

Scheper, T. (ed.): **Advances in Biochemical Engineering Biotechnology: Bioprocess and Algae Reactor Technology, Apoptosis.** – Springer-Verlag, Berlin – Heidelberg – New York 1998. ISBN 3-540-63417-7. 259 pp., DM 294.00, GBP 113.00, USD 198.00, FF 1108.00, Lit 324 690.00, øS 2147.00, sFr 265,00 (hardcover).

This series represents critical reviews on the present and future trends in Biochemical Engineering/Biotechnology, including microbiology, genetics, biochemistry, chemistry, computer science, and chemical engineering. It is addressed to all scientists who wish to keep up-to-date in this extremely fast developing area of science.

In general, special volumes are dedicated to selected topics and are edited by well-known guest editors. This volume comprises six chapters.

Fed-batch bioproduction of spectinomycin (J. Gomes and A.S. Menawat): This paper investigates the relation between glucose and oxygen in spectinomycin bioproduction. Spectinomycin production is favoured at two different concentrations of glucose. The mechanism of spectinomycin biosynthesis is described by a model employing an exponential structure. Theory of nonlinear systems is applied to predict concentration from air-flow rate values. A control strategy for optimal spectinomycin production is also presented.

Role of hydrodynamic shear on activity and structure of proteins (C.B. Elias and J.B. Joshi): The review discusses the effects of fluid shear stress on proteins including enzymes. The model system used to subject proteins to shear and some unit operations during protein processing or use wherein there are exposed to shear stresses are been presented as well as significance of shear effects in designing bioprocesses involving shear sensitive biocatalysts.

Novel screen methodologies for identification of new microbial metabolites with pharmacological activity (D.C. Hille *et al.*): Microbial metabolites of potential pharmacological utility are surveyed that represent an extensive range of structural types produced by a wide

variety of organisms.

Photobioreactors: Design and performance with respect to light energy input (O. Pulz and K. Scheibenberg): The review surveys outdoor cultivation systems and indoor photobioreactors with respect to light utilisation and productivity. To evaluate reactor performance independently of its design and location, growth yields were calculated from published data.

Kinetics and energetics of photosynthetic microorganisms in photobioreactors. Application to *Spirulina* growth (J.F. Cornet *et al.*): This report provides the basis for description and quantitative analysis of cultures of photosynthetic microorganisms in batch and continuous photobioreactors. The methodology accepted for modelling submerged aerobic or anaerobic cultures is applied to the growth of the blue-green algae *Spirulina platensis*. From analysis of metabolic pathways inside the cell, stoichiometric equations are derived for the main metabolic events. Together with the description of the reaction kinetics, it forms the basis for modelling. Special attention is paid to the description of radiant energy transfer inside dense liquid cultures. The reaction kinetics accounts also for mineral as well as physical and physiological limitations by the carbon source. The proposed methodology enables to calculate the thermodynamic efficiency for radiant energy conversion process in photobioreactors

Apoptosis and cell culture technology (Mohamed Al-Runeai): Characteristics, significance and regulatory mechanisms of apoptosis are reviewed as well as the progress and opportunities in cell culture engineering. The strategies to prevent the induction of apoptosis in cell cultures are also explained.

V. ZACHLEDER (Třeboň)