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Pursuit of excellence in cancer research

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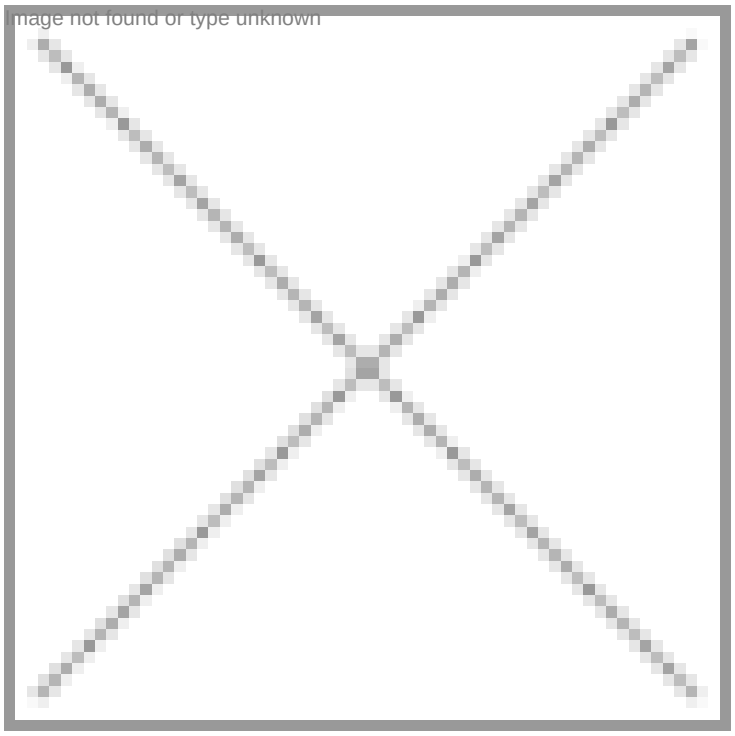

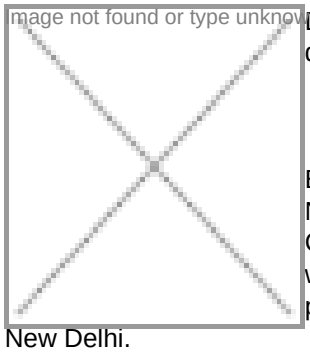

Dr Manu Jaggi has spent over 20 years in cancer drug discovery and preclinical drug development. He has been instrumental in developing a novel nanoparticle-based drug delivery

Back in the days, Dr Jaggi spent his formative years developing a novel drug delivery system at New Delhi-based Institute of Nuclear Medicine (INMAS) and Institute of Genomics and Integrated Center for Biotechnology (earlier called as the Center for Biochemical Technology (CBT)) where he worked as a research scholar working on Cancer treatments. He gained his masters degree in pharmacy from the Delhi University and started working for National Institute of Immunology (NII), New Delhi.

AT NII, he got an opportunity to learn and understand cell biology and molecular mechanisms underlying cancer, which is one of the most dreaded diseases. During his doctorate, he proposed and validated a hypothesis that neuropeptides work as growth factors in adenocarcinomas, which is now a widely accepted finding. His professional education in pharmaceutics helped in the development of a peptide-based anti-cancer drug, DRF 7295, which went through a long journey and successfully completed phase II clinical development.

Research initiatives

After joining DRF in 1994 as a senior research scientist, he set up a state-of-art anti-cancer laboratory and started drug discovery and development in oncology. His team developed and standardized a panel of in vitro and in vivo screening assays for cancer and specialized in hit identification and pre-IND candidate selection. In 1998, they started working on a novel nanotechnology-based delivery system and made a significant contribution in the early and late preclinical development

of a nanoparticle based drug called Nanoxel, which was launched in India in January 2007. Nanoxel is a first polymeric nanoparticle-based drug delivery system in the world. Further in this direction, his team has co-developed six to eight anti-cancer leads belonging to peptide, small organic synthetic molecules and phytochemical class of molecules.

DRF turned into a full-fledged contract research organization (CRO) and started offering services in preclinical domain. â€œWe differentiated ourselves from other CROs by providing customized high-end services in cell biology and pharmacology besides the complete collection of toxicology ADME-PK, and analytical services.â€? The experienced preclinical team that had developed its own pipeline in the past quickly adapted to this new business model.

Innovation front

Dr Jaggi believes that the vision of Dr Anand C Burman, chairman of DRF, and his relentless pursuit of excellence in cancer research is responsible for the movement of the company to the position of a leading oncology company in India. He says, â€œIn 2008, Dr Burman once again saw the unmet need in preclinical outsourcing and focused the efforts of DRF in that direction.â€?

On talent, Dr Jaggi says, â€œIt was the free hand given by Ajay K Vij, CEO of Althea Lifesciences, the contract researcharm of DRF, who has always encouraged talent pool. We set up an innovation research team, which has the mandate to develop novel and unique models required to complete the preclinical development of specific molecules in the pipeline of our clients. This has enabled us to have large multinationals clients from all parts of the world.â€?

Currently as the Director of Dabur Research Foundation, Dr Jaggi leads a team of about 40 scientists and is backed by Dr Anu T Singh who leads the preclinical R&D team. While appreciating her efforts he says, â€œDr Singh and her team developed several cell biology-based efficacy models for several diseases. These offer value to companies that are looking for a proof of concept evaluation of their compounds to enable critical go/no go decisions in a cost-effective fashion.â€?

Fully content with his research achievements, Dr Jaggi says, â€œMy research journey starting from the National Institute of Immunology to Dabur Research Foundation, where I presently work has been professionally very satisfying and fulfilling.â€?

Life and family

A workaholic that he is, Dr Jaggi is a family man. â€œMy weekends are completely for my family. I love traveling and make it a point to go for a short vacation with my family at least twice a year. I love collecting souvenirs from all over the world and also keep a close watch on new gadgets that help me stay organized and in tune with the times and I usually don't wait too long before buying them.â€?

Dr Jaggi belongs to a family of doctors and researchers and lives in a joint-family setup with his parents, brother and their families. While talking about his family, he says, â€œThis has worked beautifully for us as it provides a sense of security without compromising on the independence. Right from my childhood scientific discussions were encouraged at home. While my father and brother are both renowned doctors, my wife is a teacher. I have a daughter studying in class XI.â€?

Feeling indebted to his father Prof. (Dr) OP Jaggi for his encouragement, he also remembers the role of Prof. DS Kothari, Prof. GP Talwar and Prof. TAV. Subramaniam; whom he considers his mentors and guides in encouraging him in his formative years as a scientist.

More on Dr Manu Jaggi

? Dr Jaggi holds a doctorate in cancer biology from the National Institute of Immunology, New Delhi, and is a post-graduate in pharmaceutical sciences (Gold Medalist).
? He holds the position of Director of R&D at Dabur Research Foundation (DRF) since 2008. Previously he was the head of preclinical research at DRF. He set up a state-of-art anti-cancer laboratory in 1994 at DRF.
? He has developed and standardized a panel of in vitro and in vivo screening assays for cancer and specializes in hit identification to pre-IND candidate selection. He has proposed and validated a hypothesis that neuropeptides work as growth factors in adenocarcinomas, which is now a widely accepted finding.
? He has been fairly active in patenting and publishing his work. He holds 27 US patents, more than 70 in rest of the world and even more in India. He has also published and presented more than 60 research papers in peer-reviewed journals.
? At DRF, Dr Jaggi has trained more than 200 biotechnology post-graduates students in modern techniques of drug discovery and has also guided several PhD students. He holds memberships in several scientific committees and has attended and presented at many international and Indian conferences and meetings.

INTERVIEW

â€œIn targeted therapeutics lies the future of cancer treatmentâ€?

- **Dr Manu Jaggi,** director, DRF, Uttar Pradesh

In an interview with BioSpectrum, Dr Manu Jaggi speaks about the cancer research, challenges before biotech industry and host of other issues

Q What are your views on the latest trends in cancer research?

Recent years have witnessed new discoveries on diverse molecular and biological changes underlying cancer development and progression. These insights are changing our understanding of the complex pathways that regulate cancer cell biology, the interactions of tumors with their microenvironment, and the mechanisms that normally restrain tumorigenesis. Importantly, researchers today are translating these findings into novel approaches towards cancer diagnosis, prognosis and therapies.

In my opinion, the future of cancer treatment lies in the targeted therapeutics. This approach uses genetically engineered cell lines and organisms that help to locate and attack defective molecules. Using gene knockdowns, signal transduction knowledge, and more, today's researchers are working towards treatment modalities that fight cancer. As a result, I strongly believe that targeted therapeutics is undergoing development at a fast pace.

The next decade will bring a continued focus on access to new cancer therapeutics in countries with aging populations such as the US, Europe and Japan, as well as in countries with emerging economies such as India and China. The pharmaceutical and biotechnology industries are dedicating resources for developing innovative treatments, but more assistance by government is needed to get products to market in a timely fashion.

In terms of research activities of Dabur Research Foundation, for many years our focus has been towards understanding the mechanism that turns a normal cell into a cancerous cell. We have developed unique cell signaling strategies that enables us to screen potential anti-cancer molecules against specific targets. The 'Cell MAP' (Mechanism of Action Profiling) technology platform developed by DRF profiles novel molecules as well as modified formulations of anti-cancer drugs for their putative mechanism of action in target cancers. The combination of drug uptake studies and signal transduction approaches elucidate the underlying mechanism of action of the candidate molecules. In vitro and in vivo assessment of effects on neovascularization and programmed cell death are also investigated to critically assess the anti-cancer potential of the molecules under investigation. The strategies encompassing Cell MAP are adaptable to molecules for other therapeutic areas as well.

Apart from that, to the best of my knowledge, we are the first to develop a battery of models that enable identification of molecules with potential chemotherapy induced toxicities. The SAFETY (Screens Available for Frequently Encountered Toxicities) screen developed at DRF is designed specifically to monitor clinical toxicities frequently seen with cytotoxics in the clinical practice. The screen investigates toxicities that are typically not detected in conventional safety assessment strategies. The SAFETY screen includes preclinical models for assessment of cardiotoxicity, gastrointestinal toxicity, alopecia, neutropenia and peripheral neuropathy.

Q What are the challenges faced by the biotech sector in India?

India, today, holds a small share of the global biotech market, but it has all the capabilities to become a dominant player. India has the strength and capabilities in this industry, and a definite advantage to forge ahead and become the chosen location for many biotech companies looking for large markets and low cost qualified manpower. With numerous comparative advantages in terms of R&D facilities, knowledge, skills, and cost effectiveness, the biotechnology industry in India has immense potential to emerge as a global key player.

Further, India provides an ideal setting for manufacturing activities and high-level biotechnology research programs. With the initiatives taken by the government, Indian biotechnology is poised for a tremendous growth.

While the key challenges faced by the industry are the social and environmental implications. Biotechnology has certainly opened several effective approaches to disease treatment and enhanced the prospect of further advances in treatment for the benefit of patients. However, these advantages have come at a price, and biopharmaceuticals, partly due to their complex manufacturing and handling, are comparatively costly. The cost-effectiveness of the products and offering them at an affordable cost to patients remains a major challenge for the industry. The other challenge before the government is to change the general perception among common man that all biotech products pose an environmental risk to the population. I believe that well-designed preclinical studies addressing the efficacy and safety of the biotech products will certainly aid in bringing novel biotechnology-based products to the market

Q What are the future prospects of the biotech sector?

Biotechnology will help to develop a large number of genetically improved plant varieties in India. There has already been a

spurt of activities in this direction. The development of molecular biology will extend the scope of diagnostic kits and vaccines for major diseases and thereby makes health care system more efficient and cheaper. Genetic counseling clinics, molecular probes, and fingerprinting techniques will all be used in due course to solve the genetic disorders in people. The establishment of ex situ gene banks to conserve valuable germplasm and diversity, and a large number of repositories, referral centers for animals, plants, and microorganisms should be given a priority. Information technology, where India is already a leader, together with biotechnology is likely to become a major economic force. To achieve the goal of self-reliance in this field, India requires a strong educational and scientific base.

Rahul Koul in New Delhi