

# MEMBRANE BIOREACTORS

## Models for Bioprocess Design

by Anna Trusek-Holownia

Process intensification in a microbiological membrane bioreactor is due, first of all, to the concentration of bacterial biomass. In an enzymatic membrane bioreactor this is achieved by immobilization, and consequently multiple use of the enzyme which, depending on its activity, can remain in the membrane bioreactor either in a native form or can be bound with the membrane. Additionally, a properly selected membrane and method of transmembrane mass transport can replace a multi-stage, often complicated and costly, process of reagent separation used in traditional technologies.

A description of the membrane bioreactor in this book helps to minimize costs of membrane bioreactor application. This must be preceded by proper familiarity with the process and identification of parameters which affect the operation of a membrane bioreactor.



### Anna Trusek-Holownia

Ph.D., D.Sc., born in Wroclaw, Poland, in 1972.

Since 1995 she has carried out scientific work receiving an M.A. degree in biotechnology, and Ph.D. and D.Sc. in chemical engineering. She is an Assistant Professor in the Division of Chemical and Biochemical Processes in the Department of Chemistry, Wroclaw University of Technology. She is a member of the European Membrane Society and the Federation of Biotechnology.

For 15 years she has carried out research on the applications of native and immobilized enzymes and microorganisms in production processes and wastewater treatment technologies. She carries out her studies with the use of classical bioreactors and bioreactors integrated with membrane processes, both in the laboratory and on a pilot-plant scale. She has dedicated most of her investigations to the application of a membrane contactor in enzymatic synthesis of hydrophobic products, applicability of a bioreactor with a catalytic membrane to enantioselective enzymatic hydrolysis and biodegradation of organic pollutants in industrial effluents in MBM.



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**by Anna Trusek-Holownia**

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