

Advances in Biotechnological Processes, Vol. 5

Edited by A. Mizrahi and A. Vanwezel

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This substantial and well-produced book contains nine chapters (unnumbered however) covering a remarkably wide diversity of topics, as noted in the Editors' introduction (p.xiii), ranging from mushroom fermentation to protein modelling using computer graphics. Such diversity is a feature too of the previous four volumes in this valuable series of books (see contents of previous volumes pp.xv–xvi).

Volume 5 begins with an extensively-referenced and useful practical account of 'Culture Media for Propagation of Mammalian Cells, Viruses and Other Biologicals'. The next chapter is on 'Protein Modeling using Computer Graphics' (pp.31–58), by A.J. Morffew of the IBM UK Scientific Centre, Winchester, England. This is a valuable overview of the approaches used, and illustrates the different forms of 'protein representation', ranging from stick models to various types of space-filling models and surface representations. Molecular dynamics simulations 'an area of research that is one of the biggest users of computer time' (p.50) is important to indicate how a protein's atoms may move during a millisecond. It is through these approaches that biological mechanisms involving enzymes and other proteins will be understood. This in turn will lead to the designing of new proteins by the recently developed techniques of 'protein engineering' (via site directed mutagenesis). Alternatively, 'protein tailoring' by specific chemical modification of existing proteins can be useful. Eventually, the replacement of enzymes in biotechnological applications by 'mimetic systems' should become possible!

The next chapter 'New Trends in Lignin Biodegradation' by M.S.A. Leisola and A. Fletcher, Zürich, discusses one of the outstanding problems of biotechnology – the development of ligninases that will rapidly dissolve the huge quantities worldwide of waste lignin (and lignocelluloses) derived mainly from wood. The note added in proof of recent references reflects the great activity in the field with the acceptance that ligninase is a haem-containing peroxidase, produced by, for example, wood-rot fungi such as *Phanerochaete chrysosporium*. Ligninase acts by a one-electron oxidation that generates aromatic radical cations from the lignin itself and these promote the degradation of the lignin (a polymer of three different types of *p*-hydroxycinnamyl alcohols). Many laboratories worldwide, including our own, have recently begun investigations on this remarkably interesting system, and its biotechnology (including gene cloning into yeast).

Later chapters in this book include plant tissue culture (pp.91–121), poultry viral vaccines (pp.123–147), biodegradation in effluents (pp.149–192), wastewater treatment (pp.193–225), mushroom fermentation (pp.227–273) and production of plasminogen activator by cells in culture (pp.275–299). An adequate subject index is provided.

Overall this book is a worthwhile addition to the biotechnologist's library, and parts of it will be useful to biochemists with an interest in useful biological products.

Alan Wiseman