

Drug Discovery: D₄PS-2010

National Institute of Pharmaceutical Education and Research (NIPER) Hyderabad and Indian Institute of Chemical Technology (IICT) are jointly organizing a workshop entitled 'Drug Discovery: Drug Design, Development, Delivery and Preclinical Studies (D₄PS)'. It is designed in a series of three modules, each one with duration of two days. Module-1 is on Drug Discovery and Development Overview, scheduled on 8th & 9th October, 2010, Module-2 is about Dosage form Development and NDDS (Emerging Technologies), scheduled on 12th & 13th November, 2010 and Module-3 is about Preclinical Phase and Toxicology Evaluation (GLP), scheduled on 26th & 27th November, 2010.

About NIPER-Hyderabad: National Institute of Pharmaceutical Education and Research (NIPER) is an autonomous body and



established under the aegis of Ministry of Chemicals & Fertilizers at Hyderabad as a centre of excellence for higher education, research and development in pharmaceutical sciences. The institute has been declared as an "Institute of National Importance" by Government of India through an Act of Parliament (NIPER ACT 1998 & NIPER Amendment ACT 2007). It is offering Post Graduate Programmes in Pharmaceutical Sciences.



About IICT: Indian Institute of Chemical Technology (IICT), Hyderabad is a premier Council of Scientific and Industrial Research (CSIR) R&D Institute in India. Major areas of research at IICT are: Natural Products Chemistry, Drugs & Intermediates, Chemical Engineering, Lipid Sciences & Technology, Agrochemicals, Fine Chemicals, Fluoro-Organics, Inorganic & Physical Chemistry (Catalysis & Materials Science), Coal, Gas & Energy. With highly professional scientists, an excellent laboratory and instrument facility for research, IICT is known internationally for its contribution to both basic and applied sciences.



There are large number of private and government educational & pharmaceutical institutes in and around Hyderabad offering graduate and post graduate courses in Science and Pharmacy. The students coming from some of these establishments are not adequately trained in modern topics necessary for Pharmaceutical Industry to take-up challenging assignments in pharmaceutical and higher educational institutions. Hence, services of training in teaching and practical skills in modern areas of drug development are in

large demand by the pharmaceutical industry for the future development of drug industry in India. This workshop is aimed to impart training to discuss the current advances in Drug Discovery and Development. The target audience includes Industry, Academicians and Students. The workshop methodology includes lectures, panel discussions, demonstrations and hands-on exercises for the participants with eminent scientists from the Academia & Industry.

The workshop on Drug Discovery: D₄PS was inaugurated by Dr. Ahmed Kamal, Project Director, NIPER-Hyderabad and Dr. Ashwini Mathur, Operations Head, Integrated Information Sciences from Novartis, Hyderabad. In his welcome address, Dr. Kamal briefed the audience on the inception of NIPER-Hyderabad and its journey since 2007. He mentioned that this workshop is unique in nature as it has three modules spanned over a period of two months time. He enlightened on the contribution made by IICT (formerly RRL, Hyderabad) in the field of the Drug Discovery Process citing Methaqualone as the first drug synthesized from India.



Dr. Ashwini Mathur, emphasized the importance of this workshop which was initiated with an objective to share knowledge in all aspects currently in Drug Discovery and Development. He compared the cost of marketing generic drugs and making a new drug reach the market. He urged on developing better research models at low cost. He concluded by appreciating the contribution made by NIPER-Hyderabad, IICT and Novartis. In the inaugural session, Prof. N. Satyanarayana, Registrar of NIPER-Hyderabad, Dr. R. Srinivas, Course Coordinator, Faculty of NIPER-Hyderabad; Dr. Amit Khanna, Dr. Priyadarshini Roy from Novartis, were present. Dr. Amit Khanna, Group Head, Global Regulatory CMC at Novartis, Hyderabad, gave the introduction to different phases of Drug Discovery research. He highlighted the importance of knowledge of the Target and Biology for developing a lead into a marketed drug. He concluded that the science as well as logistics is important considerations in Drug Discovery and Development.

Dr. Manika Pal Bhadra, Scientist from IICT, discussed a modern technique of RNA interference for target identification and its applications in medicine, in viral inflammation, cancer etc. The role of RNAi in target identification and validation pathway was highlighted. The importance of target based drug discovery approach to identify new drug molecules with lesser side effects was elaborated in detail by Dr. Sanjay Banerjee, Ramalingaswami Fellow of IICT. He focused on development of a model for heart failure



and its correlation with glucose uptake and practical implications on finding a novel target, SGLT1 for development of drugs against cardiomyopathies.



Dr. S. Chandra Sekhar, Scientist from IICT, discussed how a hit can be transformed into a lead and further to a drug. He highlighted the efforts of medicinal chemist to identify the lead and optimize conditions for synthesis of a chemical entity with least side effects and more efficacies. He elaborated on the Combinatorial Synthesis, Solid Phase Synthesis.

Using live examples Dr. Chandra Sekhar has shown the delegates how to prepare a simple 2D library by taking Suzuki and Heck reactions. The importance of team work was stressed upon in his talk citing Gleevec which was discovered and marketed in a very short time of 9 years as compared to the traditional 15 years of drug development and marketing. Dr. Jagannath Kota, a Senior Scientist at Novartis Hyderabad, enumerated the key role of Drug Metabolism and Pharmacokinetics (DMPK) in identifying pharmaceutical challenges relevant to the development of clinical candidates and designing optimal steps to improve the characteristics. The reasons for failure of numerous clinical candidates in the past, during the development stage due to incomplete pharmacokinetic profiling, including drug-drug interactions were also discussed in detail.

Prof. V. Lakshmi pathi, Retired Professor, Kakatiya University highlighted the role of signaling pathways as therapeutic targets. He stressed the importance of signal mechanisms and its role in pathology and disease management. He also discussed on how the signal mechanism makes an impact on the nutrient intake and their consequences. Dr. Prabhat Arya, Adjunct Professor, Biochemistry, McGill University, and Scientist, ILS delivered a talk on the growing chemical biology arena in the post-genomic age. The presentation highlighted his collaborative research work carried out at McMaster University for successful identification of several novel chemical modulators of Bcl-2 protein family that has opened doors to investigate the modulations of various protein-protein interactions in membrane environment.



Dr. J. M. Rao, Scientist from IICT, emphasized the importance of natural products as lead molecules. Case studies were discussed to explain the process of drug development with special emphasis in cancer research. Dr. Vinu Jose, a Senior Scientist at Novartis Hyderabad, elaborated the significance of various scientific studies involved at the different phases of drug development; i.e Phase I to Phase IV studies.



Dr. Amit Khanna, gave an overview of regulatory activities during the product life cycle. The challenges facing drug discovery programme in the industry were elucidated.



Dr. G. Narahari Sastri, Dr. Hemant Srivastava, Ms. Preethi Badrinarayan and Ms. A. Subha Mahadevi from IICT have engaged a demo session in molecular modelling. It commenced with a lecture by Dr. G. Narahari Sastri, Scientist on the role, relevance, utility and the limitations of molecular modeling techniques in designing drug molecules. The talk was followed by specific case study delineating the role of molecular dynamics (MD), Docking and QSAR in designing potential drugs. This was followed by practical demonstration showing the novel type-II kinase inhibitors design approaches, molecular similarity and diversity and HKS on the description of working principles of QSAR.

The workshop was organized by Prof.

J. S. Yadav, Director, IICT; Dr. Ahmed Kamal, Project Director; Prof. N. Satyanarayana, Registrar; Dr. R. Srinivas, Dr. S. Ramakrishna, Prof. V. Peesapati; Prof. Nalini Sastry, Dr. Kolupula Srinivas, Dr. B. Nagendra Babu, Dr. A. Krishnam Raju (Convener), Dr. N. Shankariah, Dr. Narendra Kumar Talluri, Dr. S. Ganadhamu, Dr. T. Venu from NIPER-Hyderabad & Dr. S. Chandrasekhar, Dr. Manika Pal Bhadra and Dr. G. Narahari Sastri from IICT. This workshop is supported by Novartis under the knowledge sharing initiative. The supporting staff of NIPER-Hyderabad and IICT also actively contributed in the workshop.



The response from institutes and industry was overwhelming in spite of a short notice about the workshop. The workshop was attended by delegates from IICT, NIPER, NIN and pharmacy colleges from all over India. Novartis, Aurigene Labs, Daiichi Labs, Ranbaxy Labs and others from industry have participated. The participants expressed that they benefited a lot from this workshop and it would be beneficial if many more such workshops are conducted.

Note: Schedule of **Module-2 (12-13th Nov'2010) & Module-3 (26-27th Nov' 2010)**

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