



Biocatalysis for Green Chemistry and Chemical Process Development

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This book describes recent progress in enzyme-driven green syntheses of industrially important molecules. The first three introductory chapters overview recent technological advances in enzymes and cell-based transformations, and green chemistry metrics for synthetic efficiency. The remaining chapters are directed to case studies in biotechnological production of pharmaceuticals (small molecules, natural products and biologics), flavors, fragrance and cosmetics, fine chemicals, value-added chemicals from glucose and biomass, and polymeric materials.

The book is aimed to facilitate the industrial applications of this powerful and emerging green technology, and catalyze the advancement of the technology itself.

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Editorial Review

Review

“Therefore, this book is a valuable compendium for researchers and users of biocatalysis from both, the academic and the industrial world.” (*Catal Lett*, 1 March 2013)

“This book is well organised, containing most key subjects one would expect in the multiple research areas of biocatalysis. It is suitable for graduate level students, postdocs, and industrial researchers. It also can be regarded as an auxiliary textbook for students who wish to know the pros and cons of biocatalysis in chemical processes, and what the future holds for the development of biotechnology in green chemistry.” (*Chemistry World*, 2012)

From the Back Cover

Biocatalysis for Green Chemistry and Chemical Process Development offers an exciting alternative to today's complex, multidisciplinary approach to green chemistry by focusing exclusively on the most potent weapon in this field's arsenal—biocatalysis. In-depth coverage details the technological advances being made in biocatalysis-driven green syntheses of industrially important molecules, as well as how these advances show great promise in streamlining current chemical processes for reducing or eliminating hazardous substances. In addition, coverage of the biotechnological production of pharmaceuticals (small molecules, natural products and biologics), flavors, fragrance and cosmetics, fine chemicals, and more underscore the book's main goal of facilitating industrial applications of this powerful and pioneering green technology. Highlights include:

- A variety of case studies, not only in pharmaceuticals and fine chemicals, but also specialty and bulk chemicals and polymers
- A comprehensive overview of green chemistry applications of enzyme-driven transformations for a wide range of industries
- A look at the application of biocatalysis across a wide range of chemical manufacturing fields, and why it is a good sustainable manufacturing option

Biocatalysis is emerging as a transformational technology uniquely suited to deliver green chemistry solutions for safer, efficient, and more cost-effective chemical synthesis. Biocatalysis for Green Chemistry and Chemical Process Development serves a key role in promoting this significant and potentially world-changing technology—and offers valuable perspective on achieving widespread sustainable industrial practices.

About the Author

JUNHUA (Alex) TAO is currently CEO of Metabomics, Inc. Prior to that, he was the CSO of Elevance Renewable Sciences, and the creator and head of the Biotransformations Group at Pfizer, where he was also a core member of the API Development Team. He co-authored over 60 publications including “Biocatalysis for the Pharmaceutical Industry” (Wiley, 2009) and co-invented over 20 patents. In addition, he was the

recipient of the Pfizer Achievement Award, the Pfizer Green Chemistry Award, and a key member of the Lyrica process development team, which won the IChemE Award for Excellence in Green Chemistry and Engineering (2006).

ROMAS JOSEPH KAZLAUSKAS is Professor of Biochemistry, Molecular Biology and Biophysics at the BioTechnology Institute of the University of Minnesota, Twin Cities. He is the coauthor of over eighty papers and reviews, and the book *Hydrolases in Organic Synthesis*. He also served as the co-chair of two Gordon Research Conferences, one on biocatalysis and one on green chemistry.

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