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"I see RGCB as a national research institute with a difference"

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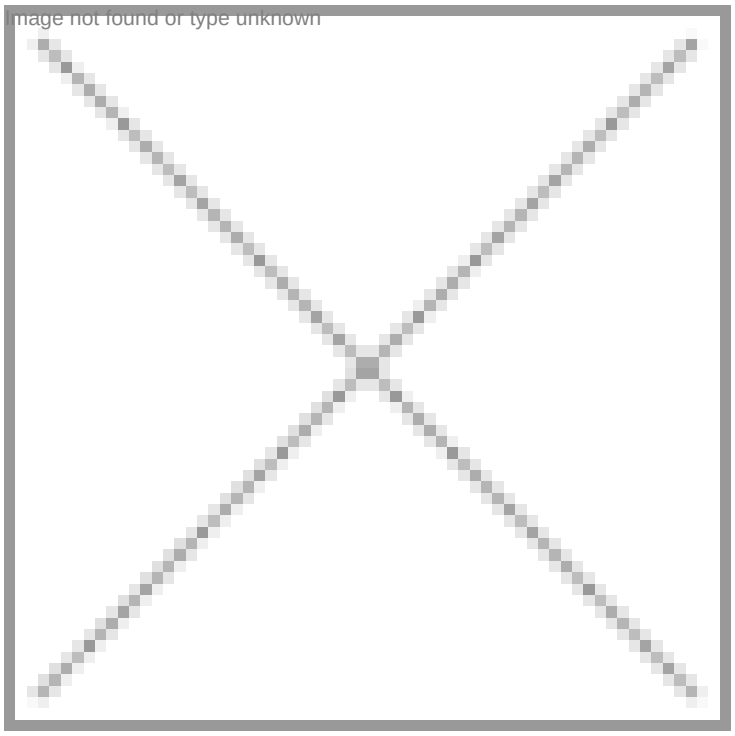

"I see RGCB as a national research institute with a difference"

-Dr M Radhakrishna Pillai, director, RGCB

The Rajiv Gandhi Center for Biotechnology (RGCB), Thiruvananthapuram, will now be a national autonomous center under the administrative control of the Department of Biotechnology (DBT), Government of India. This announcement came in the last week of July.

It may be recalled, that following the Budget announcement in 2006, DBT had asked the state government (Kerala) to sign an MoU transferring the institute to it. However, with a new state government assuming office, it preferred to review the entire process. This unfortunately took 10 months. The matter was then placed before the state cabinet that passed formal orders in February 2007 to transfer the institute to Government of India. Following this, the Central government also decided to take a full Union Cabinet approval. This was done on July 26, 2007, with the effective takeover date as April 1, 2007. With this, the takeover decision is now fully implemented.

The institute will now be a national autonomous center under the administrative control of the DBT. Kapil Sibal, the union minister for science and technology and earth sciences, will be the president of the institution. And a governing council headed by the secretary, DBT will oversee the administration of the institute. A scientific advisory committee will monitor and advice on research and development.

RGCB is a state-of-the-art biotechnology institute, which is the only one in the country to focus on translational research. It is working on novel and highly potent drug leads and nutraceuticals and identification of genes and disease variants of significance to pharmacogenomics and molecular medicine as well to plant biodiversity and crop improvement. According to BioSpectrum's Top 20 Schools survey, published in January 2007, RGCB was the No.1 ranked biotech institute in India. With the current development, the institute now has the mandate to be one of the best biotech research centers in the world.

In an exclusive interview to BioSpectrum, Dr M Radhakrishna Pillai, director, RGCB, explains the merits of this development and the plans of the institute.

What would it mean for RGCB being accorded the status of an autonomous institute under the administrative control of DBT?

The union minister for science and technology and earth sciences, Kapil Sibal, very aptly summarized the implications of RGCB becoming a national institute. Speaking to the media after formally announcing the Union Cabinet's decision of taking over RGCB by Government of India, he said, "RGCB is an institute that has been doing very well nationally. We will now take this center to international levels."

I confess to being a dreamer. I came to RGCB in March 2005 with a dream of converting it to a national center. Showcasing our institute and its potential to the Department of Biotechnology, minister of science and technology and the prime minister, we accomplished this achievement in less than a year. The Union Budget 2006 announced RGCB being made a national autonomous research institution. The calculations of the Indian government were proved correct when BioSpectrum after a national survey ranked RGCB as India's best biotechnology school.

I now have no limits to the dreams and plans for RGCB. I would like it to be different from other similar institutions. Our strength is in the wealth of knowledge bases that we have in biological and chemical sciences. Kerala is best known for its excellent knowledge wealth, but has been unable to translate this into commercial rewards. What we would like to do is to really bridge this gap by really doing what we do best--translating our biotech knowledge into health care requirements and better quality medicinal plants, nutraceuticals and spices.

What is your vision for RGCB?

I envision RGCB as an institute with two components as part of the 2020 strategy. One, a state-of-the-art research center nestled close to India's greatest biodiversity resources in the Western Ghats and located in the center of an ecologically balanced biotech park. Here we will translate our drug development program in close association with biotech and bio-pharma units located around the research center. We will use our genetic engineering and molecular medicine knowledge to transform and improve medicinal plants, nutraceuticals and spices, all so prevalent in this biodiversity zone.

The other component would be to convert our present campus into a unique teaching and training center in applied biotechnology. I foresee state-of-the-art academic courses and programs specifically catering to the new industries of healthcare, hospitals, CROs, biotech and biopharma companies. These would include Master's level courses in clinical biotechnology, molecular medicine and systems biology as well as management degrees in biotechnology. In addition, we see ourselves as a major training center for the huge number of BTech and MSc Biotechnology graduates who come out every year with poor foundations in molecular and clinical biology.

What would be the mandate for RGCB now?

Our mandate is to conduct interdisciplinary collaborative research with industry and clinical centers in translational research aimed at the rapid translation of scientific discoveries from our lab to the benefit of society. RGCB's expertise in the areas of cancer research, pharmocogenetics, protein engineering, molecular reproduction, infectious diseases, neuro and stem cell biology and plant genetic engineering biology will be integrated for achievement of this main goal. This achievement is also expected to promote the growth of biotech industries in Kerala.

We have as our major objective a National Drug Development Center working based on the extensive traditional Indian medicine practice and the extensive biodiversity resources available in Kerala. We will use these two sources in combination with modern biology, bioprospecting with a matrix of systems and computational biology to develop this unique drug development program. Our research to date has given us sound models for analyzing bioactive compounds including transgenic cell lines, in vitro models for neuron damage, tumor stem cells and hepatitis C besides numerous targets in cancer and tuberculosis. These will be the base on which we will take our drug development to high throughput automated levels.

Our expertise in genetic engineering has brought us enquiries on taking up joint ventures in plant biotechnology. We have been approached by NABARD for improving the output of biofuel from jatropha and from Kannan Devan Tea Plantations for genetically improved varieties of tea. In addition, we are providing a master plan to the commerce ministry for a comprehensive program on disease resistant ginger and pepper, two of Kerala's primary cash crops. We have already begun efforts to express major recombinant human therapeutic proteins in plants with a view of mass production at low costs. In addition we see a social relevance in this--both by bringing down costs of these expensive proteins and rehabilitating the tobacco farmer in view of strong national and international pressures on the tobacco industry. These programs in genetic engineering will be a major function of RGCB in the months to come.

We will also promote high quality biotechnology education at postgraduate, doctoral and postdoctoral level and act as a nodal contract research centre for carrying forward research leads in bioprospecting and drug screening from pharmaceutical industries and R& D centers.

What are some of the key developments you foresee at RGCB now that it is placed as a national institution?

At present there are six national biotechnology institutes in India. RGCB will be the seventh and the first in Kerala. The annual core budget will rise from the present Rs 8 crore per year to at least Rs 20-25 crore per year. We can attract direct participation of national and international agencies in research and development programs. And this will also allow clusters of biotechnology industries around RGCB. History shows that this is the only way to attract and develop biotechnology-based industry.

The Centre in Union Budget 2006 announced to grant RGCB the autonomous institute. Did you receive any grants from the Center following that announcement? Will a budget of Rs 100 crore be sufficient?

Since the effective take over date is from April 1, 2007, funds will be released by DBT from that date. We therefore underwent tremendous hardship in 2006-07 with only a lifeline support from the state. With the large extramural support and savings (income) the institute got from training students and providing DNA fingerprinting services to judicial and crime investigating agencies and molecular diagnostic services, we managed to break even. It's a process that I hope the institute will never have to go through again.

I fully realize that the Rs 100 crore allocated for us in this five-year plan is not going to get us any of these dreams. But I am fully confident of convincing the right financial sources--government, private and venture capital that we have this knack of delivering on what we promise. Two years ago, we were a little known state institute located in a southern corner of the country. We are today the most talked about institute. I have full faith in our primary assets--the scientists, technical personnel and students. We will deliver.

What are the major achievements of RGCB till date?

Investigators at the Regional Cancer Centre and Rajiv Gandhi Centre for Biotechnology in Thiruvananthapuram have developed an anti-inflammatory and anti-microbial mouthwash consisting of three commonly used medicinal herbs for controlling radiation associated mucositis (painful swelling of the gums and cheek) in patients being treated with radiation therapy for oral cancer.

We have made significant progress in the area of bioprospecting, target identification and assay development in the drug

discovery process against infectious diseases, reproductive disorders, cancer and neurological ailments.

We has also developed diagnostic techniques for infectious diseases such as dengue fever, Chikungunya, HCV, cholera and Mycobacterium tuberculosis, DNA fingerprinting based diagnostics including HLA typing. Further, protocols for value addition to medicinal plants like Baccopa monniera (Brahmi) and Andrographis paniculata have also been developed successfully.

We also established facilities for molecular diagnostics and DNA finger printing to cater to social and criminal justice systems as well as diagnostic and health needs of the society as a spin-off of the research activities of RGCB, besides developing novel cell based assays for screening compounds s for anticancer, antiviral and neuroprotective activities.

What are some of the breakthroughs that you expect in the future?

Some of them would include:

- Marketable, ultra sensitive diagnostic kits for Dengue fever, Chikungunya and Tuberculosis.
- High-throughput cell-based screening assays for target based drug screening for cancer, viral diseases and neurological diseases.
- Stem cell-based therapy for chronic diseases and tumor stem cell based screening systems for anti-cancer drug design.
- Identification of novel biomarkers for disease predisposition, stress tolerance, drug sensitivity, etc. in humans and plants.

What is the current staff and student strength?

We have 28 full time staff scientists, 14 well-trained technical officers, five bioinstrumentation/electrical engineers, 10 skilled technical assistants, a small compact and efficient administration of 12 and remaining 13 support staff.

Our student strength currently exceeds 100, including PhD students, project fellows, and research assistants. This is really the "mind and body; heart and soul" of RGCB (with due acknowledgement to VISA for lifting their slogan)

Can you briefly tell us about the infrastructure and other facilities available at RGCB?

We currently have over 1,50,000 sft of prime laboratory space. The institute has all state-of-the-art equipment for modern biology research including flow cytometers, real time PCRs, MALDI TOF, Protein sequencer and synthesizer, 46 capillary DNA sequencer, electron microscope, confocal microscope, HPLCs, GC-MS, Pulse field gel systems besides all routine molecular biology equipment. The institute also has a start-up animal research facility and transgenic green house. RGCB has an excellent on campus accommodation for its students and a state of the art convention center seating 300.

How closely do you work with the industry and how many products or technologies are seeing commercialization?

RGCB has been the attraction of several industries for the validation and evaluation of their products both from India and abroad. We are in negotiation as to the further development and processing of our unique mouthwash described earlier. Currently several bioactive compounds are undergoing their functional evaluation at various laboratories of RGCB. These include Mediscien (bioactive peptide development and evaluation); Strides-Arco (human growth hormone functional evaluation); and Treeland (monoclonal antibody production).

A major long-term initiative with Hindustan Latex Limited for vaccines and diagnostics is being jointly prepared.

Discussions are on to transfer some of the patented technologies from RGCB for commercial applications.

An incubation facility will be established at RGCB to cater to the needs of biotechnology industries. Infrastructural and technical expertise of RGCB will be made available to both established and small or start-up industries to enable them to become more competitive in the generation of biotechnology based products and process.

How would you rate RGCB on the international scale? BioSpectrum ranked RGCB as India's top biotech institute this year. How different are you compared to other universities or institutes like IISc or JNU in India or globally?

In addition to the vision plans I have answered in the previous questions, I see RGCB as a national research institute with a difference. This is why we are so highly regarded. We have a number of leading advantages that may not still be known to researchers, prospective collaborators, career seeking students, postdoctoral trainees, pharma companies and biotech industry. To put it into a nutshell, RGCB has a vibrant research atmosphere, loyal, dedicated and talented personnel, energetic and excellent infrastructure, efficient corporate culture in R&D administration, encourages industry partnerships, excellent track record in project implementation and obtaining extramural funding, well sought after and comprehensive PhD program in biotechnology, and leadership in contract research, among other things.

Ch.Srinivas Rao