

Our Technology
for Your Innovations

Biocatalytic Oxygenfunctionalization

We offer selective oxygenfunctionalization using unspecific peroxygenases (UPOs) to place oxygen precisely at the desired site and in the correct stereochemical orientation of complex molecules. Our substrate conversion operates under mild conditions with hydrogen peroxide, eliminating the need for additional redox partners and minimizing protecting-group work. This translates to fewer steps and faster decision-making. We manage the entire process from feasibility screening and condition optimization to metabolite identification and isolation. Applications include late-stage diversification of APIs, authentic human metabolites, flavors, fragrances, agrochemicals, cosmeceutical ingredients and specialty chemicals.

TRL-Level: 5
Open for R&D Collaboration

Industry



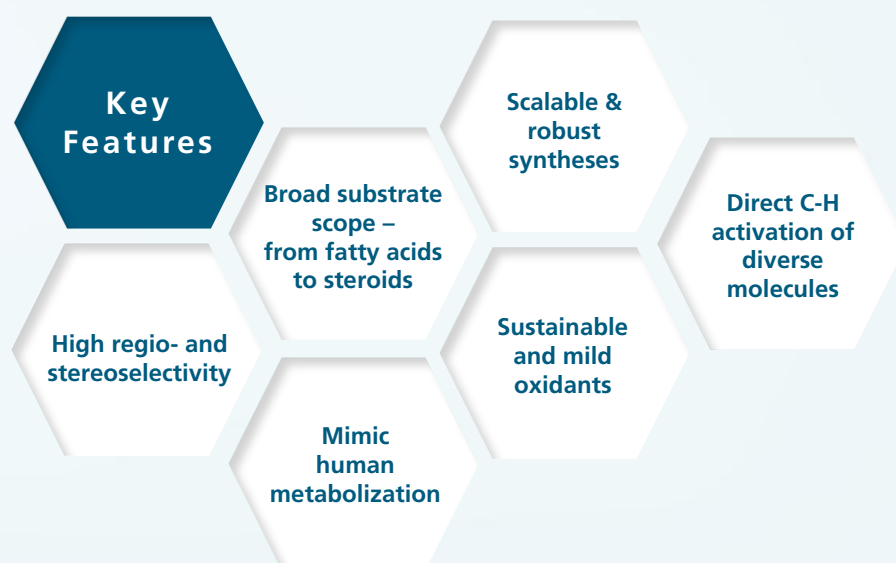
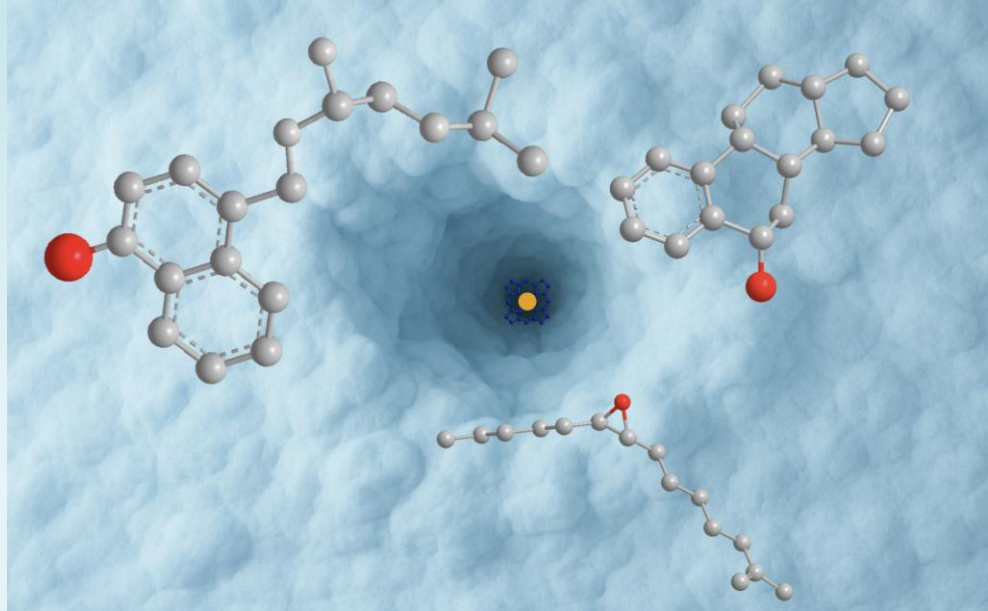
Biotech



Bioeconomy



Pharmaceuticals



Applications

- Late-stage functionalization of complex APIs and natural products
- Direct preparation and identification of oxygenated drug metabolites
- Rapid SAR (structure-activity relationship) exploration via individual oxygenation libraries
- Selective access to alcohols, epoxides, phenols, ketones, and carboxylic acids for specialty chemicals
- Chiral synthons for agrochemicals and flavors

Customer Benefits

- **Faster route decisions:** streamlined UPO screening with clear go/no-go and conditions window
- **Fewer steps:** precise oxygenation reduces protecting-group overhead and rework
- **Mild & practical:** often near ambient temperature; easy work-up
- **Greener by design:** hydrogen peroxide as a clean oxidant; compatible with green solvents
- **Verified deliverables:** isolated products plus analytical confirmation

Further information

Kiebig et al. 2021, J Fungi, 7(9): 752
Walter et al. 2022, Front Bioeng Biotechnol, 10: 964396
Kiebig et al. 2017, ChemBioChem, 18(6): 563

<https://s.fhg.de/izi-bb-Biokat>
<https://s.fhg.de/izi-bb-Metabolisierung>

www.izi-bb.fraunhofer.de



Contacts



Dr. Jan Kiebig
Biocatalytic Syntheses
Tel. +49 160 9818 6157
jan.kiebig@izi-bb.fraunhofer.de



Ruben Walter
Cell-Free and Cell-Based Bioproduction
Tel. +49 331 58187-226
ruben.walter@izi-bb.fraunhofer.de

