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Model to screen toxicity

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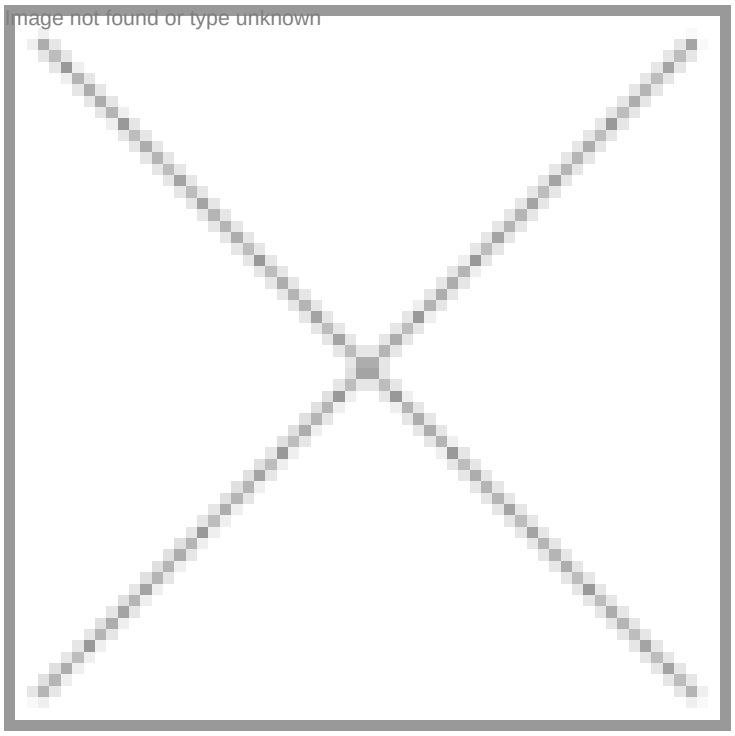
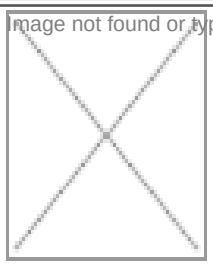
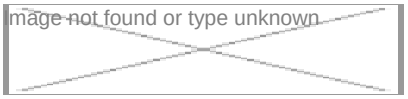




Dr Kalyanasundaram Subramanian, CSO, Strand Life Sciences



The current trend in the life sciences industry of using innovative approaches to solve existing problems is a refreshing one and a pioneering leader in this field has been Strand Life Sciences. Leading the research and development at Strand is its chief scientific officer, Dr Kalyanasundaram Subramanian.

In 2005, Dr Subramanian or Kas, as he is popularly known, moved back to India, after working at Entelos, a US-based life sciences company, where he headed the group for inflammation and immunology and joined Strand Life Sciences, then known as Strand Genomics. At Entelos, he helped build models of disease pathology and physiology, such as rheumatoid arthritis and HIV.

Dr Kas, a graduate in chemical engineering from IIT Bombay, followed by a masters degree from State University of New York College at Buffalo, pursued his PhD in biomedical engineering from Johns Hopkins University. Post his PhD, Dr Kas took up the position of senior scientist at Genetic Therapy (Novartis) where he helped set up a group to perform research in

synthetic and hybrid vectors for gene delivery.

At Strand, Dr Kas has been involved in the design of structure activity relationship (SAR) models. Besides that, he is closely associated with a project on virtual liver for the last six years. Elaborating on his association with this model, Dr Kas explains, “One of the major challenges with pharma companies is how to make drugs safe. The most common form of toxicity is liver toxicity. Around one in five compounds fail in clinical trials due to toxicity. We have been using a systems approach towards solving this problem. The first phase consisted of building a model that could reproduce the normal physiology of the liver correctly. Once this was done the normal physiology was then altered to mirror a diseased state through literature validation.”

In the next phase, a set of specific assays involving parameters of liver physiology, were designed, which when combined with the model could trace the evolution of the disease and elucidate the mechanism involved.

This model has been validated through blinded trials by using drugs, which are known to cause liver toxicity. Dr Kas hopes to offer this groundbreaking technology to pharma companies, which may save millions of dollars before clinical trials as it helps to screen out those drugs that will cause toxicity. An additional advantage is that this approach will help reduce the use of animals for testing and hence further drop costs. The current model is a rat liver and now that it has been fully developed Dr Kas hopes to further replicate this system for a human or dog liver.

Another project that Dr Kas is closely involved with, which is still in its infancy, is finding the molecular basis of cancer. In collaboration with Kidwai Memorial Institute of Oncology, Indian Institute of Science (IISc), Bangalore, the team at Strand has profiled more than 100 breast cancer patients molecularly and used that information to address many questions about cancer.

Using this information, Dr Kas aims to help doctors design effective and personalized therapies for a group of patients showing similar characteristics on the molecular level. He explains, “We are trying to find out what makes one person’s cancer different from the other person’s cancer and how it can be treated differently. The goal is to personalize the treatment to minimize the side effects and, also, try to develop cheap diagnostics to detect these molecular differences. We hope to get at least one or two diagnostics out in the market costing around $500, which will help design better therapies in the next five years.”

This project is going to be one of the major thrust areas for years to come with collaborations with St Johns Hospital, Bangalore and Mazumdar-Shaw Cancer Hospital, Bangalore.