

Chemical Biology To Drug Discovery: Challenges and Opportunities in the Post-Genomic Arena!

Prabhat Arya

Professor, Chemical Biology Program
Dean, Academic Affairs
Institute of Life Sciences
(An Associate Institute of University of Hyderabad)
University of Hyderabad Campus
Gachibowli, Hyderabad 500046, India

Adjunct Professor, Biochemistry, McGill University
Affiliate Investigator, Ottawa Hospital Research Institute
Member, Ottawa Institute of Systems Biology
prabhata@ilsresearch.org
<http://www.ilsresearch.org> (see: chemical biology)

The post-genomic chemical biology age is challenging us to develop a better understanding protein-protein interaction-based signaling pathways and to examine their precise role(s) in regulation and de-regulation of cellular processes with an aim to exploit this knowledge in the modern drug discovery arena. Because these pathways are highly dynamic and temporal in nature, the classical approaches that utilize *design strategies* to access novel small molecules have been very difficult to apply. Over the years, although the high-throughput synthetic approaches have been very successful in generating a large number of small molecules but in most cases, these compounds are simple in nature and thus lack the features that are commonly found in bioactive natural products (i.e. 3D architectures, rich in chiral display of dense functional groups etc). With an objective to build a *high performing small molecule collection* that is inspired by bioactive natural products to undertake post-genomic challenges, our group aims at developing high-throughput synthesis methods to access highly unique natural product-inspired compounds. Through working in collaboration with the cell signaling biomedical community, this collection is then subjected to a thorough evaluation to hunt for functional chemical probes that are highly attractive candidates from a drug discovery perspective. A successful study leading to the discovery of novel small molecule modulators of Bcl-2 protein family related to cell death pathways will be highlighted.

Selected References:

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Prabhat Arya Brief Biography

Prabhat Arya grew-up in University of Delhi campus where he received his education (BSc Hons, MSc, MPhil, PhD, 1974-85). Following post-doctoral tenures with Professors Robert Corriu (Univ of Montpellier, France), Ian Paterson, FRS (Cambridge Univ) and Bill Chan (McGill Univ), he then joined the National Research Council of Canada, Ottawa and quickly moved the ranks and worked with this organization for nearly 20 years. Later, he accepted a challenge to help the newly created institute, Ontario Institute for Cancer Research (OICR), to develop the Medicinal Chemistry Program. *His long-standing quest to establish a Chemical Biology Program in India to undertake post-genomic drug discovery challenges finally brought him to his roots recently.* He is enjoying every moment of the current challenges and opportunities at the Institute of Life Sciences located on the beautiful University of Hyderabad campus. He holds several other appointments: Adjunct Professors at Biochemistry, Microbiology and Immunology (BMI), University of Ottawa, Biochemistry, McGill University, Affiliate Investigator, Ottawa Hospital Research Institute (OHRI) and Member, Ottawa Institute of Systems Biology. The research in his group aims to develop novel methods leading to high-throughput generation of natural product-inspired small molecules with the goal to hunt for chemical dissectors of signaling pathways. Over the years, his team has written several authoritative articles on the need to strengthen the advanced organic chemistry efforts in the signaling biology arena. To date, he has trained more than 50 post-doctoral fellows and several graduate and undergraduate students. He also enjoys serving the research community through his active participation at several national and international committees.