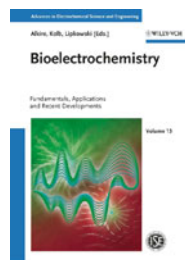


Richard C. Alkire, Dieter M. Kolb and Jacek Lipkowski (Eds): Bioelectrochemistry. Fundamentals, Applications and Recent Developments

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Bibliography

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This latest publication in the series *Advances in Electrochemical Science and Engineering* is centred on the recent developments of bioelectrochemistry. Three main research trends can be extracted from the eight chapters of this book: (1) biosensors and biofuel cells (Chapters 1 and 5), (2) advances in characterisation techniques for electrode surfaces modified with biomolecules (Chapters 2, 3 and 6) and (3) model lipid bilayer membranes and electroporation (Chapters 4, 7 and 8). Each chapter can be read on its own, but information presented in one chapter resonates in, at least, one other chapter.

Chapters 1 and 5 deal with probably the largest field in bioelectrochemistry in terms of publications: amperometric biosensors and enzymatic biofuel cells. Indeed, Borgmann et al., highlight that more than 11,000 publications (including 549 reviews) have been published between 2005 and 2010 under the keyword ‘biosensor’. The challenge for the authors resided in making a contribution that differed from its 549 predecessors. The authors have succeeded as they addressed a very critical review of the quality of the majority of these publications, which recommend “cook-book-type mixing” of many components. They call for a

dual approach to biosensors: either a fully practical approach at the end of which a real analytical application is met, or a fully fundamental approach, which deals with the understanding of the physical and chemical phenomena governing biosensors. This chapter is an essential companion to any researcher engaged with biosensor technology. Progress in the field of biosensors has sparked interest in enzymatic fuel cells, which are reviewed in Chapter 5. In their conclusion, the authors call for the standardisation of methodologies to facilitate the comparison of the performance of biofuel cells.

Three characterisation techniques (scanning tunnelling microscopy, neutron reflectivity and surface-enhanced Raman spectroscopy) coupled to electrochemistry are described with an emphasis on examples found in the literature. Both theoretical aspects and experimental considerations are highlighted. These three chapters (2, 3 and 6) constitute an excellent starting point for researchers who want to have an overview of the techniques and of their potential. Finally, the last trend is centred on lipid bilayer membranes. Chapters 4 and 7 review the formation and the characterisation of lipid bilayer membranes, which can be supported by an electrode (Chapter 4) or in the form of a giant vesicle (Chapter 7). The last chapter lists the different clinical applications of electroporation.

One may regret the absence of certain aspects of bioelectrochemistry (whole-cell electrochemistry, bioelectrosynthesis...), although, it is difficult to cover all aspects of one given research field. This 13th volume produces a broad series of snapshots of bioelectrochemistry, from fundamental research (neutron reflectivity of adsorbed proteins and DNA) to clinical applications (electroporation for patient treatment), highlighting the wealth and the depth of the field.

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