



Fermenter used in the production of vaccines.

(Connaught Laboratories Ltd.)

In Canada, Connaught Laboratories, a firm engaged in developing, manufacturing and marketing vaccines, has focused on the development of a new type of vaccines created using genetic engineering and peptide synthesis techniques. The company is considered a world leader in the production of human vaccines. In 1987, it sold over 350 million doses of various types.

Connaught Laboratories is also involved in the development of the new so-called biosynthetic vaccines for diseases such as whooping cough, hepatitis B, influenza and AIDS.

The Institut Armand-Frappier is another firm dedicated to vaccine research. It has recently marketed its own vaccine against hepatitis B (Engérix-B), and its researchers are also developing a vaccine against whooping cough.

At the forefront of advanced research, Connaught is also interested in the production of synthetic vaccines, the ultimate in immunization. These vaccines are made from very small fragments of protective proteins that have the power to induce the formation of antibodies. These small molecules, known as peptides, can be easily synthesized in the laboratory, and make possible very powerful and safe vaccines.

In 1988, Connaught Laboratories, in collaboration with Finnish researchers, obtained from a peptide a vaccine against meningitis far more effective than the existing one. Other synthetic vaccines against diphtheria, streptococcal infections and rabies are also being developed.

### Protein engineering and peptide synthesis: The last word

The development of recombinant DNA and monoclonal antibody technology has paved the way for the commercial production of new or replacement drugs prepared using proteins and peptides.

Protein engineering makes it possible to act directly at the level of DNA coding to change the protein sequence and create proteins with different properties. For this reason, researchers are seeking molecules that are more stable, active and easy to purify; that are more or less immunogenic, depending upon the needs; and that have new specificities.

Peptide synthesis is another technique that uses proteins as raw materials. Peptides are, in fact, small fragments of proteins that are naturally found in all living organisms. Numerous companies are already very active in this area of advanced biotechnology.

A company working in the forefront of this sector, Synthetic Peptides Inc. of Edmonton, Alberta, is developing peptides for pharmaceutical and diagnostic applications, as well as for the manufacture of synthetic vaccines. The firm has also developed two computer programs (Surfaceplot and HPLC 1) that facilitate the design of biologically active proteins and peptides.

IAF Biochem International Inc. of Montreal, Quebec, a research-oriented company, is involved in the development and manufac-