



# Life Sciences and Biotechnology at the Crossroads

■ **In global perspective, the life sciences and biotechnology are moving forward at a fast pace. In a competitive situation, no one is asking who wants to join the race. Choices must be made: will we in Europe retain and, better still, improve our international position, or will we fall hopelessly behind? Finland is part of Europe, and decisions made at the level of the European Union will strongly determine the future of the Finnish bioindustry.**

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Europe has recently awakened to the realization that countries in some other parts of the world are widening their lead in the application of biotechnology. Even though there are more biotech companies in Europe than in the United States, companies on the other side of the ocean are larger, more people are employed and the number of products is greater. In autumn 2001 and early 2002, the European Commission formulated a strategy by means of which Europe might catch up with the United States and continue a strong player on the international stage. The proposed strategy will be considered in appropriate bodies of the Member States during 2002.

Finland has responded positively to the Commission's proposal. It is widely appreciated, among decision-makers and public officials as well, that the considerable investments of past years will not deliver results unless advanced knowledge and

know-how are effectively translated into commercial applications. The involved part of Finnish industry is also reacting positively to the Union's decision actively to promote the life sciences and biotechnology. It is important that Europe chooses a path in which technology, research and know-how are exploited and investments are expanded in a responsible manner, in accordance with European ethical values and societal goals. Otherwise, the lead enjoyed by other countries will become so great that catching up becomes impossible.

## **National, goal-directed investment pays off**

Many of the Commission's proposals have already been acted upon in Finland. For example, investments aimed at increasing knowledge and raising the levels of research and know-how in the life sciences

and biotechnology have been made for 20 years now. The foundation for development was created in the 1980s, when the Academy of Finland targetted investments to basic research in the field, while Tekes (National Technology Agency) and Sitra (Finnish National Fund for Research and Development) supported applied research. Nor should the investments, at that time, of the Finnish companies Orion and Cultor be forgotten.

More recently, Tekes and Sitra have developed effective measures for improving the commercial prospects of start-up companies. Finnish companies have also participated actively in EU research programmes.

The high levels of knowledge, research and know-how in Finland, together with a sound infrastructure, have created a favourable climate for the development of entrepreneurial activity. It continues to be the case that most new companies are established to carry forward research and innovations that originated in universities and institutes of technology. Companies tend to be clustered around five biotech centres, located in the Helsinki area, Turku, Tampere, Kuopio and Oulu.

### **Finland measures up well in European comparison**

In size, the biotech sector in Finland is solidly in sixth place in Europe. Ahead of it are Great Britain, Germany, France, the Netherlands and Sweden. About 10 per cent of all European biotechnology companies are Finnish. We cannot succeed alone, however, but we need the support of a common EU strategy and effective Community measures. In this sense, Finland is an integral part of Europe. Markets and the means for financing enterprises are international. Community legislation is adapted in Finland, and Finnish researchers actively participate in Community research programmes.

There are currently over 120 biotech companies in Finland. Of these, 75% were established in the 1990s, and new companies continue to appear. More than half of the companies operate in the health sector, carrying out research and developing or manufacturing drugs, diagnostics, biomaterials or functional food. Finnish enzyme manufacturers have already staked a position in the international market. A few companies are engaged in plant biotechnology. Production in the food industry profits widely from biotechnology. And it is considered that, in the long run (10 to 20 years), the chemical industry, too, will benefit substantially from the environmentally benign solutions offered by biotechnology.

Finnish bio companies tend to focus on research. By no means all product development reaches the product stage, and some companies even have no intention of moving into production. The legal protection of innovations is thus essential.

Finding viable applications in biotechnology demands long research and development cycles and huge investments. Opera-

tions become economically profitable only after many years. Unusual patience is thus required on the part of funding bodies.

### **Growth in an ethical context**

In the view of many, the bio industry will flourish in Finland and Europe in response to the establishment of favourable conditions. And employment will increase as a result. Growth depends, however, on a highly educated workforce – not only upon graduates in the life sciences and biotechnology but personnel skilled at various levels in chemistry, computer engineering and process technology. Nor should the growing need for business and marketing skills and for lawyers competent in intellectual property rights be forgotten. The strategic vision formulated by the European Commission takes note of these requirements.

The need for improved competitiveness, and particularly the rapid pace of development of biotechnology, pose a great challenge to legislators as well. Unfortunately, it is in no way possible to keep legislation up to date when developments and new applications cannot even be predicted within a five-year period. The best possible result will be achieved, however, if systems are kept flexible enough – for the writing of new legislation and replacement of the old.

Peculiar to Europe are ethical assessment and the inclusion of the precautionary principle in decision making. Questions of predictability are immediately raised, however, as no practical experience yet exists. At the moment, the precautionary principle has not been defined, and there is no model for its application. Once the rules of the game have been spelled out, the principle can be applied in a manner satisfactory to all involved, with prediction of the risks that need to be addressed. Also, the ethical assessment will be credible when done in a professional manner, without injection of subjective opinion.

The starting point for all sustainable commercial activity is action consistent with ethical values and existing legislation. For its part, a well-functioning system depends upon close cooperation and effective communication among researchers, public officials and entrepreneurs. The Commission proposal underlines the value of open discussion of biotechnology by all parties, including the public. Finnish industry is eager to take up this challenge. ▲