

A Fresh Look at Biology



M. Vijayan

Being a fellow traveller of DBT since the days it was still the National Biotechnology Board M Vijayan has devoted time and ability to help DBT structure and implement several new initiatives. He takes a walk down the memory lane and retraces those initial steps that led to longer leaps.

My early association with the Department of Biotechnology (DBT) has been to a large measure institutional, representing the Indian Institute of Science, Bangalore. This association started when it was incipient in the form of the National Biotechnology Board (NBTB) under the Department of Science and Technology (DST) prior to its formal establishment in 1986. As part of its human resources development programme, the NBTB started a post doctoral programme at the Institute with the Department of Biochemistry, the Microbiology and Cell Biology Laboratory and the Molecular Biophysics Unit (MBU) as participating departments. I was actively involved in this effort as the then Chairman of MBU. This was the first time that the three biology departments of IISc were brought together in a common effort. Subsequently, in 1987, a Division of Biological Sciences (DBS), encompassing all science departments, was formed. In addition to providing

financial support, DBT helped developing the DBS as a coherent group of scientists through its major Divisional programmes. I was seriously involved in these efforts and the post doctoral programme for close to two decades as the Chairman of MBU, as well as Chairman of DBS (as the coordinator of the programmes) and as Associate Director of the IISc. The then Secretaries of the DBT, Dr. S. Ramachandran, Dr. C.R. Bhatia and Dr. Manju Sharma took deep interest in our programmes, in particular, Dr. Manju Sharma, who has been a source of strength in all our activities at the institute. Incidentally, Dr. Manju Sharma stepped down as Secretary, DBT and I retired from formal positions at the Institute during the same year, in 2004.

I have all along been involved in the other efforts of DBT as well, but this involvement intensified further during the tenure of Dr. M.K. Bhan. My longest continuous association with DBT has been perhaps with

the Bioinformatics Programme including the Biotechnology Information System Network (BTISNet.), established under the guidance of Dr. N. Seshagiri in 1987. During the last couple of decades, I have watched and participated in the transformation of the system from purveyors of information to generators of information. BTISNet played a major role in the resurgence in the country in the general area of bioinformatics and computational biology, after it went through a trough for reasons explained elsewhere (Biobytes, February 2011, pp.22-23) following the glorious days of G.N. Ramchandran and his colleagues. The mandate of the Bioinformatics Task Force has now been expanded to explicitly include computational biology and systems biology. Efforts are also underway to develop comprehensive sectoral databases on TB, rice etc. The recently initiated BIF programme had the effect of bringing in a large number of working biologists, including leaders in the field,

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► into the bioinformatics fold. All put together, BTISNet is now a vibrant, multi-disciplinary national network for effective application of computational approaches in biology.

The Thrust Area Programme of the DST, initiated in the early eighties, provided a major impetus for the development of macromolecular crystallography, which is central to structural biology, in the country. Subsequently, DBT also came forward to support the area in a big way. By the end of the last century, the macromolecular crystallography activity in the country had reached a reasonable level of maturity. The question then was how to reach out to problems of national concern. In the meantime, the sequences of several genomes, including those of microbes, had become available. Taking advantage of this development, a concerted programme of structural genomics of microbial pathogens was orchestrated through the DBT. In addition to the financial support it provided, the programme also helped to create a proper ambience for work on proteins from pathogenic microbes. An example of work of this nature is the concerted effort on the structural biology of TB proteins. Today, of the total

number of TB protein structures determined in the world, more than 10% are from India. Structures of many proteins from malarial parasites have also been determined in India. Efforts are also on for the structure analysis of proteins from *Salmonella typhimurium* and *Entamoeba histolytica*. Work on proteins from *Leishmania donovani* is also underway. The available results from the structural work in the country on proteins from microbial pathogens provide a reasonably robust platform for initiating serious efforts in structure-based design of inhibitors with the eventual objective of drug development. In the long term perspective, the work also enhances our understanding of the basic biology of pathogens, which is essential for combating them on a continuous basis. It is often the relevant fundamental research and prepared minds that result in leads for drug and vaccine development.

Yet another facet of my relationship with DBT has been my involvement with the Scientific Advisory Committees/Governing Bodies of the National Institute of Immunology (NII), New Delhi and the Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad, both autonomous institutions under

DBT. My association with NII has been particularly long and intimate. NII has over the years grown into a premier institution in the country. There are also a few other biology institutions of similar size and comparable performance, all of which have received substantial support from the DBT. They have now reached a level of development at which it is important to devise systems of governance for their future progress. It is robust systems which combined leadership and participatory democracy that enabled well-known Indian institutions like the Indian Institutes of Technology, the Indian Institute of Science and the Tata Institute of Fundamental Research to function smoothly, effectively and in a person-independent manner. I think the time is appropriate to address the issue of systems of governance in institutions like NII. In order to make a still higher impact, the size of these organizations also needs to be augmented. Small could be beautiful, but not necessarily effective.

In addition to successfully pursuing its other specific mandates, the DBT contributed very substantially to transforming modern biological research in India. I deem it a privilege to have been part of this endeavour. ■