



Equipment used in the waste-water purification process (waste produced by cheese production and washing water).
(Coopérative agro-alimentaire Agropur)

In the last few years, more discoveries have been made and new applications have been developed. At present, Canadian biotechnology researchers work mainly in such key sectors as health, the agri-food and forestry industries, the control of environmental pollution and mining.

The National Research Council (NRCC), which is Canada's national laboratory, fulfils its mandate to promote the development of expertise in biotechnology and help industry carry out commercially promising research activities through the National Biotechnology Program. In order to do this, the NRCC takes advantage of its high-level network of laboratories that includes the Biotechnology Research Institute in Montreal, the Plant Biotechnology Institute in Saskatoon and the Biological Sciences Branch in Ottawa.

This network is continually growing and encompasses a large number of Canadian universities and private-sector companies seriously committed to biotechnology. From coast to coast numerous Canadian companies that are deeply involved in research and development (R&D) efforts in biotechnology are beginning to thrive as a result.

It is expected that the biotechnology market will be worth some 60 billion dollars by the year 2000.¹ Though not a world leader, Canada is now starting to claim a share of this promising market. Relying on creative individuals, as well as sophisticated equipment and cutting-edge expertise, Canada aims to capture a position in the forefront of research in biotechnology, and to take advantage of the innumerable possibilities offered by this new and powerful technology.

One area of particular interest is the development of vaccines. Taking into account the fact that five million people throughout the world die each year of diseases for which there are still no vaccines — diseases such as malaria, viral diarrhoea and such STDs as acquired immunodeficiency syndrome (AIDS) — the major disadvantage of vaccines is that they contain whole micro-organisms.

Researchers, therefore, are struggling to develop a new generation of vaccines based on the knowledge acquired in the field of immunology combined with such advanced techniques as genetic engineering. Unlike traditional vaccines, these new vaccines do not contain pathogenic agents that have been killed or inactivated, or any traces of such agents. They consist solely of elements that provoke an immune response, namely the micro-organisms and are known as subunit vaccines. The key to production of these new vaccines is the identification of antigens that can lead to the secretion of protective antibodies. However, such identification is the most difficult stage in the process.

1. Roger Miller, *The Strategic Management of Biotechnology R&D for the Successful Industrialization of Biotechnology*. Second Industrial Biotechnology Conference, NRCC, 4 and 5 December 1986.