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Editorial

Opening Address 20th International Symposium on Pharmaceutical and Biomedical Analysis

It is wonderful to be here with you this morning at the opening ceremony of the 20th International Symposium on Pharmaceutical and Biomedical Analysis. I would also like extend a very warm welcome to the distinguished scientists, researchers and academicians who have converged here from India and across the world. It is a pleasure to join you all in this seamless world of knowledge sharing at the 20th International Symposium on Pharmaceutical and Biomedical Analysis.

The field of pharmaceutical research is quite unpredictable and quite excitingly so.

In 1957, Jens Christian Skou was working on some odd experiments, studying the effects of various salts on tissue from a shore crab. No one could have imagined that this would lead to the discovery of the enzyme called sodium, potassium ATPase (or Na+,K+-ATPase), which maintains the right ion balance in living cells. No one knew how important 40 years later this discovery would be. Today, we are also aware of a number of other ion pumps, which have been discovered as a consequence of Dr. Skou's pioneering work.

As the Hungarian Biochemist and the recipient of the 1937 Nobel Prize for Medicine, Albert-Szent Gyorgi said, "Research is to see what everybody else has seen, and to think what nobody else has thought". Indeed, even today, there is always an element of uncertainity and unpredictability about research and outcomes which cannot be custom-ordered. While the combination of curiosity, scientific excellence and far-sightedness remains a constant in the way we approach research today, there is much that has changed.

Pharmaceutical companies and researchers are trying to break new ground with highly novel applications. This holds out a lot of promise for the future if it is reasonable to believe that new approaches, in the form of different kinds of molecules, might be able to help us conquer some of the elusive medical challenges that are not being fully addressed by the current molecules that we have. The future of biopharmaceutical innovation is geared around these unmet needs.

Our medicines are becoming more and more personalised, and our clinical practices are faced with newer challenges as we are exploring newer frontiers in diagnosis and therapy. While there is an increasing need for new molecules there have also been concerns regarding the safety of new drugs. This has made the entire process of clinical trials and evaluation most critical in the process of drug discovery.

Another significant factor has been the economics of research. Cuts in research spending has had pharmaceutical and biotech companies and the academic sector look closely at productivity in R&D. In recent years, a huge variety of powerful new tools and technologies has become available to researchers enabling them to make key advances and discoveries in biotechnology, drug discovery, and other industrial and academic fields. Tools such as DNA and protein arrays, short interfering RNA (siRNA), stem cells, and methods of transferring genes from one species to another, combined with high throughput instruments and other systems for laboratory automation, have increased productivity in many laboratories.

Analytical science has enhanced our perspective and improved our understanding in the process of development of new drugs, characterisation of small molecules, complex peptides as well as large therapeutic proteins and monoclonal antibodies. An interesting example is that of insulins. The characterisation of insulins has led to our greater understanding of this drug's mechanism of action, metabolites etc, and this has further led to newer, better and safer versions of insulins being developed.

We live in an interesting era where for the first time biological systems are being understood at a molecular level. Because the functions of the proteins are determined by their three-dimensional structures, protein crystallography has had a major role in shaping this understanding. Structural genomics "the high-throughput endeavour of solving three-dimensional protein structures" has triggered an abundance of technological developments, making the process of structure determination less of an art and more of a science.

Through the development of new methods, automation, miniaturization, new softwares, the average cost, not to mention the elapsed time, to obtain a structure has dropped by more than half. This helped immensely during the recent outbreak of the SARS epidemic. Many scientists are also exploring the field of RNAi's. Pharmaceutical companies like Merck, GSK, Roche, etc. are also entering this area in a big way with the acquisition of biotechs. I personally believe that this revolution will continue and bring our understanding of science to the new level.

The future holds the promise of personalised DNA sequencing and high-throughput screening for pathogens at an affordable cost and viable time. These promises are riding high on a surge of single molecule-based technologies that enable us to manipulate and probe individual molecules. One such interesting technique is the Single-molecule fluorescence resonance energy (smFRET), that is being practised by most biophysicists.

There is no question that a better understanding of the biological and chemical processes will greatly improve productivity in drug discovery process, delivering efficient drugs with less adverse effects and at lower costs. This forum represents an excellent

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opportunity for the established and the emerging pharmaceutical world to come together to review the current frontiers of the analytical science that is so critical for our industry.

With a large pool of talented, experienced, scientific manpower and quality infrastructure of international standards, India has emerged as a preferred destination for high-end services such as drug discovery and development. In these challenging times of rapidly escalating R&D expenditures, increasing span of the drug development phase and complex review processes, India offers an excellent skill base in areas of chemical and biological sciences at a tremendous cost advantage.

India has also become a global destination for clinical research services with an easy access to a large, diverse and therapy-naïve population and a vast genetic diversity. The arrival of PBA2009 in our country is timely as the Indian pharmaceutical industry enjoys robust growth with a momentum that will surely take it to a position amongst the world leaders. At Zydus Cadila, we believe that in view of the rapidly advancing frontiers of scientific research and the increasing importance of international collaboration, a forum such as this has immense possibilities. We had recently hosted an International Symposium at Ahmedabad on Advances in Cardiometabolic research which had eminent panel of speakers from across the world converging to share insights and expertise.

At PBA2009 we are delighted to have some of the leading doctors of India who are key opinion leaders in their respective specialties, joining us in this knowledge sharing forum. I am sure all of us are looking forward to the discussions, presentations and new understandings that will come out of this conference. It is only through such explorations that we open up new paths in scientific research. On that note, I would like to thank the organizers of PBA2009 for this opportunity to share my thoughts. I wish you a stimulating and productive learning vista through this symposium.

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