Vol. 6 No. 1 April - September 2014

CSIR - CDRI Newsletter

Council of Scientific & Industrial Research
www.csir.res.in

CSIR-Central Drug Research Institute
www.cdriindia.org

From the Director's Desk

It is a matter of pride and equally gratifying to serve from the front for a vibrant premier Institute like CSIR-Central Drug Research Institute, Lucknow. Past accomplishments, current perspectives and future vision give a strong belief of luminous future for the Institute in the service of Nation.

Modernization and adapting to newer technological advancement has remained a key mantra of success for the Institute towards delivering high quality outputs with Global Impact. Newly established state of the art campus with unique features has already placed the Institute at the top in the niche area. Under 12th Five Year Plan programs, with committed desire for modernization, several sophisticated equipments have been procured which include the *In vivo* Animal Imaging System, High Resolution Confocal microscope, Oxymax calorimeter, Label free interaction analysis lab (Biacore), DNA Analyzer, etc. With an aim for GLP certification, regulatory studies are being undertaken in compliance with GLP guidelines, which is a testament to high quality research through thorough SOP-driven Good Laboratory Practices. We are committed to achieve the target of GLP Certification at the earliest.

As per a recently compiled report, Institute is having a wealthy pipeline of drugs for different diseases of national importance viz. malaria, osteoporosis, thrombosis, cancer, diabetes, and dyslipidemia. Teams of medicinal chemists are dedicated to augment the drug pipeline. With the special budgetary support from CSIR and team spirit of my colleagues, strident progress has been made towards achieving the target of taking up couple of molecules to IND stage at the earliest.

In terms of measurable performance, Institute continued to show enhanced accomplishments in all the aspects. As per the preliminary count, in the year 2014, Institute has so far published more than 280 research articles with impressive Impact Factor, which includes a total of 21 publications with IF >6. At the same period 4 Indian and 10 foreign patents have been filed. Scientists and students continued to fetch prestigious honours & awards. Dr. Atul Kumar has been conferred with Vigyan Ratna Samman of UPCST. Young colleagues, Dr. Rajender Singh and Dr. Arun Trivedi have received Young Scientist Awards instituted by CSIR and UPCST respectively. I take this opportunity to congratulate all of them and wish many more accolades in their career. During the reporting period, 18 of my colleagues superannuated after dedicated service to the Institute. I wish all of them a very happy retirement life.

In the coming months, Institute is organizing several National & International Conferences including the 25th National Conference of Parasitology (16-18 October, 2014); the 43rd National Seminar on Crystallography (12-14 November, 2014); National Symposium on Clinical Research (3-4 December, 2014); the 37th All India Cell Biology Conference (10-12 December, 2014) and 21st ISCB International Conference (25-28 February 2015). These conferences aim to be a magnanimous milieu of experts from research institutions, academia, industry and international agencies that constitutes the global R&D ecosystem in niche areas and benefit young researchers. I hope delegates will not only appreciate the scientific interactions, but also the cultural heritage of Lucknow; the historical city famous for its etiquette. I extend my heartiest compliments to all and wish a resounding success.

I thank all the staff members and students of the institute for their valuable contributions and hope they shall continue to work even harder in the years ahead to fulfill the aspiration.

With best wishes

(SK Puri)

A Newsletter from
CSIR-CENTRAL DRUG RESEARCH INSTITUTE
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Sector 10, Jankipuram Extension, Sitapur Road, Lucknow-226 031
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CONTRIBUTIONS TO DRUG DEVELOPMENT

CSIR-CDRI Drug Pipeline

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

Lead Optimization

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

Anti-dyslipidemic
- CDR4655K09

Spermicidal
- S003-296

Anti-diabetic
- S009-629

Pre-clinical Studies

Antimalarial
- 99-411
- S011-1793

Fracture healing
- CDR914K058
- S007-1500

Osteoprotective
- CDR4744 F004
- CDR1020F147

Anti-thrombotic
- S007-867
- S002-333

Anti-diabetic
- S007-1261
- CDR914K058

Anti-dyslipidemic
- CDR267F018

Memory enhancer
- Gugulipid

Anti-leukemia
- S007-1235

Anti-tuberculosis
- S006-830

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 Business Enquiries, 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

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CONTRIBUTIONS TO SCIENCE & TECHNOLOGY

1. **Orally active osteoanabolic agent 6-C-β-D-glucopyranosyl-(2S, 3S)-(+)-5,7, 3',4'-tetrahydroxydihydroflavonol binds to adiponectin receptors, with a preference for AdipoR1, induces adiponectin-associated signaling and improves metabolic health in a rodent model of diabetes** (Singh AK, Joharapurkar AA, Khan MP, Mishra JS, Singh N, Yadav M, Hossain Z, Khan K, Kumar S, Dhanesha NA, Mishra DP, Maurya R, Sharma S, Jain MR, Trivedi AK, Godbole MM, Gayen JR, Chattopadhyay N, Sanyal S, ***Diabetes,*** [Epub ahead of print] **IF: 8.474**)

   Adiponectin is an adipocytokine that signals through plasma membrane-bound adiponectin receptors (AdipoR) -1 and -2. Plasma adiponectin depletion is associated with type 2 diabetes, obesity and cardiovascular diseases. Adiponectin therapy however, is yet unavailable owing to its large size, complex multimerization and functional differences of the multimers. We report discovery and characterization of 6-C-β-D-glucopyranosyl-(2S, 3S)-(+)- 5,7, 3',4'- tetrahydroxydihydroflavonol (GTDF) as an orally active adiponectin mimetic. GTDF interacted with both AdipoRs, with a preference for AdipoR1. It induced adiponectin-associated signaling and enhanced glucose uptake and fatty acid oxidation in vitro, which were augmented or abolished by AdipoR1 overexpression or silencing respectively. GTDF improved metabolic health, characterized by elevated glucose-clearance, β-cell-survival, reduced steatohepatitis, browning of white adipose tissue and improved lipid profile in an AdipoR1-expressing but not an AdipoR1-depleted strain of diabetic mice. The discovery of GTDF as an adiponectin mimetic provides a promising therapeutic tool for the treatment of metabolic diseases.

2. **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** (Tripathi C, Tewari BN, Kanchan RK, Baghel KS, Nautiyal N, Shrivastava R, Kaur H, Bhatt ML, Bhadauria S, ***Oncotarget,*** 5(14), 5350-5368, **IF:6.636**)

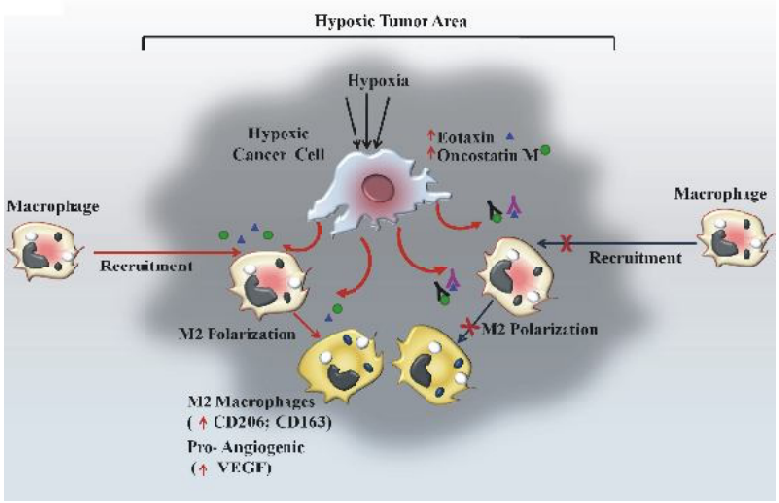
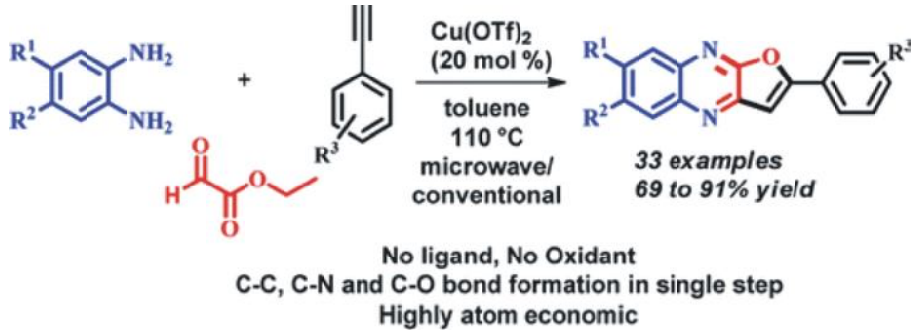


Fig: Schematic Representation of Oncosatin M and Eotaxin mediated Recruitment of TAMs and subsequent M2 polarization in Hypoxic Tumor area.

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 TAMs-related 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 phenotype 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 4T1/BALB/c-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.

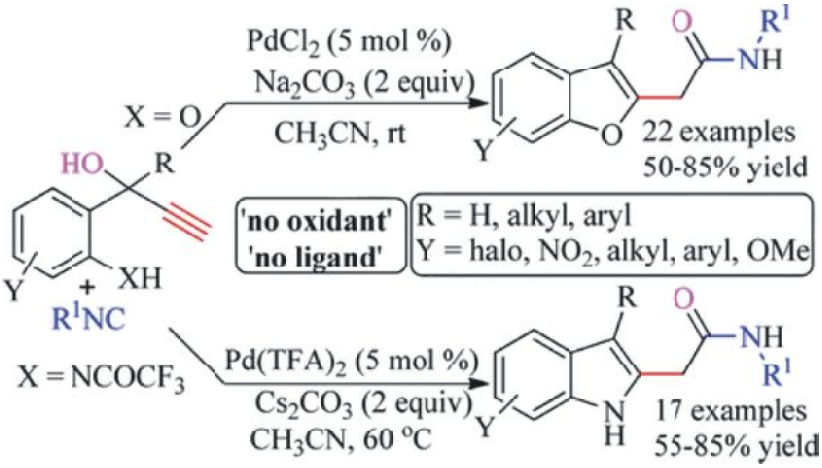
3. **Copper(II) Catalyzed Expeditious Synthesis of Furoquinoxalines through a One-Pot Three-Component Coupling Strategy** (Naresh G, Kant R, Narender T., ***Org Lett.***, 16(17), pp 4528–4531, **IF: 6.324**)



Microwave assisted one-pot transformation has been developed for the synthesis of biologically significant polysubstituted furoquinoxalines in good to excellent yields through a copper(II) catalyzed three-component coupling of o-phenylenediamine, ethylglyoxalate, and terminal alkyne, known as A(3)-coupling, followed by 5-endo-dig cyclization.

4. **Palladium-Catalyzed Tandem Intramo-lecular Oxy/Amino-Palladation/Isocyanide Insertion: Synthesis of alpha-Benzofuranyl/Indolylacetamides,** (Thirupathi, Nuligonda; Babu, Madala Hari; Dwivedi, Vikas; Kant, Ruchir; Reddy, Maddi Sridhar, ***Org. Lett.,*** 16(11), 2908-2911, **IF:6.324**)

A novel palladium-catalyzed approach to 2-benzofuranyl/indolylacetamides from 1-(o-hydroxy/aminophenyl) propargylic alcohols and isocyanides is described. The reaction proceeds through a cascade that includes oxy/aminopalladation, isocyanide insertion, and 1,4-hydroxyl migration. No oxidant or ligand is needed to promote the cascade, and the reactions are carried out under mild conditions to afford the products through high functional tolerance.



5. **New Fluoranthene FLUN-550 as a Fluorescent Probe for Selective Staining and Quantification of Intracellular Lipid Droplets** (Atul Goel, Ashutosh Sharma, Manoj Kathuria, Arindam Bhattacharjee, Ashwni Verma, Prabhat R. Mishra, Aamir Nazir and Kalyan Mitra, ***Org. Lett.,*** 16(3), 756-759, **IF:6.324**)

A new class of live cell permeant, nontoxic fluoranthene-based fluorescent probe (FLUN-550) having a high Stokes shift in aqueous medium has been discovered. It showed selective staining of lipid droplets (LDs, dynamic cytoplasmic organelles) at a low concentration without background noise in *in vitro* live cell imaging of 3T3-L1 preadipocytes, J774 macrophages, MCF7 breast cancer cells, and single-celled, parasitic protozoa *Leishmania donovani* promastigotes and *in vivo* nonparasitic soil nematode *C. elegans*.

New Projects Undertaken

Grant-in-Aid Projects

1. Validation of WNT pathway modulation and efficacy study in primary osteoporosis, fracture healing and secondary osteoporosis for repositioning of clofazimine

It is proposed to investigate a) whether clofazimine (CFZ), activates cannonical wnt signaling pathway in osteoblasts, b) possible osteogenic effects of CFZ in osteopenic rats (ovariectomized rats, a WHO recommended model of primary osteoporosis), c) fracture healing efficacy of CFZ in osteopenic rats (as in b) and d) possible osteogenic effect of CFZ in secondary osteoporosis induced separately by dexamethasone (DEX) and methylprednisolone (MP) in male and female rats. Successful completion of this study will form the basis for repositioning CFZ for the human diseases where lack of bone formation is the pathology, such as osteoporosis.

PI: Dr. Naibedya Chattopadhyay
Chief Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: ₹ 12.67 Lakhs (Ist year)

2. Development of novel strategies towards the synthesis of N-Heterocycles using isocyanide based multicomponents reaction

The prime goal of proposed study is to design novel, cost effective and operationally simple methodology towards the synthesis of *N*-heterocycles. The special collaborative effort is exemplified by a knowledge exchange not only from India and Germany, but also between two techniques. i.e. liquid phase combinatorial chemisty versus solid phase combinational chemistry.

PI: Dr. PMS Chauhan
Sr. Principal Scientist
Medicinal & Process Chemistry Division
Funding agency: DST
Approved budget: ₹ 20.80 Lakhs

3. Lead identification of non steroidal molecule with anti-proliferative activity for management of endometrial hyperplasia

The project is aimed at evaluating the anti-hyperplasic potential of the anti-estrogenic, apoptosis inducing benzopyran molecule, in human endometrial hyperplasic cells and to explore the therapeutic effect on estrogen-induced endometrial hyperplasia. The study would explore the molecular mechanism of action of benzopyran derivative at uterine level and help designing new strategies for the management of endometrial hyperplasia.

PI: Dr. Anila Dwivedi
Sr. Principal Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: 10.61 Lakhs *(Ist year)*

4. Design synthesis, evaluation and identification of novel dually effective spermicidal agents with-trichominal activity for prophylactic contraception

The project is aimed at creating novel drug candidates by rationally coalescing pharmacophores to incorporate microbicidal activity in potent spermicides, which can be developed as prophylactic vaginal contraceptives for simultaneous protection against unwanted pregnancies and sexually transmitted infections. It is envisaged that dual action spermicides can empower women to exercise full control over their fertility and reproductive health.

PI: Dr. Gopal Gupta
Sr. Principal Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: ₹ 15.04 Lakhs (Ist year)

5. Studies on the effects of obesogens in male germ cells an exploratory study

The overall objective of the project is to understand the mechanism of obesogen action in male germ cells with special reference to gene and protein expression. Obesogens are believed to compromise male germ cell function and induce adipogenic differentiation on MSCs through nuclear receptor signaling. Based on it, we envisage to study the detailed mechanism of action of known obesogens in male germ cells *in vitro* and identifying the novel obesogens through the development of a screening system. In this project we would focus on 1. Mechanisms of obesogen action in male germ cells using a rat model (*in vivo*). 2. Conduct mechanistic studies on the mechanisms of obesogen action in a male germcells (*in vitro*). 3. Establish a Luciferase and Mesenchymal Stem Cell based assay system for screening of compounds with obesogenic activity.

PI: Dr. D.P. Mishra
Principal Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: ₹ 10.61 Lakhs (Ist year)

6. Preclinical development of Kaempferol with enhanced drug delivery for superior osteogenic activity

The project is aimed to improve the stability of kaempferol and improve its osteogenic efficacy synergistically. Our technology will act by increasing osteoblast survival, which is pathological basis of secondary osteoporosis. Therefore, the aim of the project is to develop K charged prototype delivery system and to assess improvement in osteogenesis with proof of efficacy with currently available treatment.

PI: Dr. Ritu Trivedi
Sr. Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: ₹ 12.36 Lakhs (Ist year)

7. Target oriented delivery of chemotherapeutic agent in leishmaniasis via macrophage scavenger receptors

Project is broadly aimed to minimize the toxic effects and maximize the therapeutic index. The proposed project has been undertaken in view of targeting the macrophages infected with targeting the macrophages as it is established that mammalian macrophages infected with pathogenic *Leishmania* up-regulate the expression of scavenger receptors on their surface.

PI: Dr. Manish K. Chaurasia
Sr. Scientist
Pharmaceutics Division
Funding agency: DST
Approved budget: ₹ 40.09 Lakhs

8. Preclinical development of orally active, rapid fracture healing agent

Our studies have led to identification of CDRI-S007-1500 as an agent which stimulates bone regeneration in osteopenic rats. However, the mechanism through which CDRI-S007-1500 promotes fracture repair was not addressed. This project seeks to study the mechanism by which S007-1500 induces rapid fracture healing and its role in chondrogenesis. Successful completion of the study will have potential to develop CDRI-S007-1500 as a rapid fracture healing agent.

PI: Dr. Divya Singh
Sr. Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: ₹ 15.04 Lakhs *(Ist year)*

9. Identification and functional characterization of novel microRNA Candidates altered by phytoestrogen medicarpin: Role in the pathogenesis of osteoporosis

This study has the scope to identify and characterize Med-regulated novel miRNA candidate(s) which may provide new biomarkers and therapeutic targets in bone disorders like osteoporosis.

PI: Dr. Divya Singh
Sr. Scientist
Endocrinology Division
Funding agency: DBT
Approved budget: ₹ 40.00 Lakhs

10. Attenuation of GCSFr signaling by ubiquitination: Implications of E3 ubiquitin Ligases in GCSFr signaling mediated myeloid leukemia Pathogenesis (INSA Young Scientist Award)

Project aims to identify E3 ubiquitin ligases that may regulate the steady state levels of G-CSFr based on homology with other proteins which are substrates for known E3 ubiquitin ligases. Also aim to explore the mechanisms behind hyper activation of truncated forms of G-CSFr found in SCN and AML. In nutshell, we indent to identify and investigate E3 ubiquitin ligases that may be involved in attenuation of GCSFr signalling.

PI: Dr. Arun Kumar Trivedi
Sr. Scientist
Biochemistry Division
Funding agency: INSA
Approved budget: ₹ 15.00 Lakhs

11. Holistic epigenome analysis to identify methylated regions (DMRs) that affect male fertility (INSA Young Scientist Award)

This project is aimed to further improve the understanding on involvement of epigenetic factors in male infertility. We believe this study would help not only explain the cause in a large lot of infertility, but also in developing appropriate strategies to treat male infertility as mechanisms to reverse some of the epigenetic changes have been established.

PI: Dr. Rajender Singh
Sr. Scientist
Endocrinology Division
Funding agency: INSA
Approved budget: ₹ 15.00 Lakhs

12. Studying mechanism of pro-fertility activity of *Mucuna pruriens, Withania somnifera* and *Asparagus racemosus* in spermatogenically compromised rat model and identification of active phyto-constituents

The project aims at identifying the herbal products having pro-male fertility activity with a long-term aim to identify products that could be useful in treating male infertility. The mechanism of action of promising products would be studied in detail for molecular mechanisms.

PI: Dr. Rajender Singh
Sr. Scientist
Endocrinology Division
Funding agency: ICMR
Approved budget: ₹ 10.61 Lakhs *(Ist year)*

13. Development of catalytic asymmetric fluorination and fluorocyclization reactions

This proposal is aimed at the development of new camphor based chiral thiourea derivatives and their applications in asymmetric fluorination and fluorocyclization reactions by carrying out a careful and systematic investigation involving various active methylene groups.

PI: Dr. Kishor Mohanan
Sr. Scientist
Medicinal & Process Chemistry Division
Funding agency: DST
Approved budget: ₹ 22.60 Lakhs

14. Investigations on the immunomodulatory properties of cyclic and linear host defence peptides

The novelty in the project is the development of novel therapeutic agents which can selectively enhance the innate immunity, and as well as act direction on pathogens to combat the emerging and re-emerging infectious diseases.

PI: Dr. Mukesh Pasupuleti
Sr. Scientist
Microbiology Division
Funding agency: DST
Approved budget: ₹ 21.30 Lakhs

15. Exploring the potential of heterodienophiles in Hauser-kraus annulations

It is proposed to utilize suitable heterodienophiles as Hauser acceptors and it is anticipated that such Hetero-Hauser-Kraus annulations will play a pivotal role in the regio- and stereoselective construction of novel heterocyclic scaffolds.

PI: Dr. Namrata Rastogi
Scientist
Medicinal & Process Chemistry Division
Funding agency: DST
Approved budget: ₹ 24.80 Lakhs

Sponsored Projects

1. *In vitro* testing of GSKCH formulation for osteogenic effect

The project aim to study the impact of micronutrients and *novel active* on osteoblast proliferation and mineralization using human osteoblast cell lines and also elucidate possible MOA of nutrients that exhibit osteogenic properties.

PI : Dr. Naibedya Chattopadhyay
Chief Scientist
Endocrinology Division
Funding Agency: GSKCH, Gurgaon
Approved Budget : ₹ 24.87 Lakh

2. Genotoxicity & Molecular mechanism of RISUGadv

The project proposes to measure the Genotoxicity of Risugadv in mice by Vas deferens/Fallopian tube injection at CDRI using the study protocol duly approved by IIT Kharagpur.

PI : Dr. R.K Singh
Sr. Principal Scientist
Toxicology Division
Funding Agency : IIT, Kharagpur
Approved Budget : ₹ 7.05Lakh

Some Important Publications

(April - September 2014)

Biological Sciences

Title	Authors	Journal	Volume, Issue, Page No.	Impact Factor-2013
Orally active osteoanabolic agent 6-C-β-D-glucopyranosyl-(2S, 3S)-(+)- 5,7, 3',4'-tetrahydroxydihydroflavonol binds to adiponectin receptors, with a preference for AdipoR1, induces adiponectin-associated signaling and improves metabolic health in a rodent model of diabetes.	Singh AK, Joharapurkar AA, Khan MP, Mishra JS, Singh N, Yadav M, Hossain Z, Khan K, Kumar S, Dhanesha NA, Mishra DP, Maurya R, Sharma S, Jain MR, Trivedi AK, Godbole MM, Gayen JR, Chattopadhyay N, Sanyal S.	DIABETES	doi:10.2337/db13-1619	8.474
Human DNA Ligases: A comprehensive new look for cancer therapy	Singh, Deependra Kumar; Krishna, Shagun; Chandra, Sharat; Shameem, Mohammad; Deshmukh, Amit Laxmikant; Banerjee, Dibyendu	MEDICINAL RESEARCH REVIEWS	34(3), 567-595	8.131
Interaction of inducible Nitric Oxide Synthase with Rac2 regulates Reactive Oxygen and Nitrogen Species generation in the Human Neutrophil Phagosomes: Implication in microbial killing	Jyoti, Anupam; Singh, Abhishek K.; Dubey, Megha; Kumar, Sachin; Saluja, Rohit; Keshari, Ravi Shankar; Verma, Anupam; Chandra, Tulika; Kumar, Ashutosh; Bajpai, Virendra Kumar; Barthwal, Manoj Kumar; Dikshit, Madhu	ANTIOXIDANTS & REDOX SIGNALING	20(3), 417-431	7.667
Nanoemulsion based concomitant delivery of Curcumin and Etoposide: Impact on cross talk between Prostate cancer cells and Osteoblast during metastasis	Shukla, Prashant; Mathur, Vineet; Kumar, Amit; Khedgikar, Vikram; Teja, B. Venkatesh; Chaudhary, Dharmendra; Kushwaha, Priyanka; Bora, Himangsu K.; Konwar, Rituraj; Trivedi, Ritu; Mishra, Prabhat Ranjan	JOURNAL OF BIOMEDICAL NANOTECHNOLOGY	10(11), 3381-3391	7.578
Engineered nanocrystal technology: *In-vivo* fate, targeting and applications in drug delivery	Pawar, Vivek K.; Singh, Yuvraj; Meher, Jaya Gopal; Gupta, Siddharth; Chourasia, Manish K.	JOURNAL OF CONTROLLED RELEASE	183, 51 - 66	7.261
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	Tripathi C, Tewari BN, Kanchan RK, Baghel KS, Nautiyal N, Shrivastava R, Kaur H, Bhatt ML, Bhadauria S.	ONCOTARGET	5(14), 5350 - 68	6.627
Enhanced Immunoprotective effects by Anti-IL-17 antibody translates to improved skeletal parameters under Estrogen deficiency compared with Anti-RANKL and Anti-TNF-α± Antibodies.	Tyagi AM, Mansoori MN, Srivastava K, Khan MP, Kureel J, Dixit M, Shukla P, Trivedi R, Chattopadhyay N, Singh D.	J BONE MINER RES	29(9), 1981 - 92	6.589

The metabolic enhancer piracetam attenuates mitochondrion-specific endonuclease G translocation and oxidative DNA fragmentation	Gupta, Sonam; Verma, Dinesh Kumar; Biswas, Joyshree; Raju, K. Siva Rama; Joshi, Neeraj; Wahajuddin; Singh, Sarika	FREE RADICAL BIOLOGY AND MEDICINE	73, 278-290	5.710
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	Chandra V, Fatima I, Manohar M, Popli P, Sirohi VK, Hussain MK, Hajela K, Sankhwar P, Dwivedi A.	CELL DEATH DIS	5, e1380	5.177

Chemical Sciences

Title	Authors	Journal	Volume, Issue, Page No.	Impact Factor-2013
Copper(II) catalyzed expeditious synthesis of Furoquinoxalines through a One-Pot Three-Component Coupling Strategy	Naresh G, Kant R, Narender T.	ORGANIC LETTERS	16 (17), 4528–4531	6.324
An approach to a Bislactone Skeleton: A scalable total Synthesis of (+/-)-Penifulvin A	Das, Dipendu; Kant, Ruchir; Chakraborty, Tushar Kanti	ORGANIC LETTERS	16(10), 2618-2621	6.324
Selective 5-exo-dig Cyclization of in Situ Synthesized N-Boc-2-aminophenyl Ethoxyethynyl Carbenols: Synthesis of Multifunctional Indoles and their derivatives	Thirupathi, Nuligonda; Kumar, Yalla Kiran; Kant, Ruchir; Reddy, Maddi Sridhar	ADVANCED SYNTHESIS & CATALYSIS	356 (8), 1823-1834	5.542
Cu-Catalyzed conversion of Propargyl Acetates to E-alpha,beta-Unsaturated Amides via Ketenimine formation with Sulfonyl Azides	Kumar, Yalla Kiran; Kumar, Gadi Ranjith; Reddy, Maddi Sridhar	JOURNAL OF ORGANIC CHEMISTRY	79(2), 823-828	4.564
Diversity-oriented synthesis of Ketoindoloquinoxalines and Indolotriazoloquinoxalines from 1-(2-Nitroaryl)-2-alkynylindoles	Samala, Srinivas; Arigela, Rajesh K.; Kant, Ruchir; Kundu, Bijoy	JOURNAL OF ORGANIC CHEMISTRY	79(6), 2491-2500	4.564
Molecular Iodine promoted divergent synthesis of Benzimidazoles, Benzothiazoles, and 2-Benzyl-3-phenyl-3,4-dihydro-2H-benzo[e][1,2,4]thiadiazines	Naresh, Gunaganti; Kant, Ruchir; Narender, Tadigoppula	JOURNAL OF ORGANIC CHEMISTRY	79(9), 3821-3829	4.564
Regioselective Synthesis of Fused Imidazo[1,2-a]pyrimidines via Intramolecular C-N Bond Formation/6-Endo-Dig Cycloisomerization	Kumar, Atul; Kumar, Mukesh; Maurya, Shivam; Khanna, Ranjana S.	JOURNAL OF ORGANIC CHEMISTRY	79(15), 6905-6912	4.564

PATENTS

Patents Granted Abroad

1. **US 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 and Naibedya Chattopadhyay

   Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt and Amruta Kendurkar

2. **US 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 and Anil Kumar Dwivedi

   Supporting Staff: Abdul Malik and Avinash Kumar

3. **Australian Patent No.:** 2010217238 **Date of Grant:** 19.06.2014

   Title: Polymeric nanomatrix associated delivery of Kaempferol in rats to improve its osteogenic

   Inventors: Prabhat Ranjan Mishra, Ritu Trivedi, Girish Kumar Gupta, Avinash Kumar, Varsha Gupta, Srikanta Kumar Rath, Kamini Srivastava, Naibedya Chattopadhyay and Anil Kumar Dwivedi

Patents Filed Abroad

1. **US 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 and Arvind Kumar Srivastava

2. **Europe 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 and Arvind Kumar Srivastava

3. **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, P R Mishra, Neelam S Sangwan, Prabodh Trivedi, Divya Singh, Rajendra S Sangwan, Priyanka Kushwaha, Vikram Khedgikar, Sulekha Adhikari, Dharmendra Choudhary, Jyoti Swarup, Avinash Kumar, Anirudha Karvande, Ashwni Verma and Shweta Sharma

Supporting Staff: Naseer Ahmed

4. **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: Sanyal Sabyasachi, 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 and Shailendra Kumar Dhar Dwivedi, Manisha Yadav, Preeti Dixit, Devendra Pratap Mishra, Sharad Sharma and Kamal Ram Arya

5. **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 and Manish Jain

6. **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: Goel Atul, Sharma Ashutosh, Mitra Kalyan, Bhattacharjee Arindam and Kathuria Manoj

7. **PCT Application No.:** PCT/IN2014/000156 **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 and Arun Kumar Trivedi

8. **US 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 and Naibedya Chattopadhyay

Supporting Staff: Satish Chandra Tiwari, Abdul Malik Tyagi, Devi Dutt and Amruta Kendurkar

Patents Filed in India

1. **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 and Zakir Hussain

2. **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 Srivstava, Kumaravelu Jagavelu, Manoj Kumar Barthwal and Ram Pratap

3. **Patent Application No.:** 1566DEL2014 **Date of Filing:** 10.06.2014

   Title: Cationic lipid derivatives of cordiarimide: A useful as anti cancer agents by targeting Human DNA ligase-I

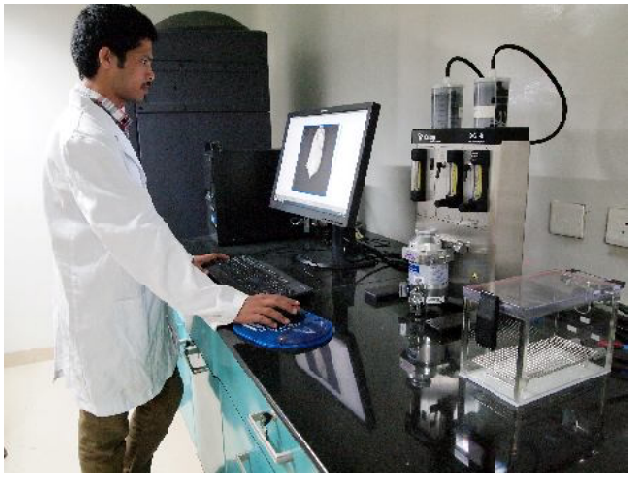
   Inventors: Bathula Surendra Reddy, VKK Durga Rao, Komal Sharma, M Prathap Reddy, Dibyendu Banerjee and Deependra Kumar Singh

4. **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

New Facilities Established



In vivo Animal Imaging System

Label free interaction analysis Lab (Biacore)

Honours & Awards

Dr. Atul Kumar
Vigyan Ratana Awards by Uttar Pradesh Council of Science & Technology

Dr. Rajesh Kumar Jha
International Best Abstract Award at Annual meeting/conference of Society of Study in Reproduction (SSR), Michigan, USA

Dr. Rajendra Singh
CSIR Young Scientist Award - 2014

Vikram Khedgikar
(Student of Dr. Ritu Trivedi)
Young Investigator Award by International Osteoporosis Foundation (IOF), Orlando, USA

Dr. Arun K Trivedi
Yuva Vaigyanik Awards by Uttar Pradesh Council of Science & Technology

Ms Priyanka Kushwaha
(Student of Dr. Ritu Trivedi)
Young Investigator award by American Society for Bone and Mineral Research (ASBMR) Houston, Texas USA

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 two authors with highest h-index value are N. Chattopadhyay (h-index12) and K. Sharan (h-index 10)*.

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

BUSINESS DEVELOPMENT ACTIVITIES

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

Details	Client/Collaborator	Date of Signing the Agreement
Memorandum of Understanding signed for joint R&D		
Delineation of Rac1 signaling association with PCOS pathophysiology	King George Medical University, 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 Banarsi Das College of Dental sciences, Lucknow	20.05.2014
CTPL as Non Exclusive Technology Commercialization Agency for finding a suitable partner for the commercialization of CSIR-CDRI technologies, products and services	CSIR-Tech Pvt. Ltd., Pune	02.06.2014
Collaborative research program in specific field of mutual interest	Babu Banarsi Das University, Lucknow	18.06.2014
Augmentation of effector immune responses using immunomodulators in conjunction with chemotherapy against experimental Visceral Leishmaniasis	King George Medical University, 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	Indian Institute of Sciences, Bengaluru	15.07.2014
Mechanistic studies on the anticancer effects of candidate CSIR-CDRI compounds in myleloid leukemia and solid cancers	King George Medical University, Lucknow	16.07.2014
An indigenous amalgamated/single unit alveolar distractor implant system for oral rehabilitation	King George Medical University, Lucknow	17.07.2014
Role of p53 codon 72 polymorphism on risk of juvenile nasopharyngeal angiofibroma (JNA)	King George Medical University, 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	King George Medical University, Lucknow	05.08.2014
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

Major Events Organized

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.

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

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.

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.

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

National Technology Day Celebrations

To commemorate the Technology Day, CSIR-Central Drug Research Institute, Lucknow invited Padmashri Dr. Lalji Singh, 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.

13th Dr. B. Mukerji Memorial Lecture

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, was

organized on 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 7 million. 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 emphasised 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.

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

Workshop on Plagiarism

A workshop on Plagiarism was organized 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.

Hindi Saptah

"Hindi Saptah" was celebrated from September 08-15, 2014. The Chief Guest of opening ceremony was Mr. Shiv Murti, Ex-Commissnor, U.P. Govt. 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. The Chief Guest of closing ceremony was Justice H.N. Tilhari, Ex-Justice Allahabad High Court. Senior Hindi officer Mr. V. N. Tiwari proposed the vote of thanks to the participants.

Distinguished Lectures & Visitors

Speaker & Address	Title of Lecture	Date
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, Bengaluru	Let there be light: Optical methods and biosensors for cellular and organismal dynamics	27.08.2014

Deputations Abroad

Name of Scientist	Country of Visit	Purpose of Visit	Period of Deputation
Dr. Madhu Dikshit	France	To attend the meeting	26th May 2014
	Denmark	To participate in workshop on Challenges in Health Research, Indo-Danish Research Collaboration	4th to 5th September2014
Dr. Neeloo Singh	Turkey	INSA-Turkish Academy of Science (TUBA) Exchange of Scientist Programme	09th to 13th June 2014
	Mexico	Invited to deliver a talk in 13thInternational Congress of Parasitology	10th to 15thAugust, 2014
Dr. Srikanta Kumar Rath	USA	Invited to undertake training in the Phase-II, Safety Risk Assessment of foods Derived from Genetically Engineered Plants	15th to 19th September2014
Dr. Amit Misra	Australia	To attend the 5th FIP Pharmaceutical Sciences World Congress	13th to 16th April 2014
	Japan	To attend the 5th Indo- Japanese International Joint Symposium on Overcoming Intractable Infectious Diseases Prevalent in Asian Countries	16th to 17th September 2014
Dr. Kalyan Mitra,	Japan	For advanced applications training for JEOL JEM-1400 Electron Microscope	12th to 23rdMay 2014
Dr. Namrata Rastogi	Germany	For INSA-DFG Academy of Science Exchange of Scientist Programme	03rd July to 30th September 2014
Dr. Rajesh Kumar Jha	USA	For Participation in the 47th Annual Meeting of the Society for the Study of Reproduction	19th to 23th July 2014
Dr. Tejender Singh Thakur	Germany	To attend a workshop on the application of SAXS and synchrotron facility	9th to 20th September 2014

STAFF NEWS

(April - September 2014)

New Scientist In-charge of Divisions

- **Dr. P.K. Shukla**, Sr. Principal Scientist, Microbiology Division
- **Dr. R. Ravishankar,** Sr. Principal Scientist Molecular Structural Biology Division

New Joining

- **Mr. Anil Kumar Upadhyay,** Security Officer, Security Office

Internal Transfers

- **Dr. Niti Kumar**, Scientist, MSB Division to Parasitology Division
- **Mr. DN Vishwakarma**, Sr. Tech. (2), MPC to SAIF
- **Mr. AS Kushwaha**, STO, MPC Division to Business Development Division
- **Mr. Pankaj Sengupta**, Lab Assistant (1) Pharmacology to S&T Management Unit

External Transfers

- **Mr. Santosh Shukla,** Scientist, Computer Section (Transfered from CSIR-NBRI, Lucknow)
- **Mr. Anil Kumar,** Section Officer (General), (Transfered from CSIR-NBRI, Lucknow)
- **Mr. Prashant**, Assistant, Vigilance Section (Transfered from CSIR-CSIO, Chandigarh)

Superannuation

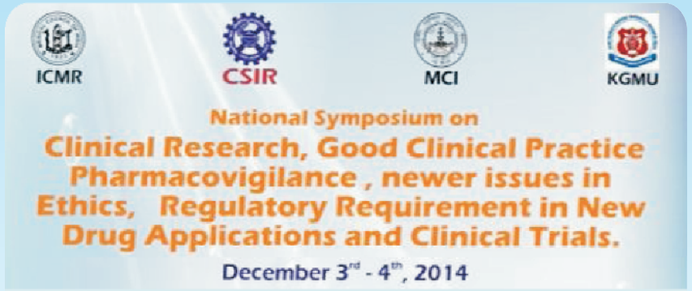
- **Mr. Pradeep Srivastav,** Sr. Principal Scientist, MPC Division (May 2014)
- **Mrs. Tarun Lata Seth,** Sr. Technical Officer, Pharmacology Division (May 2014)
- **Dr. Ajay Kumar Srivastav,** Sr Principal Scientist, Laboratory Animal Division (June 2014)
- **Mr. Shekhar Sarkar,** SPO, Store & Purchase Division (June 2014)
- **Mr. Chandra Prakash Navani,** SO, Vigilance Section (June 2014)
- **Mr. Gaffar Ali,** Lab Asistant, Laboratory Animal Division (June 2014)
- **Mr. Shyamendra Mehrotra,** Microbiology Division (August 2014)
- **Mr. Leela Ram Arya,** CoA, Administration Office (July 2014)
- **Mrs. Shibani Sengupta,** Sr. Technical Officer, Pharmacology Division (July 2014)
- **Mr. Bhagwan Singh Pokhariya,** Group II Technician (I) (July 2014)
- **Mr. Rajesh Chandra Dwivedi,** Sr. Technician (I) Refrigeration Section (July 2014)
- **Mr. Ashok Kumar Joshi,** Principal Technical Officer, Microbiology Division (July 2014)
- **Mr. Anil Kumar Bhargav,** Sr. Technical Officer, Laboratory Animal Division (July 2014)
- **Mr. Anil Dayal,** Sr. Technical Officer (I), Other Lab Services (July 2014)
- **Mr. Suresh Yadav,** Sr. Technician (2), Biochemistry Division (July 2014)
- **Mr. Chandra Mool,** Sr. Technician (2), Biochemistry Division (July 2014)
- **Ms. Smriti Srivastava,** Establishment-I Section (August 2014)
- **Mr. Shyamendra Mehrotra,** Microbiology Division (August 2014)

Forthcoming National & International Conferences in CSIR-CDRI, Lucknow

The "25th National Congress of Parasitology on "Global Challenges in the management of Parasitic Diseases (GCMPD) will be held in Lucknow, India, from October 16th-18th, 2014. The Congress will highlight cutting-edge advances on all major disciplines of parasites, hosts and arthropod vectors with special emphasis on human and animal parasitic diseases. The program will feature a wide range of topics, such as host-parasite interactions, developmental biology, pathogenesis, virulence, biochemical pathways, immune response, immune evasion, vaccine, drug discovery and development including synthetic and natural product chemistry, ADME, drug assays, mode of action of antiparasitic agents, drug resistance and drug targets, epidemiology and control.

NSC43c will be held in Lucknow during November 12-14, 2014. This will be an excellent opportunity for Crystallographers from all over the country to meet and deliberate on various aspects of X-ray Crystallographic research. We welcome all Crystallographers and Scientists related to Crystallography and crystal growth to share their observations, scientific views and new achievements of Crystallography and crystal growth on all its facets. The Programme Committee will be organizing a rich scientific programme of keynote lectures, invited talks and oral presentations.

There is a constant need to update our knowledge with the latest developments in research. In this pursuit All India Society of Cell Biology organizes one conference every year on different themes pertaining to Cell Biology Research. This year CDRI, Lucknow is honored to organize XXXVIII All India Cell Biology Conference and International Symposium on "Cellular Response to Drugs". CDRI, being a drug research institute, may offer a flavour different from those seen in earlier Cell Biology Conferences. The scientific content will include sessions not only in areas of basic cell biology but also those related to diseases, treatments and therapies.



Symposium will be cover the following topics

- *Important Issues in Clinical Research*
- *Regulatory requirement in New Drug Applications and clinical Trails*
- *Issues in Herbal, Neutraceuticals clinical research*
- *Good Clinical Practices Guidelines*
- *Newer issues in Ethics in Clinical Trials and Basic Research*
- *Pharmacovigilance*

ISCB conference has prime objective to provide an opportunity for a close interaction of scientists with varied interests in diverse fields of the research. Conference will also provide common platform and more opportunities to the researchers in the areas of chemical sciences and biological sciences and other related areas to interact with each other. ISCBC will also provide a forum for in-depth assessment of the challenges involved in the dynamic and fast moving field of Drug research. It will bring together leading Chemists, medicinal chemists, pharmacologists, biotechnologists, and other allied professionals to discuss and present the latest important developments in drug discovery and therapeutics. It is expected that approximately thousand delegates will participate coming from different part of India and abroad. A large number of pharmaceutical and biotechnology industry professionals will join us for this event, share ideas and built networks.