

Biotechnology
International Trends And Perspectives

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Recent Commercial Development

Over past 5 years some hundreds of new companies formed in USA, Europe and Japan to exploit new biotechnology or genetic engineering developments. Rates of development slackened in 1982- some US companies failed and a number shed staff. However, some novel products were marketed. Two principle factors appeared to operate-over-optimism with respect to time scale for commercialisation and the costs involved. Failure to appreciate the essential roles of fermentation technologists and biochemical engineers in the exploitation of the capabilities of genetically-engineered organisms. Also, in some cases, inadequate identification of market opportunities and requirements.

Countries entering biotechnology field later have good opportunity to avoid making these mistakes.

Governmental Interventions

Governments in all industrial Countries have been quick to perceive possible benefits from rapid and extensive developments of biotechnology or genetic engineering processes. See: OECD Report, 1982. Appendix VII, P.77. Many other governmental initiatives, e.g. up-dating of patents, environmental and public health legislation financial support for relevant research groups, financial incentives for industrial research and development, provision of venture capital, etc.

In Australia, strong initiatives from Dept. of Science and Technology in exploration of areas for Commercialisation and in preliminary identification of priority areas for research and development. A recent report to the Prime Minister by the Australian Science and Technology Council (ASTEC) recommends, amongst other things, the establishment of a National support for selected research and development , programs in biotechnology, and especially genetic engineering and cell manipulation and culture. And also, to substantially increase the financial support of projects predominantly involving advanced biotechnology, selected under the Australian Industrial Research and Development Incentives scheme.

The OECD Report, 1982

Photocopies of conclusions and recommend actions and the appendices available.

Probably the most cogent and balanced report, in the international content, yet produced.

Comments on Conclusions ant Recommendations of OECD Report

1. Need for common definition of biotechnology important. My view is that it should include application of genetic manipulation in plant and animal agriculture and in animal husbandy.
2. The general R and D priorities suggested are important and balanced
3. The shortage of microbial physiologicals and biochemical engineers is likely to be a rate-limiting step in exploiting the application of genetic manipulation techniques
4. The mechanism of industry or University Collaboration require vary careful attention if the danger to each partner role is to be minimised

5. There is an important governmental role in the improvement of Culture Collection facilities and the extension of data banks.
6. Biotechnology and food processing industries draw on substantially the same base for raw materials. The impact of large extension of biotechnological processes on food and other agriculture production requires careful evaluation in each national context.
7. Other economic impacts of biotechnology developments require very serious study. Those listed do not exhaust the areas requiring attention
8. The patents systems of few countries are adequate to meet likely developments in biotechnology and many require quite drastic overhaul
9. The stem over the hazards of genetic engineering research has subsidies. Careful study of possible hazards of industrial-scale usage of genetically-engineered organisms must be made. Appropriate legislation must not discourage innovation

Conclusions

Four conditions are probably necessary for the successful implementation of biotechnological techniques and processes for the benefit of industry and national communities

1. The formulation of a national policy, based on information from all relevant and contributing activities, leading to a designation of priority areas for research and development.
2. The substantial Concentration^{7a} of that portion of national research resources deemed appropriate for biotechnological development in these priority areas
3. The intensive promotion and facilitation of collaborative arrangements between research groups and the industrial sector.

4. Increased government assistance to industries seeking to use biotechnology to improve existing processes or to introduce new products

An active role for government and positive government support is essential to the achievement of these objectives. In addition, the support of government is essential in the provision of a favourable infra-structure in the form of appropriate patent legislation, maintenance of Culture Collections and data banks, the monitoring of environmental and public health aspects, the facilitation of training programs for professional and technical personnel, and the Continuing over-seeing of the impacts of biotechnological developments on existing trade and Commercial activities