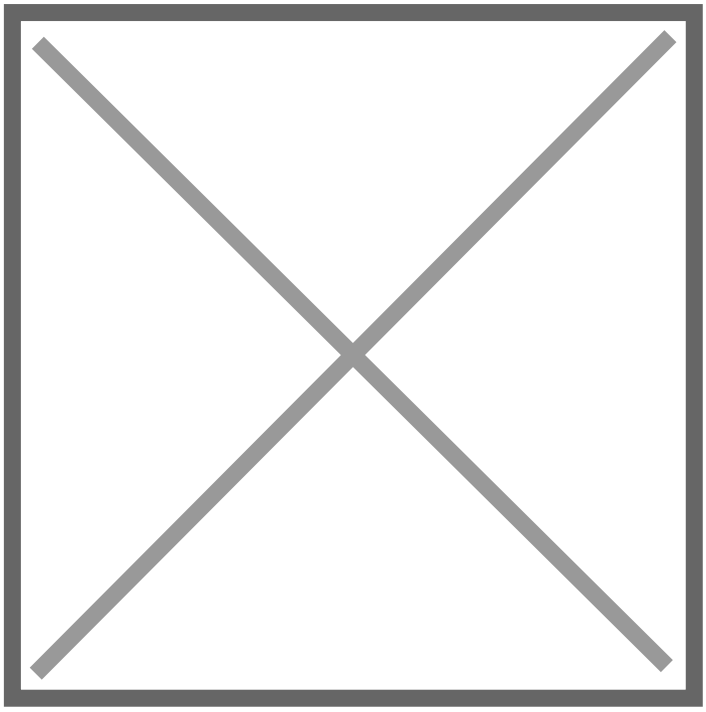
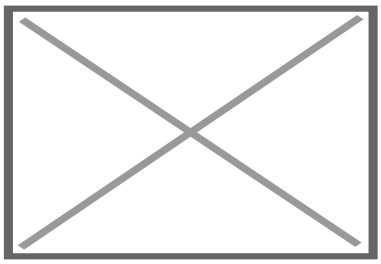
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"DBT is an enabler of technology while supporting science"

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Dr MK Bhan, DBT secretary, speaks about the year gone by, the Department's future role and new initiatives/challenges in the coming year, in an exclusive interview with Rolly Dureha of BioSpectrum.

How does the DBT envisage its role in the future?

The DBT views its role as a general enabler in the development of biotechnology. We already know how to function like a science agency. The question is how do we become a technology-developing agency. Since there are no preset norms, we have to be realistic. Our agenda will be: one, to enhance the ability of public sector institutions so that they make a more effective contribution to the technology development; and second to recognize that the larger possibility of technology development must come from the small and medium industry. We have to work on both fronts and try to converge them.

The DBT will always support basic biology. It will support curiosity driven research because without that solid base, the thrust in innovation is not possible, important discoveries are not possible and someday we have to learn to do that.

Now the question is that how do we go about supporting innovation, translation and product development? For this we need to increase the chances of the public sector institutions to do translation, without destroying their science base. This is the first challenge. The next challenge is to enable the Small and Medium Enterprises (SMEs) as a whole-encourage the small and medium industry to take more risks, pursue more challenging ideas and support them to do more late stage development for whatever proof of principle has been generated.

How is the Department going to support the large, medium and small-scale industry?

The SMEs need risk taking capital and early stage research support. Now with the Small Business Innovation Research Initiative (SBIRI) scheme already in place, we have funded about 12 companies this week. From now onwards we will expand

the scale of this program. In the next plan we are hoping to scale up the funding to about Rs 100 crore or so per year, so that it will become a major source of support. The SBIRI is a very unique scheme where we are funding the industry directly.

We intend helping out the large industry in a different way. We shall offer support by way of regulations, bringing scientific scrutiny of research, for example, Reliance Life Sciences, Mumbai is working on cancer vaccines and DBT will partner with them very strongly by bringing good scientific review for their work, problem solving help, contacts with world class people within this arena so that the scientists are not working in isolation but are surrounded by a wealth of experience and mentorship. Secondly when the industry is dealing with an outstanding technology, a real innovation, then the DBT is going to help in late stage development, wherever the public sector institutes are concerned. For example, if for a vaccine, a trial in a public sector institute is required than we will be happy to facilitate that and make some kind of contribution. So our philosophy for the large companies is to provide them with scientific support, science meetings, clinical validation and training. And most importantly surround the innovative and challenging industry projects with science and technology expertise and bring mentors closer to them.

Then in the case of technology transfer projects, where the technology transfer involves international companies/scientists, the DBT will step in as a third party, as an enabler. Thirdly we are now bringing the industry as a regular participant in all our science meetings. For example in the new science collaborations with the UK, Finland, Denmark, Norway, we took the industry with us as part of the delegations, which has facilitated their striking agreements right away. This will be the enabling support from our end.

In addition, we want to institutionalize this whole partnership by creating an industry research support cell-a research cell that is purely focused on the R&D of small and medium companies as a total support structure. This structure will also partner with Association of Industry Led Enterprises (ABLE) and make ABLE stronger. The same cell will now streamline India's participation in biotech fairs abroad, in making contact with industry leaders abroad, which means, building total relationship. I think one of the biggest challenges for us is to build relationships with the global industry. The research cell and ABLE will work on this front.

We shall shortly start different types of fellowships to support people who are working in the industry. There will soon be 20-30 different schemes in the offing, which will basically ensure that the SMEs will not feel isolated but always feel supported by the government in its endeavor for innovation.

So what is emerging is a wholesome industry package, which is larger than money. It is important to see the totality of the concept because the DBT realizes that it must be an enabler of technology while supporting science. It cannot do stand-alone technology development.

How is the DBT planning to strengthen the institutional sector?

As an enabler of translational research in the public sector institutions, we will expand our existing support for science education and training. And since many of the existing institutional structures are not adequate for translation, we will support creation of innovation centers, which are structured to suit needs of translation and translational research. For this we will offer support to universities, IITs and the research institutions. Currently we are in a major dialogue with the IITs.

One of the most important things that the DBT can do is to increase effective contact and engagement between engineers, physicians, chemists, biologists through special granting schemes, interdisciplinary centers of excellence-virtual, in single institutes or across institutions. An example of this is the grant that has been given to CMC Vellore. This year we propose to give at least 5-6 more grants of this nature. Some of the priority areas for such grants are: virus research, embryonic stem cell research, nano agriculture and nano medicine, rational drug discovery, human and animal vaccine, future diagnostics, marine and seri biotechnology, agri biotechnology and industry processing. So we will form innovation centers on a competitive basis in a number of areas.

Our Centers of Excellence (CoE) scheme will be revised now and will be of two types: One where it is purely a creation of CoE around people who have been outstanding and are still young enough; And the other in areas where we believe that CoE are required and must be pushed down in a top down manner. Both the schemes will coexist and will run every year. We plan to allocate about Rs 60 to 100 crore per year for the CoEs scheme. This year we have earmarked about Rs 60 crore for the scheme but will increase the budget for the next plan. We will provide building support, new faculty, the whole range of support system and all this will be outside the department structure so that the ambiance is more suited to translation. We hope that in the next 5 years, we will create about 30-50 CoEs in the country.

In fact, for translation we now have two tracks of overseas fellowship. One where we simply send the best people abroad and they pursue the area that they want. The second is what we call a "niche area oversees training scheme" via which we create

a critical mass of people in new areas like stem cell research, animal health, animal nutrition, medical genetics and so on. So wherever there is lack of human resource, we will start a scheme there. Notably, here merit will not be the only criteria, for example, suppose we have funded a center of excellence somewhere, then we will preferentially send their people for training. It will be a case of marrying the infrastructure with competent people.

We have also been giving large infrastructure grants to the institutes. The other scheme that we have started in the area of translational research is giving grants for five years instead of three, wherever appropriate. This is because translation requires several related projects to be done and takes a longer time. So such research projects will be funded for a duration that is appropriate for the project rather than by a rigid predetermined period.

Quality human resource is a concern for the industry. How is the DBT planning to strengthen this area?

Starting from 2007, the DBT will support Masters in health sciences, PhD in health sciences and Masters in clinical sciences, as we do not have physician researchers. This will be in addition to the conventional MD and PhD programs. One may ask as to what is different about this approach? Actually it gives a variety of options to choose from in a medical institution-a kind of a cafeteria approach. For example, the Masters in health sciences program will be run on the lines of an executive MBA where existing young faculty can improve their science capacity, in transition, through the program that is run during the summer vacations, evening classes and Sunday classes. The program will suitably compensate the best teachers so that they find it attractive to teach at these unusual hours. The idea is to have a range of options/approaches and allow the people to choose from them. The key here is that there will be a reward for every clinician who decides to learn science-a financial reward for that period and there will be a reward for teachers who are willing to do this extra job. And eventually we will work on a strategy by way of which we can create more jobs for the physicians. Somewhat similar schemes are being discussed for the environment, agriculture, marine and other different sectors where they are very strong in their core disciplines but need more understanding of science and modern biotechnology. This year we have evolved the system for the medical professionals and now we are working on the other areas. This requires a lot of consultation with the user department. The core of the strategy is to create a pool of jobs, as there is no point of creating people in an area if the institutional career structure does not exist.

Another initiative is that we will give summer project support in diverse fields (medicine, life science) on a very large scale. This is based on the feedback from a lot of scientists that early exposure to research thinking is of profound importance in the formative years. We will promote this in a big way, irrespective of disciplines, under a mentor. Students will be able to take a 2-3 month project during their summer vacation and some of these may extend and continue beyond this time frame. Eventually great scientists are not the ones with the greatest grades but they are people who have experience in pursuing intellectual curiosity and if they are temperamentally driven to it, then they will be hooked to research. This can be done only in the formative years.

Our focus is also to improve the skills of teachers so that they can bring in experimentation at the undergraduate and postgraduate level more effectively. We plan to launch this exercise on a large scale and are looking for places to locate the teacher training schools.

We are also working on the idea of having one high quality life science college in every city. This has to be very comprehensive as it means teachers training, infrastructure, visiting faculty, industry visit, summer project-convergence of all these ideas in one place. So that there is a symbol of world high-class life science within the country.

We have started the "Institutional Innovation Grants Scheme", whereby we are willing to consider proposals for innovation grants managed by the institutes themselves and not the DBT for students at all levels.

There has been a substantial increase in fellowships-PhD fellowships, post doctoral fellowships and we will go on increasing them. There is no limit to the number as long as we keep on getting good candidates. We have sent a proposal to the government for the creation of a national pool of jobs for life sciences. We have asked for 500 jobs and are currently waiting for an approval.

In addition, we are starting a number of fellowships that will give performing scientists additional income and we will do this on scale. Because I think to keep people in science, particularly in translation, the financial rewards must be higher. So we will introduce a number of incentives in that direction.

What are the new life science institutions in the pipeline?

The Planning Commission has already approved a translational health science institute in Faridabad and a UNESCO center for training and education in Delhi. The translational health science center has three independent translational units-vaccine development and vaccine related research, diagnostics, bio based drug development, infectious disease research and a clinical trial center. The clinical trial center will be open to almost all industry efforts. A major help, which the companies need

now, is good quality trials at low cost and this translational health center will assist in providing that. The translational health science center will also have a center for technology health policy, which will shape ideas on what technologies are needed and can be created. It will not do technology development but will look at the technology in the broader policy frameworks of public health needs, patient needs, market aspects, ethical aspects and a number of such areas. We are thinking of taking over the Seri Biotechnology Center of the Central Silk Board and run it like an autonomous body. We are also taking over a biotechnology institute in Kerala-the Rajeev Gandhi Center for Biotechnology in Thiruvananthapuram.

Recently the Scientific Advisory Committee to the Prime Minister has recommended the creation of an animal biotech institute and we are working on it. The other idea under discussion is the creation of an agri biotech cluster in Punjab in which agriculture and food biotechnology institute and a biotech park will be developed in partnership with Canada.

How will the National Biotechnology Regulatory Authority be structured?

The government is having a serious discussion on the creation of a single biotechnology authority. The modalities of how it will be created and managed are under consideration and maybe in a month or two we will get the Cabinet decision on that.

How are the international programs of the Department progressing?

The international programs are getting a major revamp. What is now distinctive about the international programs is that the financial commitment from the international partners is clear and substantial. Each partnership is doing $10-15 million a year and they are all on equal footing. The contribution of the collaborating partners is matched by that of the DBT.

We are integrating the international programs with the national programs and are making them more focused, for example our program with Norway will concentrate on human vaccines, animal vaccines and fisheries. Similarly the programs with Denmark, Finland, UK, Australia-all have a distinct focus so that these international partnerships are seen in the context of the overall national efforts of DBT. For example we have started a program for tailor made biotechnologies for agriculture that are of local relevance, not necessarily of national or global importance, in association with the Netherlands and this is a very farmer centric program. Here we will look at local needs and technologies that will benefit the local people.

Earlier the international programs were more free floating and there was a certain disconnect between them and the national programs. Now they are less driven by political considerations and more by science and economic considerations. All the international programs are on a public-private platform, so there is good participation from the both the industry and the academia. In fact, they are now becoming a major R&D effort of the DBT.

What have been DBT's efforts in the stem cell arena? What are its future plans?

We have the ICMR-DBT guidelines and have got a fairly effective program on adult stem cells. We have also got an effective mechanism of assessment of proposals which takes into account ethics, science and clinical study aspects through three independent committees and all embryonic stem cell proposals will go through a combined interministerial interagency committee. So a system is put into place. We have provided GMP training to many medical schools. We have regularly organizing science meetings and have brought the best international people for these meetings, with the help of the overseas scientific advisory committee. We are hoping to fund an embryonic stem cell institute or center this year if we get an attractive proposal. Now a major grant has been given to the National Brain Research Institute (NBRC), Gurgoan, for embryonic stem cell work particularly relevant to neurosciences. We hope that the National Centre For Cell Sciences (NCCS), Pune, will come up with a proposal for a cell and tissue engineering center. Our effort has been to build capacity, build human resources, make more progress in ideas, promote and partner with industry wherever necessary and now build the institutional base as well. CMC Vellore is focusing on adult stem cells and we hope that the National Centre of Biological Sciences (NCBS), Bangalore and NCCS, Pune will come up with proposals for independent centers on embryonic stem cell research. The NBRC, Gurgoan, has picked up and eight of their proposals have been funded as a program support. Hence we are moving in that direction. On the whole, the embryonic stem cell arena is still very weak and we hope to make a dent this year by funding at least one-two more CoEs. The area is picking up, but there are still weaknesses and we need to incrementally work on them.

What have been the achievements of the DBT in the last one year and what are the current challenges?

We are happy that the Mashelkar Committee Report is on and will be implemented from April 1, 2006. Along with this major achievement, we have fulfilled the other commitments that we had given last year-about industry financing through SBIRI, then whatever reform was possible in regulation have been done. So we are happy that we have delivered on our promises. It is important to note that many of the schemes, due to the long approval time, were approved only by October 2005 and yet the officers at the DBT had released everything by January/February 2006. We must complement their hard work as by March 31, we had each of the schemes already out. There has been a great pressure on us. Over all it has been a great year of

learning.

I think that the challenge for next year is setting a large animal facility and also a transgenic animal facility, a single biotech authority by whatever mechanism it is created. Another concern is that we have spread our institutions very far and wide but our clustering efforts have not been good enough. We need to constantly work towards building around institutions, complementary facilities and structure. We are now much more focused on one change that has come in our system that we want to fund fewer projects for product development. But the ones that we fund, we want to go really after them, in terms of resources and effort. So our thinking has become a little more like the industry in that sense. On the whole it has been an interesting year.