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Antidote for autoimmune diseases

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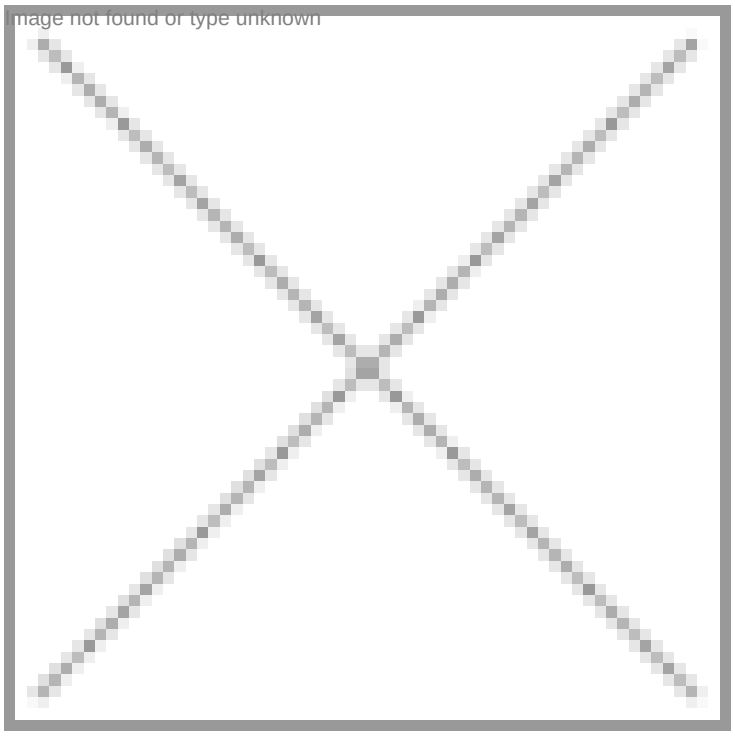

The funding from Department of Biotechnology has enabled the Bangalore-based Bhat Biotech to pursue its joint project to create humanized antibodies in coordination with Manipal Life Sciences Centre

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ailure of an organism to recognize its own constituent parts as self, which allows an immune response against its own cells and tissues. Any disease that results from such an abnormal immune response is termed an autoimmune disease. Autoimmune responses cau-sed due to numerous factors, lead to a spectrum of ailments in the body. To tackle the same, the monoclonal antibodies in form of *Tocilizumab* or *Atlizumab*, developed by Hoffmann La Roche and Chugai Pharma, is sold under the trade name Actemra and RoActemra. These antibodies alleviate symptoms of rheumatic arthritis, sclerosis, psoriasis and other autoimmune diseases. It is also important to note that the initial patents for the antibodies, even after extension are due to expire.

With an aim to create better alternatives to treat patients, Bhat Biotech, Bangalore initiated a project in early May, 2012 on expression of humanized antibodies against soluble Interleukin-6 receptor (sIL-6R) and soluble gp130 (sgp130) in bacterial and animal cell lines. The project also involved Manipal Life Science Centre, Manipal University as a partner and received funding from Biotechnology Industry Partnership Program (BIPP) of the DBT. While BIPP contribute 86 lakh to the project, the company's contribution stood at 91.32 lakh. The funding has proved to be useful for the company in terms of buying new and necessary equipment. The company obtained only a low-interest loan whereas Manipal Life sciences received a grant of 147 lakh and thus has benefited them as well.

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According to the company, the basic objective is to express sIL-6R in CHO cells and then to make mouse

monoclonal antibodies for them. Both *invivo* and *invitro* tests (mouse arthritic models) will be used to evaluate the antibodies. Humanized antibodies will be designed based on the data obtained from the mouse monoclonals. Currently, the company is in the process of expressing the sIL-6R and sgp130. Both the partners intend to collaborate on every aspect of the work, complimenting and synergizing their research efforts.

Explaining the research logic, Dr Shama Bhat, managing director, Bhat Biotech says, â€œSoluble IL-6R is released from some cells and binds to Interleukin 6. The two then move together in the blood and bind to cells containing another receptor for Interleukin 6 called sgp130. Once binding occurs, there happens the phosphroylaton of sgp130 and a cascade of phosphorylations of a protein kinase of the Janus Kinase (JAK) pathway. Eventually a transcription factor is activated. This is the STAT, which activates a number of genes that include metalloproteases involved in inflammation and arthritis.â€?

Way forward

Once humanized antibodies have been made, extensive toxicity and efficacy testing will be required as per standards. After that, the antibody may be taken for phase I clinical trials. The success of the project can surely benefit millions of patients with better treatment alternative.

On the role of PPPs, Dr Bhat feels that the things are going in the right direction. He remarked, â€œThis is the precise way to go. We feel that the company should also receive grants as with the SIBRI funding. Some basic research advancements made will increase the repertoire of products that can be developed, evaluated and commercialized.â€?

Rahul Koul