Report on

International Conference on Emerging Trends in Biotechnology (ICETB-2014)

November 6-9, 2014

Organized by

School of Environmental Sciences

Jawaharlal Nehru University

New Delhi-110067, India

The International Conference on Emerging Trends in Biotechnology and the 11th Convention of the Biotech Research Society, India (BRSI) along with the Indo-Italian workshop on Industrial Pharmaceutical Biotechnology was held at Jawaharlal Nehru University, New Delhi, India, during November 6-9, 2014. The scientific program of the conference comprised of mini-symposia, workshops, oral and poster presentations on industrial, environmental, medical and food & agricultural biotechnology including mitigation and adaptive options for climate change. Around 125 eminent speakers from all over the world delivered keynote and invited lectures apart from 650 posters presentations. Apart from this, many eminent researchers chaired different sessions. A total of 800 people attended and contributed to the success of the conference.

The conference began on 6th November, 2014 with the inaugural and BRSI award session with chief guest Dr. V.M. Katoch, Director General, ICMR, New Delhi, and Guest of Honor, H.E. Mr. Daniele Mancini, the Ambassador, Embassy of Italy, New Delhi, and other dignitaries including Prof. S.K. Sopory, Vice Chancellor, JNU, New Delhi, Prof. Prasenjit Sen, Pro-Vice Chancellor, JNU, New Delhi, Madam Lidia Szpyrkowicz, Embassy of Italy, New Delhi, Prof. P. Gunasekaran, President, BRSI, Professor Ashok Pandey, Founder President, BRSI, and Professor I.S. Thakur, Dean, School of Environmental Sciences, JNU, and Convener, ICETB-2014, who delivered highly motivating words for young researchers. Vote of Thanks was delivered by Dr. Dinesh Mohan, SES, JNU.

The second day, 7th November, of the conference witnessed presentations from BRSI award winners followed by three parallel sessions. One of them was Indo-Italian Workshop whole day session on Industrial Pharmaceutical Biotechnology where Madam Lidia Szpyrkowicz, Embassy of Italy, New Delhi, emphasized the significance of Indo-Italian collaboration and role of present workshop. Participants of Italy delivered their talk on API discovery and industrial production, synergies between chemistry and nanotechnology: applications to nanomedicine, recent trends in computer-aided engineering of G protein-coupled receptor (Gpcr*)* ligands, mitochondrial atp synthase as a molecular target for drugs, screening, validation and development of mitochondrial drugs active in degenerative diseases, chitin nanofibrils as therapeutic support in advanced medications and a biotechnological approach for

the rational design and development of a new multi-target vaccine against tuberculosis. Paricipants from Indian side equally delivered their talk on pharmaceutical biotechnology. The Indo-Italian workshop on Industrial and Pharmaceutical Biotechnology highlighted discovery of active pharmaceutical ingredients, importance of defining molecular targets for synergistic therapy of Parkinson's disease, applications of nanomedicine, recent trends in computer-aided engineering of GPCR ligands, recombinant E. coli as a biocatalyst for production of colchicines, cyclin-dependent kinase inhibitor in chemoprevention of prostate cancer, mitochondrial ATP synthase as a molecular target for drugs, development of the wonder drug Rifamycin B for fighting against tuberculosis, screening, validation and development of mitochondrial drugs for degenerative diseases and discovery of antibiotics, chitin nanofibrils as therapeutic support in advanced medications.

A mini-symposia on White Biotechnology was organized where keynote lectures included new generation biofuel production from agro-industrial wastes, production of lactic acid from lignocellulosic biomass, biological conversion of lignocellulose into biofuels and high added value products using thermophiles, fractionation of tropical feedstocks for bioenergy and biobased products, catalytic chemical production from biomass-derived compounds using water and carbon dioxide under high-temperature and high-pressure conditions, microbial production of lipids and biomethanol from anaerobic process platforms and leveraging model systems to improve sugar yields and sustainability in bioenergy grasses. Parallel sessions on Food and Agricultural Biotechnology and Genomics and Metabolomics were conducted. The session on food and agricultural biotechnology gave insight into Biotechnological applications of *Pistacia terebinthus* resin for food production, engineering abiotic stress tolerance in groundnut for sustainable agriculture and development of probiotics, biosynthesis of secondary metabolites. Emerging trends in the field of Genomics and Metabolomics was seen with talks ranging from metagenomics to microarray based insights into functional gene diversity to sumoylation playing an important role in modification of large number of proteins in heat and salinity stress in plants.

After the enriching second day, the third day of the conference, 8th November, began with parallel sessions on Microbial ecology and diversity, Enzyme technology and Mini-symposium on Bio-inspired Engineering. Session on Microbial ecology and diversity emphasized on microbial community structure analysis following molecular approach to assess ecological

impact of pollution, coral microbiome as a potential resource in biotechnology, effect of genetically modified Bt crops and associated microbial communities and Marine microbiota as a novel source for anti-infectives. Enzyme technology session provided insights in the field of enzymology with lectures on continuous production of xylanase using a trickle bed reactor with *Aspergillus nidulans*, microbial production of industrially important substrate specific aminopeptidases, multiple amylases of the extreme thermophile *Geobacillus thermoleovorans*, applications of laccases in biotechnology and biocatalytic recovery of chitotriose and chitotetraose from chitinous seafood waste. Mini-symposium on Bio-inspired Engineering included lectures on effect of chemical pretreatments on digestibility of lignocellulosic materials and bioenergy production, role of solid catalysts for thermo-catalytic valorization of waste biomass, biomass derived sustainable carbon materials from hydrothermal processes, sustainable platforms for valorization of waste to resources, process development and scale up of cyclic glucans, commercial production of Artemisinin, enhanced glycerol bioconversions, bioprocess development for caffeine degradation, development of chitosan-based adhesive, green catalytic conversion processes for production of fuels from renewable biomass materials and applications of nano particles in the production and processing of microalgal biodiesel. The second half of the day had sessions on Innovations in Biotechnology, Plant biotechnology, Biological Waste Treatment, Bioremediation and Environmental Management and Microbial Products. The session on Innovations in Biotechnology showed the recent innovations in the field with lectures on the development of innovative biotechnological processes for the production of biosurfactants, next generation instrumentation development for infectious diseases, developing bacterial bioprotectants for building materials, designer lipids based on vegetable oils, emerging technological advancements in diabetes and formulation of herbal bath soap from *Vitex negundo* leaf extract. Session on Plant Biotechnology showed recent advancements in the field with lectures on rhizospheric and endophytic bacteria of mandarin orange and King chilli and their inoculants for plant growth, studies to improve wheat for high temperature stress areas and secreted effectors of fungi for generating disease free plants. Session on Biological Waste Treatment covered topics ranging from degradation of chlorpyrifos in batch and continuous aerated packed bed bioreactors by *Aspergillus* sp. and mathematical modeling of biodegradation of sewage under varying chloride concentrations. Bioremediation and Environmental Management session highlighted applications of phytoremediation as a technology to cleanup

textile effluents and contaminated sites, Environmental Health hazards of distillery waste and its biodegradation for environmental safety, Application of sulphate reducing bacteria for microbial electrocatalysis and Kinetics and biofiltration of dimethyl sulfide emitted from P&P Industry. Session on Microbial Products had lectures on Emerging trends in enzyme and nanotechnology using Acinomycetes, Speciality of Solanesol bioresources, Media engineering for the production of an alkaline xylanase from *Bacillus pumilus* MTCC 5015 by submerged fermentation and its application in bio-bleaching, Cloning and expression of gamma carbonic anhydrase from *Serratia* sp. ISTD04 for sequestration of atmospheric carbon dioxide and production of hydrocarbons as biofuel and an effective exobiopolymer based process for binding phosphate from water.

The last day of the conference, 9th November, had parallel sessions on Medical Biotechnology, Workshop on Nanomaterials, Workshop on Environment and Occupational Health, Socio-biological Perspectives of Environment, Bioethics and IPR, Climate change: mitigation and adaptation options. Session on Medical Biotechnology gave interesting insights into cancer proteomics, Direct visualization of HIV-enhancing endogenous amyloid fibrils in human semen, Efficacy of a novel 9-OAcSG based antigen assay for early diagnosis of Visceral Leishmaniasis, Hypoglycemic and hepatoprotective effect of *Cinamomum cassia* on alloxan induced diabetic mice and Mechanism of gene activation and remedy by heterogeneous phyto-antibiotics. Workshop on Nanomaterials had lectures on Bioinspired innovations in nanotechnology, Interaction of nanoparticles with non-halophilic and halophilic bacteria and Preparation, properties and applications of a new set of nanocelluloses and nanolignins from sugarcane bagasse. Workshop on Environment and Occupational Health covered topics ranging from analysis of natural progesterone and synthetic progestins in Czech wastewaters, Effects of anti-estrogenic activity on the measurement of estrogenic activity in wastewater, Di (2-ethylhexyl) phthalate (DEHP) induces oxidative stress and DNA damage in human breast cancer cells, Extreme resistance to endotoxin in fish and Impact of methoxyacetic acid, an endocrine disruptive compound, on androgen-mediated gene response in mice testes. Sessions on Socio-biological Perspectives of Environment and Climate change: mitigation and adaptation options gave importance to the environmental problems and their mitigation with lectures on Biodiversity conservation and its implications for human rights, Climate Change Impact on Water Resources: Adaptation and Mitigation Options and Climate change and society.

There were around 665 poster presentations by young researchers from November 6-9, 2014 in 5 major theme areas: ***Energy and Environment*** with sub themes Biological Wastewater Treatment, Bioremediation, Microbial Fuel Cells, Solid Waste Management, Environmental Genomics, Environmental Indicators; ***Industrial Biotechnology*** with sub themes Production of Enzymes, Organic Acids, Biopolymers, Biosurfactants, etc., Production of Secondary Metabolites, Bioprocess Development and Design & Operation of Bioreactors, Downstream Processing ; ***Food and Agriculture*** with sub themes Probiotics, Nutraceuticals & Functional Foods, Food Fermentation, Tissue Culture, GM Crops, Plant Genomics, Plant Health and Protection, Plant-Microbe Interaction; ***Medical Biotechnology*** with sub themes Infectious and Non-infectious diseases, Vaccines, Diagnostic platform, Animal improvement and reproductive technologies, Animal genomics, Immunity and immunology, Biomedical imaging and bioengineering, Gene therapy and functional genomics, Occupational health, Nanomaterials and drug delivery and ***Socio-biological perspectives of Environment*** with sub themes Climate Change, Biodiversity and Conservation, Bioethics and IPR, Environment and Society. The posters were evaluated by scientists with expertise in respective theme areas and researchers with the best poster presentations were awarded in the closing ceremony of the conference.

The icing on the cake was the Industry – young researchers' interactive session with Dr. Raghavendra P. Gaikaiwari, CBD, Hi-Tech Biosciences, Pune, India heading the session together with Dr. Anjan Ray, UDP India Pvt Ltd., Gurgaon, india, and Professor Krishnan, Anna University, Chennai. It helped in clearing the doubts from the mind of young researchers and motivated them towards pursuing a fascinating career in Biotechnology. This was followed by closing ceremony. Prof. Asis Datta, Distinguished Emeritus Scientist, NIPGR, New Delhi was the Chief Guest. Other dignitaries on the dais were Dr. Raghavendra P. Gaikaiwari, Prof. P. Sen, Pro-Vice Chancellor, JNU, Prof. Ashok Pandey, founder president, BRSI and Prof. I.S. Thakur, Convener, ICETB-2014. The conference ended with the distribution of poster awards and declaration of the XII BRSI venue by Prof. Pandey.

Figure 1. Welcome address by Professor I.S.Thakur, Dean, School of Environmental Sciences, JNU, New Delhi, and Convener of the ICETB-2014, also on the dais are Professor Prasenjit Sen, Pro-Vice-Chancellor, JNU, New Delhi, Professor Sudhir K. Sopory, Vice-Chancellor, JNU, New Delhi, Dr. V.M. Katoch, Director General, ICMR, New Delhi, H.E. Mr. Daniele Mancini, the Ambassador, Embassy of Italy, New Delhi, Prof. P. Gunasekaran, President, BRSI, Professor Lidia Szpyrkowicz, Scientific Attaché, Embassy of Italy, New Delhi and Professor Ashok Pandey, Founder President, BRSI.

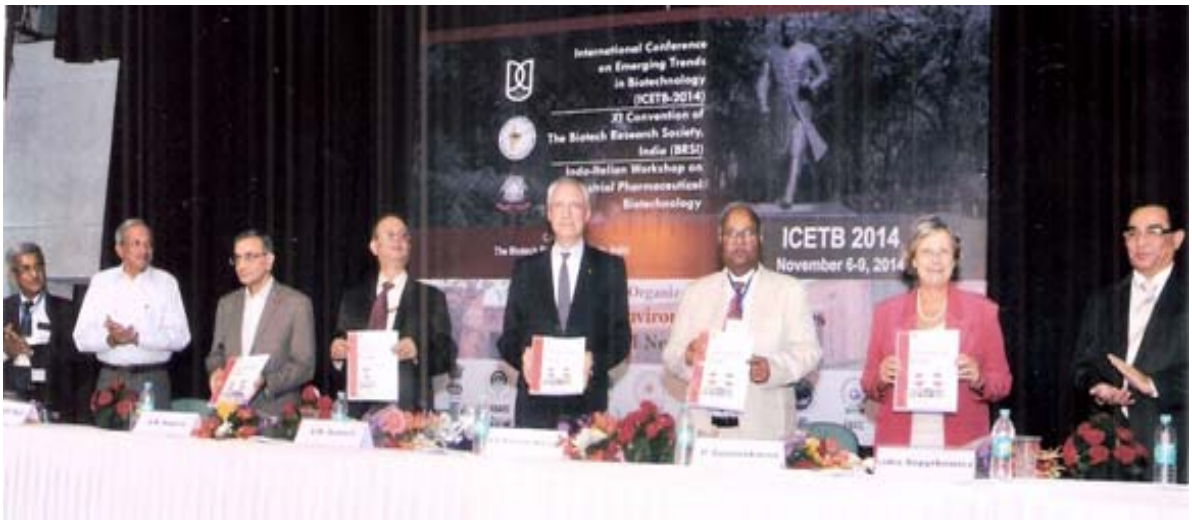

Figure 2. Release of Journal- Special Issue of Indian Journal of Experimental Biology by the dignitaries during the conference.

Figure 3. Presentation of Memento to H.E. Mr. Daniele Mancini, the Ambassador, Embassy of Italy, New Delhi, by Professor Ashok Pandey, Founder President BRSI.

Figure 4. Presentation of Memento to Dr. V.M. Katoch, Director General, ICMR, New Delhi, by Professor I.S.Thakur, Convener, ICETB-2014 and Dean, SES, JNU, New Delhi.

Figure 5. Distinguished dignitaries during the conference on dais- Professor I.S.Thakur, Convener, ICETB-2014, Professor Prasenjit Sen, Pro-Vice-Chancellor, JNU, New Delhi, Professor Sudhir K. Sopory, Vice-Chancellor, JNU, New Delhi, Dr. V.M. Katoch, Director General, ICMR, New Delhi, H.E. Mr. Daniele Mancini, the Ambassador, Embassy of Italy, New Delhi, Prof. P. Gunasekaran, President, BRSI, Professor Lidia Szpyrkowicz, Embassy of Italy, New Delhi and Professor Ashok Pandey, Founder President, BRSI.

Figure 6. Presentation of mementos to Professor Prasenjit Sen, Pro-Vice-Chancellor, JNU, New Delhi, and Professor Lidia Szpyrkowicz, Embassy of Italy, New Delhi, chairs of the session, by Professor I.S.Thakur, Convener, ICETB-2014 during indo-Italian workshop on Pharmaceutical Biotechnology on November 7, 2014.

Figure 7. Delegates attended the Inaugural session of ICETB-2014 in the Auditorium I, Convention Centre, JNU, New Delhi, from Nov. 6-9, 2014.

Figure 8. Indo-Italian form on Health, Environment and Nutrition formed during conference ICETB-2014 on November 7, 2014.

Figure 9 and 10. School of Environmental Sciences function was organized on November 6, 2014 to felicitate superannuated Professors of the School.

Figure 11 and 12. Pre-conference workshop poster session was organized on November 6, 2014 on Biogeochemistry sponsored by ENVIS, MOEF, Govt. of India, poster indicated (figure 11) and figure 12 indicated various sponsored helped to organize the conference.