Editorial

Biotechnology, powerful tools for research and development

The concept of biotechnology has been in the human mind since very ancient times, when the first human beings discovered the production of wine by fermenting fruit juices, the brewing beer industry, and the conversion of milk into cheese or yogurt. However, as these basic processes have going through a wide range of developments to supply specific requirements, biotechnology has evolved and some of its most dramatic advances were observed during in the last 30-years. Modern biotechnology begins with the ability to transfer a specific gene from one organism to another by using a set of genetic engineering techniques, thus recombinant DNA technology sparked an era o biotech revolution. This major achievement, together with the maintenance and growth of genetically uniform plant-and animal cell cultures increased dramatically the spectrum of biotechnology's applications in disease prevention, treatment and quality of life.

Biotechnology, through the exploration of several unicellular and multicellular genomes, the genes and the proteins they encode, has made outstanding advances and contributions to human and animal medicine. Biotechnology has been motivated by the need to pay for new medical treatments, and fueled by a wide range of technologies, which drives science, included gene amplification (PCR) and rapid genetic sequencing, protein engineering and analysis (Gas chromatography-mass spectroscopy, GCMS, Liquid chromatography-mass spectrometry, LCMS), real-time gene expression analysis, fermentation and monoclonal antibody technology, and very important, high-speed computing. The development of transgenic animal models together with several recombinant proteins lead to a better understanding of the biochemical pathways in many diseases and the development of specific enzyme and protein inhibitors. As today, the most successful and promising uses of biotechnology so far are the production of protein therapeutics (biologics), like cytokines, hormones, and enzymes, humanized monoclonal antibodies; genetically modified (GM) plants; medical diagnostic kits and by the use of crystallography and systems biology, a structure-based drug design. It is believed that future developments in biotechnology, particularly identifying specific and/or inherent differences in the individual genotype, will establish the area of a personalized medicine.

Since many biotechnology companies born in laboratories at universities in the United States during the 1980's and 1990's the industry is mainly restricted to developed countries. Colombia and other developing countries have been forced to use the products of the industry with very low if any contribution in research and development. This has been in part to the fast evolving rate of these technologies, making difficult to access, maintain and develop it, in addition to the social structure and political principles of major's investment in national defense than education and science. Since there still many possibilities ahead to explore and contribute in human and animal health, agriculture and food technology, it is worth to mention the need for cooperation and integration, to properly use our limited economic resources. I would like to invite and encourage the readers of this journal to initiate and to make academic contributions in the field of biotechnology.

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