

Foreword

This book was written with the purpose of providing a sound basis for the design of enzymatic reactions based on kinetic principles, but also to give an updated vision of the potentials and limitations of biocatalysis, especially with respect to recent applications in processes of organic synthesis. The first five chapters are structured in the form of a textbook, going from the basic principles of enzyme structure and function to reactor design for homogeneous systems with soluble enzymes and heterogeneous systems with immobilized enzymes. The last chapter of the book is divided into six sections that represent illustrative case studies of biocatalytic processes of industrial relevance or potential, written by experts in the respective fields.

We sincerely hope that this book will represent an element in the toolbox of graduate students in applied biology and chemical and biochemical engineering and also of undergraduate students with formal training in organic chemistry, biochemistry, thermodynamics and chemical reaction kinetics. Beyond that, the book pretends also to illustrate the potential of biocatalytic processes with case studies in the field of organic synthesis, which we hope will be of interest for the academia and professionals involved in R&D&I. If some of our young readers are encouraged to engage or persevere in their work in biocatalysis this will certainly be our more precious reward.

Too much has been written about writing. Nobel laureate Gabriel García Márquez wrote one of its most inspired books by writing about writing (*Living to Tell the Tale*). There he wrote "life is not what one lived, but what one remembers and how one remembers it in order to recount it". This hardly applies to a scientific book, but certainly highlights what is applicable to any book: its symbiosis with life. Writing about biocatalysis has given me that privileged feeling, even more so because enzymes are truly the catalysts of life. Biocatalysis is hardly separable from my life and writing this book has been certainly more an ecstasy than an agony.

A book is an object of love so who better than friends to build it. Eleven distinguished professors and researchers have contributed to this endeavor with their knowledge, their commitment and their encouragement. Beyond our common language, I share with all of them a view and a life-lasting friendship. That is what lies behind this book and made its construction an exciting and rewarding experience.

Chapters 3 to 5 were written with the invaluable collaboration of Claudia Altamirano and Lorena Wilson, two of my former students, now my colleagues, and my bosses I am afraid. Chapter 4 also included the experience of José Manuel Guisán, Roberto Fernández-Lafuente and César Mateo, all of them very good friends who were kind enough to join this project and enrich the book with their world known expertise in heterogeneous biocatalysis. Section 6.1 is the result of a cooperation sustained by a CYTED project that brought together Sonia Barberis, also a former graduate student, now a successful professor and permanent collaborator and, beyond that, a dear friend, Fanny Guzmán, a reputed scientist in the field of peptide synthesis who is my partner, support and inspiration, and Josep López, a well-known scientist and engineer but, above all, a friend at heart and a warm host. Section 6.3 was the result of a joint project with Gregorio Alvaro, a dedicated researcher who has been a permanent collaborator with our group and also a very special friend and kind host. Section 6.4 is the result of a collaboration, in a very challenging field of applied biocatalysis, of Dr. Guisan's group with which we have a long-lasting academic connection and strong personal ties. Section 6.5 represents a very challenging project in which Josep López and Gregorio Alvaro have joined Pere Clapés, a prominent researcher in organic synthesis and a friend through the years, to build up an updated review on a very provocative field of enzyme biocatalysis. Finally, section 6.6 is a collaboration of a dear friend and outstanding teacher, Juan Lema, and his research group that widens the scope of biocatalysis to the field of environmental engineering adding a particular flavor to this final chapter.

A substantial part of this book was written in Spain while doing a sabbatical in the Universitat Autònoma de Barcelona, where I was warmly hosted by the Chemical Engineering Department, as I also was during short stays at the Institute of Catalysis and Petroleum Chemistry in Madrid and at the Department of Chemical Engineering in the Universidad de Santiago de Compostela.

My recognition to the persons in my institution, the Pontificia Universidad Católica de Valparaíso, that supported and encouraged this project, particularly to the rector Prof. Alfonso Muga, and professors Atilio Bustos and Graciela Muñoz. Last but not least, my deepest appreciation to the persons at Springer: Marie Johnson, Meran Owen, Tanja van Gaans and Padmaja Sudhakher, who were always delicate, diligent and encouraging.

Dear reader, the judgment about the product is yours, but beyond the product there is a process whose beauty I hope to have been able to transmit. I count on your indulgence with language that, despite the effort of our editor, may still reveal our condition of non-native English speakers.

Andrés Illanes
Valparaíso, May 15, 2008