्रेसः ग्लोबल चैलेन्जेज इन द मैनेजमेन्ट ऑफ पैरासिटिक डिज़ीज़ेज, लखनऊ (16–18 अक्टूबर)

59. सिन्थिसिज़ ऑफ फंक्शनलाइज़्ड क्विनोलीन–4 वन्स एंण्ड देयर ऐक्टिविटी अगेन्स्ट एक्सपेरीमेन्टल विसरल लीशमैनियासिस; एम. रवी, एन. परमार, एस. कार और प्रेम पी. यादव

60. डिजाइन एण्ड सिन्थिसिज़ ऑफ़ 3,6,–इपॉक्ज़ी [1,5] डायोक्ज़ोसिन्स–इमीडैजॉल कन्जुगेट्स ऐज़ ऐण्टीलीशमैनियल एजेण्ट्स; रवितेज सिंह, अनिल जैसवाल, अनुराधा दुबे, कोनेनी वी. शशिधरा

61. डिस्कवरी ऑफ़ चालकोनथायज़ॉलिल–हाइड्रेजोन्स एज़ ए न्यू क्लास ऑफ़ ऐण्टीलीशमैनियल एजेण्ट्स; प्रगति कुशवाहा, के. भास्कर राव, अनिल जैसवाल, अनुराधा दुबे, कोनेनी वी. शशिधरा

62. टीएच1 इस्टीम्युलेटरी प्रोटीन्स ऑफ़ *लीशमैनिया डोनोवनी* कम्पैरेटिव सेल्युलर एण्ड प्रोटेक्टिव रिस्पॉन्सेज़ ऑफ़ आर ट्राइओज़ फॉस्फ़ेट आइसोमरेज़ आर प्रोटीन डाइसल्फ़ाइड आइसोमेरा एण्ड आर इलांगेशन फ़ैक्टर–2 इन कॉम्बीनेशन विद rHSP70 अगेन्स्ट विसरल लीशमैनियासिस, अनिल कुमार जायसवाल, प्रशांत खरे, सुमित जोशी, प्रमोद के. कुशवाहा, श्याम सुन्दर और अनुराधा दुबे

63. लॉन्ग टर्म *इन विट्रो* कल्चर ऑफ़ *लीशमैनिया डोनोवनी* प्रोमैस्टिगोट्स शोज़ लेपटोमोनाज़ लाइक फ़ॉर्म्स ऐज़ रिवील्ड बाई रिस्ट्रिक्शन फ्रैग्मेन्ट लेन्थ पॉलीमौर्फ़िज़म (RFLP) पैटर्न; कीर्ति रावत, नरेन्द्र के. यादव, सुमित जोशी और अनुराधा दुबे

64. मॉलीक्युलर कैरेक्टराइज़ेशन ऑफ़ द डेल्टा सब यूनिट ऑफ़ टी कॉम्प्लेक्स प्रोटीन–1 फ्रॉम *लीशमैनिया डोनोवनी*, नरेन्द्र के. यादव, कीर्ति रावत, सुमित जोशी, प्रशांत खरे, अनिल के. जायसवाल और अनुराधा दुबे

65. इवैल्युएशन ऑफ़ प्रोटेक्टिव एफ़ीकेसी ऑफ़ सेन्ट्रिन KO (LdCen1-/-) लाइव ऐटेन्युएटेड लीशमैनिया वैक्सीन अगेन्स्ट *लीशमैनिया डोनोवनी* चैलेन्ज इन इण्डियन लंगूर मंकीज़ (*प्रेसबाइटिस एन्टिलस*); सुमित जोशी, रति टंडन, नरेन्द्र के यादव, कीर्ति रावत, रनधीर डे, पूनम सैलोट्रा अंगामुथु सेल्वापन्डियन, हीरा एल. नखासी और अनुराधा दुबे

66. द इम्यूनो प्रोफ़ाइलैक्टिक एफ़ीकेसी ऑफ़ *ब्रूज़िया मलाई* ऐडल्ट फ़ीमेल हेवी चेन मायोसिन (BmAF-Myo) ऐज़ ए डीएनए एण्ड हेट्रोलोगस प्राइम ब्रूस्ट वैक्सीन इज़ ए रोडेन्ट मॉडल;ज्योति गुप्ता, मनीषा पाठक, शैलजा मिश्रा भट्टाचार्या

67. फ़ास्फ़ोमाइसिन टार्गेट्स लिम्फैटिक फ़ाइलेरियल पैरासाइट, *ब्रूज़िया मलाई* बाइ इनहिबिटिंग मुरए ऑफ़ वॉलबैशिया इन्डोसिम्बॉएन्ट; मो. शहाब, मीनाक्षी वर्मा और शैलजा मिश्रा भट्टाचार्या

68. ट्रांसक्रिप्शन एलनगेशन फ़ैक्टर GreA ऑफ़ वॉलबैशिया, एन एण्डोसिमबॉएन्ट ऑफ़ *ब्रूज़िया मलाई*, कैरेक्टराइजेशन एण्ड इण्टरैक्शन स्टडी विद $\alpha 2\beta\beta\sigma$ सबयूनिट्स ऑफ़ आरएनए पॉलीमरेज़; डी. चहार, जे.के. नाग, एम. गंगवार, जे. झा, ए. चावला और एस. मिश्रा भट्टाचार्या

69. फ़ंक्शनल जीनॉमिक एनालिसिज ऑफ़ वाइटल *ब्रूज़िया मलाई* जीन्स यूजिंग कैनॉर हैबडाइटिस एलेगैन्स ऐज़ मॉडल ऑर्गेनिज़्म; सुशील भट्टाचार्या, आमिर नाज़िर, शैलजा मिश्रा भट्टाचार्या

70. नैनो रिसर्वाएर कैरीइंग *ब्रूज़िया मलाई* रिकॉम्बीनेन्ट प्रोटीन्स फ़ॉर ओरल इम्यूनोप्रोफाइलैक्सिस अगेन्स्ट इनफ़ेक्टिव लार्वल चैलेन्ज; एम. गंगवार, वी.टी. बनाला, डी. चहार, आर. झा, पी. आर. मिश्रा और एस. मिश्रा भट्टाचार्या

71. वॉलबैशिया एण्डोसिमबॉएन्ट ऑफ़ *ब्रूज़िया मलाई* इलिसिट्स टीएच–17 मीडिएटेड प्रो इनफ्लमेटरी इम्यून रिस्पॉन्स थ्रू सर्फ़ेस प्रोटीन); मनीषा पाठक, मीनाक्षी वर्मा, मृगांक श्रीवास्तव और शैलजा मिश्रा भट्टाचार्या

72. क्लोनिंग, एक्सप्रेशन, प्योरिफ़िकेशन ऑफ़ *ब्रूज़िया मलाई* यूडीपी, गैलेक्टोपाइरैनोज़ म्यूटेज़ (यूजीएम) एण्ट इट्स इम्यूनोरिऐक्टिविटी विद बैक्रोटियन ह्यूमन सेरा; श्वेता मिश्रा और शैलजा मिश्रा भट्टाचार्या

73. मॉक्लीडेक्टिन एलोन एण्ड इन कॉम्बीनेशन विद डॉक्जीसाइक्लिन एक्ज़र्टस मैक्रोफ़ाइलेरिसाइडल ऐक्टिविटी एकम्पनीड विद मार्क्ड रिडक्शन इन वॉलबेशिया डेनिसिटी फ्रॉम ह्यूमन लिम्फ़ैटिक फ़ाइलेरिया, *ब्रूज़िया मलाई* ; एम. वर्मा, एम. पाठक, के मित्रा, एस. मिश्रा भट्टाचार्या

74. एण्टीमलेरियल थेराप्यूटिक इण्टरवेन्शन्स यूजिंग वेरिअस कॉम्बीनेशन्स ऑफ़ स्टैन्डर्ड एण्टीमलेरियल्स एण्ड एण्टीबायोटिक्स अगेन्स्ट इन विट्रो लेबोरेट्री मेन्टेन्ड स्ट्रेन्स ऑफ़ *प्लाजमोडियम फ़ैल्सीपेरम* ; पी. अग्रवाल, आर.के. श्रीवास्तव, एस.के. पुरी और के श्रीवास्तव

75. पॉसिबल रोल ऑफ़ हीम डीटॉक्सीफ़िकेशन प्रोटीन इन आर्टीथर रेज़िस्टेन्स; अवकाश सोनी, मनीष गोयल, कृतिका प्रकाश और एस.के. पुरी

76. मॉलीक्युलर एण्ड बायोकेमिकल कैरेक्टराइज़ेशन ऑफ़ माइटोकॉन्ड्रियल को–चेपरॉन PfCPN10 इन ह्यूमन मलेरिया पैरासाइट *पी. फ़ैल्सीपेरम*; मनीष गोयल, कृतिका प्रकाश, अवकाश सोनी और एस.के. पुरी

77. मॉलीक्युलर क्लोनिंग एण्ड बायोकेमिकल कैरेक्टराइज़ेशन ऑफ़ आयरन सुपर ऑक्साइड डिसम्यूटेज़ फ्रॉम द रोडेन्ट मलेरिया पैरासाइट *प्लाज़मोडियम विंसकी* प्रकाश, मनीष गोयल और एस.के. पुरी

78. एपॉपटॉसिस इन द मलेरिया प्रोटोज़ोअन, *प्लाज़मोडियम फ़ैल्सीपेरम*: ए पॉसिबल ऐक्शन मेकैनिज़म ऑफ़ क्लोरोक्वीन; सारिका गुंजन और रेणु त्रिपाठी

79. ऐण्टीट्रिपैनोज़ोमल एजेण्ट्स ऑफ़ मैरिन ओरिजिन; हेमलता द्विवेदी, ए.के. सिन्हा, वाई. वेंक्टेश्वरलु, बृजेश कुमार और रेणु त्रिपाठी

80. आल्टर्ड लेविल ऑफ हिस्टमाइन एण्ड एक्सप्रेशन ऑफ़ इट्स रिसेप्टर्स इन सेरेब्रल मलेरिया मॉडल एण्ड देयर रिस्पॉन्स टु ऐण्टीमलेरियल्स सुनील कुमार सिंह और रेणु त्रिपाठी

81. सोल्यूबल फ़ैक्टर्स एण्ड देयर रोल इन पैथॉलॉजी ड्यूरिंग मलेरिया इन्फ़ेक्शन इन माइस; भावना सिंह चौहान, यशवीर सिंह और रेणु त्रिपाठी

82. ट्रॉपिकल पल्मोनरी इओसिनोफ़ीलिया इन म्यूरिन लंग इस केरेक्टराइज़्ड बाई आल्टर्ड एक्सप्रेशन पैटर्न्स ऑफ डिफ़रेन्ट साइटोकाइन्स; पी. शर्मा, ए. शर्मा, एम. श्रीवास्तव

83. इन्वेस्टिगेटिंग मैक्रोफ़ेज पोलराइजेशन ऐट अर्ली होस्ट पैरासाइट इण्टर फेस ड्यूरिंग लिम्फ़ैटिक फाइलेरियासिस; ए. शर्मा, पी. शर्मा, एम. श्रीवास्तव

84. 15d-PgJ2 डिपेन्डेन्ट कैसपेज़–3 ऐक्टिवेशन लीड्स टु प्रोग्रैम्ड सेल डेथ ऑफ़ *लीशमैनिया डोनोवनी* पैरासाइट्स इन एक्सपेरीमेन्टल विसरल लीशमैनियासिस; प्रीति विश्वकर्मा, पवन कुमार यादव, नवीन परमार और सुशांत कार

साइटोमीट्री सोसाइटी, नई दिल्ली का 7वां वार्षिक सम्मेलन (25–27 अक्टूबर)

85. इण्टरैक्शन ऑफ़ इन्ड्यूसिवल नाइट्रिक ऑक्साइड सिन्थेज़ विद रैक2 रेगुलेट्स रिऐक्टिव ऑक्सीजन एण्ड नाइट्रोजन स्पीशीज़ जेनरेशन इन द ह्यूमन न्यूट्रोफिल फैगोज़ोम्सः इम्प्लीकेशन इन माइक्रोबियल कीलिंग ए ज्योति; ए.के. सिंह, एम. दुबे, एस. कुमार, आर. सलूजा, आर.एस. केसरी, ए. वर्मा, टी. चन्द्रा, ए. कुमार, वी.के. बाजपेई, एम.के. बर्थवाल और एम. दीक्षित

इण्डो–यूएस सिम्पोज़ियम ऑन कन्टम्पपॉरेरी इश्यूज़ इन सेल काइनेटिक्स, बाबसाहेब भीमराव अम्बेडकर यूनिवर्सिटी, लखनऊ (29–30 अक्टूबर)

86. ए नॉवेल जिंक कॉम्प्लेक्स्ड डायथियोकार्बोमेट डेरीवेटिव करैक्ट्स मिसरेग्युलेटेड प्रोटेसामल पाथवे टू सॉल्वेज़ एण्टी–ट्यूमर ईआर–बीटा एण्ड ई–कैडहिरिन प्रोटीन्स फ्रॉम डिगारडेशन इन प्रोस्टेट कैन्सर पीसी–3 सेल्स, विशाल सिंह, विकास वर्मा, विकास शर्मा, धनराजू मण्डलापू, भावना कुशवाहा, आस्था पाण्डेय, जे.पी. मैखुरी, विष्णु एल. शर्मा और गोपाल गुप्ता

इण्डियन एकैडमी ऑफ़ न्यूरोसाइंसेज़ आईएन का 32वाँ वार्षिक सम्मेलन–2014, बंगलरु (01–03 नवम्बर)

87. प्रोटेक्टिव इफ़ेक्ट्स ऑफ़ मेमनटाइन इन स्ट्रेप्टोज़ॉटोसिन इनड्यूज्ड इन्स्युलिन रिसेप्टर डिस्फ़ंक्शन एण्ड न्यूरोइनलेमेशन इन ऐस्ट्रोसाइट्स; एन. राजशेखर, चण्डीश्वर नाथ, काशिफ हनीफ़, राकेश शुक्ला

88. रोल ऑफ़ एनएमडीए रिसेप्टर मीडिएटेड सीआरईबी फ़ॉस्फोरिलेशन इन स्ट्रेप्टोज़ॉटोसिन (एसटीजेड) इन्ड्यूज्ड ऐस्ट्रोग्लायल ऐक्टिवेशन; शिविका राय, चण्डीश्वर नाथ, राकेश शुक्ला

89. ए कम्पैरेटिव स्टडी ऑन न्यूरोइनफ़्लमेटरी रिस्पॉन्स एण्ड मेमोरी फ़ंक्शन्स इन लिपोपॉलीसैक्राइड (आईसीवी) ट्रीटेड स्पॉन्टेनियसली हाइपरटेन्सिव एण्ड नॉर्मोटेन्सिव रैट्स; रुबी गोयल, काशिफ हनीफ, चण्डीश्वर नाथ, राकेश शुक्ला

एशियन प्लाण्ट साइंस कांफ्रेंस, भैरहवा (लूम्बिनी), नेपाल (01–03 नवम्बर)

90. ओस्टियोप्रोटेक्टिव ऐक्टिविटी फ्रॉम *कोलोज़िन क्रिस्टेटा* लिंडले (ऑर्चिडेसीश्वल): ए ट्रेडीशनल प्लाण्ट यूज्ड फ़ॉर बोन हीलिंग इन उत्तराखण्ड, भारत; सी शर्मा, के.आर. आर्या, डी. सिंह, टी. नरेन्द्र

एएपीएस–2014 वार्षिक बैठक और एक्सपोज़िशन सैन डिएगो, यूएसए (02–06 नवम्बर)

91. नेटामाइसिन लैडन नैनोपार्टिकल्स एज़ सस्टेन्ड ऑकलर डिलीवरी व्हीकल्सः डिवेलपमेन्ट *इन विट्रो–इन वीवो* कैरेक्टराइज़ेशन एण्ड पीके/पीडी इन्डिसेज; हार्दिक चन्डासना, येरा दुर्गा प्रसाद, यशपाल एस. छोंकर, कल्याण मित्रा, प्रवीण के शुक्ला, रवी एस. भट्टा

इनोवेशन्स इन ऐथ्रोस्क्लेरॉसिस एण्ड कार्डिएक डिज़ीज़ेज ऑफ इण्डिया सोसाइटी ऑफ़ ऐथ्रोस्क्लेरॉसिस रिसर्च, भारत, लखनऊ (25–27 नवम्बर)

92. सीडीआर–267–एफ़018 ऐमिलियोरेट्सफ्रुक्टोज़ रिच डायट इन्ड्यूज्ड इन्स्युलिन रेज़िस्टेन्स एण्ड वैस्कुलर डिस्फंक्शन इन रैट्स; एस.एस. रेड्डी, वी. सिंह, पी. पाठक, एम.एन. श्रीवास्तव, टी. नरेन्दर, ए.के. द्विवेदी, एम. दीक्षित और एम.के. बर्थवाल

93. हिस्टोलॉजिकल एण्ड फंक्शनल कैरेक्टराइज़ेशन ऑफ़ ऐथ्रोस्क्लेरॉसिस प्रोग्रेशन इन रैबिट इलिऐक एटरी; जे.एस. कांशना, वी. खन्ना, वी. सिंह, एम. जैन, एम. फारूकी, ए. मिश्रा, एम.के. बर्थवाल और एम. दीक्षित

94. मॉडुलेशन ऑफ़ हेपैटिक कोलॅजन कन्टेन्ट इन द हाई फ्रैट डायट फ़ेड माइस; एस.सी. रिवेलो, जे.एस. कांशना, के. नागेश्वर राव, पी. पाठक, एस. शर्मा और एम. दीक्षित

95. टाइम डिपेन्डेन्ट चेन्जेज़ इन द न्यूट्रोफ़िल एक्युमुलेशन एण्ड हेपैटिक रिडॉक्स स्टेट्स फ़ॉलोइंग हाई फैट डाइट फ़ीडिंग इन माइस; के. नागेशवर राव, एस.सी. रिबेलो, जे.एस. काशना, पी. पाठक, डी. अवस्थी, डी. नागरकोटि और एम. दीक्षित

96. प्रोटेक्टिव इफ़ेक्ट ऑफ सीडीआर–267–एफ़018 अगेन्स्ट डिस्लिपिडेमिया इन्ड्यूज्ड इण्डोथिलियल डिस्फंक्शन इन द गिनी पिंग एण्ड रैबिट; पी. पाठक, जे.एस. कांशना, वी. श्रीवास्तव, वी. खन्ना, वी. सिंह, एम.एन. श्रीवास्तव टी. नरेन्दर, ए.के. द्विवेदी, एम.के. बर्थवाल और एम. दीक्षित

तृतीय ग्लोबल सस्टेनेबल बायोटेक कांग्रेस–2014 उत्तरी महाराष्ट्र विश्वविद्यालय, जलगाँव (1–5 दिसम्बर)

97. हेमैटोपॉइटिक ऐसेज़ ऐज सब्स्टीट्यूट ऑफ़ *इन विट्रो* हेमाटोटॉक्सीसिटी फ़ॉर न्यू ड्रग; डॉ. रामा के. सिंह

नेशनल सिम्पोज़ियम ऑन क्लीनिकल रिसर्च, गुड क्लीनिकल प्रैक्टिस, फ़ार्माकोविजिलेन्स, न्यूअर इश्यूज़ इन एथिक्स, रेगुलेटरी रिक्वाएरमेन्ट इन न्यू ड्रग ऐप्लिकेशन्स एण्ड क्लीनिकल ट्रायल्स, लखनऊ (03–04 दिसम्बर)

98. चेन्जेज़ इन पॉस्थॉक टेस्ट्स ऑन नाइट्रिक ऑक्साइड एण्ड लिपिड पेरॉक्सीडेशन विद सिक्आिरिटी ऑफ़ डायबिटिक रेटिनोपैथी; सी. सिंह, एम. श्रीवास्तव और एम. दीक्षित

शोध छात्रों हेतु 10वाँ NOST सम्मेलन(जे नॉस्ट–2014), मद्रास (04–06 दिसम्बर)

99. डॉनर–ऐक्सेप्टर फ़्लोरेन्थीन एण्ड बेन्ज़ो ऐक्रिडीन [अ] बेस्ड फ़्लोरेसेन्ट डाइज़ ऐज़ बायोप्रोब्स एण्ड ऑर्गेनिक इलेक्ट्रॉनिक मैटीरियल्स; आशुतोष शर्मा और अतुल गोयल

अमेरिकन सोसाइटी ऑफ़ हेमाटोलॉजी, सैन फ्रांसिस्को की 56वीं वार्षिक बैठक, सीए, यूएसए (06–09 दिसम्बर)

100. ग्लूटाथियॉनिलेशन ऑफ़ एनएफ–केबी रेगुलेट्स इनड्यूसिबल नाइट्रिक ऑक्साइड सिन्थेज़ एक्सप्रेशन इन क्रोनिक मायलाइड ल्यूकीमिया सेल्स; ए.के. सिंह, डी. अवस्थी, एम. दुबे, टी. चन्द्रा, ए. कुमार, एम.के. बर्थवाल, ए.के. त्रिपाठी, एम. दीक्षित

छठीं एनुअल मीटिंग ऑफ प्रोटियोमिक्स सोसायटी ऑफ़ इण्डिया (पीएसआई) एण्ड इण्टरनैशनल कांफ्रेंस ऑन प्रोटियोमिक्स फ्रॉम डिस्कवरी टु फंक्शन, मुम्बई, (7–9 दिसम्बर)

101. कॉम्पेरेटिव प्रोटियोम एनॉलाइसिस ऑफ पैथोजेनिक ऐण्ड नॉन–पैथोजेनिक मायकोबैक्टीरियम Δ सिगएफ म्यूटेण्ट ऐण्ड आइसोजेनिक वाइल्ड टाइप स्ट्रेन्स; विशाल श्रीवास्तव, देबाशीष दत्ता और भूपेन्द्र एन. सिंह

38वां अखिल भारतीय सेल बायोलॉजी सम्मेलन और 'सेल्युलर रिस्पॉन्स टु ड्रग्स' पर अन्तर्राष्ट्रीय संगोष्ठी, लखनऊ (10–12 दिसम्बर)

102. डैमेज–एसोशिएटेड मॉलीक्युलर प्रोटीन एचएमजीबी–1 स्युमॉइलेशन स्टिमुलेट्स इन्डोथिलायल, सेल इन्ड्यूज्ड इनफ़्लमेशन; दीपिका गोयल और कुमारवेलु जगवेलु

103. क्लोनिंग, एक्सप्रेशन एण्ड प्यूरीफ़िकेशन स्ट्डीज़ विथ एमआरए_1916, ए प्यूटेटिव डी–अमिनो एसिड ऑक्सीडेज़ ऑफ़ *माइकोबैक्टीरियम ट्यूबरकुलोसिस* एच37आरए, कुमार सचिन सिंह और सुधीर कुमार सिंह

104. क्लोनिंग, एक्सप्रेशन एण्ड प्यूरीफ़िकेशन स्ट्डीज़ विथ एमआरए_1571, ए प्यूटेटिव जीन फॉर आइसोल्यूकाइन बायोसिन्थिसिस इन *माइकोबैक्टीरियम ट्यूबरकुलोसिस* एच37आरए, ऋषभ शर्मा और सुधीर कुमार सिंह

105. क्लोनिंग, एक्सप्रेशन एण्ड प्यूरीफ़िकेशन स्ट्डीज़ विथ एमएसएमईजी_5684, ए प्यूटेटिव फॉस्फोरिन अमिनोट्रांसफ्रेज़ ऑफ़ *माइकोबैक्टीरियम स्मेग्मेटिस* एमसी2, दीपक केसरी और सुधीर कुमार सिंह

106. कैरेक्टराइज़ेशन ऑफ मल्टी ड्रग–रिसस्टेन्ट *माइकोबैक्टीरियम ट्यूबरकुलोसिस* जिनोटाइप्स अर्गेनाइटेड फ्रॉम बीजिंग, कंचन श्रीवास्तव, दिनेश के. त्रिपाठी, किशोर के. श्रीवास्तव और सूर्य कांत

107. असेस्मेण्ट ऑफ़ फंक्शनल एफिकेसिज ऑफ टायरोसाइन फॉस्फेटसेज़ फ्रॉम पैथोजेनिक एण्ड नॉन–पैथोजेनिक माइकोबैक्टीरिया एण्ड आइडेण्टीफ़िकेशन ऑफ़ स्पेस्फिक इन्हिबिर्टस, अदिति चटर्जी, सपना पाण्डेय, प्रमोद के. सिंह, नवेन्दु प्रकाश पाठक, नियति राय, रविशंकर रामचन्द्रन, रामापति त्रिपाठी और किशोर के. श्रीवास्तव

108. पोस्ट–ट्रॉंसलेशनली मोडिफाइड ईएसपीजे प्रोटीन इज़ इम्प्रोटेण्ट इन ग्रोथ एण्ड इन इन्ट्रा–सुल्युलर सरवाइवल ऑफ़ माइकोबैक्टीरिया, प्रमोद के. सिंह, रिचा सक्सेना, समीर तिवारी, सुष्मिता के. सिंह, रूमा कुमार और किशोर के. श्रीवास्तव

109. ओवरएक्सप्रेशन ऑफ सिगएफ एन्टागोनिस्ट इन *माइकोबैक्टीरियम स्मेगमटिज़* मिमिक्स सिग्फ़ म्यूटन्ट फीनोटाइप, लॉस ऑफ़ पिगमेन्टेशन एण्ड सेन्सीटिविट टू ऑक्सीडेटिव स्ट्रेस, वन्दना सिंह और भूपेन्द्र एन. सिंह

110. इन्स्यूलिन मॉड्युलेट्स द आउटकम ऑफ़ अल्फ़ा साइन्यूकलिन एग्रीमिशन वाया डीएएफ–2/डीएएफ–16 सिग्नलिंग पॉथवेज़ इन ट्रांसजेनिक *सी. इलेगेन्स* मॉडल ऑफ पार्किनसन्स डिज़ीज, रिजवानुल हक, ललित कुमार, शमशुज़्जामा, सोबिया फ़ातिमा, पूजा जड़िया और आमिर नाज़िर

111. वैलिडेशन, सिक्वेंसिंग एण्ड फंक्शनल एनालिसस ऑफ सर्कुलर आरएनए मॉलीक्युल, सीआरएनए, इन *सी. इलेगेन्स* मॉडल, ललित कुमार, शमशुज़्जामा और आमिर नाज़िर

112. स्ट्डीज़ ऑन लेट–7 माइक्रोआरएन इम्प्लायिंग जेनेटिक मॉडल सिस्टम *सी. इलेगेन्स* : इम्प्लिकेशन फ़ॉर एज़ एसोशिएटेड न्यूरोडिजनरेटिव डिज़ीज़ेज, शमशुज़्जामा, ललित कुमार और आमिर नाज़िर

113. मेम्मेलियन डायबिटीज़ आटोऐण्टीजन आईए–2 एक्सहिबिट्स न्यूरोप्रोटेक्टिव एक्टिविटी : स्ट्डीज इम्प्लायिंग ट्रांसजेनिक *सी. इलेगेन्स* मॉड्ल्स ऑफ न्यूरोडिजनरेटिव डिज़ीज, सोबिया फातिमा, रिजावनुल हक, ललित कुमार शमशुज़्जामा, पूजा जाडिया और आमिर नाज़िर

2015

सिम्पोज़ियम ऑन ड्रग डिस्कवरी इन इण्डिया, पास्ट, प्रेजेण्ट ऐण्ड यूचर, लखनऊ (01 जनवरी, 2015)

1. क्लोनिंग, एक्सप्रेशन एण्ड प्यूरीफ़िकेशन स्ट्डीज़ विथ एमआरए_1104, ए प्यूटेटिव सीराइन हाइड्रोक्सीमिथाइल ट्रांसफ़िरेज ऑफ *माइकोबैक्टीरियम ट्यूबरकुलोसिस* एच37आरए, कुमार सचिन सिंह और सुधीर कुमार सिंह

2. इफेक्ट ऑफ कार्बन सोर्स एण्ड ऑक्सीज़न अवेलेबिलिटी ऑन एक्सप्रेशन ऑफ एमआरए_1571, ड्यूरिंग *माइकोबैक्टीरियम ट्यूबरकुलोसिस* एच37आरए ग्रोथ, ऋषभ शर्मा और सुधीर कुमार सिंह

3 नेटवर्क एवं लिंकेज

1. 12वीं पंचवर्षीय योजना की सीएसआईआर नेटवर्क परियोजनाएं (2012–2017)

कोड सं.	ऐक्रॉनिम	परियोजना शीर्षक	नोडल ऑफिसर सीएसआईआर–सीडीआरआई
बीएससी0201	अस्थि	ऐनाबोलिक स्केलेटल टार्गेट्स इन हेल्थ एण्ड इलनेस (सीएसआईआर– सीडीआरआई, नोडल लैब)	डॉ. नैबेद्य चट्टोपाध्याय
बीएससी0101	प्रोग्राम	फ़ैक्टर्स गवर्निंग कॉम्पीटेन्ट गेमीट प्रोडक्शन एण्ड रिप्रोडक्टिव डिस्फ़ंक्शन (सीएसआईआर– सीडीआरआई, नोडल लैब)	डॉ. राजेन्द्र सिंह
बीएससी0102	थन्डर	टुवर्ड्स होलिस्टिक अण्डरस्टैन्डिंग ऑफ़ कॉम्प्लेक्स डिज़ीज़ेज़: अनरैवलिंग द थ्रेडस ऑफ़ कॉम्प्लेक्स डिज़ीज़ेज़ (सीएसआईआर–सीडीआरआई, नोडल लैब)	डॉ. मधु दीक्षित
बीएससी0103	अनडू	न्यू ऐप्रोचेज़ टुवर्ड्स अण्डरस्टैन्डिंग ऑफ़ डिज़ीज़ डायनमिक्स एण्ड टु ऐक्सेलरेट ड्रग डिस्कवरी (सीएसआईआर– सीडीआरआई, नोडल लैब)	डॉ. एस.के. रथ
बीएससी0104	स्प्लेन्डिड	इमर्जिंग एण्ड री–इमर्जिंग चैलेन्ज़ेज इन इनफ़ेक्शियस डिज़ीज़: सिस्टम बेस्ड ड्रग डिजाइन फ़ॉर इनफ़ेक्शस डिज़ीज़ेज़ (सीएसआईआर– सीडीआरआई, नोडल लैब)	डॉ. आर. रविशंकर
बीएससी0106	बायोप्रॉस्पर	बायो प्रॉस्पेक्शन ऑफ़ प्लाण्ट रिसोर्सेज़ एण्ड अदर नैचुरल प्रॉडक्ट्स (सीएसआईआर–एनबीआरआई, नोडल लैब)	डॉ. दीपक दत्ता
बीएससी0108	मेडकेम	मेडिसिनल केमिस्ट्री फ़ॉर स्टेम सेल बायोलॉजी एण्ड रिजेनरेटिव मेडिसिन्स (सीएसआईआर– आईआईआईएम, नोडल लैब)	डॉ. अतुल कुमार
बीएससी0111	इनडेप्थ	इन्टीग्रेटेड नेक्स्टजेन ऐप्रोचेज़ इन हेल्थ, डिज़ीज़ एन एनवायरमेन्टल टॉक्सिसिटी (सीएसआईआर–आईआईटीआर, नोडल लैब)	डॉ. बी.एन. सिंह
बीएससी0112	नैनोशी	नैनो–मटीरियल्स: ऐप्लिकेशन्स एण्ड इम्पैक्ट ऑन सेफ़्टी हेल्थ एण्ड एनवॉयरमेन्ट (सीएसआईआर–आईआईटीआर, नोडल लैब)	डॉ. अमित मिश्रा
बीएससी0113	अन्सीन	अण्डरस्टैण्डिंग सुप्रा–मॉलीक्युलर एनसेम्बल्स एण्ड मैशीन्स (सीएसआईआर–आईआईसीबी, नोडल लैब)	डॉ. आशीष अरोड़ा
बीएससी00114	होप	अण्डरस्टैण्डिंग द रोल ऑफ़ होस्ट मॉलीक्यूल्स इन पैरासिटिक इन्फ़ेक्शन्स (सीएसआईआर–आईआईसीबी, नोडल लैब)	डॉ. अनुराधा दुबे
बीएससी0115	माइन्ड	न्यूरोडिजेनरेटिव डिज़ीज़ : कॉज़ एण्ड करेक्शन्स (सीएसआईआर–आईआईसीबी, नोडल लैब)	डॉ. शुभा शुक्ला
बीएससी0118	एपिहेड	एपिजेनेटिक इन हेल्थ एण्ड डिज़ीज़ (सीएसआईआर–सीसीएमबी, नोडल लैब)	डॉ. आमिर नाज़िर
बीएससी0119	हम	अण्डरस्टैण्डिंग द ह्यूमन माइक्रोबायोम (सीएसआईआर–इमटेक, नोडल लैब)	डॉ. अरुणव दास गुप्ता
बीएससी0120	बायोडिस्कवरी	सेन्टर फ़ॉर बायोथेराप्यूटिक मॉलीक्यूल डिस्कवरी (सीएसआईआर–इमटैक, नोडल लैब)	डॉ. जे.के. घोष
बीएससी0121	जेनेसिस	जेनॉमिक्स एण्ड इन्फ़ॉर्मेटिक्स सोल्यूशन्स फ़ॉर इन्टीग्रेटिंग बायोलॉजी (सीएसआईआर–इमटेक नोडल लैब)	डॉ. एम. आई. सिद्दीकी

कोड सं.	ऐक्रॉनिम	परियोजना शीर्षक	नोडल ऑफिसर सीएसआईआर–सीडीआरआई
बीएससी0123	जीनकोड	जीनोम डायनमिक्स इन सेल्युलर ऑर्गनाइज़ेशन, डिफ़रेन्सिएशन एण्ड इनैन्शियोस्टैट्सि (सीएसआईआर–आईजीआईबी, नोडल लैब)	डॉ. डब्ल्यू हक
सीएससी0302	एड	एडवांस ड्रग डिलीवरी सिस्टम (सीएसआईआर–आईआईसीटी नोडल लैब)	डॉ. मनीष कुमार चौरसिया
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. पी.आर. मिश्रा
आइएससी0102	नोगेट	सीएसआई नॉलेज़ गेटवे ओपन सोर्स प्राइवेट क्लाउड इन्फ्रास्ट्रक्चर, निस्केयर, नोडल लैब	श्री सुमन मलिक
पीएससी0111	मिस्टीक	मेज़रमेन्ट फ़ॉर इनोवेशन इन साइंस एण्ड टेक्नोलॉजी फ़ॉर इम्प्रूवमेन्ट ऑफ़ क्वालिटी एण्ड इकोनॉमी ऑफ़ लाइफ़ (सीएसआईआर–एनपीएल, नोडल लैब)	डॉ. ए.के. द्विवेदी

2. अनुदान परियोजनाएँ

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
जैव प्रौद्योगिकी प्रभाग			
स्ट्रक्चरल एनालिसिस ऑफ़ वैक्टीरियल पेप्टाइडिल–tRNA हाइड्रोलेज़ एन्ज़ाइम्स एण्ड डिज़ाइन ऑफ़ हाई ऐफ़िनिटी बाइन्डर्स	डॉ. आशीष अरोड़ा	13.08.2010	12.08.2014
क्रिस्टलोग्राफ़िक एण्ड बायोकेमिकल स्ट्डीज़ ऑन फ़ीस्ट/फ़ैमाइन रेगुलेटरी प्रोटीन्स फ्रॉम माइकोबैक्टीरिया	डॉ. रविशंकर आर.	01.05.2011	30.04.2014
इन्वेस्टीगेशन ऑफ़ इफ़ेक्ट ऑफ़ पॉलीसैक्राइड इन मॉडीफ़ाइंग लीशमैनिसाइडल पोटेन्शियल ऑफ़ नैनोपार्टिकुलर सिस्टम बियरिंग केमोथेराप्यूटिक्स एजेण्ट	डॉ. मनीष के. चौरसिया	01.10.2011	30.09.2014
फ़ंक्शनल कैरेक्टराइज़ेशन ऑफ़ CRN12 इन लीशमैनिया पैरासाइट्स	डॉ. अमोघ ए. सहस्रबुद्धे	01.11.2011	31.10.2014
डिस्कवरिंग एण्टीमलेरियल्स फ्रॉम मैरिन आर्गेनिज़म्स (फेज़–।।।): बल्क रिकलेक्शन ऑफ़ प्रॉमिसिंग मैरिन ऑर्गेनिज़म्स–आइसोलेशन, प्योरिफ़िकेशन, कैरेक्टराइज़ेशन एण्ड केमिकल सिंथिसिज़ ऑफ़ मैरिन डिराइव्ड एण्टीमलेरियल	डॉ. ए.के. सिन्हा	01.01.2012	30.03.2015
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
एन्हांन्सिंग फ़ंक्शनल रेपरट्वार ऑफ RNAP II इन नॉर्मल एण्ड कैंसर सेल	डॉ. मो. सुहैल अख्तर	01.05.2012	30.04.2015
आइडेण्टीफ़िकेशन ऑफ़ यूरिनरी बायोमार्कर्स फ़ॉर डायग्नॉसिस, प्रॉग्नॉसिस एण्ड फ़ालोअप ऑफ़ पेशेन्ट्स विद SLE नेफ्राइटिस	डॉ. एस.के. सिन्हा	01.05.2012	30.04.2015

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
एण्टीऑक्सीडेण्ट कैपेसिटी ऑफ़ ऐस्ट्रोसाइट्स एण्ड न्यूरोट्रॉफिक फ़ैक्टर इन एजिंगः एज़ एण्ड जेण्डर बेस्ड एनालिसिस (नैशनल इनीशिएटिव ऑन ग्लायल सेल रिसर्च इन हेल्थ एण्ड डिज़ीज़)	डॉ. सारिका सिंह	07.05.2012	06.05.2015
वैलिडेशन ऑफ़ द कैन्सर टेस्टिस बायोमार्कर CABYR इन सर्विकल स्क्वेमस सेल कार्सिनोमास	डॉ. मोनिका सचदेव	01.06.2012	31.05.2014
सोल्यूशन स्ट्रक्चर एण्ड डायनमिक्स ऑफ़ Unc-60 एडीएफ/*कॉफ़िलिन* प्रोटीन्स ऑफ़ *सीनॉरैब्डाइटिस एलेगैन्स*	डॉ. आशीष अरोड़ा	24.08.2012	23.08.2015
ड्रग अगेन्स्ट सेन्ट्रल बॉडी फ़ैटनेस एण्ड इन्स्युलिन रेज़िस्टेन्स (हाईजलपेरी/पोस्ट मेनोपॉलत प्रिवैलेन्स) RGY	डॉ. जे. आर. गायन	12.09.2012	11.09.2015
मॉलीक्युलर कैरेटराइज़ेशन एण्ड ऐपिडेमिऑलोज़िकल मॉडलिंग ऑफ़ एण्टी माइक्रोबियल रेस्टिेन्स 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 (RGYl)	डॉ. दिब्येन्दु बेनर्जी	10.06.2013	09.06.2016
एन एप्रोचेज़ टुवर्ड्स आइडेण्टीफ़िकेशन एण्ड सिन्थिसिज़ ऑफ़ एण्टीजेनिक एपिटोप्स ऑफ़ पोटेन्शियल *एल. डोनोवनी* Th1 स्टिमुलेटरी प्रोटीन्स फ़ॉर द डिवेलपमेन्ट ऑफ़ सिंथेटिक वैक्सीन अगेन्स्ट विसरल लीशमैनियासिस	डॉ. अनुरोधा दुबे	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
जेनेटिक मैनीपुलेशन एण्ड ड्रग टार्गेटिंग एप्रोचेज़ अगेन्सट *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
असेम्बली ऑफ़ आयरन सल्फ़र [Fe-S] क्लस्टर्स ऑन क्रिटिकल प्रोटीन्स ऑफ़ द प्लाज़मोडियम एपिकोप्लास्ट	डॉ. समन हबीब	11.10.2013	10.10.2018
इन्वेस्टीगेटिंग द एक्स्ट्रा रिबोज़ोमल फ़ंक्शन्स ऑफ़ रिबोज़ोमल प्रोटीन्स ड्यूरिंग स्ट्रेस एण्ड इन्फेक्शन	डॉ. नीति कुमार	13.11.2013	12.11.2018
डिस्कवरी एण्ड डिवेलनमेन्ट ऑफ़ नॉवेल बोन एनाबोलिक एजेण्ट्स फॉर एक्सीलेरेटेड फ्रैक्चर हीलिंग	डॉ. नैबेद्य चट्टोपाध्याय	21.02.2014	21.02.2016
आइडेण्टीफ़िकेशन एण्ड फ़ंक्शनल कैरेक्टराइज़ेशन ऑफ़ नॉवेल माइक्रोRNA कैण्डीडेट्स आल्टर्ड बाई फ़ाईटोएस्ट्रोजेनः रोल इन द पेथोजेनेसिस ऑफ ऑस्टियोपोरोसिस	डॉ. दिव्या सिंह	01.08.2014	31.01.2017
miRNA इन द रेगुलेशन ऑफ़ स्क्लेरोस्टिन ए थेराप्यूटिक एप्रोच फ़ॉर ओस्टियोपोरोसिस (वीमेन साइंटिस्ट स्कीम)	डॉ. शमिष्ठा भट्टाचार्य और डॉ. एन. चट्टोपाध्याय	26.09.2014	25.09.2014
स्ट्डीज़ ऑन द इन्टरैक्शन्स बिटवीन माइकोबैक्टीरिया एण्ड होस्ट डिफेन्स पेप्टाइड्स	डॉ. मुकेश पसुपुलेती	01.10.2014	30.09.2017

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
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 *लीशमैनिया डोनोवनी*, देयर एक्सप्लोरेशन ऐज़ ड्रग टार्गेट	डॉ. नीन गोयल	24.12.2014	23.12.2017
विज्ञान एवं प्रौद्योगिक प्रभाग			
सोफ़िस्टिकेटेड एनालिटिकल इन्स्ट्रूमेन्ट फ़ैसिलिटी (सैफ)	निदेशक	01.04.1975	दीर्घ अवधि
एण्टीमलेरियल प्रिंसिपल्स फ्रॉम प्लाण्ट्स बिलांगिंग टु द जेनस *बर्नोनिया* एन्डमिक टु द वेस्टर्न घाट्स	डॉ. ए.के. भट्टाचार्य, एनसीएल, और डॉ. कुमकुम श्रीवास्तव	01.09.2011	31.08.2014
टु स्टडी इम्यूनोप्रोटेक्टिव रोल्स ऑफ़ मेथॉक्ज़ीआइसोफ्लेवॉन्स इन एस्ट्रोजन डेफ़िशिएन्सी इन्ड्यूज्ड बोन लॉस	डॉ. दिव्या सिंह	10.10.2011	09.10.2014
इन्वेस्टीगेशन ऑन इम्यूनोमॉडुलेशन मीडिऐटेड बाइ *माइकोबैक्टीरियम ट्युबरकुलोसिस* ड्युरिंग पर्सिन्टेन्ट इनफ़ेक्शन	डॉ. वाई.के. मंजू	01.11.2011	31.10.2014
सर्केडियन मॉडीफ़िकेशन इन कैन्सर प्रोग्रेशन	डॉ. डी.पी. मिश्रा	02.01.2012	01.01.2014
प्रोटीन ट्रांसलेशन इन ऑर्गेनिलीज़ ऑफ़ *प्लाज़मोडियम फैल्सीपेरम* (इन्डो–स्पेन रिसर्च प्रॉडक्ट)	डॉ. समन हबीब	04.04.2012	03.04.2015
रोल ऑफ़ इन्नेट इम्यून कम्पोनेन्ट्स इन इनफ़्लमेशन इन्नड्यूज्ड इन्स्युलिन रेज़िस्टेन्स	डॉ. अखिलेश ताम्रकार	01.06.2012	31.05.2015
आइसोलेशन एण्ड कैरेक्टराइज़ेशन ऑफ़ एण्टीफ़ंगल पेप्टाइड्स फ्रॉम नैचुरल सोर्सेज़	डॉ. विनीता सिंह	01.06.2012	31.5.2015
रेगुलेशन ऑफ़ पैक्रियास्टैटिनः ए नॉवेल ऐप्रोच टु कंट्रोल डायबिटीज़	डॉ. जे.आर. गाइन	12.06.2012	11.06.2015
फार्माकोकाइनेटिक, मेटोबोलिक एण्ड बायोफ़ार्मास्युटिक असेसमेन्ट ऑफ़ एण्टीमेलेरियल ल्यूमफ़ैन्ट्रिन एण्ड इट्स ऐक्टिव एण्ड मोर पोटेण्ड मेटाबोलिक	डॉ. वहाजुद्दीन	18.06.2012	17.06.2015
नॉवेल जेनेटिक एण्ड एपीजेनेटिक टार्गेट्स फ़ॉर ब्रेस्ट कैन्सर प्रिवेन्शन एण्ड थेरेपी : ए मेकैनिस्टिक ऐप्रोच विद बायोऐक्टिव डायटरी सप्लीमेन्ट्स	डॉ. सैयद मुस्तफ़ा एम.	18.06.2012	17.06.2015
अण्डरस्टैन्डिंग द मेकैनिज़म ऑफ़ एण्टी कॉर्सिनोजेनिक इफ़ेक्ट ऑफ़ अल्फ़ा–सोलोनिन	डॉ. जयन्त सरकार	01.10.2012	30.09.2015
एक्सप्लोरेशन ऑफ़ पोटेन्शी, एफ़ीकेसी एण्ड मोड ऑफ़ एक्शन ऑफ़ *अल्मस वॉलिचियाना* अगेन्स्ट हाइपरटेन्शन	डॉ. जे.आर. 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. टी.एस. ठाकुर	07.11.2012	06.11.2015
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 फिशन 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

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
बायोटेक्नोलॉजिकल इण्टरवेंशन फॉर फार्मास्यूटिकली वैल्युएबल कम्पाउण्ड्स फ्रॉम फॉरेस्ट रेजिन्स	डॉ. राकेश शुक्ला	01.05.2013	30.04.2016
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
एन ऐप्रोच टुवर्ड्स नॉवेल स्टेरॉयडोमिमेटिक्स–डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ स्ट्रक्चरली डाइवर्स स्टेराइड शुगर हाइब्रिडस एण्ड एज़ास्टरॉइड्स	डॉ. प्रीती गुप्ता डॉ. गौतम पांडा	07.10.2013	06.10.2018
क्लोनल मल्टीप्लिक्शन ऑफ़ इण्डियन ट्रेडीशनल प्लाण्ट *अल्मस वालिचियाना* प्लैनकॉनः ऐन इन्डेन्जर्ड ट्री फॉर हीलिंग फ्रैक्चर	डॉ. के.आर. 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
डीकॉन्सट्रक्टिंग कॉर्टीकॉस्ट्रायल सर्किट : इम्प्लिकेशन इन एक्ज़ीक्यूटिव फंक्शन	डॉ. प्रेम एन. यादव	01.11.2013	31.10.2016
टाइरोसिन हाइड्रोलेज़ एज़ पोटेन्शियल ड्रग टार्गेट इन पार्किन्सन्स डिज़ीज़ : स्टडीज विद जेनेटिक नॉकडाउन मॉडल ऑफ़ *सी. एलेगैन्स*	डॉ. आमिर नाज़िर	01.11.2013	30.10.2016
प्रोबिंग इलेक्ट्रोफ़िलिक साइक्लाइज़ेशन ऑफ़ एल्किनॉल्स एण्ड ऐल्किलएमीन्स फ़ॉर द सिन्थिसिज़ ऑफ़ वेरिअस हेट्रोसाइक्लिक कम्पाउण्ड्स	डॉ. मड्डी श्रीधर रेड्डी	02.12.2013	01.12.2016
आइडेण्टीफ़िकेशन ऑफ़ ड्रग टार्गेट्स इन *हेलिकोबैक्टर पाइलोरी* यूज़िंग डुएल टैग्ड काबोहाइड्रेट्स	डॉ. पिन्टू कुमार मण्डल	01.03.2014	28.02.2017
डिवलपमेन्ट ऑफ़ नॉवेल स्ट्रैटजीज़ टुवर्ड्स द सिन्थिसिज़ ऑफ़ एन–हेट्रोसाइकल्स यूजिंग आइसोसायनाइड बेस्ड मल्टीकॉम्पोनेन्ट रिऐक्शन्स	डॉ. पी.एम.एस. चौहान	15.05.2014	14.05.2017
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
इन्वेस्टीगेशन्स 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	डॉ. किशोर मोहनन	01.08.2014	31.07.2017
मॉलीक्युलर एण्ड फ़ंक्शनल कैरेक्टराइज़ेशन रिऐक्शन्सस ऑफ MAP काइनेज़1 होमोलॉग ऑफ़ *लीशमैनिया डोनोवनी*	डॉ. नीना गोयल	01.01.2015	31.12.2017
इण्डियन कांउसिल ऑफ़ मेडिकल रिसर्च			
डिलीवरी सिस्टम फ़ार द मैनेजमेन्ट ऑफ सेप्टिक शॉकः रैशनल ऐप्रोच टुवर्ड्स लिपोपॉलीसेक्रकाइड (lps) न्यूट्रलाइज़ेशन एण्ड डिटॉक्सीफ़िकेशन	डॉ. पी.आर. मिश्रा	01.08.2011	31.07.2014
न्यूक्लिओज़ोमल हिस्टोन प्रोटीन्स ऑफ़ *लीशमैनिया डोनोवनी* : मॉलीक्युलर एण्ड इम्यूनोबायोकेमिकल कैरेक्टराइज़ेशन फ़ॉर इट्स पोटेन्शियल ऐज़ वैक्सीन टार्गेट अगेन्स्ट विसरल लीशमैनियासिस	डॉ. अनुराधा दुबे	01.09.2011	31.08.2014

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
इम्पैक्ट ऑफ ऐडिपोकाइन एण्ड केमोकाइन जीन पॉलिमॉर्फ़िज्म एण्ड इट्स प्रोटीन एक्सप्रेशन इन मेटाबोलिक सिन्ड्रोम	डॉ. आसीम घटक और डॉ. रितुराज कोनवर	01.09.2011	31.08.2014
प्रीक्लीनिकल स्ट्डीज़ ऑफ ए नॉवेल फ़ाइटोएस्ट्रोजन–लाइक कम्पाउण्ड फ़ॉर द मैनेजमेन्ट ऑफ पोस्ट मेनोपॉज़ल ओस्टियोपोरोसिस	डॉ. एन. चट्टोपाध्याय	10.01.2012	09.01.2015
न्यूरोइन्फ़्लमेशन एण्ड मेमारी इम्पेयरमेन्ट इन हाइपरटेन्शन : रोल ऑफ़ द सेन्ट्रल रेनिन ऐन्जियोटेन्ज़िन सिस्टम	डॉ. राकेश शुक्ला	01.02.2012	31.01.2015
नैनोरिज़र्वाएर्स कैरीइंग *ब्रूज़िया मलाई* रीकॉम्बीनेन्ट प्रोटीन्स एज़ पोटेन्शियल वैक्सीन अगेन्स्ट एक्सपेरीमेन्टल लिम्फैटिक फ़ाइलेरियासिस	डॉ. शैलजा भट्टाचार्य	01.02.2012	31.01.2015
आइडेण्टीफ़िकेशन एण्ड कैरेकटराइज़ेशन ऑफ़ क्रॉस रिऐक्टिव, मॉलीक्यूल्स ऑफ़ फ़ाइलेरियल एण्ड लीशमैनियल पैरासाइट्स एण्ड देयर पॉसिबल प्रोफ़ाइलैक्टिक पोटेन्शियल अगेन्स्ट आइदर इन्फ़ेक्शन	डॉ. पी. कल्पनामूर्ति डॉ. शरद शर्मा	01.02.2012	31.01.2015
इल्यूसिडेशन ऑफ़ इन्फ़्लमेटरी पाथवेज़ इनवॉल्व्ड इन सेप्टिक शॉक	डॉ. मधु दीक्षित	01.02.2012	31.01.2015
नैचुरल मॉड्युलेटर्स ऑफ़ GLUT-4 ट्रान्सलेशन फ़ॉर द ट्रीटमेन्ट ऑफ़ इन्स्युलिन रेज़िस्टेन्स	डॉ. अखिलेश ताम्रकार	02.04.2012	01.04.2015
डिवेलपमेन्ट ऑफ एण्टी डिस्लिपिडेमिक एजेण्ट्स फ़्रॉम एजेल मार्मेलोज एण्ड *ट्रिगोनला फ़ीनमग्रेकम* (मेथी)	डॉ. टी. नरेन्दर	09.05.2012	08.05.2015
डिज़ाइन सिंथिसिज़ एण्ड बायोलॉजिकल इवैल्युएशन ऑफ़ नॉवेल एजेण्ट्स फ़ॉर मैनेजमेण्ट्स डिज़ाइन प्रॉस्टैटिक हाइपरप्लेज़िया	डॉ. वी.एल. 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
डिज़ाइन्ड सिन्थिसिज़, इवैल्युएशन एण्ड आइडेण्टीफ़िकेशन ऑफ़ नॉवेल ड्यूअली इफ़ेक्टिव स्पर्मिसाइडल एजेण्ट्स विद एण्टी ट्राइकोमोनल एक्टिविटी फ़ॉर प्रोफ़ाइलैक्टिक कॉन्ट्रासेप्शन	डॉ. गोपाल गुप्ता	15.06.2014	14.06.2017
वैलिडेशन ऑफ़ डब्ल्यूएनटी पॉथवे माडुलेशन एण्ड एफ़िकेसी स्टडी इन प्राइमरी ओस्टियोपोरोसिस, फ्रैक्चर हीलिंग एण्ड सेकेण्डरी ओस्टियोपोरोसिस मॉडल्स फ़ॉर रिपोज़िशनिंग ऑफ़ क्लोफ़ैज़िमिन	डॉ. एन. चट्टोपाध्याय	15.06.2014	14.06.2017
स्ट्डीज़ ऑन द इफ़ेक्ट्स ऑफ़ ओबिसोजन्स इन मेल जर्म सेल्स एन एक्सप्लोरेटरी स्ट्डी	डॉ. डी.पी. मिश्रा	15.06.2014	14.06.2017
प्री–क्लीनिकल डिवेलपमेन्ट ऑफ़ केम्फ़ेरॉल विद इनहान्स्ड ड्रग डिलीवरी फ़ॉर सुपीरियर ओस्टियोजोनिक ऐक्टिविटी	डॉ. रितु त्रिवेदी	15.06.2014	14.06.2017
लीड आइडेण्टीफ़िकेशन ऑफ़ नॉन स्टेरॉयडल मॉलीक्यूल विद ऐण्टी–प्रॉलीफ़रेटिव ऐक्टिविटी फ़ॉर मैनेजमेन्ट ऑफ़ इन्डोमीट्रियल हाइपरप्लेज़िया	डॉ. अनिला द्विवेदी	15.06.2014	14.06.2017

शीर्षक	प्रधान अन्वेषक	प्रारंभ करने की तिथि	पूर्ण होने की संभावित तिथि
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
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 फ़ैल्सीपैरम* 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 प्रोजेकट 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
आयुष			
एक्सप्लोरेशन, आइडेण्टीफ़िकेशन एण्ड आइसोलेशन ऑफ़ बोन फ्रैक्चर हीलिंग एजेण्ट्स फ्रॉम इण्डियन ट्रेडीशनल प्लाण्ट्स *फ़ोलिडोटा आर्टीकुलेट* एण्ड *सोलोज़िन क्रिस्टेटा* (ऑर्किडेसी)	डॉ. के.आर. आर्या	31.12.2014	31.12.2017
एमरिट्स वैज्ञानिक			
इन्टीग्रेटेड 3डी मॉलीक्युलर मॉडलिंग, डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ नॉवेल केमिकल एन्टिटीज़ (NCEs) एज़ पोटेन्शियल एजेण्ट्स फ़ॉर द ट्रीटमेन्ट ऑफ़ अल्ज़ाइमर डिज़ीज़	डॉ. ए.के. सक्सेना	01.05.2014	30.04.2017

3. प्रायोजित परियोजनाएं

परियोजना शीर्षक	निधि प्रदाता एजेन्सी	प्रधान अन्वेषक	अवधि
जीनोटॉक्सिसिटी एण्ड मॉलीक्युलर मेकैनिज़म ऑफ़ RISUGadv	आईआईटी, खड़गपुर	डॉ. आर.के. सिंह	2014–2016
इन विट्रो टेस्टिंग ऑफ़ GSKCH फ़ार्मुलेशन फ़ॉर ओस्टियोजेनिक इफ़ेक्ट	GSKCH गुड़गांव	डॉ. एन. चट्टोपाध्याय	2014–15 (12 महीने)

4. NMITLI परियोजनाएं

परियोजना शीर्षक	प्रधान अन्वेषक
लीड बेस्ड ड्रग डिवेलपमेन्ट एण्ड जेनेटिक डम्प्रूवमेन्ट ऑफ़ अश्वगंधा (*विदैनिया सोमनीफ़ेरा*)	डॉ. शैलजा भट्टाचार्या
नॉवेल डीपीपीIV इनहिबिटर फ़ॉर द ट्रीटमेन्ट ऑफ़ डायबिटीज़	डॉ. एस.के. रथ/डॉ. एस. सान्याल

5. सीएसआईआर युवा वैज्ञानिक परियोजनाएं

परियोजना शीर्षक	प्रधान अन्वेषक	अवधि
आइडेण्टीफ़िकेशन ऑफ़ काइनेज़ एण्ड फ़ॉस्फ़ेट स्पेसिफ़िक टु CTD सिरीन 7 ऑफ़ RNA पॉलीमरेज़ III	डॉ. सोहेल अख्तर	2011 – 16
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. ए.के. त्रिवेदी	2014 – 19

6. सीएसआईआर एम्पावर प्रोजेक्ट

परियोजना शीर्षक	प्रधान अन्वेषक	अवधि
मैक्रोफ़ेज असिस्टेड इन्वेडोज़ोम बायोजेनेसिस : अनरैवलिंग द हिडन ट्रैल्स टु कैन्सर मेटास्टैटिस	डॉ. स्मृति भदौरिया	2010–14

4 मानव संसाधन विकास

1 प्रस्तुत शोध प्रबन्ध (पीएचडी)

क्र. सं.	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक	सुपरवाइज़र
	जवाहर नेहरू विश्वविद्यालय, नई दिल्ली		
1.	शुभेन्दु भौमिक	सिन्थिज़ ऑफ़ हेट्रोसाइक्लिक स्कफ़ल्ड्स एण्ड नैचरल प्रॉडक्ट मिमिक्स यूजिंग मॉरिटा–बेलिस–हिलमैन केमिस्ट्री,	डॉ. संजय बत्रा
2.	शुभाशीष बिस्वास	सिन्थिसिज़ ऑफ़ पॉसिबल एण्टीमलेरियल एजेण्ट्स एण्ड एन्युलेटेड हेट्रोसाइक्लिक फ्रेमवर्क,	डॉ. संजय बत्रा
3.	अवुला श्रीनिवास राव	डिज़ाइन एण्ड सिंथिसिज़ ऑफ़ नॉवेल हेट्रोसाइक्लिक कम्पाउण्ड्स एज पोटेन्शियल बायोडायनमिक एजेण्ट्स	डॉ. के.वी. शशिधरा
4.	चन्द्रा सौरभ आज़ाद	सिंथिसिज़ ऑफ़ कार्बोहाइड्रेट डिराइव्ड स्कफ़ल्ड्स एण्ड ग्लाइकोसाइलेटेड क्विनोलिन डेरीवेटिव्स एज़ पोटेन्शियल बायोऐक्टिव एजेण्ट्स	डॉ. ए.के. सक्सेना
5.	रिचा वर्मा	स्ट्डीज़ ऑन इम्यूनोप्रोफ़ाइलैक्टिक पोटेन्शियल ऑफ़ क्रॉस रिऐक्टिव मॉलीक्यूल्स ऑफ़ फाइलेरियल एण्ड लीशमैनियल पैरासाइट्स	डॉ. पी.के. मूर्ति
6.	रोहित श्रीवास्तव	सिस्टमैटिक इवैल्युएशन एण्ड मेकैनिस्टिस्क स्ट्डीज़ ऑन सेलेक्टेड एण्टी डायबिटिक प्लाण्ट्स	डॉ. अरविन्द के. श्रीवास्तव
7.	विनय कुमार सिंह	सिंथिसिज़ एण्ड केमिकल ट्रांसफ़ार्मेशन्स ऑफ़ प्लाण्ट्स सेकेण्डरी मेटाबोलाइटिस ऑफ़ बायोलॉजिकल इम्पॉर्टेन्स	डॉ. टी. नरेन्दर
8.	सौरव बेरा	क्वेस्ट फ़ॉर टारगेट एण्ड डाइवर्सिटी ओरिएन्टेड सिन्थिसिज़ ऑफ़ मेडिसिनली इम्पॉर्टेन्ट नैचुरल प्रॉडक्ट एण्ड नैचुरल मॉलीक्यूल फ्रॉम एमिनो एसिड्स	डॉ. गौतम पाण्डा
9.	अमित कुमार जाना	सिंथेटिक एप्रोच टुवर्ड्स ऐल्कलॉइड्स यूजिंग एमिनो ऐसिड्स एज़ बिल्डिंग ब्लॉक्स	डॉ. गौतम पाण्डा
10.	सुदीप्त कुमार मन्ना	सिंथेटिक एप्रोच टुवर्ड्स एमिनो एस्ड्स एण्ड बेंज़ोपायरन बेस्ड टेट्रासाइक्लिक आर्किटेक्चर्स ऑफ़ बायोलॉज़िकल इम्पॉर्टेन्स	डॉ. गौतम पाण्डा
11.	मोहम्मद कामिल हुसैन	डिज़ाइन एण्ड सिंथिसिज़ ऑफ़ नॉवेल नॉन स्टेरॉयडल लिगैन्ड्स एज़ पोटेन्शियल एस्ट्रोज़न रिसेप्टर माड्यूलेटर्स	डॉ. कंचन हजेला
12.	अनिल कुमार जायसवाल	इवैल्युएशन ऑफ़ स्ट्रेस प्रोटीन्स ऑफ़ *लीशमैनिया डोनोवनी* प्रोमैस्टिगोट्स एण्ड एमैस्टिगोट्स आइडेण्टीफ़ाइड थ्रू प्रोटियामिक्स एज़ टीएच1 स्म्युलेटरी प्रोटीन्स फ़ॉर देयर प्रोफ़ाइलैक्टिक पोटेन्शियल अगेन्स्ट एक्सपेरीमेन्टल विसरल लिश्मानियासिस	डॉ. अनुराधा दुबे
13.	सहज गुप्ता	डिज़ाइन एण्ड सिंथिसिज़ ऑफ़ प्रिविलेज्ड स्ट्रक्चर बेस्ड एन्युलेटेड पॉलीहेट्रोसाइकल	डॉ. बिजोय कुण्डू
14.	बलवन्त कुमार	मॉलीक्युलर कैरेक्टराइज़ेशन ऑफ़ इण्टरैक्शन ऑफ़ एच.आई.वी.–1नेफ विद होस्ट प्रोटीन्स इनवॉल्वड इन एपॉप्टॉटिक पॉथवेज़	डॉ. आर.के. त्रिपाठी
15.	संतोष जांगिड़	सर्च ऑफ़ नॉवेल डबल–एज्ड स्पर्मिसाइड्स एण्ड एण्टीस्पर्मेटॉजेनिक एजेण्ट्स	डॉ. वी.एल. शर्मा
16.	मुहीब बेग	आइडेण्टीफ़िकेशन ऑफ़ नॉवेल टारगेट्स फ़ॉर थेराप्यूटिक इन्टरवेन्शन इन इन्स्यूलिन रेज़िस्टेन्स थ्रू इन्टीग्रेटेड एप्रोचेज़ ऑफ़ प्रोटियॉमिक डिफ़रेन्शियल जीन एक्सप्रेशन एण्ड हाई कन्टेन्ट बायोलॉजी	डॉ. अनिल गायकवाड़
17.	दीपक कुमार सिंह	कैरेक्टराइज़ेशन ऑफ़ ए प्यूटेटिव ऐक्टिन रिलेटेड प्रोटीन इन लीशमैनिया पैरासाइट	डॉ. अमोघ सहस्रबुद्धे

क्र. सं.	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक	सुपरवाइज़र
18.	ललित प्रकाश गुप्ता	डिज़ाइन एण्ड सिंथिसिज़ ऑफ़ नॉवेल इन्डोल एण्ड क्विनोलिन बेस्ड डेरीवेटिव्स एज़ एण्टीकैन्सर एण्ड एण्टीडिस्लिपिडेमिक एजेण्ट	डॉ. अतुल कुमार
19.	अभिषेक डे	स्ट्रक्चरल स्ट्डीज़ ऑन ट्रासक्रिप्शनल रेगुलेटरी प्रोटीन फ्रॉम माइकोबैक्टीरिया	डॉ. आर. रविशंकर
20.	प्रियंका गुप्ता	इण्डोप्लाज़मिक रेटिकुलम रेगुलेशन ऑफ़ सेल डेथ पॉथवेज़ इन ग्लिओब्लास्टोमा	डॉ. डी.पी. मिश्रा
21.	विक्रम खेडगिकर	फंक्शनल प्रोटियोम ऑफ़ सीरम/टिश्यू टु डिस्टिंग्विश एनाबोलिक रिस्पॉन्सिव प्रोटीन्स इन एन एस्ट्रोज़न डेफिशिएन्सी मॉडल ऑफ ऑस्टियोपोरोसिस बाय ट्रीटमेन्ट विथ एनाबोलिक एजेन्ट	डॉ. रितु त्रिवेदी
22.	नम्रता रस्तोगी	प्रोटियॉमिक प्रोफ़ाइलिंग ऑफ़ ड्रग एपॉप्टॉसिस इन कैन्सर सेल्स	डॉ. डी.पी. मिश्रा
23.	रचना त्रिवेदी	प्रोटियॉमिक प्रोफ़ाइलिंग ऑफ़ एक्यूट मायलॉइड ल्यूकीमिया इन केमोथेरेपी एण्ड केमोरेजिस्टेन्स	डॉ. डी.पी. मिश्रा
24.	हीखम काजल देवी	नैचुरल पॉलिमर नैनोपार्टिकल फ़ॉर ओरल इम्यूनाइज़ेशन एण्ड ड्रग डिलीवरी	डॉ. अमित मिश्रा
25.	अमित गौड़	स्ट्रक्चरल एण्ड फंक्शनल स्ट्डीज़ ऑफ़ प्रोटीन्स इनवॉल्व्ड इन सीक्रेशन पॉथवेज़ ऑफ़ माइकोबैक्टीरिया	डॉ. आर. रविशंकर
26.	पंकज नाग	सिंथिसिज़ ऑफ़ बेन्ज़एन्युलेटेड पाइरैनॉन्स एण्ड देयर न्यूक्लियोफ़ाइल इन्ड्यूज्ड रिंग ट्रांसफ़ार्म्ड प्रॉडक्ट्स	डॉ. अतुल गोयल
27.	मृदुल मोहन	आइएनए इण्टरफ़ियरेन्स स्ट्डीज़ ऑन सप्रेसर्स ऑफ़ साइटोकाइन सिग्नलिंग टु इनवेस्टीगेट इन्टरैक्शन बिटवीन *माइकोबैक्टीरियम ट्युबरकुलोसिस* एण्ड द ह्यूमन मैक्रोफ़ेज	डॉ. अमित मिश्रा
28.	सुधीर कुमार सिंह	स्ट्रक्चरल एण्ड फंक्शनल कैरेक्टराइज़ेशन ऑफ़ हिल्प टाइप वैक्टीरियोफ़ेज़ एनकोडेड हायल्यूरोनेटलाइसेज़	डॉ. सुहैल अख्तर
29.	नताशा जायसवाल	न्यूट्रीशनल मॉडीफ़िकेशन इनड्यूज्ड इन्स्युलिन रेज़िस्टेन्सः टिश्यू स्पेसिफ़िक रोल ऑफ़ इनफ़्लमेशन एण्ड ऑक्सीडेटिव स्ट्रेस	डॉ. अखिलेश कुमार ताम्रकार
30.	अरुण कुमार रावत	इफ़ेक्ट ऑफ़ सेलेक्टेड एण्टी डायबिटिक एजेन्ट्स ऑन माइटोकॉन्ड्रियल फंक्शन्स इन एक्सपेरीमेन्टल टाइप 2 डायबिटीज़ मेलिट्स	डॉ. अरविन्द कुमार श्रीवास्तव
31.	प्रमोद कुमार सिंह	इन्वेस्टीगेशन ऑफ़ पोस्ट ट्रांसलेशन मॉडीफ़िकेशन इन आरडी1–एन्कोडेड प्रोटीन्स ऑफ़ माइकोबैक्टीरिया विद पर्टिकुलर रिफ़रेन्स टु Rv3878 बाइ सिरीन थ्रेयोनिन काइनेसेज़	डॉ. किशोर के. श्रीवास्तव
32.	पूनम सिंह	आइडेण्टीफ़िकेशन ऑफ़ इन्टरैक्टिंग पार्टनर्स विद एचआईवी–1नेफ़: *सी एलिगैन्स* टु ह्यूमन	डॉ. आर.के. त्रिपाठी
33.	लक्ष्मी शुक्ला	डिज़ाइन एण्ड सिंथिसिंज़ ऑफ़ नाइट्रोजेनस हेट्रोसाइकल्स एण्ड पॉलीमिथाइलीन लिंकर बेस्ड फ्लेक्सिबल मॉडल्स फ़ॉर द स्ट्डी ऑफ़ नॉन को–वैलेन्ट इण्टरैक्शन्स एण्ड बायोलॉजिकल एक्टिविटी स्ट्डीज़	डॉ. डब्ल्यू हक
34.	देबाशीष दत्ता	हेट्रोलोगस कॉम्प्लीटमेन्टेशन ऑफ़ *माइकोबैक्टीरियन बोविस* सिगएफ म्यूटेन्ट एण्ड इट्स इफ़ेक्ट ऑन माइकोबैक्टीरियल पैथॉजेनेसिस	डॉ. बी.एन. सिंह
35.	शशि पाण्डे	डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ नॉवेल हेट्रोसाइकल्स एज़ एण्टी इन्फ़ेक्टिव एजेण्ट्स	डॉ. पी.एम.एस. चौहान
36.	प्रमोद कुमार गुप्ता	नैनो–एन्जिनियर्ड सिस्टम्स फ़ॉर इम्प्रूव्ड ड्रग डिलीवरी ऑफ़ केमोथेराप्यूटिक एजेण्ट्स	डॉ. पी.आर. मिश्रा
37.	राम निवास	प्रोडक्शन, प्योरिफ़िकेशन एण्ड कैरेक्टराइज़ेशन ऑफ़ बायोलॉजिकली एक्टिव फ्रॉम एनज़ाइम्स फ्रॉम माइक्रोबियल सोर्सेज़	डॉ. पी.के. शुक्ला
38.	निशि गुप्ता	आइडेन्टीफ़िकेशन ऑफ़ ऑटोज़ोम रिलेटेड फैक्अर्स कंट्रीब्यूटिंग टू इटियोलॉजी ऑफ मेल इन्फर्टिलिटी	डॉ. राजेन्द्र सिंह
39.	किरण खण्डेलवाल	प्री–फ़ॉर्मुलेशन एण्ड फ़ॉर्मुलेशन डिवेल्पमेन्ट ऑफ़ सम एण्टीमलेरियल, एण्टीथ्रॉम्बोटिक एण्ड एण्टीडायबिटिक कैन्डीडेड ड्रग्स	डॉ. ए.के. द्विवेदी

क्र. सं.	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक	सुपरवाइज़र
40.	विवेक कुमार	एनजिनियर्ड नैनोकैरियर फ़ॉर इम्प्रूव्ड डिलीवरी ऑफ़ पुअरली वॉटर सोल्युबल बायोएक्टिव	डॉ. ए.के. द्विवेदी
41.	सुदीप गौतम	आइडेण्टीफ़िकेशन ऑफ़ मॉलीक्यूलर मेकैनिज़्म्स फ़ॉर एण्टीहाइपर ग्लाइसेमिक एण्ड एण्टीडिस्लिपिडमिक इफ़ेक्ट्स ऑफ़ सिलेक्टेड सिंथेटिक एण्ट नैचुरल कम्पाउण्ड्स	डॉ. अरविन्द के. श्रीवास्तव
42.	प्रशांत शुक्ला	नॉवेल ड्रग डिलीवरी सिस्टम्स फ़ॉर थेराप्यूटिक इण्टरवेन्शन ऑफ़ सेप्सिस एण्ड सेप्टिक शॉक	डॉ. पी.आर. मिश्रा
43.	राम कुमार मोदुकुरी	ए सिंथेटिक एप्रोच टुवर्ड्स द डिवेल्पमेन्ट ऑफ़ नॉवेल बायोएक्टिव ऑक्सीजन हेट्रोसाइकल्स	डॉ. के.वी. शशिधरा
44.	अभिषेक कुमार सिंह	थेराप्यूटिक इफ़ेक्ट ऑफ अल्मोसाइड्स ऑन मसल एट्रोफ़ी एण्ड मेटाबोलिक डिसआर्डर	डॉ. सव्यसांची सान्याल
45.	अरविन्द मिश्रा	लेट स्टेज कॉम्पलिकेशन इन स्ट्रेप्टोज़ोक्टिन इन्ड्यूज्ड डायबिटीज मेलिटस इन रैट एण्ड माइस एण्ड देअर प्रिवेन्शन बाय नेचर आइडेन्टिकल्स	डॉ. अरविन्द के श्रीवास्तव
46.	मानसी गर्ग	कैरेक्टराइज़ेशन ऑफ़ प्रोटीन काइनेजेज़ होमोलॉग ऑफ़ *लीशमैनिया डोनोवनी* एण्ड एक्सप्लोरेशन ऑफ़ इट्स पॉसिबल रोल इन एण्टीमोनी रेजिस्टेन्स इन क्लीनिकल आइसोलेट्स	डॉ. नीना गोयल
47.	अखण्ड प्रताप सिंह	आडेण्टीफ़िकेशन ऑफ़ प्रो–मेल फ़र्टिलिटी एक्टिविटी एण्ड मेकैनिज़म ऑफ़ एक्शन ऑफ़ सिलेक्टेड मेडिसिनल प्लाण्ट्स	डॉ. राजेन्दर सिंह
48.	आफ़रीन हैदर	एनालिसिज़ ऑफ़ प्यूटेटिव न्यूक्लियर एनकोडेड प्रोटीन्स इनवॉल्व्ड इन ट्रांसलेशन इनीशिएशन इन *प्लाज़मोडियम फ़ैल्सीपैरम* ऑर्गेनिलीज़	डॉ. समन हबीब
49.	राम नजर कुशवाहा	डिज़ाइन एण्ड सिंथिसिज़ ऑफ़ डाइपेप्टिडिल पेप्टिडेज़–IV इनहिबिटर्स एज़ पोटेन्शियल एण्टीडायबेटिक एजेण्ट	डॉ. एस.बी. कट्टी
50.	अजीत कुमार वर्मा	स्टडी ऑफ़ आइसोनायज़िड पाइरेज़िनैमाइड इनक्लूडेड एपॉप्टॉसिस एण्ड रोल ऑफ़ Nrf2 इन हेपाटोसेल्युलर कार्सिनोमा	डॉ. एस.के. रथ
51.	श्रीश राज शम्मी	ए सिस्टमैटिक स्क्रीन टुवर्ड्स वैलिडेटिंग एण्ड आइडेण्टीफ़ाइंग जेनेटिक एण्ड एक्सट्रिंज़िक एपिजेनेटिक मॉडुलेटर्स ऑफ़ अल्ज़ाइमर्स डिज़ीज़: स्टडीज़ एम्प्लाइंग ट्रांसजेनिक *सी. एलैगैन्स* मॉडल	डॉ. आमिर नाज़िर
52.	सविता पाल	आइडेण्टीफ़िकेशनल ऑफ़ द टारगेट्स फ़ॉर द एक्शन ऑफ़ एण्टीबायटिक फ्रैक्शन्स ऑफ़ टेस्ट्रियल मेडिसिनल प्लाण्ट्स	डॉ. अरविन्द के. श्रीवास्तव
53.	अर्जुन कुमार मिश्रा	स्ट्रक्चरल एण्ड फ़ंक्शनल ऑफ़ करेक्टराइजेशन न्यूक्लिओसाइड डाइफ़ॉस्फ़ेट कायनेज़ एण्ड प्रोटीन्स ऑफ़ ट्राइपैनोथियॉन बायोसिन्थिसिज़ पॉथवे फ़्रॉम लीशमैनिया स्पशीज़	डॉ. जे.वी. प्रताप
54.	तरन खानम	स्ट्रक्चरल एण्ड फंक्शनल स्ट्डीज़ ऑन प्रोटीन्स फ्रॉम ह्यूमन पैथॉजन्स इनवॉल्व्ड इन न्यूक्लीइक एसिड मेटाबोलिज़्म	डॉ. आर. रविशंकर
वैज्ञानिक एवं अभिनव अनुसंधान अकादमी (एसीएसआईआर)			
55.	अविनाश कुमार	टु स्टडी द ओस्टियोज़ेनिक पोटेन्शियल ऑफ़ पॉलीमरिक नैनो मैट्रिक्स एसोशिएटेड केम्फ़ेरॉल इन रैट मॉडल ऑफ़ ओस्टियोपोरोसिस	डॉ. ऋतु त्रिवेदी
56.	कामिनी श्रीवास्तव	आइडेण्टीफ़िकेशन एण्ड इवैल्युएशन ऑफ़ ओस्टियोजेनिक इफ़ेक्ट ऑफ़ मेथॉक्सिआइसोफ्लेवॉन्स इन एस्ट्रोजन डिफ़ीशिएन्ट कण्डीशन	डॉ. दिव्या सिंह
57.	कनिका कंचन	एनालिसिस ऑफ़ जेनेटिक वेरिएशन्स इन सेलेक्टेड ह्यूमन जीन्स एण्ड देयर एसोसिएशन विद ससेप्टिबिलिटी/रेज़िस्टेन्स टु *प्लाज़मोडियम फ़ैल्सीपैरम* मलेरिया इन इण्डियन पापुलेशन्स	डॉ. समन हबीब
58.	वीनू बाला	डिज़ाइन, सिन्थिसिज़ एण्ड बायोलॉजिकल इवैल्युएशन ऑफ़ नॉवेल डुएल फंक्शन स्पर्मिसाइडल एजेण्ट्स	डॉ. वी.एल. शर्मा

क्र. सं.	शोधकर्ता का नाम	शोध प्रबन्ध का शीर्षक	सुपरवाइज़र
59.	पूजा जड़िया	फंक्शनल जीनॉमिक्स एण्ड एक्सट्रिज़िंक एपिजेनेटिक इण्टरवेन्शन्स इन पार्किन्सन्स डिज़ीज़: स्ट्डीज़ इम्प्लाइंग ट्रांसजेनिक *सी. एलेगैन्स*	डॉ. आमिर नाज़िर
60.	यशपाल सिंह छोन्कर	फार्माकोकायनेटिक एण्ड मेटाबोलिज़्म स्टडीज़ ऑफ़ गुगुलस्टरॉन एण्ड रोहिट्युकिन एण्ड क्लीनिकल ड्रग इण्टरैक्शन स्टडीज़ ऑन आर्टीथर	डॉ. रबी एस भट्टा
61.	मीनाक्षी वर्मा	द एण्टीफ़ाइलेरियल एफ़ीकेसी ऑफ़ एनडेक्टोसाइडमॉक्ज़ीडेक्टिन (मिल्बेमाइसिन) इन वेरिअस ड्रग कॉम्बीनेशन अगेन्स्ट एक्सपेरीमेन्टल *ब्रूज़िया मलाई* इन्फ़ेक्शन	डॉ. शैलेजा भट्टाचार्य
62.	मो. शहाब	क्लोनिंग, एक्सप्रेशन एण्ड मॉलीक्युलर कैरेक्टराइज़ेशन ऑफ़ UDP-N-एसिटिलग्लुकोजामाइन इनोलपाइरूविल ट्रांसफ़रेज़ (MurA) ऑफ़ इन्डोसिम्बॉएन्ट *वॉलबैशिया* ऑफ़ ह्यूमन लिम्फ़ैटिक फ़ाइलेरियल पैरासाइट *ब्रूज़िया मलाई*	डॉ. शैलजा भट्टाचार्य
डॉ. बी.आर. अम्बेडकर विश्वविद्यालय, आगरा			
63.	रश्मि शर्मा	डिज़ाइन एण्ड सिन्थिसिज़ ऑफ़ नॉवेल हेट्रासाइकल्स एज़ एक्टिव मॉलीक्यूल्स	डॉ. पी.एम.एस. चौहान
जामिया हमदर्द विश्वविद्यालय			
64.	प्रतिभा मिश्रा	*इन विट्रो* एण्ड *इन वीवो* स्ट्डीज़ ऑफ़ कार्डियोटॉक्सिक इफ़ेक्ट रोज़ीग्लिटाज़ोन इन म्यूरिन मॉडल्स	डॉ. एस.के. रथ
65.	नीतू सिंह	स्ट्डीज ऑन एण्टीकैन्सर एक्टिविटी ऑफ़ कूमारिन–चालकोन हाइब्रिड इन ह्यूमन सर्विकल कैन्सर सेल्स	डॉ. सुधीर सिन्हा
66.	रिज़वान अहमद	मोनोक्लोनल एण्टीबॉडी एज़ ए डायग्नॉस्टिक एण्ड/ऑर थेराप्यूटिक टूल अगेन्स्ट म्यूरिन पल्मोनरी एस्परजिलोसिस	डॉ. पी.के. शुक्ला
67.	अमित कुमार त्रिपाठी	स्ट्डीज़ ऑन न्यूरोप्रोटेक्टिव एक्शन ऑफ फ़ाइटोकेमिकल इन्ट्रांज़िएन्ट फोकल सेरेब्रल इश्मिया इन रैट	डॉ. डी.पी. मिश्रा
68.	नेहा राहुजा	बायोकेमिकल एण्ड मॉलीक्युलर मेकैनिज़्म्स ऑफ़ एक्शन ऑफ़ पोटेन्ट एण्टीडायबैटिक एजेण्ट्स	डॉ. अरविन्द के. श्रीवास्तव
इन्टीग्रल विश्वविद्यालय, लखनऊ			
69.	मनीष जैन	इल्यूसिडेशन ऑफ़ नॉवेल इनफ़्लमेटरी मेकैनिज़म इन एक्सपेरीमेन्टल मॉडल्स ऑफ़ एथ्रोस्क्लेरॉसिस	डॉ. मनोज कुमार बर्थवाल
70.	शिशिर श्रीवास्तव	स्ट्डीज़ इन एण्टीकैन्सर एक्टिविटी ऑफ़ कम्पाउण्डस डिराइव्ड फ़्रॉम सेलेक्टेड मेडिसिनल प्लाण्ट्स	डॉ. ए.के. सक्सेना
लखनऊ विश्वविद्यालय, लखनऊ			
71.	कनिका	डिज़ाइन, सिन्थिसिज़, बायोलॉज़िकल इवैल्यूएशन ऑफ़ नाइट्रोजन एण्ड/ऑर सल्फ़र कन्टेनिंग हेट्रोसाइक्लिक कम्पाउण्ड्स एण्ड बायोसिन्थिसिज़ ऑफ़ बायोलॉजीकली एक्टिव एल्कलॉइड	डॉ. ए.के. सक्सेना
बनस्थली विश्वविद्यालय, राजस्थान			
72.	पंकज द्विवेदी	एन्जिनियर्ड नैनो–कैरियर्स बेयरिंग आर्टीथर फ़ॉर द इफेक्टिव मैनेजमेण्ट ऑफ़ मलेरिया	डॉ. पी.आर. 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

कैलेण्डर वर्ष के दौरान देश भर के 41 कॉलेज़ो/विश्वविद्यालयों और संबद्ध कॉलेजों के कुल 128 स्नातकोत्तर छात्र–छात्राओं को योग्यता के आधार पर चयन किया गया और औषधि तथा औषधि निर्माण अनुसंधान के विभिन्न विषयों में 4–10 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 बायो मेडिकल रिसर्च में एक वर्ष को प्रशिक्षण प्रदान करता है। इस वर्ष भी 30 छात्रों 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 03 और 02 इन्स्पायर फेलोज़ को बायोमेडिकल रिसर्च के विभिनन पहलुओं पर प्रशिक्षण दिया गया।

2.4 द्विपक्षीय सहयोग के अन्तर्गत अन्तर्राष्ट्रीय प्रशिक्षण

नेपाल के 12 अनुसंधान कार्मिकों को लघु अवधि प्रशिक्षण (दो सप्ताह) प्रदान किया गया। इसके अतिरिक्त निम्नलिखित विदेशी प्रशिक्षु को दीर्घ अवधि (3 से 13 माह) का प्रशिक्षण प्रदान किया गया।

प्रशिक्षु का नाम और पता	फेलोशिप कार्यक्रम	सुपरवाइज़र	अवधि
ओलुयोरी ऐबिमबोला पीटर, यूनिवर्सिटी ऑफ़ लॉरिन, नाइजीरिया	ट्वास (TWAS) सैन्डविच पोस्टग्रैजुएट फ़ेलोशिप	डॉ. ए.के. शॉ	30 जुलाई, 2014 से 09 फरवरी, 2015

3. सीएसआईआर–सीडीआरआई स्टॉफ द्वारा प्रशिक्षण कार्यक्रमों में प्रतिभागिता

रिपोर्टिंग वर्ष में सीएसआईआर–सीडीआरआई के निम्नलिखित वैज्ञानिक/तकनीकी स्टाफ ने विभिन्न विषयों में अपने ज्ञान एवं विशेषज्ञता को अद्यतन रखने के लिये विभिन्न प्रशिक्षण कार्यक्रमों में भाग लिया–

नाम	कार्यक्रम	स्थान	अवधि
डॉ. प्रेम एन. यादव	लीडरशिप कैपेसिटी बिल्डिंग प्रोग्राम मॉड्यू–	सीएसआईआर–एचआरडीसी, गाज़ियाबाद	20–23 अप्रैल, 2014
डॉ श्रीपति कुलकर्णी	8वां एन्युअल ट्रांस एटलांटिक इन्टलेक्चुअल प्रॉपर्टी समर अकादमी	सीडब्लूआरयू, स्कूल ऑफ लॉ, क्लीवलैण्ड, यूएसए	02 से 06 जून, 2014
डॉ. मोनिका सचदेव	प्लूरीपोटेण्ट स्टेम सेल्स इन ऐडल्ट मैमेलियन गोनैड्स	आईसीएमआर वर्कशॉप	13 सितम्बर, 2014

5 पुरस्कार एवं सम्मान

डॉ. अनुराधा दुबे

- इण्डियन अकैडमी ऑफ़ साइंसेज़, बेंगलुरू वर्ष 2015 के हेतु फेलो निर्वाचित

डॉ. आर.पी. त्रिपाठी

- एसोसिएशन ऑफ़ कार्बोहाइड्रेट कैमिस्ट एण्ड टेक्नोलॉजिस्ट्स (इण्डिया) 2014 हेतु फेलो निर्वाचित

डॉ. अरुण कुमार सिन्हा

- नैशनल अकैडमी ऑफ़ साइंसेज़, इलाहाबाद, इण्डिया वर्ष 2014 हेतु फेलो

डॉ. पी.एम.एस. चौहान

- इण्डियन काउंसिल ऑफ़ कैमिस्ट्स का प्रोफे. एस.पी. हीरेमठ अवार्ड – 2014

डॉ. राजेन्दर सिंह

- सीएसआईआर युवा वैज्ञानिक पुरस्कार–2014

डॉ. एम.एन. श्रीवास्तव

- एसोसिएशन ऑफ़ प्लांट टैक्सोनॉमी, देहरादून का डॉ. बी.एन. प्रसाद मेडल 2013–14

डॉ. मधु दीक्षित

- वास्विक श्रीमती चन्दाबेन मोहनभाई पटेल औद्योगिक अनुसंधान महिला पुरस्कार–2012
- जीजेएस राव मेमोरियल लेक्चर अवार्ड–2014, आईआईएससी, बेंगलुरू

डॉ. जियाउर आर. गाइन

- आईसीएमआर इण्टरनैशनल फेलो 2014–15, आईसीएमआर, इण्डिया

डॉ. अतुल कुमार

- विज्ञान एवं प्रौद्योगिक परिषद उत्तर प्रदेश द्वारा विज्ञान रत्न सम्मान

डॉ. वहाजुद्दीन

- अकैडमी ऑफ एनवॉयरमेन्टर बायोलॉजी का डीईएफ युवा वैज्ञानिक पुरस्कार

डॉ. अरुण कुमार त्रिवेदी

- विज्ञान एवं प्रौद्योगिक परिषद उत्तर प्रदेश द्वारा युवा वैज्ञानिक सम्मान

डॉ. राजेश कुमार झा

- सोसायटी ऑफ़ स्टडी इन रिप्रोडक्शन, यूएसए, की वार्षिक बैठक/सम्मेलन में सर्वोत्तम अन्तर्राष्ट्रीय व्याख्यान पुरस्कार

डॉ. रबि शंकर भट्टा

- आईएनएसए अन्तर्राष्ट्रीय सहयोग/आदान–प्रदान कार्यक्रम 2014–15 हेतु चयनित

कु. प्रियंका कुशवाहा (डॉ. रितु त्रिवेदी की शोध छात्रा)

- अमेरिकन सोसाइटी फॉर बोन ऐण्ड मिनरल रिसर्च, यूएसए द्वारा युवा अनुसंधानकर्ता पुरस्कार

डॉ. सी. नाथ

- किंग जॉर्ज मेडिकल यूनिवर्सिटी, लखनऊ द्वारा प्रायोजित प्रोफे. के.पी. भार्गव ओरेशन अवार्ड–2014

श्री सौरभ अग्निहोत्री (डॉ. मोनिका सचदेव के शोध छात्र)

- इण्डियन सोसाइटी फॉर द स्ट्डी ऑफ रिप्रोडक्शन एण्ड फर्टिलिटि–2014 में तृतीय बेस्ट पोस्टर अवार्ड

डॉ. श्रीपति आर. कुलकर्णी

- स्कूल ऑफ लॉ, केस वेस्टर्न रिज़र्व यूनिवर्सिटी, क्लीवलैण्ड, ओहियो, यूएसए द्वारा स्पेनगनबर्ग फेलो फॉर लॉ ऐण्ड टेक्नोलॉजी वर्ष 2015–16 के लिए चयनित

श्री अभिषेक के. सिंह (डॉ. मधु दीक्षित के शोध छात्र)

- साइटोमीट्री सोसाइटी इण्डिया द्वारा टीसीएस–बीसी अवार्ड 2014,

डॉ. करुणेश राय

- लेब्रोटरी एनिमल साइंस एसोसिएशन ऑफ इण्डिया द्वारा डॉ. के.आर. भारद्वाज अवार्ड 2013–14,

श्री संजय सी. रेबेल्लो (डॉ. मधु दीक्षित के शोध छात्र)

- इण्डियन सोसायटी फॉर एथरोसिक्लेरोसिस रिसर्च द्वारा लार्ड श्रीनिवास ऑफ सेवन हिल्स गोल्ड मेडल फॉर बेस्ट ओरिज़नल पेपर 2014,

श्री अजय कुमार झा (डॉ. अतुल गोयल के शोध छात्र)

- हम्बोल्डट अकैडमी ऑफ़ लखनऊ, द्वारा बेस्ट पोस्टर अवार्ड

श्री सुभाष द्विवेदी (डॉ. राकेश शुक्ला के शोध छात्र)

- कोलकाता न्यूरोसाइंस कांफ्रेंस 2014, कोलकाता द्वारा द्वितीय बेस्ट ओरल प्रेजेण्टटेशन अवार्ड

श्री विक्रम खेदिग्कर (डॉ. रितु त्रिवेदी के शोध छात्र)

- अन्तर्राष्ट्रीय ओस्टियोपोरोसिस फाउण्डेशन, यूएसए द्वारा युवा अनुसंधानकर्ता पुरस्कार

श्री मनीष चरन (डॉ. समन हबीब के शोध छात्र)

- दसवीं ज्वाइंट एनुअल कांफ्रेंस ऑफ आईएसएमओसीडी एण्ड आईएई, गोवा द्वारा द्वितीय बेस्ट पोस्टर प्रेजेण्ट्टेशन

कु. ज्योति कुरील (डॉ. दिव्या सिंह की शोध छात्रा)

- अन्तर्राष्ट्रीय ओस्टियोपोरोसिस फाउण्डेशन, यूएसए का युवा अनुसंधानकर्ता पुरस्कार

कु. सरिका गुंजन (डॉ. रेणु त्रिपाठी की शोध छात्रा)

- 25वीं नैशनल कांग्रेस ऑफ़ पैरासिटालॉजी –2014, लखनऊ में बेस्ट पोस्टर प्रेजेण्ट्टेशन अवार्ड

श्री अब्दुल मलिक त्यागी (डॉ. दिव्या सिंह के शोध छात्र)

- सर्वोत्तम शोध प्रबंध–2014 के लिए डॉ. एम.एम. धर मेमोरियल अवार्ड

श्री विनीत कुमार (डॉ. राजेश के. झा के शोध छात्र)

- 24वीं एनुअल मीटिंग ऑफ इण्डियन सोसायटी फॉर द स्ट्डी ऑफ रिप्रोडक्शन एण्ड फर्टिलीटि–2014 में बेस्ट पोस्टर अवार्ड

कु. ईशा कपूर (डॉ. अरुण कुमार त्रिवेदी की शोध छात्रा)

- इण्टरनैशनल कांफ्रेंस इन कैंसर एण्ड स्टेम सेल्स–2014 में बेस्ट पोस्टर अवार्ड

कु. रेनु पाण्डेय (डॉ. बृजेश कुमार की शोध छात्रा)

- नैशनल सेमिनार ''ऐप्लिकेशन्स ऑफ़ मॉस एण्ड एनएमआर टैक्नीक्स इन ड्रग रिसर्च'' 2014, लखनऊ में प्रथम बेस्ट पोस्टर अवार्ड

कु. हफ़सा अहमद (डॉ. ए.के. द्विवेदी की शोध छात्रा)

- प्रथम आईबीआरओ/एपीआरसी, पंजाब यूनिवर्सिटी, चण्डीगढ़, में नेशनल स्टूडेन्ट हेतु चयनित
- नैशनल कांफ्रेंस ऑन ड्रग कैरियर्स इन मेडिसिन ऐण्ड बायोलॉजी–2015, इरोड, तमिलनाडु में बेस्ट ओरल प्रेजेण्ट्टेशन अवार्ड

कु. प्रीति चन्द्रा (डॉ. बृजेश कुमार की शोध छात्रा)

- नैशनल सेमिनार ''ऐप्लिकेशन्स ऑफ़ मॉस एण्ड एनएमआर टैक्नीक्स इन ड्रग रिसर्च'' 2014, लखनऊ में द्वितीय बेस्ट पोस्टर अवार्ड,

कु. आकांक्षा श्रीवास्तव (डॉ. ए.के. द्विवेदी के शोध छात्रा)

- फ्यूचर प्रोस्पेक्ट्स ऑफ़ एडवांसमेन्ट्स इन बायोलॉजीकल साइंसेज, हेल्थ इश्यूज़ ऐण्ड एनवायरमेन्टल प्रोटेक्शन –2014 में द्वितीय बेस्ट पोस्टर अवार्ड

कु. तृप्ति जोशी (डॉ. संजीव कनौजिया की शोध छात्रा)

- नैशनल सेमिनार ''ऐप्लिकेशन्स ऑफ़ मॉस ऐण्ड एनएमआर टैक्नीक्स इन ड्रग रिसर्च'' 2014, लखनऊ में तृतीय बेस्ट पोस्टर अवार्ड,

कु. शुभ्रा सिंह (डॉ. विनीता चतुर्वेदी की शोध छात्रा)

- इण्डो–फ्रेंच कोलेबरेशन फॉर द प्रमोशन ऑफ एडवांस्ड रिसर्च द्वारा रमन चार्पाक फेलोशिप हेतु चयनित

श्री हार्दिक चण्डासाना (डॉ. रबी एस. भट्टा के शोध छात्र)

- एप्लाईड फार्मास्यूटिकल एनालिसिस कांफ्रेंस 2014, अहमदाबाद में द्वितीय बेस्ट पोस्टर अवार्ड

कु. पूजा जडिया (डॉ. आमिर नाज़िर की शोध छात्रा)

- नोबेल लॉरेट्स एण्ड स्टूडेन्ट्स की 63वीं मीटिंग लिन्डाउ 2014, जर्मनी में हेतु चयनित
- डॉ. जे.एम. खन्ना मेमोरियल अरली कैरियर एचिवमेण्ट पुरस्कार–2014

कु. शलिनी अस्थाना (डॉ. मनीष चौरसिया की शोध छात्रा)

- डॉ. जे.एम. खन्ना मेमोरियल डिस्टिंग्युश्ड कैरियर एचिवमेण्ट अवार्ड (प्री–क्लीनिकल एण्ड क्लीनिकल साइंस) 2014

मो. रिजावनुल हक (डॉ. आमिर नाज़िर के शोध छात्र)

- करेन्ट सिनारियो इन ड्रग डिस्कवरी एण्ड डिवेलपमेन्ट सिम्पोज़ियम, नाइपर, रायबरेली में बेस्ट पोस्टर प्रेजेण्ट्टेशन अवार्ड

कु. कायनात खान (डॉ. एन. चट्टोपाध्याय की शोध छात्रा)

- डॉ. स्वर्ण नित्या आनंद मेमोरियल अर्ली कैरिअर एचिवमेन्ट अवार्ड फॉर वूमैन रिसर्च स्कॉलर्स

कु. मोनी शर्मा (डॉ. पी.एम.एस. चौहान की शोध छात्रा)

- डॉ. एम.एम. धर मेमोरियल डिस्टिंग्युश्ड कैरियर एचिवमेण्ट अवार्ड (कैमिकल साइंस) 2014

श्री पवन कुमार यादव (डॉ. सुशान्त कार के शोध छात्र)

- 10दसवीं ज्वाइंट एनुअल कांफ्रेंस ऑफ आईएसएमओसीडी एण्ड आईएई, गोवा में बेस्ट पोस्टर प्रेजेण्ट्टेशन अवार्ड

कु. मनीषा पाठक (डॉ. शैलजा भट्टाचार्या की शोध छात्रा)

- 25वीं नैशनल कांग्रेस ऑफ़ पैरासिटालॉजी–2014, लखनऊ में बेस्ट पोस्टर प्रेजेण्ट्टेशन अवार्ड

कु. प्रीति विश्वकर्मा (डॉ. सुशान्त कार की शोध छात्रा)

- 25वीं नैशनल कांग्रेस ऑफ़ पैरासिटालॉजी–2014, लखनऊ में बेस्ट पोस्टर प्रेजेण्ट्टेशन अवार्ड

अन्य गतिविधियाँ

CSIR-Central Drug Research Institute, Lucknow

अन्य गतिविधियाँ

1 आयोजित प्रमुख कार्यक्रम

एलसी–क्यूटीओएफ–एमएस/एमएस और एनएमआर तकनीक के प्रयोग पर कार्यशाला

मॉस स्पेक्टोमीट्री (एमएस) विश्लेषणात्मक उपकरणों में सर्वाधिक महत्वपूर्ण होने के साथ–साथ रसायनिक और जैविक विज्ञान में तेज़ी से विकसित होता हुआ अनुसंधान क्षेत्र है। विभिन्न क्षेत्रों में एचआरएमएस तकनीक की हर प्रकार से उपयोगिता ने अनुसंधानकर्ताओं का ध्यान हाल के वर्षों में आकर्षित किया है। इस

तकनीक के भावी प्रयोगकर्ताओं के मध्य जागरूकता बढ़ाने की आवश्यकता है। एलसी–क्यूटीओएफ़, एमएस/एमएस और एनएमआर तकनीक के प्रयोग पर सैफ़, सीडीआरआई द्वारा 10–12 फरवरी, 2014 को एक कार्यशाला का आयोजन किया गया। भारत के विभिन्न भागों से सोलह (16) सहभागियों ने कार्यशाला में भाग लिया।

सीएसआईआर–सीडीआरआई वार्षिक दिवस समारोह–2014

17 फरवरी, 2014 को सीएसआईआर–सीडीआरआई ने अपना 63वां वार्षिक दिवस मनाया। इसके अन्तर्गत बायोटेक्नोलॉजी विभाग, भारत सरकार में सचिव प्रो. के. विजयराघवन ने संस्थान के संस्थापक

निदेशक सर एडवर्ड मेलानबी की स्मृति में 39वां मेलानबी स्मृति व्याख्यान, ''टेन्स सिचुएशनः इण्डिया इज़ (वॉज़) द डिज़ीज़ कैपिटल ऑफ़ द वर्ल्ड'' प्रस्तुत किया जिसमें उन्होंने भारत में मधुमेह ग्रस्त लोगों की संख्या और अन्य बीमारियों में वृद्धि पर चिन्ता व्यक्त की साथ ही स्वास्थ्य के क्षेत्र में कार्यरत लोगों का ध्यान आकर्षित करते हुए उनसे एकजुट होकर काम करने की अपील करते हुए एक ऐसे भारत की कल्पना की जो इन बीमारियों से पूर्णतया मुक्त हो। वार्षिक दिवस कार्यक्रम के मुख्य अतिथि पद्मश्री प्रो. के. विजयराघवन थे। कार्यक्रम की अध्यक्षता सीएसआईआर–सीडीआरआई के भूतपूर्व निदेशक डॉ. वी.पी. कम्बोज ने की। सीएसआईआर–सीडीआरआई के कार्यवाहक निदेशक डॉ. सुनील के. पुरी ने मुख्य अतिथि तथा अन्य विशिष्ट अतिथियों का स्वागत किया और रिर्पोटिंग अवधि के दौरान संस्थान की उपलब्धियों का विस्ततृ विवरण प्रस्तुत किया। तत्पश्चात् मंच पर आसीन विशिष्ट अतिथियों द्वारा ''वार्षिक रिपोर्ट 2013–14'' का विमोचन किया गया और सर्वोत्तम कार्य करने वाले कर्मचारियों और छात्रों को वार्षिक पुरस्कार प्रदान किये गये। इस अवसर पर औषधि अनसुंधान में उत्कृष्टता हेतु वर्ष 2014 के प्रतिष्ठित सीडीआरआई पुरस्कारों की घोषणा की गयी। आईआईएससी, बंगलौर के ऐसोसिएट प्रोफेसर डॉ. सतीश सी. राघवन को लाइफ़ साइंसेज़ में और आईआईएसईआर, पुणे के ऐसोसिएट प्रो. डॉ. श्रीनिवास होथा को केमिकल साइंस श्रेणी में पुरस्कार प्रदान किया गया। सर्वोत्तम शोध प्रबंध हेतु डॉ. एम.एम. धर पुरस्कार केमिकल साइंसेज़ में सुश्री मोनी शर्मा को और बायोलॉजिकल साइंसेज में श्री अब्दुल एम.त्यागी को दिया गया। सुश्री कायनात खान को डॉ. स्वर्ण नित्यानन्द महिला शोधकर्ता पुरस्कार प्रदान किया गया। डॉ. एम.एम. खन्ना स्मृति पुरस्कार विशिष्ट कैरियर उपलब्धियां 2014 हेतु प्री–क्लीनिकल और क्लीकिल साइंसेज़ में सुश्री शालिनी अस्थाना को और डॉ. एम.एम. खन्ना स्मृति पुरस्कार कैरियर में शीघ्र उपलब्धि हेतु सुश्री पूजा जड़िया को दिया गया। 5 से अधिक इम्पैक्ट फ़ैक्टर वाले प्रकाशनों को उत्कृष्टता पुरस्कार तथा विदेशों में स्वीकृत पेटेण्ट्स को सर्वोत्तम प्रौद्योगिकी पुरस्कार भी प्रदान किये गये। इसके बाद संस्थान ने उन कर्मचारियों को सम्मानित किया जिन्होंने संस्थानमें अपनी सेवा के 25 वर्ष पूर्ण कर लिये हैं। अपने अध्यक्षीय संबोधन में डॉ. वी.पी. कम्बोज ने संस्थान द्वारा सभी क्षेत्रों में की जा रही प्रगति की सराहना की। उन्होंने नए परिसर को देखकर अपनी प्रसन्नता व्यक्त की और कहा कि इस अत्याधुनिक परिसर में भावी अनुसंधानकर्ताओं से सभी की आशाएं जुड़ी हुई है। श्री विनय त्रिपाठी ने कार्यक्रम का समापन करते हुए धन्यवाद प्रस्ताव प्रस्तुत किया।

मुख्य अतिथि प्रो. वाई.के. गुप्ता ने सीएसआईआर–सीडीआरआई न्यूज़लेटर (खण्ड 5 अंक 1, अप्रैल–सितम्बर, 2013) जारी किया और सीएसआईआर– सीडीआरआई के उन कर्मचारियों को सम्मानित किया

जो सितम्बर 2012–अगस्त 2013 के मध्य सेवानिवृत्त थे। इसके पश्चात् कर्मचारियों को भी सम्मानित किया गया जिन्होंने संस्थान की सेवा में 25 वर्ष पूर्ण लिये थे। संस्थान के कर्मचारियों के उन बच्चों को सम्मानित किया गया जिन्होंने इण्टरमीडिएट बोर्ड परीक्षा में विज्ञान विषय में 90 प्रतिशत अंक प्राप्त किये। लखनऊ और इलाहाबाद विश्वविद्यालयों के लगभग 200 पोस्ट ग्रैजुएट और ग्रैजुएट छात्रों ने संस्थान का भ्रमण किया और वैज्ञानिकों से बातचीत की।

''करेण्ट सिनैरियो इन ड्रग डिस्कवरी एण्ड डिवेलपमेन्ट'' पर छठा नाइपर (रायबरेली)–सीएसआईआर–सीडीआरआई संगोष्ठी

20–22 फरवरी, 2014 को नाइपर(रायबरेली) और सीएसआईआर–सीडीआरआई ने ''करेण्ट सिनैरियो इन ड्रग डिस्कवरी एण्ड डिवेलपमेन्ट'' पर छठी संगोष्ठी का आयोजन किया। मुख्य अतिथि प्रो. वाई.के. गुप्ता, एम.डी. प्रोफेसर एवं विभागाध्यक्ष, औषधि प्रभाव विज्ञान विभाग, अखिल भारतीय आयुर्विज्ञान संस्थान (एम्स), नई दिल्ली ने कार्यक्रम का उदघाटन किया और ''चैलेन्जेज़ इन क्लीनिकल ट्रायल्स इन इण्डिया'' पर उद्घाटन व्याख्यान दिया। कार्यक्रम के सम्मानीय अतिथि सीएसआईआर–सीडीआरआई, लखनऊ के भू.पू.

निदेशक प्रो. बी.एन. धवन थे। कार्यक्रम के दौरान औषधि निर्माण, क्लीनिकल फ़ार्माकोलॉजी, एक्सपेरीमेन्टल फार्माकोलॉजी, औषधि निर्माण और चिकित्सा रसायन और करेन्ट ट्रेण्ड्स इन डिज़ीज़ रिसर्च पर वैज्ञानिक सत्रों का आयोजन किया गया बहुत से वैज्ञानिकों और शोधकर्ताओं ने व्याख्यान दिये, छात्रों ने पोस्टर प्रस्तुत किये।

'क्रिस्टलोग्राफ़ी इन फ़िजिक्स, केमिस्ट्री एण्ड बायोलॉजी' पर एक दिवसीय लघु संगोष्ठी

एक्स–रे क्रिस्टलोग्राफ़ी मैक्रोमौलिक्यूल्स जैसे प्रोटीन और छोटे अणुओं और औषधियों के 3डी स्ट्रक्चर्स के समाधान की आधुनिकतम तकनीकी है। क्रिस्टलोग्राफी के अन्तर्राष्ट्रीय वर्ष 2014 (संयुक्त राष्ट्र द्वारा घोषित) को मनाने के लिये सीएसआईआर–सीडीआरआई ने 03 मार्च, 2014 'क्रिस्टलोग्राफ़ी इन फ़िजिक्स, केमिस्ट्री एण्ड बायोलॉजी'

पर एक दिवसीय लघु संगोष्ठी का आयोजन किया। मैक्स प्लैंक इन्स्टीट्यूट फॉर बायोकेमिस्ट्री, जर्मनी के नोबेल लॉरिएट प्रो. डॉ. रॉबर्ट ह्यूबर सम्मानित अतिथि थे। सीएसआईआर–सीडीआरआई के निदेशक डॉ. एस.के. पुरी ने अतिथि का स्वागत किया। सीएसआईआर–सीडीआरआईके पूर्व निदेशक डॉ. सी.एम. गुप्ता ने अध्यक्षीय व्याख्यान दिया। संगोष्ठी के दौरान डॉ. ए. के. शॉ ने 'एप्लिकेशन्स ऑफ़ एक्स–रे क्रिस्टलोग्राफी इन मेडिसिनल केमिस्ट्री : ए सीएसआईआर–सीडीआरआई पर्सपेक्टिव' पर डॉ. आर. रविशंकर ने 'माइकोबैक्टीरियल डीएनए बेस–एक्सीज़न रिपेयर पॉथ–वे एण्ड न्यू इनहिबिटर डिस्कवरी स्ट्रैटजीज़' पर और डॉ. तेजेन्दर ठाकुर ने 'क्रिस्टल स्ट्रक्चर प्रेडिक्शन ऑफ़ द ऐन हाइड्रस फ़ार्म ऑफ़ लेवोलोक्ज़ैसिन' पर व्याख्यान प्रस्तुत किया।

नॉबेल लॉरिएट प्रो. डॉ. राबर्ट ह्यूबर ने 'प्रोटिएज़ कन्ट्रोल इन हेल्थ एण्ड डिज़ीज़' पर एक रोचक व्याख्यान प्रस्तुत किया। अपने व्याख्यान के पश्चात् नोबेल लॉरिएट ने छात्रों से बातचीत की और उनके प्रश्नों के उत्तर दिये। उन्होंने अपने वैज्ञानिक जीवन के अनुभवों को साझा किया। नोबेल लॉरिएट ने सीएसआईआर–सीडीआरआई की एक्स–रे क्रिस्टलोग्राफी प्रयोगशाला को देखा जिसकी स्थापना दस वर्ष पूर्व की गयी थी। उन्होंने डॉ. रविशंकर के नेतृत्व में सीडीआरआई में किये गये एक्स–रे क्रिस्टलोग्राफ़ी कार्य की प्रशंसा की। सीडीआरआई के एक्स–रे अनुसंधान ग्रुप ने प्रोटीन के 30 स्ट्रक्चर्स और 300 से अधिक छोटे मॉलीक्यूल स्ट्रक्चर्स को हल किया। एक्स–रे प्रयोगशाला ने हमारे समाज के अभावग्रस्त वर्ग को प्रभावित करने वाली बीमारियों जैसे–टी.बी., मलेरिया और लीशमैनिया के विरूद्ध नये इन्हिबिटर्स के विकास में स्ट्रक्चर बेस्ड रैशनल डिज़ाइन एप्रोचेज़ को स्थापित करने में महत्वपूर्ण भूमिका निभाई है।

नेपाली प्रतिनिधि मंडल का अध्ययन–यात्रा कार्यक्रम

पौध संसाधन प्रभाग, थापाथल्ली काठमाण्डू नेपाल का 12 सदस्यों का एक प्रतिनिधिमण्डल दो सप्ताह के अध्ययन भ्रमण पर सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ आया। यह दौरा 3 मार्च से 2014 मार्च, 2014 तक जारी रहा। इस अध्ययन यात्रा का उद्देश्य केन्द्रीय औषधि अनुसंधान संस्थान के विभिन्न

प्रभागों में शोध एवं विकास की जानकारी प्राप्त करने के साथ–साथ औषधीय पौधों की पहचान, संग्रहण, प्रसंस्करण, शोधन तकनीक, गुणवत्ता आश्वासन, स्थिरता एवं पृथक्करण की तकनीक एवं विपणन की जानकारी प्राप्त करना था। संस्थान के वैज्ञानिकों से वार्ता करके अध्ययन दल ने जैविक स्क्रीनिंग, प्राकृतिक उत्पादों में पृथक्करण के क्षेत्र में प्रशिक्षण, प्रयोगशाला जन्तुओं, दवा वितरण रोगाणुरोधी, एण्टी–वायरल, मलेरिया रोधी औषधियों का मूल्यांकन के साथ–साथ प्रयोगशाला जन्तुओं के प्रजनन, देखभाल, जन्मजात उपभेदों के आनुवांशिक गुणवत्ता नियंत्रण पर भी जानकारी प्राप्त की।

संस्थान के निदेशक डॉ. एस.के. पुरी ने प्रतिनिधियों की सराहना करते हुए उन्हें संस्थान में उपलब्ध सुविधाओं और गतिविधियों के बारे में जानकारी दी। अध्ययन–यात्रा कार्यक्रम का संयोजन विज्ञान एवं प्रौद्योगिक प्रबंधन इकाई के वरि. प्रधान वैज्ञानिक डॉ. डी.एन. उपाध्याय ने किया। अपनी अध्ययन यात्रा के सफलतापूर्वक संपन्न होने पर सभी प्रतिनिधि संस्थान के आतिथ्य एवं सहयोग के अभिभूत थे।

राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान (नाइपर), रायबरेली का द्वितीय दीक्षांत समारोह

राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान का द्वितीय दीक्षांत समारोह, इसके संरक्षक संस्थान सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में 07 अप्रैल, 2014 को आयोजित किया गया। इस अवसर पर प्रख्यात वैज्ञानिक एवं शोध प्रवक्ता, रसायन

विज्ञान विद्यालय, हैदराबाद विश्वविद्यालय के पद्मश्री प्रोफे. गोवर्धन मेहता, ने मुख्य अतिथि के रूप में उपस्थित होकर कार्यक्रम की शोभा बढ़ाई। साथ ही रसायन एवं उर्वरक मंत्रालय, भारत सरकार के औषधि विभाग की सचिव सुश्री आराधना जौहरी ने समारोह की अध्यक्षता की। समारोह में शैक्षिक उत्कृष्टता हेतु उन्हें स्वर्ण एवं रजत पदक देकर पुरस्कृत किया गया। इस अवसर पर प्रोफे. गोवर्धन मेहता ने महत्वपूर्ण एवं ज्ञानवर्धक भाषण दिया तथा सुश्री आराधना जौहरी नें अपने प्रेरणादायी संबोधन में उत्तीर्ण छात्रों को उचित रोजगार दिये जाने की आवश्यकता पर बल दिया। समारोह में नाइपर के परियोजना निदेशक डॉ पी.के. शुक्ला द्वारा वार्षिक प्रगति प्रतिवेदन प्रस्तुत किया।

विश्व जन्तु प्रयोगशाला दिवस

मानव कल्याण एवं मानव स्वास्थ्य की रक्षा हेतु बलिदान हो जाने वाले जन्तुओं की स्मृति में विश्व जन्तु प्रयोगशाला दिवस, सीएसआईआर–केन्द्रीय औषधि अनुसंधान परिषद, लखनऊ में भावनात्मक रूप से 24 अप्रैल, 2014 को मनाया गया। यह कार्यक्रम भारत के जन्तु विज्ञान प्रयोगशाला संस्था (LASAI) के सहयोग से सम्पन्न हुआ। इस अवसर पर आयोजित व्याख्यानों में जन्तु प्रयोगशालाओं के उपयोग, रख–रखाव, सुरक्षा के लिए उचित शिक्षा एवं अनुसंधान पर बल दिया गया। साथ ही विज्ञान एवं तकनीकी का सदुपयोग मानव के साथ ही साथ जन्तु कल्याण के लिये किये जाने के महत्वपूर्ण विषय को भी उद्धारित किया गया।

राष्ट्रीय प्रौद्योगिकी दिवस समारोह

राष्ट्रीय प्रौद्योगिकी दिवस के उपलक्ष्य में सीएसआईआर–सीडीआरआई, लखनऊ ने काशी हिन्दू विश्वविद्यालय के कुलपति पदम् श्री डॉ. लालजी सिंह को व्याख्यान देने के लिये 13 मई 2014 को आमंत्रित किया। संस्थान के निदेशक, डॉ. एस.के. पुरी के स्वागत भाषण के पश्चात् डॉ. सिहं ने नये परिसर के मुख्य प्रेक्षागृह में व्हाट मेक्स अस ह्यूमन (What makes us human?) विषय पर एक व्याख्यान प्रस्ततु किया। अपने संबोधन में उन्होंने बताया कि हमारे कपि (प्राइमेट) जो हमारे सामान्य पूर्वजों से लाखों वर्ष पूर्व पृथक हो चुके थे, किस प्रकार उनके जीनोम हमारे स्वयं के विकास और चिकित्सीय समस्याओं के रहस्य को सुलझाने में सहायक हो सकते हैं। उनसे हमको यह अन्तरदृष्टि भी प्राप्त होती है कि विकास कैसे हुआ और नई जीन्स और प्रजातिया कैसे बनी। यही कारण है कि विभिन्न जीवों के जीनोम अनुक्रम के डेटा एकत्र करने के प्रयासों को जारी रखा जाए। हाल ही में एक साधारण चिपैंजी (*पैन ट्रोग्लोडाइटस*) का एक ड्राफ्ट जीनोम सीक्वेन्स पूर्ण किया गया हैं। हमारे सबसे नजदीकी जीवित संबंधी चिम्पैंज़ी के जीनोम और हमारे जीनोम आपस में 98.8 प्रतिशत मिलते हैं। श्रेणियों में अन्तर हमारे बौद्धिक और भाषा की क्षमता को प्रकट करता है और इससे यह भी स्पष्ट होता है कि क्यों हम कुछ ऐसी बीमारियों से प्रभावित हो जाते हैं जो कपियों को प्रभावित नहीं करती हैं। इस प्रकार जो कहानी हमको विशेष बनाती है वह हमारे डीएनए में लिखी है, उसके लिए यह आवश्यक नहीं है

कि हमारे जीन्स में भी हो।

व्याख्यान के पश्चात् इस अवसर पर मंच पर उपस्थित गणमान्य व्यक्तियों ने सीएसआईआर–सीडीआरआई समाचार पत्र खण्ड–5, अंक–2 का विमोचन भी किया। लखनऊ के विभिन्न स्कूल–कॉलेजों के छात्रों ने प्रयोगशालाओं का भ्रमण किया और वैज्ञानिकों से बातचीत कर यह भी जाना कि औषधि खोज में प्रौद्योगिकी का विकास कैसे होता है। एक दीर्घ अवधि के अनुसंधान के पश्चात किस प्रकार एक नई औषधि सामने आती है। कार्यक्रम का समापन श्री विनय त्रिपाठी के धन्यवाद प्रस्ताव के साथ हुआ।

फ्लोसाइटोमीट्री द्वारा एपोप्टोसिस एवं सेल सायकल के अध्ययन पर कार्यशाला

फ्लोसाइटोमीट्री में सीएसआईआर–सीडीआरआई–बैकमेन कोल्टर उत्कृष्टता केन्द्र के तत्वाधान में एक प्रशिक्षण कार्यक्रम सह–कार्यशाला का आयोजन संस्थान में 3–6 जून 2014 को किया गया। कार्यशाला बैकमेन कोल्टर लोसाइटोमीटर एफसी 500 पर आधारित व्याख्यान एवं प्रायोगिक प्रशिक्षण के दो चरणों में विभक्त थी। इसमें 12 चयनित प्रतिभागियों ने फ्लोसाइटोमीट्री संबंधित प्रयोगों जैसे, इन्स्ट्रूमेन्ट सेट अप, डिजायनिंग एवं कंपेन्सेशन कंट्रोल्स, मल्टीकलर इम्यूनो फीनोटायपिंग, सेल सायकल एनालिसिस एवं एनेक्सिन V-PI एस्से आदि थे। कार्यशाला में मुख्य वक्ता बीसी इण्डिया प्रा. लि. से डॉ रितेश कुमार, एप्लिकेशन विशेषज्ञ तथा श्रीमति साक्षी पॉल, प्रोडक्ट एवं एप्लिकेशन मैनेजर तथा सीएसआईआर– सीडीआरआई से डॉ. मधु दीक्षित, डॉ. शैलेजा भट्टाचार्या डॉ. अनुराधा दुबे, डॉ. अनिल गायकवाड़ तथा डॉ. मृगांक श्रीवास्तव थे। कार्यशाला सह प्रशिक्षण कार्यक्रम के अंतिम दिन निदेशक, डॉ. एस.के. पुरी ने फ्लोसाइटोमीट्री पर क्विज के विजेता सुश्री ज्योति भारद्वाज को पुरस्कार तथा अन्य प्रतिभागियों को प्रमाण पत्र प्रदान किए।

13वां डॉ. बी. मुखर्जी स्मृति व्याख्यान

सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ के प्रथम भारतीय निदेशक एवं प्रख्यात औषधि शास्त्री डॉ. बिष्णुपद मुखर्जी की स्मृति में सचिन एवं सिक्ता प्रधान फाउण्डेशन बेथेस्डा, यूएसए द्वारा प्रायोजित 13वें डॉ. बी. मुखर्जी व्याख्यान का आयोजन केन्द्रीय औषधि एवं अनुसंधान संस्थान में 24 जनू , 2014 किया गया। इस अवसर पर पदम् भूषण प्रोफे. जी. पदम्नाभन ने ''मूल जीव

विज्ञान से मलेरिया में संभावित चिकित्सीय सूत्र तक'' विषय पर व्याख्यान प्रस्तुत किया। उन्होंने कहा कि वर्तमान संकेतों एवं अनुमानों के अनुसार विश्व में लगभग 250 मिलियन लोग संक्रमित हैं, कोई टीका न होने के कारण इनकी मृत्युदर लगभग 7 मिलियन होने का अनुमान है। अग्रणी मलेरिया प्रतिरोधक परजीवी आर्टीमिसनिन के प्रभावी न होने के कारण मलेरिया निवारण हेतु नये प्रयास, नये टीके एवं प्रतिरोधकों के नए संयोजन खोजने की आवश्यकता है।

व्याख्यान के पश्चात् संस्थान के वैज्ञानिकों डॉ. अतुल कुमार और डॉ. अरुण कुमार त्रिवेदी को उनके वैज्ञानिक कार्यों के लिये प्रतिष्ठित यूपीसीएसटी पुरस्कार प्राप्त करने पर बधाई दी गई। डॉ. अतुल कुमार को यूपीसीएसटी का विज्ञान रत्न एवं डॉ. अरुण कुमार त्रिवेदी को यूपीसीएसटी का युवा वैज्ञानिक पुरस्कार प्राप्त करने हेतु संस्थान द्वारा सम्मानित किया गया है

लिक्विड क्रामेटोग्राफी पर एक दिवसीय सहभागिता कार्यक्रम

परिष्कृत विश्लेषणात्मक उपकरण सुविधा सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान तथा वाटर्स इंडिया के सहयोग से एक दिवसीय लिक्विड क्रामेटोग्राफी सहभागिता कार्यक्रम का आयोजन 16 जुलाई, 2014 को किया गया। कार्यक्रम का उद्देश्य विभिन्न प्रयोगशालाओं के उपयोगकर्ताओं को लिक्विड क्रामेटोग्राफी के उपयोग हेतु प्रोत्साहित करना था। कार्यक्रम का मुख्य विषय वर्तमान विश्लेषणात्मक तकनीकों की जानकारी, महत्वपूर्ण पैरामीटर तथा समन्वयन के मूल सिद्धांतों पर चर्चा करना रहा। सहभागिता कार्यक्रम के दौरान मौजूदा चुनौतियों एवं उनके निवारण का व्यापक दृष्टिकोण विकसित करना तथा कॉलम की देखभाल, तथा कारगर तरीकों के विकास पर व्यापक विचार विमर्श हुआ। कार्यक्रम के सवाल–जवाब सत्र में जिज्ञासुओं के संदेहों का सार्थक निवारण प्रस्तुत किया गया।

इथोपिया के प्रतिनिधि मण्डल का अध्ययन कार्यक्रम

इथोपियाई संसद के विज्ञान एवं प्रौद्योगिकी मंत्रालय की स्थायी समिति के अध्यक्ष श्री गेटाचाओ गेलेसे बेले के नेतृत्व में सौलह सदस्यीय उच्चस्तरीय प्रतिनिधि मण्डल ने 24 जुलाई, 2014 को संस्थान का भ्रमण किया। इस अध्ययन दौरे में इथोपियाई प्रतिनिधि मण्डल प्रौद्योगिकी हस्तांतरण विशेषज्ञों के साथ था जिसमे नेशनल क्वालिटी इन्फ्रास्ट्रक्चर कार्यक्रम की सलाहकार सुश्री क्रिस्टीना बेक, मंत्री के प्रौद्योगिकी सलाहकार एबेडीसा येलेमोटिके, लेखा परीक्षा, सेवा निदेशालय पी. एण्ड आर. कम्युनिकेशन, आपूर्ति और खरीद, प्रषासन सेवा, समन्वय निदेशालय, संस्थान एवं क्षेत्रीय राज्य से निदेशकगण, क्षमता निर्माण विशेषज्ञों, योजना विशेषज्ञों और नीति विशषज्ञों ने सहभागिता की। अध्ययन दौरे का मुख्य उद्देश्य इथोपिया में अत्याधुनिक औषधि अनुसंधान एवं विकास संस्थान की स्थापना हेतु बुनियादी आवश्यकताओं की जानकारी हासिल करना था। केन्द्रीय औषधि अनुसंधार संस्थान के निदेशक डॉ. एस.के. पुरी और व्यवसाय विकास विभाग के प्रभागाध्यक्ष डॉ. राजेन्द्र प्रसाद ने इथोपियाई प्रतिनिधि मण्डल का स्वागत करते हुए संस्थान की उपलब्धियों पर प्रकाश डाला। इसी के साथ प्रतिनिधि मण्डल ने विभिन्न विभाग के

विशेषज्ञों के साथ भी चर्चा की ओर संस्थान की विभिन्न सुविधाओं को जानने हेतु भ्रमण किया जिससे अपने राज्य में प्रयोगशाला बनाने के लिए आवश्यक जानकारी प्राप्त हो सके तथा इसकी बारीकियों से परिचित हो सकें। अध्ययन दौरे का समापन विज्ञान एवं प्रौद्योगिकी प्रबंधन इकाई के प्रभागाध्यक्ष श्री विनय त्रिपाठी के प्रस्थान उद्बोधन के साथ हुआ।

स्वतंत्रता दिवस समारोह

संस्थान ने देश का 68वाँ स्वतंत्राता दिवस राष्ट्र गौरव एवं अति उत्साह से मनाया। निदेशक डॉ एस.के. पुरी ने ध्वजारोहण किया तथा राष्ट्रगान गाया गया। उन्होंने संस्थान के विद्यार्थियों, कर्मचारियों एव उनके परिजनों को संबोधित करते हुए कहा कि हमारे राष्ट्र को स्वतंत्र

करवाने वाले उन वीर सपूतों के लिए सच्ची श्रद्धांजलि वही होगी कि हम पूर्ण समर्पण के साथ देश के विकास में जुट जाऐं। उन्होंने कहा कि स्वतंत्राता के बाद देश ने हर दिशा में विलक्षण विकास किया है, आज हमारा देश पोलियोमुक्त राष्ट्र है, हम दूसरे देशों के लिए उपग्रह प्रक्षेपित कर रहे है। औद्योगिक तथा वैज्ञानिक अनुसंधान परिषद् भी देश के विकास में महत्वपूर्ण योगदान दे रही है। सीएसआईआर–सीमेक्स द्वारा वर्ष 2013 में निर्मित सुपर कंप्यूटर देश में नं 1 है। सीएसआईआर–एनएएल को वर्ष 2014 में सर्वश्रेष्ठ प्रयोगशाला का पुरुस्कार, ब्रह्मोस के सफल परीक्षण के लिए दिया गया। इसी प्रकार यह संस्थान भी इसके स्थापना से ही देश के स्वास्थ्य विकास में भागीदारी कर रहा है। संस्थान ने सबके लिए सुलभ स्वास्थ्य सेवा उपलब्ध कराने के लिए अनेक सस्ती एवं नवीनतम प्रक्रिया प्रौद्योगिकियां विकसित करने के साथ ही देष के औषधि निर्माण उद्योग को नवजीवन देने में महत्वपूर्ण भूमिका अदा की है। निदेशक ने संस्थान से आने वाले वर्षों में भी अनवरत सहयोग की अपील की है। समारोह को समापन वृक्षारोपण कार्यक्रम एवं मिष्ठान वितरण से संपन्न हुआ।

सद्भावना दिवस समारोह

सभी धर्मों, भाषाओं, क्षेत्रों के लोगों के बीच सांप्रदायिक सद्भाव को बढ़ावा देने के उद्देश्य से संस्थान मे सद्भावना दिवस का 20 अगस्त, 2014 को आयोजन किया गया। सांप्रदायिक दुराग्रह से उपजी हिंसा के निवारण हेतु आयोजित इस कार्यक्रम में सांप्रदायिक सौहार्द, परस्पर सामंजस्य और भारतीयता की भावना का प्रसार किया गया।

इस अवसर पर संस्थान के समस्त अधिकारियों एवं कर्मचारियों ने धर्म, जाति, भाषा तथा क्षेत्र की भावना को त्यागकर सभी के मध्य भावनात्मक एवं सद्भाव बनाये रखने हेतु शपथ ली।

साहित्यिक चोरी (प्लैजरिज़्म) पर कार्यशाला

21 अगस्त, 2014 वै.औ.अ.प.–केन्द्रीय औषधि अनुसंधान संस्थान में साहित्यिक चोरी (प्लैजरिज़्म) विषय पर कार्यशाला का आयोजन किया गया। इस अवसर पर जवाहर लाल नेहरू विश्वविद्यालय के पुस्तकालय अध्यक्ष डॉ. रमेश चन्द्र गौड़ वक्ता के रूप में उपस्थित हुए। उन्होंने पहले सत्र में साहित्यिक चोरी का पता कैसे चले व इससे बचने के उपायों पर प्रकाश डाला जबकि दूसरा सत्र TURNITIN पर उन्मुखीकरण का सत्र था। इस सत्र में डॉ. गौड़ ने साहित्यिक चोरी निवारण में सहायक सॉटवेयर TURNITIN के उपयोग पर विस्तार से समझाया। कैसे TURNITIN खाता खोले, पहले कोर्स को कैसे स्थापित करें, इत्यादि। TURNITIN के उपयोग को समझाने के साथ–साथ प्रतिभागियों को प्रशिक्षित भी किया गया। अंत में कार्यक्रम की समीक्षा की गयी।

सीएसआईआर–सीडीआरआई–बीसी फ्लोसाइटोमीट्री में उत्कृष्टता का केन्द्र : फ्लोसाइट्रोमीट्री आधारित मल्टीकलर इम्यूनोफीनोटायपिंग, सेल सायकल एनालिसिस एवं एपोप्टोसिस पर कार्यशाला

संस्थान के पैरासिटालॉजी विभाग में 9–12 सितम्बर 2014 को फ्लोसाइट्रोमीटर आधारित तकनीकों पर एक प्रशिक्षण कार्यशाल संपन्न हुई। कार्यशाला बैंकमेन कोल्टर लोसाइटोमीटर एफसी 500 पर आधारित व्याख्यान एव प्रायोगिक प्रशिक्षण के दो चरणों में विभक्त थी। इसमें 11 चयनित प्रतिभागियों ने फ्लोसाइटोमीट्री संबंधित प्रयोगों से जैसे– इन्स्ट्रूमेन्ट सेटअप, डिजायनिगं एवं कंपन्सेशन कंट्रोल्स मल्टीकलर इम्यूनोफिनोटायपिगं सेल, साइकल एनालिसिस एवं एनेक्सिन V-PI, Lls आदि थे। एपोप्टोसिस/नेक्रोसिस के आंकलन हेतु कार्यशाला में डॉ. हेमन्त अग्रवाल, निदेशक फ्लोसोल्स एण्ड कंसल्टेंट FCS एक्सप्रेस सॉटवेयर ने अपने व्याख्यान में फ्लोसायमीट्री के डाटा का एनालिसस थर्ड पार्टी सॉफ्टवेयर (FCS एक्सप्रेस) द्वारा करने का प्रदर्शन किया। कार्यशाला में मुख्य वक्ता डॉ रितेश कुमार, एप्लिकेशन विशेषज्ञ तथा श्रीमति साक्षी पॉल, प्रोडक्ट एवं एप्लिकेशन मैनेजर तथा सीएसआईआर–सीडीआरआई से डॉ. मधु दीक्षित, डॉ शैलजा भट्टाचार्या, डॉ. अनुराधा दुबे, डॉ. अनिल गायकवाड़ तथा डॉ. मृगांक श्रीवास्तव थे। कार्यशाला के अंतिम दिन निदेशक, डॉ. एस.के. पुरी ने फ्लोसाइटोमीट्री पर क्विज के विजेता श्री युवराज सिंह को पुरस्कार तथा अन्य प्रतिभागियों को प्रमाण पत्र प्रदान किए।

हिन्दी सप्ताह

संस्थान में हिन्दी सप्ताह का आयोजन 8–15 सितम्बर 2014 को किया गया। उद्घाटन कार्यक्रम मुख्य अतिथि श्री शिवमूर्ति, पूर्व आयुक्त उत्तर प्रदेश शासन एवं प्रख्यात हिन्दी लेखक थे। इस दौरान

विभिन्न प्रतियोगिताएं आयोजित की गई। एक सप्ताह तक चलने वाले समारोह में हिन्दी निबंध लेखन हिन्दी अनुवाद, हिन्दी एवं टिप्पणी लेखन, हिन्दी आशुलेखन, वाद–विवाद प्रतियोगिता राजभाषा प्रश्नोत्तरी एवं हिन्दी कविता पाठ आदि प्रतियोगिताएं आयोजित की गई। हिन्दी सप्ताह समारोह का समापन विभिन्न प्रतियोगिताओं के विजेताओं को पुरस्कार एवं प्रमाण–पत्र वितरण तथा 'कवि सम्मेलन' के साथ हुआ। समापन कार्यक्रम के मुख्य अतिथि जस्टिस श्री एच.एन. तिलहरी, पूर्व न्यायाधीश इलाहाबाद उच्च न्यायालय थे। वरिष्ठ हिन्दी अधिकारी श्री वी.एन. तिवारी ने सभी प्रतिभागियों एवं कार्यक्रम में सम्मिलित सभी अतिथियों को धन्यवाद ज्ञापित किया।

मॉस स्पेक्टोमीट्री और एनएमआर तकनीक पर 22–23 सितम्बर, 2014 को कार्यशाला

मॉस और एनएमआर तकनीक के प्रयोग पर 22–23 सितम्बर, 2014 को सैफ़, सीडीआरआई द्वारा एक कार्यशाला का आयोजन किया गया। भारत के विभिन्न भागों से 32 सहभागी कार्यशाला में भाग लेने के लिये आए। वक्ता तथा प्रयोगकर्ता सभी विशेषज्ञ थे और वर्तमान अत्याधुनिक मॉस स्पेक्ट्रोमीटी तकनीक के साथ मॉस स्पेक्ट्रोमीट्री में

चर्चित विषयों और पोटेन्शियल फ्यूचर कोर्स ऑफ़ एड्वांसेज़ की झलकियां प्रस्तुत की। कार्यशाला में अत्याधुनिक मॉस और एनएमआर तकनीक के अनुभव का स्वर्णिम अवसर प्रदान किया गया।

सीएसआईआर स्थापना दिवस समारोह

सीएसआईआर–सीडीआरआई, लखनऊ में 72वाँ सीएसआईआर स्थापना दिवस मनाया गया। कार्यक्रम में पद्मश्री प्रो. विनोद कुमार सिंह, निदेशक, आईआईएसईआर भोपाल, मुख्य अतिथि थे । उन्होनें "ऑर्गेनिक सिंथिसिज फ्रॉम क्रिएटिविटी टु सस्टेनेबिलिटी एण्ड ह्यूमन वेल बीइंग" पर एक रोचक एवं ज्ञानवर्धक सम्बोधन दिया। स्थापना दिवस के अवसर पर सीएसआईआर–सीडीआरआई न्यूज़लेटर (वॉल्यूम 6 सं. 1, अप्रैल से सितम्बर, 2014) का विमोचन किया गया। संस्थान में सितम्बर 2013 से अगस्त 2014 में सेवानिवृत्त कर्मचारी और

सहयोगियों को मुख्य अतिथि द्वारा स्मृति चिह्न एवं प्रशस्ति पत्र प्रदान करके सम्मानित किया गया। साथ ही मुख्य अतिथि ने संस्थान में सीएसआईआर की सेवा में 25 वर्ष पूरे करने वाले कर्मचारियों को सम्मानित किया। इस अवसर पर संस्थान के निदेशक ने संस्थान के कर्मचारियों के उन मेधावी बच्चों को पुरस्कार प्रदान किया जिन्होंने इण्टर की परीक्षा में अपने सभी विज्ञान विषयों में 90 प्रतिशत से ज्यादा अंक प्राप्त किये। साथ ही स्थापना दिवस समारोह के तत्वाधान में संस्थान के कर्मचारियों के बच्चों के लिए आयोजित निबंध प्रतियोगिता के विजेताओं को भी पुरस्कृत किया गया।

सीडीआरआई एवार्ड विजेताओं के सम्मान एवं पुरस्कार व्याख्यान कार्यक्रम में वर्ष 2014 के प्रतिष्ठित सीडीआरआई पुरस्कार भी प्रदान किए गए। बायोलॉजिकल साइंसेज में उत्कृष्ट कार्य के लिए डॉ. सथीस सी. राघवन, आईआईएससी, बॅंगलुरु को यह पुरस्कार प्रदान किया गया। उन्होने अपना पुरस्कार व्याख्यान, "एन इन्हिबिटर ऑफ नॉन होमोलोगस डीएनए एण्ड जॉइनिंग ब्लॉक्स ट्यूमर प्रोग्रेशन इन माइस, एण्ड मे रिड्यूस डोज़ ऑफ़ रेडियोथेरेपी" विषय पर दिया। केमिकल साइंसेज का सीडीआरआई एवार्ड डॉ श्रीनिवास होथा आईआईएसईआर, पुणे को प्रदान किया गया। उन्होने अपना पुरस्कार व्याख्यान, "ग्लाइकोकेमिकल सिंथिसिज़ एण्ड इट्स सिनिफ़िकेन्स इन माइकोबैक्टीरियोलॉजी" विषय पर दिया। समारोह का समापन श्री विनय त्रिपाठी के धन्यवाद ज्ञापन द्वारा हुआ।

''औषधि अनुसंधान में मॉस और एनएमआर टेक्नीक'' पर एक दिवसीय सेमिनार, 24 दिसम्बर, 2014

परिष्कृत विश्लेषणात्मक सुविधा (सैफ़), सीडीआरआई ने ऑर्गेनिक केमिस्ट्री, नैचरल प्रॉड्क्टस / हर्बल / आयुर्वेद / प्लाण्ट मेटाबोलोमिक्स,

इन्स्ट्रूमेन्टेशन / संख्या या मात्रात्मक विश्लेषण, औषधि चयापचय और औषधि प्रभाव गति प्रयोग पर एक दिवसीय सेमिनार आयोजित किया है। मॉस और एनएमआर तकनीक के भविष्य के प्रयोगकर्ताओं के मध्य जागरूकता बढ़ाने की आवश्यकता है। विभिन्न विश्वविद्यालयों / संस्थान के 55 सहभागियों ने सेमिनार में अपनी उपस्थिति दर्ज कराई गई। आमंत्रित वक्ता डॉ. के.पी. मधुसूदन, डॉ. आर. श्रीनिवास, आईआईसीटी, हैदराबाद, डॉ. राजा राय, सीबीएमआरआई, लखनऊ ऑर डॉ. गोपाल वैद्यनाथन वॉटस इण्डिया,

सभी अपनी संबंधित क्षेत्रों में अन्तर्राष्ट्रीय विशेषज्ञ हैं जिन्होंने मॉस स्पेक्ट्रोमीट्री और एनएमआर तकनीक की वर्तमान स्थिति पर व्याख्यान प्रस्तुत किये। यह ज्ञान भागिता सत्र निष्चित रूप से अनुसंधानकर्ताओं के लिये लाभदायक होगा और उनके कार्य के लिये एक नया अवसर उपलब्ध कराएगा।

''ग्लोबल चैलेन्जेज़ इन द मैनेजमेन्ट ऑफ पैरासिटिक डिज़ीजेज़'' पर परजीवी विज्ञान का 25वां राष्ट्रीय सम्मेलन

सीएसआईआर–सीडीआरआई तथा इंडियन सोसाइटी ऑफ पैरासिटालॉजी के संयुक्त तत्वाधान में 16–18 अक्टूबर 2014 को ''ग्लोबल चैलेन्जेज़ इन द मैनजेमन्ट ऑफ पैरासिटिक डिज़ीज़ेज़'' पर 25वें तीन दिवसीय राष्ट्रीय सम्मेलन का आयोजन किया गया।

संस्थान के निदेशक, डॉ. एस.के. पुरी नें मुख्य अतिथि का स्वागत किया तथा तीन दिवसीय सम्मेलन के विषय में बताया। उद्घाटन समारोह के मुख्य अतिथि जाने–माने अनुसंधानकर्ता तथा राष्ट्रीय मलेरिया अनुसंधान संस्थान के संस्थापक निदेशक एवं आईसीएमआर के अतिरिक्त महानिदेशक पद्म भूषण डॉ. वी.पी. शर्मा थे। सम्मानीय अतिथि डॉ. पी.एस. आहुजा, महानिदेशक, सीएसआईआर ने देश को प्रभावित करने वाली संक्रामक परजीवी बीमारियों पर औषधि खोज के प्रयासों को बढ़ाने की आवश्यकता पर जोर दिया। इस अवसर पर इंडियन सोसाइटी ऑफ पैरासिटालॉजी के अध्यक्ष डॉ. एस. एल. होती नें सोसाइटी के उद्देश्यों पर प्रकाश डाला एवं टीम सीडीआरआई को इसके आयोजन के लिए किए प्रयासों की प्रशंसा की। सम्मेलन में लगभग दो सौ प्रतिनिधियों नें भाग लिया।

सम्मेलन के समापन सत्र को आईसीएमआर, नई दिल्ली के महानिदेशक डॉ. वी.एम. कटोच ने संबोधित किया। अपने संबोधन में उन्होने परजीवियों पर अनुसंधान को और अधिक अनुप्रयुक्त बनाने पर जोर दिया। इसके बाद उन्होने बी.एन सिंह ओरेशन अवार्ड, डॉ. बी. पी. पाण्डे मेमोरियल अवार्ड तथा यंग साइंटिस्ट अवार्ड प्रदान किए। आयोजक सचिव डॉ. जे.के. सक्सेना के धन्यवाद प्रस्ताव के साथ सम्मेलन का समापन हुआ।

क्रिस्टलोग्राफ़ी पर 43वाँ राष्ट्रीय सेमिनार

वर्ष 2014 को क्रिस्टलोग्राफ़ी के अन्तर्राष्ट्रीय वर्ष के रूप में मनाया जा रहा है। इसी संदर्भ में क्रिस्टलोग्राफ़ी पर 43वाँ राष्ट्रीय

सेमिनार भारतीय क्रिस्टलोग्राफ़ी एसोसिएशन (आईसीए) के तत्वाधान में सीएसआईआर–केन्द्रीय औषधि अनुसंधान संस्थान, लखनऊ में 12–14 नवम्बर 2014 को आयोजित किया गया।

कार्यक्रम के मुख्य अतिथि सीएसआईआर–इंस्टीट्यूट ऑफ माइक्रोबियल टेक्नोलॉजी के निदेशक डॉ. गिरीश साहनी थे। उद्घाटन सत्र के दौरान डॉ. साहनी ने ''ट्वीकिंग मैकेनिस्टिक इनसाइट्स फ्रॉम क्रिस्टलोग्राफ़ी यूजिंग कम्प्लीमैन्ट्री अप्रोचेज़ेस'' विषय पर सम्बोधित करते हुए रिकॉम्बिनेन्ट के विकास को समझाया। इसके साथ ही कार्यक्रम में अखिल भारतीय आयुर्विज्ञान संस्थान के प्रोफे. टी.पी. सिंह ने स्ट्रक्चर बेस्ड एविडेंस ऑफ एण्टीबायोटिक एक्शन ऑफ़ इन्नेट इम्यूनिटी प्रोटीन्स एण्ड दिअर थेराप्यूटिक एप्लीकेशन्स विषय पर व्याख्यान दिया।

इस सेमिनार में देश–विदेश के प्रतिष्ठित संस्थानों से 50 से अधिक वैज्ञानिकों/शोधकर्ताओं ने अपने विचार रखें तथा मॉलिक्युलर स्ट्रक्चरल बायलॉजी में क्रिस्टलोग्राफ़ी के अनुप्रयोगों को बताया। सेमिनार के समापन पर डॉ रविशंकर ने सेमिनार के सफल आयोजन के लिए टीम–सीडीआरआई एवं अन्य योगदानकर्ताओं को धन्यवाद ज्ञापन दिया।

क्लिनरेस्कॉन–2014

क्लीनिकल परीक्षणों और प्रतिकूल औषधि दुष्प्रभाव पर एक राष्ट्रीय संगोष्ठी क्लिनरेस्कॉन 2014 का आयोजन 3–4 दिसम्बर 2014 को सीएसआईआर–सीडीआरआई में किया गया। जिसका उद्घाटन किंग जॉर्ज चिकित्सा विश्वविद्यालय के कार्यवाहक कुलपति एवं डीन डॉ. राज मल्होत्रा ने किया। डॉ. राम विश्वकर्मा, निदेशक, सीएसआईआर –सीडीआरआई ने प्रतिकूल औषधि दुश्प्रभाव का निरीक्षण एवं नियंत्रण किये जाने पर चर्चा की। डॉ. असीम घटक, अध्यक्ष, आयोजन समिति ने सभी अतिथियों का स्वागत किया और संगोष्ठी का महत्व बताया। संगोष्ठी में प्रोफे. वाई.के. गुप्ता, विभागाध्यक्ष, फार्माकोलॉजी, अखिल

भारतीय आयुर्विज्ञान संस्थान, नई दिल्ली; डॉ. नीलिमा क्षीरसागर, क्लीनिकल फार्माकोलॉजी, भारतीय चिकित्सा अनुसंधान परिषद, भारत सरकार, नई दिल्ली एवं डीन तथा अध्यक्ष ईएसआई–पीजीआईएमएस आरएमजीएम हॉस्पिटल, मुम्बई; सुश्री अनम विसला उप–औषधि महानियंत्रक, नई दिल्ली और डॉ. सरला बालचन्द्रन, परियोजना निदेशक, ओएसडीडी यूनिट, सीएसआईआर, नई दिल्ली विशिष्ट अतिथि थे।

डॉ. विवेक भोंसले, सचिव, आयोजन समिति, ने धन्यवाद प्रस्ताव देते हुए घोषणा की कि प्रतिकूल औषधि दुष्प्रभाव के निरीक्षण हेतु संस्थान में बनाया गया केन्द्र सुचारू रूप से कार्य कर रहा है और सभी हेल्थ केयर प्रोफेशनल और उपभोक्ताओं से अनुरोध किया है कि वे सीडीआरआई को सूचना भेजें।

सेल्युलर रिस्पॉन्स टु ड्रग्स पर 38 वां अखिल भारतीय कोशिका जीव विज्ञान सम्मेलन

ऑल इण्डिया सोसायटी ऑफ सेल बायोलॉजी के तत्वाधान में सी.एस.आई.आर.–केन्द्रीय औशधि अनुसंधान संस्थान में 38वीं ऑल इण्डिया सेल बायोलॉजी कांफ्रेंस और इण्टरनेशनल सिम्पोज़ियम ऑन ''सेल्युलर रिस्पॉन्स टु ड्रग्स'' का आयोजन 10–12 दिसम्बर 2014 को किया गया। जिसका उद्घाटन प्रोफे. बी.एन. सिंह, अध्यक्ष, इण्डियन सोसायटी ऑफ सेल बायोलॉजी के अध्यक्षीय भाशण से हुआ। उन्होंने कोशिका जीवन विज्ञान और पिछले दशक में हुए उसके विकास का संक्षिप्त परिचय दिया साथ ही क्रोमोजोम अध्ययन, ऑटोरेडियोग्राफी और जीन एक्सप्रेशन एवं डीएनए–आरएनए जैसे मैक्रोमॉलीक्यूल्स और प्रोटीन के आइसोलेषन प्रक्रिया और इसके माध्यम से हुए नये विकास से अवगत कराया।

अध्यक्षीय व्याख्यान के पश्चात् बनारस हिन्दू विष्वविद्यालय, वाराणसी के प्रोफे. एस.सी. लखोटिया ने अपने उद्घाटन व्याख्यान में आयुर्वेद रसायनों के फॉर्मुलेशन का वैज्ञानिक दृष्टिकोण से कोशिका विज्ञान के आधार पर व्याख्या करने पर जोर दिया। साथ ही बताया कि आयुर्वेद, जो कि भारत में प्राचीन एवं पारंपरिक चिकित्सा पद्धति है, वर्तमान में विस्तृत वैज्ञानिक परीक्षणों के अभाव के कारण एवं आयुर्वेदिक फॉर्मुलेशन्स की वास्तविक कार्य–प्रणाली उपलब्ध न होने के कारण उसकी उपयोगिता पर वैज्ञानिक सहमत नहीं हैं जिससे जो महत्व इनको मिलना चाहिए वह वर्तमान में नहीं मिल पा रहा है। उन्होंने बढ़ते हुए सामाजिक दबाव के कारण न्यूरोडिजनरेटिव डिस्आर्डर्स के उपचार हेतु आयुर्वेदिक रसायन्स और रस–सिन्दूर्स के संभावित चिकित्सीय अनुप्रयोग को सर्वप्रथम अपने वैज्ञानिक अध्ययनों के माध्यम से सिद्ध किया।

तीन दिवसीय संगोष्ठी में कोशिका जीव विज्ञान के विभिन्न पहलुओं पर गहन विचार–विमर्श के विभिन्न सत्रों को देखा गया। देश के प्रमुख संस्थानों से सौ से अधिक प्रख्यात वैज्ञानिकों एवं शोधकर्ताओं नें विभिन्न सत्रों के दौरान पोस्टर प्रस्तुत किए और मौखिक प्रस्तुतीकरण भी दिये। सम्मेलन का समापन डॉ. बी.एन. सिंह, और डॉ. एस.के. रथ, के धन्यवाद प्रस्ताव से हुआ।

पद्म श्री डॉ. नित्या आनन्द के 90वें जन्मदिन पर ''ड्रग डिस्कवरी इन इण्डियाः पास्ट, प्रेजेण्ट एण्ड फ्यूचर'' विषय पर आधारित एक दिवसीय संगोष्ठी

डॉ. नित्यानन्द के 90वें जन्मदिन के उपलक्ष्य में उन्हें सम्मान देने के लिये दिनांक 1 जनवरी, 2015 को सीएसआईआर–सीडीआरआई ने एक दिवसीय संगोष्ठी का आयोजन किया जिसमें औषधि खोज एवं विकास के क्षेत्र की विख्यात हस्तियां सम्मिलित हुईं। संस्थान के निदेशक डॉ. आर.ए. विश्वकर्मा ने डॉ. नित्या आनन्द और उपस्थित अतिथियों का स्वागत किया।

संगोष्ठी के प्रथम सत्र में पद्म भूषण प्रो. जी.पी. तलवार ने फर्टिलिटी कंट्रोल के लिए वैक्सीन के विकास पर व्याख्यान दिया। यह वैक्सीन्स प्रोस्टेट कैंसर, ब्रीस्ट कैंसर एवं विभिन्न अन्य कैंसरों के उपचार में भी उपयोगी पाई गईं है जो कि पूर्णतया भारत में विकसित की गई हैं और मनुष्यों में प्रयोग हेतु तैयार है। हाइकल आर एण्ड डी सेन्टर, बंगालुरू के कारपोरेट सलाहकार डॉ. के. नागराजन ने भारत में औषधि खोज के विषय में बताया। उन्होंने सफल नई औषधि विकास के लिये कुछ आवश्यकताओं की चर्चा की एवं भारत में बायो थेराप्यूटिक्स के विकास पर जोर दिया। सीएसआईआर–सीडीआरआई, के भूतपूर्व निदेशक डॉ. बी.एन. धवनने इस सत्र की अध्यक्षता की।

द्वितीय सत्र में औषधि खोज में हाल में हुई प्रगति से संबंधित अनुसंधान कार्य को 50 से अधिक शोध छात्रों ने पोस्टर के रूप में प्रदर्शित किया। तृतीय सत्र में सीएसआईआर–सीडीआरआई के भूतपूर्व निदेशक डॉ. वी.पी. कम्बोज ने कार्यक्रम की अध्यक्षता की और एवरा लेबोरेट्रीज प्रा. लि., हैदराबाद के अध्यक्ष एवं प्रबंध निदेशक डॉ. ए.वी. रामाराव ने 'ड्रग डिस्कवरी इन इण्डियाः पास्ट, प्रेजेण्ट ऐण्ड यूचर' पर एक व्याख्यान प्रस्तुत किया और उन्होंने अपनी संस्था एवरा के अनुसंधान एवं विकास गतिविधियों तथा उसके व्यवसायीकरण के अनुभवों के बारे में बताया। साथ ही डॉ. नित्या आनंद के साथ अपने संस्मरणों की चर्चा की। डॉ. नित्या आनंद के बहुत से अन्य सहकर्मियों तथा छात्रों ने इस अवसर पर उनके साथ व्यतीत समय के संस्मरणों को साझा किया। सीएसआईआर–सीडीआरआई के निदेशक डॉ. आर. ए. विश्वकर्मा ने संगोष्ठी की समाप्ति पर डॉ. नित्या आनंद को स्मृति चिन्ह देकर सम्मानित किया।

2 विशिष्ट अतिथि

प्रतिष्ठित अतिथि

श्री जॉर्ज कार्डेनस रॉबल्स

बोलिविया के राजदूत

द्विपक्षीय अनुसंधान सहयोग के लिए अवसर तलाशने हेतु संस्थान आगमन, 31.10.2014

अन्य विशिष्ट अतिथि

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डॉ. संजीव श्रीवास्तव इण्डियन इंस्टीट्यूट ऑफ टेक्नोलॉजी, मुंबइ	प्रोटियोमिक्स एण्ड सिस्टम्स लेवल टूल्स फॉर ट्रांसलेशनल रिसर्च	28.05.2014
डॉ. अमित गुप्ता वन एवं पर्यावरण मंत्रालय, भारत सरकार	सस्टेनिंग एन्वायरमेन्ट इन वन्स डैली लाईफ 16.	16.07.2014
डॉ. दीपक मोदी नेशनल इंस्टीट्यूट ऑफ रिसर्च इन रिप्रोडेक्टिव हेल्थ (आईसीएमआर) मुंबई	डेसिडुअल कंट्रोल ऑफ ट्रॉफोब्लास्ट इन्वैज़न रिक्वार्स HOXSTAT क्रॉस टॉक	04.08.2014
डॉ. केली लुंसन बायोलिजेण्ड, इंक, कैलिफोर्निया, यूएसए	मल्टीकलर फ्लो सायटोमीट्री: इन्ट्रासेल्युलर एण्ड ट्रांसक्रिप्शन फैक्टर स्टैनिंग इन टी हेल्पर सबसेट्स	27.08.2014
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वैज्ञानिक / तकनीकी अधिकारी	देश	यात्रा का उद्देश्य (प्रतिनियुक्ति की अवधि)
डॉ मधु दीक्षित	फ्रांस	बैठक में भाग लेने के लिये (26 मई, 2014)
	डेनमार्क	इन्डो–डेनिश अनुसंधान सहयोग के तहत, 'चैलेन्जेज़ इन हेल्थ रिसर्च' पर कार्यशाला में भाग लेने के लिये (04 से 05 सितम्बर, 2014)
डॉ प्रेम मान सिंह चौहान	जर्मनी	संयुक्त अनुसंधान परियोजना हेतु बैठक में भाग लेने के लिए (24 नवम्बर से 31 दिसम्बर 2014)
डॉ नीलू सिंह	तुर्की	इन्सा–तुर्किश अकादमी ऑफ साइन्स के वैज्ञानिक विनिमय कायर्क्रम में भाग लेने के लिये (09 से 13 जनू, 2014)
	मेक्सिको	13 वीं इन्टरनेशनल पैरासिटोलॉजी कांग्रेस में व्याख्यान हेतु आमंत्रित (10 से 15 अगस्त, 2014)
डॉ श्रीकांत कुमार रथ	यूएसए	सेफ्टी रिस्क असेसमेंट ऑफ फूड फ्रॉम जेनेटिकली इन्जिनियर्ड प्लान्ट्स पर फेज–।। ट्रेनिंग हेतु आमंत्रित (15 से 19 सितम्बर, 2014)
डॉ. अमित मिश्रा	ऑस्ट्रेलिया	5वीं फार्मास्यूटिकल वर्ल्ड कांग्रेस में लेने के लिये (13–16 अप्रैल, 2014)
	जापान	5वीं इन्डो–जापानी अन्तर्राष्ट्रीय संयुक्त कार्यशाला में भाग लेने के लिये (16 से 17 सितम्बर, 2014)
	नार्वे	संयुक्त परियोजना हेतु बैठक में भाग लेने (06–09 जनवरी, 2015)
डॉ. जे वेंकटेश प्रताप	फ्रांस	बीएम14 बीमलाइन यूरोपियन सिन्कोट्रॉन रेडिएशन फेसिलिटी पर आंकड़े एकत्र करने (12–18 फरवरी, 2014)
डॉ कल्यान मित्रा	जापान	JEOL JEM-1400 इलेक्ट्रॉन माइक्रोस्कोप पर उन्नत अनुप्रयोग प्रशिक्षण हेतु (12 से 23 मई, 2014)
डॉ. रविशंकर अम्पापति	यूएसए	वीएनएमआरएस हार्डवेयर मेंटेनेन्स ट्रेनिंग कोर्स हेतु (18–27 फरवरी, 2014)
डॉ कुमारवेलु जगवेलु	यूके	नोवेल थेरेप्यूटिक्स इन वैस्कुलर डिस्आर्डर पर सेमिनार में भाग लेने हेतु (10 से 12 दिसम्बर 2014)
डॉ. संजीव कुमार शुक्ला	स्विट्जरलैण्ड	एनएमआर एडवांस ट्रेनिंग कोर्स हेतु (31 मार्च–4 अप्रैल 2014)
डॉ. सारिका	यूएसए	दक्षिण–पश्चिमी मेडिकल सेन्टर, टेक्सास विश्वविद्यालय, में शोध करने के लिए (30 अक्टूबर, 2013 से 29 अक्टूबर, 2014)
डॉ. श्रीपति आर. कुलकर्णी	यूएसए	अतिथि प्राध्यापक के रुप में आमंत्रित (22 जनवरी 2014 से 19 जनवरी 2015)
डॉ नम्रता रस्तोगी	जर्मनी	इन्सा–डीएफजी अकादमी ऑफ साइन्स के वैज्ञानिक विनिमय कायर्क्रम में भाग लेने के लिये (03 जुलाई से 30 सितम्बर, 2014)
डॉ राजेश कुमार झा	यूएसए	सोसाइटी फॉर द स्टडी ऑफ रिप्रोडक्शन की 47वीं बैठक में भाग लेने के लिये (19 से 23 जुलाई, 2014)
डॉ तेजन्दर सिंह ठाकुर	जर्मनी	SAXS एवं सिन्क्रोटोन के अनुप्रयोग संबंधी कार्यशाला में भाग लेने के लिये (09 से 20 सितम्बर, 2014)
डॉ जिया उर गाइन	जर्मनी	प्रोफे. माइकल रॉडेन के साथ अनुसंधान हेतु (01 नवम्बर 2014 से 30 अप्रैल 2015)
श्री बिनोद कुमार साव	स्विट्जरलेण्ड	एनएमआर एडवांस ट्रेनिंग कोर्स हेतु (31 मार्च–4 अप्रैल 2014)
श्री अनिल कुमार कलासदन	यूएसए	एनएमआर एडवांस ट्रेनिंग कोर्स हेतु (12–21 मार्च 2014)

5 विशिष्ट वैज्ञानिक समितियों की सदस्यता

डॉ. राम ए. विश्वकर्मा

- चेयरमैन, एक्सपर्ट ग्रुप ऑन ट्रांसलेशनल रिसर्च फॉर प्रोडक्ट्स एण्ड प्रॉसेसज़ फ्रॉम मेडिसिनल एण्ड ऐरोमेटिक प्लाण्ट्स ऑफ़ द डिपार्टमेन्ट ऑफ़ बायोटेक्नोलॉजी (भारत सरकार)
- **सदस्यः** 1. टास्क फोर्स ऑफ़ ''पब्लिक हेल्थ इंक्लूडिंग फूड एण्ड न्यूट्रिशनल इन्टरवेन्शन्स'', डिपार्टमेन्ट ऑफ बायोटेक्नोलॉजी (भारत सरकार); 2. एक्सपर्ट कमेटी ऑन ड्रग्स एण्ड फार्मास्युटिकल्स रिसर्च प्रोग्राम, डिपार्टमेन्ट ऑफ़ साइंस एण्ड टेक्नोलॉजी (भारत सरकार); 3. रिसर्च काउंसिल सीएसआईआर–इन्स्टीट्यूट ऑफ हिमालयन बायो–रिर्सोसेज़ एण्ड टेक्नोलॉजी, पालमपुर; 4. कोर्ट ऑफ़ द सेन्ट्रल यूनिवर्सिटी ऑफ़ जम्मू; 5. एक्सक्यूटिव कमेटी, सेन्ट्रल यूनिवर्सिटी ऑफ़ कश्मीर 6. अमेरिकन केमिकल सोसायटी, यूएसए; 7. रॉयल सोसायटी ऑफ केमिस्ट्री (यूके) और 8. फाइनेन्स कमेटी ऑफ द सेन्ट्रल यूनिवर्सिटी ऑफ़ कश्मीर
- **सदस्य, संपादक बोर्डः** 1. ''जर्नल ऑफ कैमिकल साइंसेज़'' (इण्डियन अकादमी ऑफ साइंसेज, बंगलौर); 2. ''प्रोसीडिंग्स ऑफ नेशनल अकादमी ऑफ साइंसेज इण्डिया'' (इण्डियन नैशनल साइंस अकादमी (इन्सा), नई दिल्ली;
- **अनुदान–समीक्षकः** 1. अमेरिकन (एनएसएफ), 2. ब्रिटिश (वेलकम–ट्रस्ट) और 3. इण्डियन (डीबीटी, डीएसटी और सीएसआईआर) नैशनल फण्डिंग एजेन्सिज़

डॉ. एस. के. पुरी

- **सदस्यः** 1. साइंटिफिक एडवाइज़री कमेटी, वेक्टर कंट्रोल रिसर्च सेंटर, पुदुच्चेरी; 2. इंस्टीट्यूषनल एनिमल एथिक्सकमेटी, इण्डियन एनिमल सप्लायर, लखनऊ; 3. ड्रग्स टेक्नीकल एडवाइज़री बोर्ड, डाइरेक्ट्रोट जनरल ऑफ़ हेल्थ सर्विसेज़
- **उपाध्यक्षः** इण्डियन सोसाइटी फॉर पेरासिटोलॉजी

डॉ. सी. नाथ

- **आजीवन सदस्यः** 1. इण्टरनैशनल ब्रेन रिसर्च ऑर्गेनाइजेशन; 2. नैशनल अकादमी ऑफ़ मेडिसिनल साइंसेज़;
- **सदस्यः** 1. रिसर्च काउंसिल (डीजी द्वारा नामित), सीएसआईआर इण्डियन इंस्टीटयूट ऑफ टाक्सीलॉजिकल रिसर्च (आईआईटीआर), 2. एक्सपर्ट कमेटी फॉर बायोथेरेप्यूटिकप्रोडक्ट्स, ड्रग्स कन्ट्रोलर जनरल ऑफ़ इंडिया, मिनिस्ट्री ऑफ हेल्थ, भारत सरकार; 3. अकैडमिक काउंसिल जे.एन.यू. नईदिल्ली; 4. एडवाइज़री कमेटी फॉर आईएनडी परमिशन, ड्रग कंट्रोलर जनरल ऑफ इण्डिया; 5. इंस्टीट्यूशनल एथिक्स कमेटी, एसजीपीजीआई एमएस, लखनऊ; 6. इंस्टीट्यूशनल एनिमल एथिक्स कमेटी, केजीएमयू, लखनऊ

डॉ. मधु दीक्षित

- **सदस्यः** 1. इण्डियन काउंसिल ऑफ़ मेडिसिनल रिसर्च (प्रोजेक्ट एडवाइज़री कमेटी ऑफ बेसिक मेडिकल साइंसेज), 2. काउंसिल ऑफ़ साइंसटिफिक इण्डस्ट्रयल रिसर्च (ऑर्गेनिक एण्ड मेडिसनल केमिस्ट एण्ड केमिकल टेक्नोलॉजी रिसर्च कमेटी) 3. फेलो सिलेक्शन कमेटी, इण्डियन अकादमी ऑफ साइंसेज, 4. एथिक्स कमेटी, सेन्टर ऑफ बायोमेडिकल रिसर्च लखनऊ मेग्नेटिक रेजोनेन्स, लखनऊ, 5. डीबीटी आरसीजीएम कमेटी, 6. एथिक्स कमेटी, किंग जॉर्जस मेडिकल यूनिवर्सिटी, लखनऊ
- **सदस्य, संपादक मंडलः** 1. इण्डियन जर्नल फार्माकोलॉजी, 2. प्रोसिडिंग्स ऑफ द नैशनल एकेडेमी साइन्सेस इंडिया (सेक्शन बी)

डॉ. असीम घटक

- **सदस्यः** 1. अमेरिकन कॉलेज ऑफ क्लीनिकल फार्माकोलॉजी, यूएसए, 2. नैशनल 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. अनुराधा दुबे

- **सदस्य, संपादक मंडलः** 1. जर्नल ऑफ बायोमेडिकल रिसर्च; 2. बायोमेड सेन्ट्रल, इन्फेक्शस डिजीज़ज (ओपन एक्सेस)

डॉ. जे.के. सक्सेना

- **सचिवः** द इण्डियन सोसायटी ऑफ पैरासिटालॉजी
- **उपाध्यक्षः** इण्डियन सोसायटी ऑफ़ बायोलॉजिस्ट एण्ड केमिस्टस्
- **सदस्यः** 1. इडिट्रयल बोर्ड, एशियन पैसिफिक जर्नल ऑफ ट्रॉपिकल मेडिसिन, 2. एक्सपर्ट कमेटी फॉर केमिकल एण्ड फार्मास्यूटिकलसाइंसेज़, यूपीसीएसटी, लखनऊ

डॉ. आर.पी. त्रिपाठी

- **सदस्य संपादक मंडलः** 1. एआरकेआईवीओसी, 2. जर्नल ऑफ ऑर्गेनिक बाइलॉज़िकल केमिस्ट्री

डॉ. नीरज सिन्हा

- **आजीवन सदस्यः** नैशनल अकादमी ऑफ साइंसेज़ इलाहाबाद

डॉ. डी.एस. 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 वेटेनरी कॉन्सिल, लखनऊ 4. सीपीसीएसईए सब–कमेटी फॉर रिहैबिलिटेशन आफॅ लेबोरेटरी एनीमल्स, 5. मैनेजमेन्ट कमेटी ऑफ़ द नैशनल इन्स्टीट्यूट ऑफ ऐनिमल वेलफेयर, मिनिस्ट्री ऑफ एनवॉयरमेन्ट ऐण्ड फॉरेस्ट, गवर्नमेन्ट ऑफ़ इण्डिया, 6. इंस्टीट्यूशनल एनिमल एथिक्स कमेटीज़ ऑफ, सीएसआईआर–सीमैप, आईआईटीआर, इन्टिग्रल यूनिवर्सिटी, ए.एच. डिपा., सरस्वती डेण्टल कॉलेज़ एण्ड यूनिवर्सिटी, ऐमिटी यूनिवर्सिटी, लखनऊ

डॉ. वी.एल. शर्मा

- **सदस्यः** रिसर्च ऐण्ड डिवेल्पमेन्ट कमेटी, डिपार्टमेंट ऑफ फार्मेसी, इन्टीग्रल यूनिवर्सिटी, लखनऊ

डॉ. एम. एन. श्रीवास्तव

- **सदस्यः** बोर्ड ऑफ पैनल फॉर पीएससी ऑन आर एण्ड डीऑफ सेन्ट्रल सेक्टर स्कीम फॉर कन्सर्वेशन डिवेल्पमेन्ट ऐण्डसस्टेनेबल मैनेजमेन्ट ऑफ मेडिसिनल प्लांट्स, नेशनलमेडिसिनल प्लांट्स बोर्ड, (आयुष), मिनिस्ट्री ऑफ हेल्थ ऐण्ड फैमिली वेल्फेयर, गवर्नमेन्ट ऑफ इंडिया

डॉ. अतुल कुमार

- **सदस्यः** ग्लोबल एडवाइजरी बोर्ड मेम्बर ऑफ साइफाइन्डर, केमिकल एब्स्ट्रेक्ट्स सर्विस (सीएएस) अमेरिकन केमिकल सोसाइटी (एसीएस), कोल्मबस, 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 साइंसेज़)

डॉ. जवाहर लाल

- **सदस्य संपादक मंडलः** अमेरिकन जर्नल ऑफ मॉडर्नक्रोमेटोग्राफी, यूएसए
- **कार्यकारी सदस्यः** इण्डियन सोसायटी ऑफ बायोलॉजिस्ट एण्ड केमिस्ट्स, लखनऊ

डॉ. आर. रविशंकर

- **सदस्यः** वर्किंग ग्रुप ऑन न्यू टीबी ड्रग्स (डब्ल्यूजीएनडी)

डॉ. श्रीकांत कुमार रथ

- **सदस्य संपादक मंडलः** टॉक्सीकोलोजी इन्टरनैशनल

डॉ. अमित मिश्रा

- **सदस्यः** एक्सपर्ट कमेटी ऑन ट्यूबरक्युलोसिस, डिपार्टमेंट ऑफ बायोटेक्नोलॉजी
- **उपाध्यक्षः** एशियन फेडरेशन ऑफ फार्मास्यूटिकल साईन्सेज़

डॉ. संजय बत्रा

- **सदस्यः** 1. काउंसिल ऑफ एनओएसटी, इण्डिया (2011–2014) 2. गवर्निंग काउंसिल, कैमिकल रिसर्च सोसाइटी ऑफ़ इंडिया, बंगलुरू, 3. प्रोजेक्ट एडवाइजरी कमेटी फॉर केमिकल साइंसेज़, कमेटी फास्ट ट्रैक, एसईआरबी–डीएसटी

डॉ. कुमकुम श्रीवास्तव

- **सदस्य कार्यकारी समितिः** इण्डियन सोसाइटी फॉर पैरासिटोलॉजी, इण्डिया

डॉ. गौतम पाण्डा

- सदस्य, नैशनल अकादमी ऑफ़ साइंसेज़, इलाहाबाद इण्डिया

डॉ. के.आर. आर्या

- **संयुक्त सचिवः** 1. सोसायटी ऑफ एथिनोबोटनिस्ट्स (2014–2017), 2. नैशनल बॉटनिकल रिसर्च इन्स्टीट्यूट (एनबीआरआई), लखनऊ

डॉ. मो. इमरान सिद्दीकी

- **सदस्यः** एडवाइज़री कमेटी फॉर बायोटेक्नोलॉजी (2012–2015) काउंसिल ऑफ साइंस एण्ड टेक्नोलॉजी,सीएसटी यूपी

डॉ. डी. हंसदा

- **सदस्यः** 1. वेस्ट बंगाल वेटरनरी काउन्सिल, कन्स्टीयूटअन्डर वेटरनरी काउन्सिल ऑफ इण्डिया 2. लाइव स्टॉकफीड, एक्विप्मेंट्स एण्ड सिस्टम, सेक्षनल कमिटी, एफएडी,बीआईएस, नई दिल्ली

डॉ. राजेन्दर सिंह

- **सदस्यः** सीनेट ऑफ़ अकादमी ऑफ़ साइंसटिफ़िक एण्ड इननोवेटिव रिसर्च

डॉ. वहाजुद्दीन

- **सदस्य संपादक मंडलः** 1. जर्नल ऑफ बायोइक्विवैलेन्सऐण्ड बायोएवैलेबिलिटी, 2. एनालिटिक फार्मास्यूटिक एक्टा, 3. फार्मास्यूटिकल रेगुलेटरी अफेयर्स
- **आजीवन सदस्यः** नैशनल अकादमी ऑफ़ साइंसेज़ (इण्डिया)

डॉ. एच.के. बोरा

- **सदस्यः** असम वेटरनरी काउंन्सिल, कन्स्टीट्यूट अन्डर वेटरनरी काउन्सिल ऑफ इण्डिया

Notes

THE STAFF

DIRECTOR

Ram A. Vishwakarma., M.Sc., Ph.D., FNASc,

ACTING DIRECTOR

S.K. Puri. M.Sc., Ph.D., FNASc, (Retired on 30-11-2014)

R & D DIVISIONS UNITS

BIOCHEMISTRY

Chief Scientist
Sudhir K. Sinha, M.Sc., Ph.D.
J.K. Saxena, M.Sc., Ph.D
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Senior Principal Scientist
A.K. Srivastava, M.Sc., Ph.D., *In-Charge*
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Neeloo Singh, M.Sc., Ph.D.
Vinita Chaturvedi, M.Sc., Ph.D.

Principal Scientist
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A.K. Tamrakar, M.Sc., Ph.D.
Arun Kumar Trivedi, M.Sc., Ph.D.
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Ramesh Sharma, M.Sc., Ph.D.
B. Maity, M.Sc., Ph.D.

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Ajay Singh Verma, M.Sc.
Shyam Singh, M.Sc.
Ishbal Ahmad, M.Sc.

Technical Assistant
Sanjeev Meena, M.Sc.
Priyanka Trivedi, M.Sc.
Karthik R. M.Sc.

Sr. Technician (2)
Suresh Yadav (Retired on 31-07-2014)
Hori Lal, B.Sc.
Chandramool (Retired on 31-07-2014)

Sr. Technician (2)
Ram Pal Rawat, B.Sc., LLB

Lab. Assistant
Ramesh Chandra
Noor Jehan (Retired on 31-10-2014)

BOTANY

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M.N. Srivastava, M.Sc., Ph.D.

Principal Scientist
K.R. Arya, M.Sc., Ph.D. *In-Charge*

Senior Scientist
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Sr. Technician (2)
J.K. Joshi, B.Sc.

Lab. Assistant
Devi Dutt
Makhan Lal *(Horticulture work)*
Gopi *(Horticulture work)*
Satya Narain *(Horticulture work)*

Lab Attendant (1)
R.C. Maurya
Lakhana Devi *(Horticulture work)*
N.K. Khanduri
Ashok Kumar *(Horticulture work)*

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M.P.S. Negi, B.Sc., PGDC (Biometry & Statistics)

Sr. Steno
Mohd. Sufiyan

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Savitri Devi

Lab. Assistant
Umesh Kumar

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P.S. Acharya, B.Com.
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R.B. Pawar

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Jaspreet Kaur, M.Sc.
Amar Deep Lakra

Sr. Technician (2)
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Chattar Pal
Geet Kumar Nagar, B.Sc.

Lab. Assistant
B.P. Mirsa
R.G. Pandey

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Mahesh Chandra Tewari

Lab. Attendant (1)
Nabbulal
Ram Karan
Pradeep Singh

MEDICINAL AND PROCESS CHEMISTRY

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Ram Pratap, M.Sc., Ph.D. (Retired on 30-11-2014)
Rakesh Maurya, M.Sc., Ph.D.
Arun K Sinha, M.Sc., Ph.D. FNASc, *Supervising Scientist-in-Charge, SAIF*
R.P. Tripathi, M.Sc., M.Phil, Ph.D.

Senior Principal Scientist
Kanchan Hajela, M.Sc., Ph.D.
W. Haq, M.Sc., Ph.D., *In-charge, Other Lab Services & Supervising Scientist-in-Charge, LES*
Y.S. Prabhakar, M.Sc., Ph.D.
Arun K. Shaw, M.Sc., Ph.D.
P.M.S. Chauhan, M.Sc., Ph.D.
V.L. Sharma, M.Sc., Ph.D.
Atul Kumar, M.Sc., Ph.D.
Pradeep Kumar Srivastava, M.Sc. (Retired on 31-05-2014)

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Sanjay Batra, M.Sc., Ph.D.
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Gautam Panda, M.Sc., Ph.D.
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Senior Scientist
K.V. Sashidhara, M.Sc., Ph.D.
Maddi Shridhar Reddy, M.Sc., Ph.D.
Kishor Mohanan , M.Sc.,Ph.D.
Pintu Kumar Mandal, M.Sc.,Ph.D.

Scientist
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Dipankar Koley, M.Sc., Ph.D.
Namrata Rastogi, M.Sc. Ph.D.

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S.C. Tripathi, B.Sc.
Keshav Prasad, AMIE, M.Tech.

Sr. Technical Officer (3)
Suresh Chandra, B.Sc.
S.P.S. Bhandari, M.Sc. Ph.D. (Retired on 31-10-2014)
Zahid Ali, B.Sc.
Tara Rawat, B.Sc.
Deepali Pandey, B.Sc.

Technical Officer
Ashok Kumar Sharma, B.Sc., D.Ch.E., A.M.I.E.
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Surya Pratap Singh, M.Sc., Ph.D

Technical Assistant
Vidisha Sharma

Sr. Technician (2)
Preeti Rastogi, M.Sc.
Ramjeet, B.Sc., PGDC
Zaheer Ahmad (Glass Blowing)
Radha Rani Gupta, B.Sc.
Raju Arora, B.Sc.
Shashi Rastogi, M.Sc.
Mithilesh Sharma, M.Sc.
Veena Mehrotra, M.Sc.
Rajesh Kumar
Akhilesh Kumar Srivastava, B.Sc.
A.K. Pandey, B.Sc.
S.C. Tiwari, B.Sc.

Sr. Technician (1)
Manju, B.Sc.
Ram Lakhan

Technician (1)
H.R. Misra, M.Sc.
N.P. Misra, M.Sc.
Krishna Kumar, B.Sc.

Private Secretary
Avadhesh Kumar, B.A.

Jr. Steno
Surendra Kumar, B.Com

Lab. Assistant
M.S. Bhol
J.C. Rajan

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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.

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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
A.K. Joshi, M.Sc. (Retired on 31-07-2014)

Sr. Technical Officer (3)
Shyamendra Mehrotra, B.Sc. (Retired on 31-08-2014)
Bikram Banerjee, B.Sc.
Agney Lal, B.Sc.

Technical Officer
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.

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Ravi Shankar Misra
Ram Prakash, B.A.
Shyam Sunder Yadav, B.A.

MOLECULAR & STRUCTURAL BIOLOGY

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Saman Habib, M.Sc., Ph.D.,
Ravishankar, R., M.Sc., Ph.D. *In-Charge*

Principal Scientist
Jimut Kanti Ghosh, M.Sc., Ph.D., FNASc
J. Venkatesh Pratap, M.Sc., Ph.D.

Senior Scientist
Ashish Arora, M.Sc., Ph.D.
Mohammad Imran Siddiqi, 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 (2)
R.K. Srivastava, B.Sc.
J.P. Srivastava, B.Sc., LL.B.

Technical Officer
Ruchir Kant, M.Sc. Ph. D
Anupam Jain, M.Sc.
Rima Ray Sarkar, M.Sc

Technical Assistant
Sarita Tripathi, M.Sc.

Sr. Technician (2)
Ram Radhey Shyam
Kishan Singh

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.

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.
Sushant 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 (1)
Prem Babu
Ram Das
Om Prakash

PHARMACEUTICS

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A.K. Dwivedi, M.Sc., Ph.D.

Principal Scientist
Amit Misra, M.Pharm., Ph.D., *In-Charge*
Prabhat Ranjan Mishra, M.Pharm., Ph.D.

Senior Scientist
Manish Kumar Chourasia, M.Pharm., Ph.D.

Scientist
Bathula Surender Reddy, M.Sc., Ph.D. (Transferred to CSIR-IICT on 14-02-2014)

Technical Assistant
V. Saravanakumar, M.Sc., MPhil., PGDCA, DIS
Deepak, M.Sc.,

Sr. Technician (2)
S.K. Bhatnagar, B.Sc.

Jr. Steno
Pooja Taneja (Resigned on 30-11-2014)

Lab. Attendant (1)
Ram Kumar

PHARMACOKINETICS AND METABOLISM

Sr. Principal Scientist
S.K. Singh, M.Sc., Ph.D., *In-Charge*
Jawahar Lal, M.Pharm., Ph.D.

Scientist
R.S. Bhatta, M.Pharm., Ph.D.
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

Sr. Steno
Nandita Pandey, B.A.

Technician (2)
Akhilesh Kumar

Lab. Assistant
Shiv Lal

Lab. Attendants (1)
Ram Bhajan Shukla
Ram Sunder Lal, B.A.
Chandramani

PHARMACOLOGY

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Madhu Dikshit, M.Sc., Ph.D., FNASc., FASc., FNA.
Rakesh Shukla, M.Sc., Ph.D., FIPS., FIAN., *In-Charge*

Senior Scientist
Manoj K. Barthwal, M.Sc., Ph.D.
Anil Gaikwad, M.Sc., (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)
S. Sengupta, B.Sc. (Retired on 31-07-2014)
T.L. Seth, B.Sc. (Retired on 31-05-2014)
Jharna Arun, B.Sc.
V.S. Nigam, B.Sc.
C.P. Pandey, M.Sc.

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. Technician (2)
H.C. Verma, B.A.
Bharti Bhushan, B.Sc.
Ramesh Chandra, M.Sc.

Sr. Technician (1)
Anil Kumar Verma, B.Sc.

Sr. Stenographer
Varun Kumar Pathak, B.A

Technician (2)
Surendra Singh, M.Sc., Ph.D.

Lab. Attendant (1)
Hari Joshi
K.P. Mishra

TOXICOLOGY

Chief Scientist
C. Nath, M.B.B.S., M.D.,

Senior Principal Scientist
Neeraj Sinha, M.Sc., Ph.D., D.Sc. *(Retired on 31-12-2014)*
R.K. Singh, M.Sc., Ph.D., D.Sc.
Sharad Sharma, M.B.B.S., M.D.

Principal Scientist
S.K. Rath, M.Sc., Ph.D. *In-Charge, Academic Affairs Unit*
R.K. Tripathi, M.Sc., Ph.D.

Scientist
Aamir Nazir, M.Sc., Ph.D.
Smrati Bhadauria, M.Sc., Ph.D.

Sarika Singh, M.Sc., Ph.D.
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
Shree Krishan

Lab. Attendant (1)
Ram Kumar
Nand Pal Yadav
Ganesh Prasad

TECHNICAL INFRASTRUCTURE DIVISIONS / UNITS

ACADEMIC AFFAIRS UNIT

Principal Scientist
Anju Puri, M.Sc., Ph.D.

Sr. Steno (MACP)
Renuka Mushran

Sr. Technician (2)
A.K. Pandey, B.Sc.

BUSINESS DEVELOPMENT UNIT

Chief Scientist
Rajendra Prasad, M.Sc., Ph.D., *Unit In-Charge*

Scientist
Naseem Ahmed Siddiqui., B. Pharma, M.B.A.

Sr. Technical Officer (2)
A.S. Kushwaha, B.Sc.

Technical Assistant
Neelima Srivastava, M.C.A

COMPUTER CENTRE

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A.K. Srivastava, B.E., *Centre In-Charge*

Sr. Principal Scientist
Kural, B.E.

Scientist
Santhosh Shukla, B.Tech. (Transferred from CSIR-NBRI)

Principal Technical Officer
J.A. Zaidi, M.Sc., M.L.I.Sc. (Retired on 31-12-2014)

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*
A.K. Srivastava, M.Sc., Ph.D *(Retired on 30-06-2014)*

Senior Scientist
S. Raja Kumar, M.Sc
Dhananjoy Hansda, M.V.Sc.

Trainee Scientist
H.K. Bora, M.V.Sc

Sr. Technical Officer (3)
S.N.A. Rizvi, M.Sc.
A.K. Bhargava, B.Sc. (Retired on 31-07-2014)
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)
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Dinesh Kumar, B.A.
Pradeep Tirkey

Technician (2)
Arun Sharma, B.Sc.

Sr. Steno (H)
Raj Kumar, B.A.

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Gaffar Ali (Retired on 30-06-2014)
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S.K. Verma
Shiv Pal Singh
P.B. Thapa
O.P. Verma, B.A.
Mohd. Saleem
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G.K. Sharma
Dilip Kumar

Lab. Attendants (1)
Changa Lal
Jameel Beg
Najbullah

KNOWLEDGE RESOURCE CENTRE

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R.M. Pathak, B.F.A. (Comm..Art)

Technical Officer
Ramesh Chandra Gupta, M.L.I.Sc.

Jr. Steno
Himanshu Upadhyay, B.A

Assistant (S&P) Gr. III
Chakrasen Singh

OTHER LAB SERVICES

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Scientist
Manoj Kumar Rawat, M. Tech.

Sr. Technical Officer (3)
R.N. Lal, M.Sc.

Sr. Technical Officer (1)
Anil Dayal, Diploma (Retired on 31-07-2014)
Ram Karan Harijan, AMIE

Technical Officer
Sanjay Kumar, Diploma

Sr. Technician (2)
V.K. Mishra
Kamal Singh
Laxmi Narain
Shailendra Mohan, M.Sc., PGDCA
K.M. Shukla, B.Sc.

Technician (1)
Kul Bahadur Thapa, ITI (Electronics)

Lab. Assistants
Mohd. Islam
Raju

S & T MANAGEMENT UNIT

Sr. Principal Scientist
Vinay Tripathi, M.Sc., M.B.A., P.G. Dip., *Unit In-Charge*
D.N. Upadhyay, M.Sc., Ph.D.

Principal Scientist
Prem Prakash, M.Pharm.

Scientist
Anand P. Kulkarni, M.Sc., Ph.D. (*Director Secretariat)*
Sripathi Rao Kulkarni, M.Sc., Ph.D., P.G. Dip.

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
Farah khan, B.C.A *(Director's Secretariat)*
Manish Singh, M.Sc. Ph.D. (Resign on 25-03-2014)
M. Muruganantham, B.Sc., M.B.A

Private Secretary
Manoshi Chatterjee, B.A., B.L.I.Sc.

Sr. Steno (H)
Jitendra Patel, M.A.

Sr. Technician (2)
Krishna Prasad, B.Sc.
Chandrika Singh, B.Sc., LL.B.

Technician (1)
Susheel Kumar, B.Sc
Preeti Agarwal, M.C.A.

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.

Scientist
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. 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.
S. Mehazabeen, M.Sc.
Talathoti Sandeep Kumar, M.Sc., PGDCAQM (Transferred to CSIR-IICT w.e.f. 16-01-2015)
Amit Kumar, M.Sc. (Transferred from CSIR-IICT w.e.f. 19-01-2015

Sr. Technician (2)
Ashok Pandey, B.Sc.
Sandeep Sengupta, B.Sc.
Radhey Krishna, B.Sc., L.T., C.Lib.Sc.
V.K. Maurya, ITI
A.K. Srivastava, M.Sc.
Madhuli Srivastava, B.A.
O.P. Gupta, B.Sc.
S.A. Singh, B.Sc., PGDCA
D.N. Vishwakarma

Sr. Technician (1)
Madhu Chaturvedi

Asst. (G) Grade I
V.K. Kanal

Lab. Attendants (1)
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

Sr. Technician (2)
B.P. Sunwar
Radhey Lal
Radhey Shyam (Retired on 31-10-2014)
A.K. Sonkar
K.K. Kaul
Mahindra Singh
S.K. Kar, B.A.
Pradhan Basudev
M.S. Verma
Naseem Mohammad
Harish Kumar
Vijay Kumar
Swapan Karmi
Verma Kamal Kishore
Ramesh Kunwar
Arun Kumar Srivastava

Sr. Technician (1)
G.C. Roy
Rajesh Chand Dwivedi (Retired on 31-07-2014)

Asstt. (G) Grade I
B.K. Shukla, B.Com

Technician (2)
Bhagwan Singh Pokhariya (Retired on 31-07-2014)

Lab. Assistant
R.K. Yadav
Kandhai Lal (Retired on 28-02-2014)
Ramanuj
Rama
Phool Chand (Retired on 31-03-2014)
Popinder Singh
S.K. Bhattacharya
T.P. Pathak
S.K. Yadav
Bishan Singh
A.K. Misra
Om Prakash
Iftikhar Ahmad
Shankar Roy
Z.U. Beg

Lab Attendant (2)
Ramesh Chandra

Lab. Attendant (1)
Mohd. Irfan
Dhirendra Misra
Raju Vishwakarma
Ram Autar
Sandeep Roy
Hari Om Garg
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

GENERAL ADMINISTRATION AND FACILITIES

COA OFFICE

Controller of Administration
Bijay Kumar Kar, M.A. (Transferred from CSIR-CMERI to CSIR-CDRI w.e.f. 29-10-2014 F/N)
L.R. Arya, B.A (Retired on 31-07-2014)

Administrative Officer
K.P. Sharma, B.A, LLB
H.K. Khulve (Promoted as AO w.e.f 07-10-2014 & Retired on 30-11-2014)

Section Officer (G)
Anil Kumar, B.Sc.

Private Secretary
G.M. Dayal, B.Sc, DPA (Retired on 31-10-2014)

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.

Technician (II) (Driver)
Shakeel Ahmad Khan

Lab. Attendant (1)
Nand Kishore

Helper Group D
Ramswarth Prasad Rai
Rajesh

ESTABLISHMENT I

Section Officer (G)
Sunil Kumar, B.A

Asstt. (G) Grade I
Vibhash Kumar, B.A (Hons), CIC
Jagdish Prasad, B.Sc
Smriti Srivastava, M.A, B.Ed (Retired on 31-08-2014)
Saju P. Nair

Asstt. (G) Grade II
Reena Bisaria, B.A

Sr. Steno
Deepak Dhawan

Lab. Assistant
Vinod Kumar

Group-C
Manju Yadav

ESTABLISHMENT II

Section Officer (G)
Biranchi Sarang, B.Sc, M.B.A
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
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

Group C
Ram Kumar, B.Com

GENERAL SECTION

Section Officer (G)
C.S. Rao, B.Com

Asstt. (G) Grade I
Kailash Chandra
Rajendra Prasad, B.A

Sr. Steno (ACP)
Seema Rani Srivastava, M.A

Asstt. (G) Grade II
Ajay Shukla, M.Com
Rani
Mohd. Irfan

Technician (II) (Driver)
K.K. Kashyap

Drivers
Prem Chand
Daya Shankar Singh

Helpers Group C
Kalpanath Sharma
Mohd. Saleem

BILL SECTION

Section Officer (G)
Madhuranjan Pandey, M.B.A

Asstt. (G) Grade I
H.K. Jauhar, B.A
Valsala G. Nair, B.A
Vivek Bajpai, M.A
Dilip Kumar (Cash), B.A
Md. Rijwan, B.Tech

Lab. Attendant (1)
Vinod Kumar Sharma
Lalji Prasad

Group 'D'
Sachin (Expired on 06-12-2014)

VIGILANCE

Section Officer
Krishna Raj Singh, B.Sc, MSW

Asstt. (G) Grade I
C.P. Nawani, B.A (Retired on 30-06-2014)
Prashant

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

Lab. Assistant
Ghanshyam (Retired on 30-11-2014)

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

Section Officer (F&A)
Kanak Lata Mishra, M.Sc, M.B.A
Kailash Singh
Ram Rishi Raman, M.A
R.P. Tripathi, M.Com, LL.B
Bhaskar Kumar Ravi

Private Secretary
V.P. Singh, B.A

Asstt. (F&A) Grade I
S.L. Gupta, B.A
Mahesh Babu, B.A
R.C. Bisht, B.A
Rekha Tripathi, B.H.Sc.
Ajay Kumar, B.A
Sasidharan Radha
U.K. Tewari, B.Sc

Asstt. (F&A) Grade II
D.K. Khare, M.Com
Mahender Kumar, B.Com
Sanjay Kumar, B.A
Tahseen Tilat, B.A
Chandrashekhar
S.A. Siddiqui, B.A

Lab. Attendants (1)
Vikramaditya
Angad Prasad

Group C
Mohd. Firoz, B.A

STORES & PURCHASE

Stores & Purchase Officer
S.K. Singh, M.A, GDMM, PGDBA.
Shekhar Sarcar, B.A (Retired on 30-06-2014)
Ravi Shanker Choudhary, B.A.

Section Officer (Stores & Purchase)
Praphul Kumar (Promotion posting to CSIR-IIIM, Jammu)
Prasenjeet Mitra, B.Sc. (Promotion posting to CSIR-IIP, Dehradun)

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 (ACP)
K.K. Mishra, B.A

Asstt. (S&P) Grade II
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

Private Secretary
K.P. Ballaney, B.A

Sr. Technician (2)
Ravi Kumar Mehra, B.A.

Lab. Assistant
Kishan Kumar
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 (3)
N.K. Srivastava, M.B.B.S.

Sr. Technician (2)
Nandita Dhar, Diploma in Medicine
H.U. Khan, B.M.S., B.Sc.

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

Notes

WAY TO CSIR-CDRI