

Preface

Hardly any other term in the field of biotechnology has been the subject of so much discussion among experts as white biotechnology at present. This term is an alias for "industrial biotechnology," an already established "heavyweight" that focuses on the production of the most diverse products (bulk and fine chemicals, enzymes, food and animal feed additives, pharmaceutically active substances and agrochemicals, auxiliary agents for process industries, etc.).

In some segments, white biotechnology has already captured leading market positions:

- In recent years the annual biotechnological production of amino acids exceeded one million tons.
- In vitamin production there have been several recent cases of a changeover from a chemical to a biotechnological synthesis process, a trend that is expected to increase.
- During the last 10 years the market volume for enzymes has increased by 50%.
- The successful launch of polylactide marked white biotechnology's breakthrough into the field of polymers and synthetics.

Today crude oil is the most important energy source and the most widely used chemical raw material. Both primary industry and polymer chemistry currently depend to a great extent on oil. However, it is only a matter of time before the world's oil reserves are depleted. Almost all studies presented to date agree that peak oil, i.e. the point in time when oil extraction reaches its highest level, will take place in the first half of the present century. The increasingly difficult development of new sources of oil have triggered initiatives worldwide to reduce national dependence on oil imports.

To summarize, there is no long-term alternative to developing a technology based firmly on renewable resources and industrial biotechnology may offer various solutions in this field. The tremendous pace of progress in the field of molecular biology has provided an unprecedented and promising launching pad for the development of further industrially relevant biocatalysts. Simultaneously, bioprocess engineering know-how is supporting efficient process development from titer plate format to shaker flasks to industrial scale. Thus, in principle, a basis exists for accelerating the development of new industrial

bioprocesses in parallel with all disciplines concerned. In this book authors from different scientific and business areas of industrial biotechnology aim to give you an overview of the state of the art and ongoing developments.

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