

Directed Evolution of Selective Enzymes: Catalysts for Organic Chemistry and Biotechnology

By Manfred T. Reetz

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Authored by one of the world's leading organic chemists, this authoritative reference provides an overview of basic strategies in directed evolution and introduces common gene mutagenesis, screening and selection methods. Throughout the text, emphasis is placed on methodology development to maximize efficiency, reliability and speed of the experiments and to provide guidelines for efficient protein engineering. Professor Reetz highlights the application of directed evolution experiments to address limitations in the field of enzyme selectivity, substrate scope, activity and robustness. He critically reviews recent developments and case studies, takes a look at future applications in the field of organic synthesis, and concludes with lessons learned from previous experiments.

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Editorial Review

From the Back Cover
Authored by one of the world's leading organic chemists and protein engineers, this authoritative monograph provides an overview of basic strategies in directed evolution of enzymes as selective catalysts in organic chemistry and biotechnology. In introductory chapters, Manfred T. Reetz describes the most important gene mutagenesis methods and high-throughput screening and selection techniques, and continues with in-depth analyses of different strategies in laboratory evolution that have emerged in recent years.
Throughout the text, emphasis is placed on methodology development in the quest to maximize efficiency, reliability and speed of directed evolution as a prolific source of robust biocatalysts for asymmetric transformations. Practical guidelines and tips regarding possible pitfalls are provided. The author critically reviews recent developments and case studies, takes a look at future applications in organic synthesis and industrial biotechnology, and concludes with a discussion of the lessons learned from directed evolution.

About the Author
Manfred Reetz is Director of the Max Planck institute in Mulheim, Germany, and one of the leading top organic chemists. BA Washington University, MS University of Michigan, PhD University of Gottingen (Prof. Schollkopf), Postdoc University of Marburg (Prof. R. W. Hoffmann). Afterwards Professor at the Universities of Marburg and Bonn, as well as honorary Professor at University of Bochum. Since 1993 Chairman of the Studiengesellschaft Kohle mbH, and 1995 Vice President of the German Chemical Society. He has several awards and honors including Chemical Industries Prize (1976), Jacobus van't Hoff Prize (1977), Chemistry Prize of the Academy of Sciences (1978), Otto-Bayer-Prize (1986), Leibniz Award (1989), Fluka Prize (1997), Nagoya Gold Medal of Organic Chemistry (2000), Hans Herloff Inhoffen Medal (2003), Karl Ziegler Prize (2005). In addition, he is member of the Deutsche Akademie der Naturforscher Leopoldina, member of Nordrhein-Westfalische Akademie der Wissenschaften, member of the Kuratorium der Alfried Kupp von Bohlen und Halbach foundation and foreign member of the Royal Netherlands Academy of Arts and Sciences.
More than 400 publications including one book about Organotitanium Reagents in Organic Synthesis (1986).

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