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Manfred T Reetz

Philipps-University of Marburg, Germany

Increasing the efficiency of directed evolution of enzymes

Since its conception some time ago, the idea of directed evolution of stereo-selective enzymes as a new approach to asymmetric catalysis has been generalized by us and other research groups to include essentially all of the known enzyme types, including hydrolases, reductases, oxygenases, transferases, and C-C bond forming enzymes such as aldolases, oxynitrilases and pyruvate decarboxylases. Since the screening step is the bottleneck of this type of Darwinian laboratory evolution, the real challenge is to obtain mutant libraries of highest quality requiring a minimum of screening effort. In this endeavor, we have proposed Iterative Saturation Mutagenesis (ISM), which has proven to be an extremely valuable tool. The presentation will focus on the newest methodology developments.

Biography

Manfred T Reetz was the former Director of the Max-Planck-Institut für Kohlenforschung in Mülheim, and is currently an Emeritus Hans-Meerwein Research Professor at the University of Marburg, Germany. During the last 15 years, his group has helped to shape the emerging field of directed evolution, especially in the quest to evolve stereo-selective enzymes as catalysts in organic chemistry.

reetz@mpi-muelheim.mpg.de

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