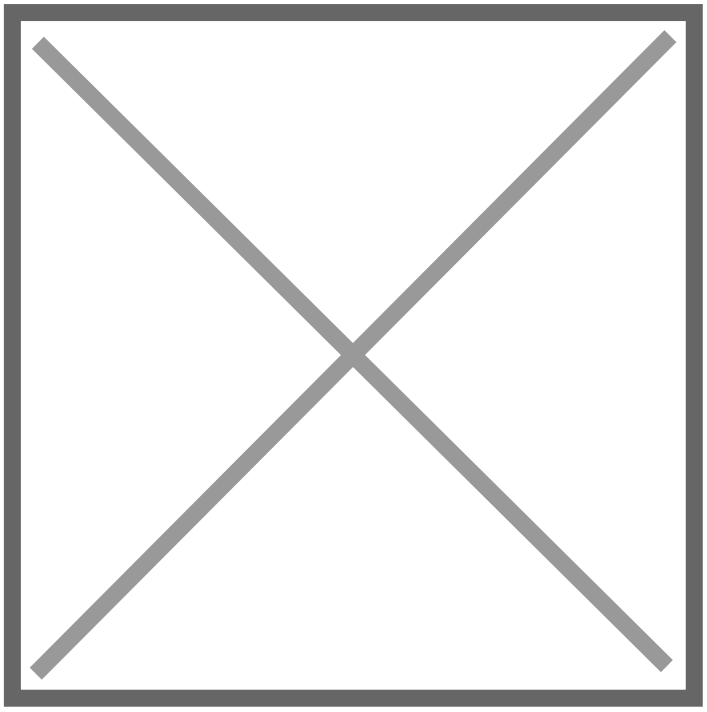
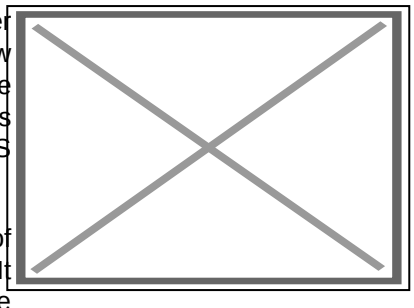
BioSpect
the business of Bi
24 years of leveraging the business of Bio
www.biospectrumindia.co

Small lab, big science

11 August 2003 | News





For instance, there are some complex questions which biologists have been trying answer for decades. And scientists at NCBS have demonstrated successes in studying how proteins fold, how super-families of proteins are organized, how cells move cargo from one place to another, how they signal to each other when they develop normally and in cancers and how the brain reacts to stress and to other less harmful stimuli, informed NCBS director K VijayRaghavan.

Success has come fairly quickly to NCBS which started as the biology research center of the Mumbai-based research giant, Tata Institute of Fundamental Research in 1991. It operated out of TIFR's Bangalore campus till five years ago. On July 1, 1998, the laboratory moved to its own facility located inside the University of Agricultural Sciences campus on the Bangalore-Bellary Road.

In fact, 1999-2001 changed the face of NCBS with an explosion in developmental activities. During this period, NCBS transformed itself from a small compact " all hands on the deck" kind of organization into a large, complex National Center as conceived by the Planning Commission of India.

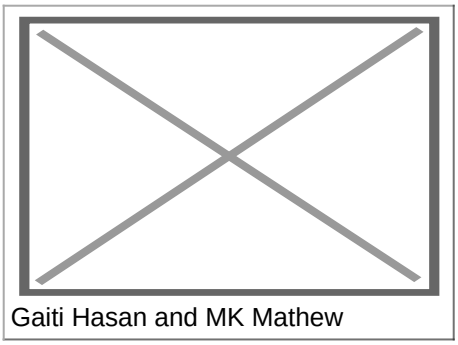
This period saw expansion on all fronts. Grants administered increased four-fold; funds increased by 300 percent. The center moved from a small set up of 1300 sq.m to a large 20-acre complex with a built up space of 15,000 sq. m. Of course, at the global level, NCBS is still small in size and numbers.

NCBS prides itself on the interdisciplinary approach to research with intense interaction between researchers in biological and physical sciences. The four areas of research are: biophysics, biochemistry and bioinformatics; cellular organization and signaling; genetics and development and neurobiology.

Inter-disciplinary approach is a key activity at NCBS.

Plants are subjected to a number of abiotic stresses such as heat, cold, drought, flooding and salinity and a large number of genes are turned on in response to stress. " We are participating in a project to look for qualitative differences in gene expression on exposure to stress. Using a differential screen, we have identified over a dozen candidate genes, including genes encoding LEA proteins which are known to be involved in stress tolerance," said Dr M K Mathew in the biochemistry, biophysics and bioinformatics division.

Scientists are currently sequencing and characterizing the novel genes picked up in this screen. The NCBS team works closely with agriculture scientists in UAS in this work.



Gaiti Hasan and MK Mathew

" If we can understand the system well enough, we can intervene effectively," said Mathew.

The genetics laboratory is one of the few in the world which is working extensively with the Drosophila (fruit fly) to understand the process of signal transduction.

When signals are transmitted beyond a single cell, more complex signal transduction pathways are used. One such pathway is the release of Calcium ions in response to Inositol 1,4,5-trisphosphates (InsP3) generation in the cell. Dr Gaiti Hasan and colleagues are studying these signal pathways extensively .

The bioinformatics division specialized in the computational approach to protein science.

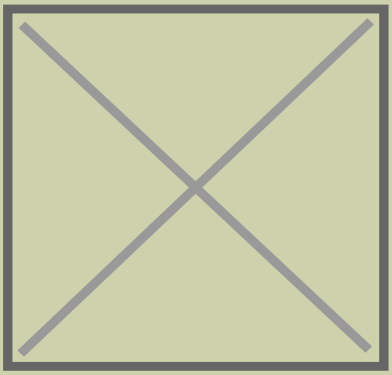
NCBS is a hot house for top end research in the world. Nearly 20 scientists besides conducting their own research guide over 140 students with their research work. NCBS also offers an integrated Ph.D program and this course is highly sought after from students around the country.

NCBS is yet another addition which is helping Bangalore emerge as the "Science Capital" of the country besides being the "Silicon Valley."

N Suresh

" We would like industry to support basic research generously"

Which are the major thrust areas of activity at NCBS?



NCBS Director
K VijayRaghavan

Research at NCBS addresses questions at the forefront of biology as seen from four perspectives. First, we study how DNA and proteins function at the molecular level and we do this using very inter- disciplinary approaches that range from computer science, experimental physics to spectroscopy. Next we study how cells function in health and disease using the tools of high- resolution microscopy. Third, we study the genetics and development of animals, humans included. And finally, we study how the brain develops and processes information.

How do you rate the success of NCBS? Could you give a few examples in which the work is considered to be world class?

Success or the lack of it is best left for history to judge. Insider- views of young organizations are likely to be unduly rosy. That said we do feel very excited about what we are doing. And we do feel that we are world class. We have demonstrated successes in studying how proteins fold, how super- families of proteins are organized, how cells move cargo from one place to another, how they signal to each other when they develop normally and in cancers, and how the brain reacts to stress and to other less-harsh stimuli.

How is NCBS helping the generation, dissemination and preservation of knowledge in the relevant areas of its mandate, both nationally and globally?

We are a small place and intend to remain so. A small place can be effective if it is focused and nimble. We try not to do everything and we try and are excellent in whatever we do. On the other hand, many aspects of modern biology require size and huge resources. We hope that we can balance the contradictors of huge resources and infrastructure on one hand and investigator-driven research on the other. We often try and do this by using our capabilities in collaboration with those of others.

Do you think a right balance has to be found between the requirements of cutting edge research for the sake of knowledge generation and applications which could be taken up by the industry in due course?

We are driven by our research in basic biology, not by an urge to be of value to industry. But, by doing our job, in basic research, well, we will be valuable to industry, much more so than if we try to be like them. So,yes there is a balance to be found. But that balance is a natural consequence of being open to the world around us while doing our job well. It is not a balance between patents and papers as are often portrayed.

What are the expectations of the NCBS community from the biotech industry and funding agencies such as the government in furthering the progress of the biotech sector?

We would like industry to support basic research generously. In particular, if industry invests even modestly in ('no- strings-attached') fellowships for talented students and other researchers, this will have a great impact on the biotech industry. Similarly the government does have attractive grants for collaboration with industry. More of these, even small grants, are needed.

How do you keep the excitement levels constantly high at NCBS?

Most of our academic population is young and will always be so, because students or others mainly populate us on fellowships. The young are excitable, excite others and are excited. We get the best people in the world to visit us. This sets the standards against which we have to perform. All this excitement is therefore not stress- free, but it is the kind of stress