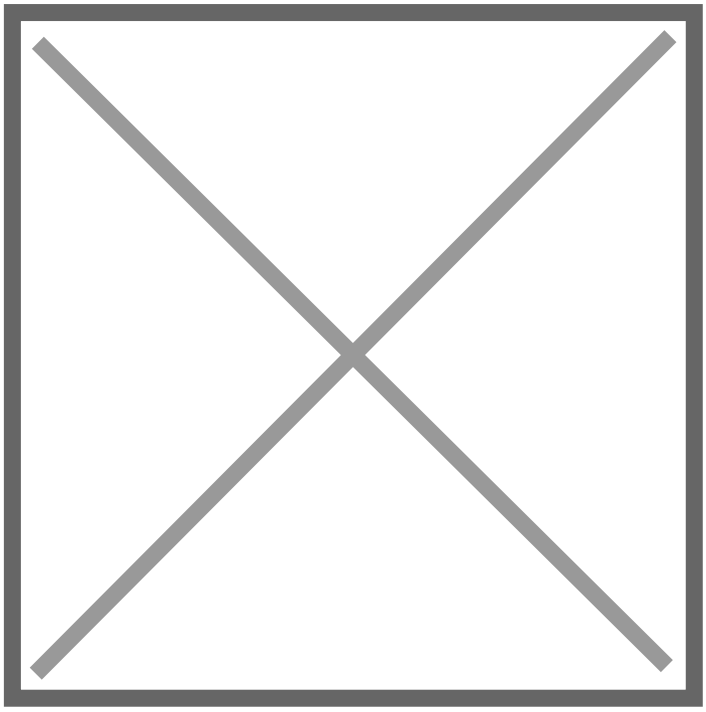
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He gave the Science of Sight a human face

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Lifetime achievement award

Fondly known as Prof. Bala, he has taken his place among the best researchers in India today. Prof. D Balasubramanian's most famous accomplishment was the description of the molecular and cellular approaches to treat diseases of the eye, however, he has another facet that is not so well-known. It is his contribution to popularizing science.

Born in pre-Independent India, this 70-year old incredibly energetic "young man" has over three decades of work behind him—right from chemistry to spectroscopy to biophysical to proteins and true biology he can be labeled as 'the experienced'.

BioSpectrum honors Prof. Balasubramanian, Director, Research, L V Prasad Eye Institute, Hyderabad with Life Time Achievement Award 2009 for his significant fundamental contributions to translational biology through both single scientific discovery and body of work. His contributions, be it in research, leadership, or mentorship, have had a lasting impact on the biochemical research field and, have demonstrated a lifetime commitment to the progress and popularization of modern

biology.

Trained as a biophysical chemist at the doctoral level, Prof. Balasubramanian initially worked on the structure and function of proteins and polypeptides. His early research focused on the spectroscopic analysis of the conformations of these molecules and the thermodynamic analysis of their stability.

It was only in 1984 when he turned his full attention to eye research—to the proteins of the eye, specifically the crystallines of the lens and their role in keeping the eye lens transparent. He showed how photochemical damage to these proteins compromises lenticular transparency and leads to cataract.

More recently, his group has vigorously pursued the field of adult stem cell biology. With the discovery of adult stem cells in the limbus, surrounding the cornea of the eye, they have isolated these stem cells, cultured them on human amniotic membrane to produce transparent, stitchable corneal epithelia. These have been successfully transplanted in over 700 patients.

Early career in science

Born on August 28, 1939 in Tamil Nadu, Prof. Bala completed his SSLC (Grade X) at the age of 13, but during that time, the Indian universities were not admitting students below the age of 15. It was only with the help of his uncle, who was then the principal at Birla College (the person who later created BITS, Pilani), that he could complete his intermediate from Pilani in Rajasthan. His professional career in science started as a lecturer at IIT Kanpur, and from there, he moved on to become the Dean of University of Hyderabad followed by becoming the director of CCMB and finally settling as the director of research at LVPEI in Hyderabad.

Prof. Bala started his life as a chemist. He did his PhD in physical chemistry with a great deal of implications in biology, and in particular, protein chemistry. After completing bio physical chemistry, Prof Bala did post doctoral work in the US on certain aspects of protein structure. He then came back to India in 1967 and joined the chemistry department of IIT Kanpur to teach not only physical chemistry and spectroscopy but also the frontier topics in biology, which was very new at that time. After rendering his selfless service at IIT Kanpur for 10 years, he was later enticed by Dr Gurbaksh Singh, former vice-chancellor of the University of Hyderabad to join the university in 1977. He left IIT and played a significant role along with Dr Gurbaksh Singh in building the University of Hyderabad.

Recalls Prof. Bala, “There were months, week after week, when Dr Gurbaksh Singh and I would take the morning flight to Delhi, arrange for finances, get clearance for equipments and take the evening flight back and, not even eat. That was the kind of dedication we had. And there was the excitement of building a campus on 2,200 acres and to build one building after another.”

Prof. Bala’s actual move from education to research happened only in 1982 when Dr P M Bhargava approached him to join the Center of Cellular and Molecular Biology (CCMB). It was his sincerity that he did not leave the university immediately rather worked for both the institutes for about two years. And once the CCMB became more official, he resigned from the University of Hyderabad to join CCMB.

Shares Dr Bala, “That was a very exciting period as modern biology had just got into India. Molecular biology and cell biology became the new mantra through which you can understand the living functions of different organisms. Immunology had also just got started. So quite a lot of our work in CCMB had to do with the basic understanding and aspects of biology.”

As India opened, its economy to the world in 1992 opening a gateway of opportunities in science and technology, innovation and research, CCMB under his directorship and capabilities in modern biology was all set to take advantage of it.

Introduction to eye research

Prof. Bala’s first encounter with true biotechnology happened only in 1992 when Shantha Biotechnics approached him with a small DNA-based molecule called Hepatitis B antigen to make a vaccine against the disease. Prof Bala played a key role in setting up an incubator for Shantha inside the CCMB, appointed an in-charge for the project.

In appreciation Shantha decided to pay CCMB royalty every year and continues to do so. The center has so far collected half-a-million dollars from the company. This, Prof. Bala believes, was a remarkable collaboration that happened. “Ours was one of the earliest such partnerships,” he claims.

Much of Prof. Bala’s work at CCMB had to do with proteins and lens of the eye. At this time Dr Gulapally Nageshwara Rao

started the non profit and non-government institute called L V Prasad Eye Hospital with funds from the popular film-maker L V Prasad.

Prof. Bala's interest in the study of eye diseases led him to form a connection between the LV Prasad Eye Institute and CCMB in 1987, followed by successfully setting up a lab at the hospital. After working for almost 10 years at CCMB, the enthusiast researcher had fully developed his eye research. His interests towards translational biology forced him to take an early retirement from CCMB in 1998 at the of 58, and join the LV Prasad Eye Institute.

Prof. Bala says, "It was in 1999, we actually saw that the eye has a kind of cells that we now know as stem cells. And if you take them from the eye you can culture them in the laboratory to produce the corneal sheet. We realized that we can possibly do something using this technology for people with damaged eyes. We made this possible at L V Prasad Eye Institute with Dr Sanghwan and Prof Geetha. We got our first funding for this remarkably new technology in 1999 from DBT."

Popularizing science

Unlike other researchers, this science child believes in popularizing science and making it accessible to as many people as possible. He has been promoting modern biology and adult stem cell technology in India and worldwide.

"If the philosophy of science wants to pass along its views adequately to the public, it is important that the latter have a basic general understanding of science. Only in this way, popularization of science can be meaningful from a philosophical and educational point of view. Scientists have to take the responsibility and be honest in their efforts, both toward science as well as the public," believes Prof. Bala.

This academician turned researcher is also a columnist, and has over 170 scientific publications in leading journals.

Recipient of several national and international awards including the Padma Shri and Chevalier de l'Ordre National de Merite, a national honor given by the French president, Prof. Bala is also the president of the Indian Academy of Sciences. His philosophy is to be the first one to do it and if not, then be the first one to propagate it.

Happily married to Shakti, a former television producer, the couple is blessed with two daughters Katyayani and Akhila. Katyayani is a research analyst, and Akhila works with Amgen in the US.

Industry Speak

Dr Balasubramanian is known to me for the last 25 years since 1994. I personally owe a great deal to him for accommodating our Shantha Bio-Scientific team of nine to work in CCMB labs for almost one year until our own facilities came up in 1995. His acceptance of a start-up company like ours to work in such a prestigious institute is an example of his great vision and keen interest in promoting the first Bio-pharma venture in India. The much needed scientific ambience to our scientists' team was provided through his kind gesture to work in CCMB as our incubation centre. Hence, Shantha and its entire team along with me would be ever grateful to his initial help.

Apart from his science capabilities (I am not a scientist and hence cannot talk much about it), I realized that he has great bent of mind on literature and music that is what has brought me close to him. His many articles on science are like sweet poems. I still remember that in one of his articles in The Hindu, he made a mention of Shantha's Hepatitis-B vaccine which was being supplied to Pakistan, he coined a beautiful phrase "Our vaccine is a missile of Peace". His interest in science application has made him to join L V Prasad Institute to address the avoidable blindness of many in the country. He is a man with great scientific temper and he has science with human face. He also has the ability to express the science poetically. I close this small note with a sense of great gratitude to him for his help in the initial days of Shantha.
—Varaprasad Reddy, MD, Shantha Biotechnics

He was one of the first two senior scientists that I had employed when I had agreed to set up the Center for Cellular and Molecular Biology in the late 1970s. Dr Balasubramanian is a very good scientist and an excellent communicator. He has certainly made significant contributions to molecular biophysics. One of these contributions that I remember was on understanding the mechanism of development of resistance to chloroquine, the anti-malarial drug. This work, if I recall, was published in Science.
—Dr Pushpa M Bhargava, Supreme Court observer to GEAC

Jahanara Parveen in Hyderabad