of destroying cancerous cells without affecting healthy ones. However, this technique is still at the developmental stage.

At the end of 1987, monoclonal antibodies were used for the first time for therapeutic purposes in organ transplant cases. The Ortho Pharmaceutical firm of Don Mills, Ontario, marketed OKT 3, or "Orthoclone," for the treatment of acute rejection of kidney transplants. This special drug makes it possible to neutralize the lymphocyte T cells — those responsible for the organ rejection — in the immune system of the transplant patient. OKT 3 makes it possible to reduce the doses of immunosuppressing drugs, and thus reduce some of the secondary effects that can be disastrous over the long term. To date, more than 30 000 patients worldwide have been treated with the drug.

The hybridoma cells that produce OKT 3 monoclonal antibodies are grown in large quantities in tissue culture flasks.
(Ortho Pharmaceutical (Canada) Ltd.)

A new generation of vaccines

Vaccination is one of the most effective tools of modern medicine. Specifically, vaccination has made it possible to eradicate smallpox and control outbreaks of diphtheria and tetanus in countries where prevention is systematic.

However, at present, traditional vaccines have serious limits in terms of effectiveness, safety and cost of production. Without 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 fraction of such agents. They consist solely of elements that provoke an immune response, namely the microbe antigens, and are known as sub-unit vaccines. The key to production of these new vaccines is the identification of antigens that can lead to the secretion of protecting antibodies. However, such identification is the most difficult stage in the process.