



## **Editorial**

### **Protein-Based Drugs in Perspective**

Since the commercial introduction of insulin in 1923, thyroid hormone in 1934, factor VIII in 1948, and calcitonin in 1970, plenty of new proteins have been firmly established as therapeutic agents. Currently there is great interest in production of the protein-based drugs which are used for both preventative and therapeutic purposes. Generally, the pharmaceutical proteins perform the same function as naturally-occurring proteins in body. Traditionally animal and plant sources have been used to obtain protein-based drugs which are indeed expensive and available in the limited supply. For instance, the human growth hormone was taken from human corpses and insulin required to treat diabetes was collected from slaughtered pigs, cows and other animals. Nowadays, the use of recombinant DNA (rDNA) technology has enabled the production of large quantities of protein drugs as cost-efficient sources. The cloned genes are then genetically engineered into microorganisms or animals to produce the protein of interest. Production of protein-based drugs in rDNA technology can be achieved through the transgenic animals (pharming), microorganisms or through hybridomas. Of the more than 200 pharmaceutical proteins which have been investigated to date, more than half are undergoing research and development, about 100 are in clinical trials, and a dozen or so have already been marketed. The most important indications for them are cardiovascular disorders, tumors, autoimmune diseases, and infections. Overall, the protein-based drugs have found significant therapeutic potential, various clinical applications and growing market worldwide. On the other hand, several research centers/institutes in the field of life sciences have been established in our universities during the past decade. Now, these research centers and institutes could be pioneer for acquiring the big responsibility in different stages of production and commercialization of many protein-based drugs.

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