

Introduction

The present edition is the first number of a series of books belonging to a more general line of books published by Formatex (Badajoz, Spain), aimed at communicating current scientific and technological research in a generalistic-didactic way, with an emphasis of those areas which are undergoing a fast evolution towards interdisciplinarity. A good example is applied microbiology, in which microorganisms and their interaction with their biological or non-biological environments are investigated. While interface between basic and applied research is always diffuse, this edition was specifically focused on applied or potentially applied aspects of the study of microorganisms. For example, there is a huge potential for industry in understanding cellular processes to use microbes as biofactories, to design and operate safe, efficient, reproducible and sustainable bioprocesses for producing chemical substances which are beneficial for us. Both low molecular weight products (small peptides, pharmaceuticals, antibiotics, etc.) and high molecular weight products (recombinant proteins, polysaccharides, enzymes, etc.) can be produced by a variety of microorganisms as yeast and bacteria. On the contrary, there is also interest in using microbes for degrading or removing toxic or undesired substances from a specific environment, or even for detecting the presence of a specific chemical or physical condition. Also, understanding interaction-adhesion of microorganisms with a variety of organic and inorganic surfaces is also crucial for predicting and controlling proliferation of microbial communities, which in many cases is not desired (infections in a living being, biofilm developments on materials). It is readily seen that for fully taking advantage of the potential benefits of microorganisms or for efficiently combating their negative effects, a fully interdisciplinary approach must be adopted, integrating knowledge ranging from pure (micro)biology or biochemistry to areas not usually associated to them as micro-physics, chemical physics or physical chemistry, sensors technology or materials science and engineering. Techniques are not less important, and formidable advances can be expected in the near future as new techniques are permitting us to characterize and modifying matter (and then also microorganisms, materials, etc.) in a controlled manner well below the single-cell level. In fact, latest developments in nanoscience and nanotechnology have already entered into the world of microorganisms study to give rise to modern *nanobiology* instead of *microbiology*.

Reports on the above and many other areas will be found in this edition. We hope you will find articles included in this edition interesting and stimulating.

A. Méndez-Vilas
Editor