BioSpectrum the business of Bio & Health Sciences

'Each decade contributed to paradigm shift in biology', says Dr Bhargava

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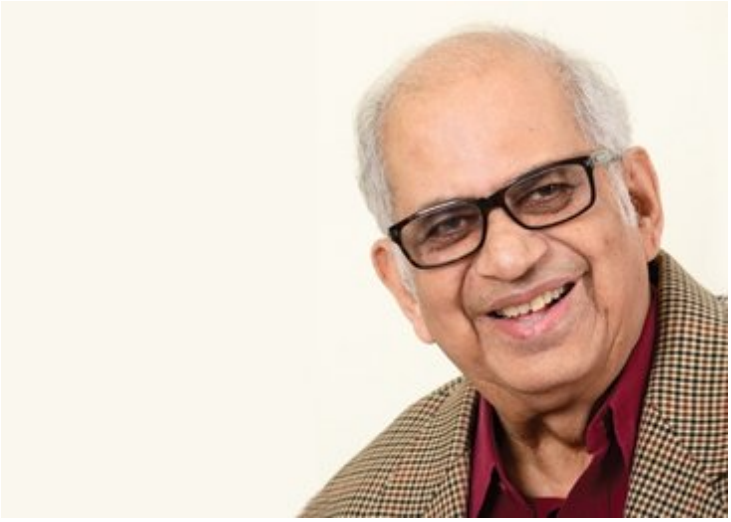

The decade of 1950s changed the course of history. The change in the paradigm of biology was one of the important constituents of the new directions given to history. Four important events that propelled this change were the coming of age of plant and animal tissue culture, the determination of the structure of DNA, sequencing of insulin, and working out the mechanism of the phenomena of enzyme induction and catabolite repression that was earlier documented in the PhD thesis of Dr Jacques Monod.

It was during this decade that some of us, trained in our country in areas other than biology, made a transition to biology. We were laughed at that time as biology was then considered a soft science which was fit only for girls! It wasn't realized even by our leaders of science during that period that biology was undergoing a revolution from being descriptive to becoming experimental.

On the world scene, the decade of 1960s saw the unraveling of the genetic code. That was a decade when, for reasons that I have just mentioned, the proposal of Dr Husain Zaheer (the then director-general of CSIR), based on a document that I was asked to prepare, to set up a National Biological Laboratory at Palampur (for which land was actually purchased by CSIR-land on which another CSIR Laboratory exists today), was shot down, setting us behind by a decade.

The emergence of the technology of genetic engineering in the decade of 1970s laid yet another foundation of modern biotechnology which was further strengthened by the discovery and quick commercialization of monoclonal antibodies in the next decade. And in India, we were able to finally convince the authorities concerned that various emerging areas in modern biology were going to play an important role in our daily lives. Terms like biochemistry, biophysics, molecular biology, immunology, genetics, virology and microbiology began to become a part of common vocabulary.

Consequently, the first laboratory in the country devoted entirely to modern biology, the Centre for Cellular and Molecular Biology (CCMB) was formally set up on April 1, 1977 in Hyderabad.

In the 1980s, immunology received a major technological impetus by the discovery of the molecular mechanisms of generation of diversity in the antibody world. In our country, several first-rate laboratories in the area of modern biology which were to play an important role in the development of biotechnology in the country, were established. Examples will be the National Institute of Immunology, National Centre for Biological Sciences, National Centre for Cell Science, and the Institute for Microbial Technology.

All the ground-work for the eventful emergence of biotechnology as a major industrial force had been done. Not only that, we were able to persuade the Government of India to recognize that the country needed an apex body for biotechnology, leading to the setting up of the National Biotechnology Board (NBTB) in 1993, and then the Department of Biotechnology (DBT) in 1986. I will not expand on NBTB and DBT here as I have described their history in detail in an earlier article in Economic and Political Weekly.

The decade of 1990s saw the emergence and consolidation of the problem of HIV infection worldwide which posed new biotechnological challenges, including in the area of vaccinology. With the production of the first genetically engineered product in the country, the hepatitis B vaccine, by Shantha Biotech, biotechnology in India came of age.

At the beginning of the first decade of this century, we had the arrival of BioSpectrum which gave a great impetus to the emerging science of biotechnology. I learnt about it through N Suresh who had taken over as the first editor of the new magazine, when he invited me to do a column for it. I had just then stopped doing a column for Business Line and Suresh's invitation posed a challenge of a different kind. Suresh was with the Times of India earlier and was one of the few science journalists whom I had come to like and respect.

With the hindsight of 10 years, I dare say that biotechnology in India wouldn't have been the same if CyberMedia had not decided to invest in BioSpectrum, and Suresh wasn't where he is now. It is not a journal of the biotechnology industry or the government. It is not the mouthpiece of any one entity. It has shown courage, and attempted to bring to light all points of view for which reasonable justification may exist. Its judicious mix of information, discussion and debate has made it eminently readable. I recall that a few years ago, I was invited by Wiley's Biotechnology Journal to edit a special issue of it on India. The first thing that I did was to ask Suresh if he would work with me as a co-editor of this special issue, which he did; the result was a highly commended product. It just wouldn't have happened if Suresh and his colleagues, and BioSpectrum, had not been so supportive.

A challenge that BioSpectrum faces in the present decade is to consolidate its non-partisan policy, and to serve as a platform for informed discussion and debate.

Perhaps, a part of the magazine could be devoted to advances in modern biology which are likely to be the basis of new, commercially viable biotechnologies. Example would be (i) apomixis, which would allow farmers to multiply their hybrid seeds themselves without the loss of "hybrid vigour" and where Indian scientists have provided proof-of-concept and world leadership, and (ii) ability to reprogram adult differentiated mammalian cells.

A minor emphasis also could be laid in the journal in the future, on areas where biotechnology has been (or can be) successfully used to answer a major unsolved basic question. An example would be the application of today's biotechnological methodologies to understand the origin of Indians (out of Africa?) which topic, in 2010, made the first cover story in Nature from an Indian laboratory.

There is, perhaps, also a case for enlarging the scope of BioSpectrum's coverage, for example, by including assisted reproductive technologies for which a bill is ready to be placed before the Parliament. The journal must also recognize the technologies of future - for example, those based on our increasing understanding of smell, or the ability to convert the language of (sense-making) DNA into the language of music, or computing using DNA, or the use of DNA to store information. An important function of science is to rationally predict the future on the basis of the past and the present.

I have great hopes from BioSpectrum in the next decade, and consider myself privileged to be associated with it from the beginning.

And the last "wise" words: Let BioSpectrum never forget that industry exists to serve the people; people do not exist to serve

industry. If the journal needs a mantra ever, that may be it!