Motivation

I am an enthusiastic scientist with expertise in bio-informatic-driven enzyme design, chemo-enzymatic biocatalysis and all common analytical techniques. With my work, I want to advance green technologies and create a brighter future for all of us.

Personal information

Date of birth	19.08.1995
Place of birth	Wuppertal, Germany
Nationality	German

Languages

German	Native
English	Fluent

Engagement

2020 – 2023 Doctoral representative
Deutsche Bundesstiftung Umwelt

2020 – 2023 Associated member
Research training group Microbial Substrate Conversion (RTG 2341)

2021 Doctoral examination board member
Faculty for chemistry & biochemistry

2017 – 2019 Faculty council member
Faculty for chemistry & biochemistry

2017 – 2019 Undergraduate examination board member
Faculty for chemistry & biochemistry

2016 – 2019 Student representative
Faculty for chemistry & biochemistry

Awards & Fellowships

Sep. 2022 Poster award
BioCat conference

Feb. 2022 Poster award
Applied enzymology workshop

Dec. 2019 PhD fellowship (39 months)
Deutsche Bundesstiftung Umwelt

Dec. 2017 Wilke award „Best Bachelor BC"
Verein zur Förderung der Chemie an der Ruhr-Universität Bochum

Hobbies

Jogging, fitness, computer, books and D&D

Daniel Eggerichs

Dr. rer. nat. | Biochemist

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0000-0002-0688-6426

Career

Oct. 2023 – Aug. 2024 **Scientific coordinator and researcher**
Innovative Power GmbH

Jan. 2020 – Sep. 2023 **Doctoral researcher**
Microbial Biotechnology, Ruhr-University Bochum

May 2019 – Dec. 2019 **Scientific assistant**
Microbial Biotechnology, Ruhr-University Bochum

Education

Jan. 2020 – Sep. 2023 **Doctoral studies in biochemistry (PhD)**
Ruhr-University Bochum
Final grade: *summa cum laude* (with distinction)

Oct. 2017 – Sep. 2019 **Master studies in biochemistry (M.Sc.)**
Focal point: Biotechnology
Ruhr-University Bochum
Final grade: 1.1

Oct. 2014 – Sep. 2017 **Bachelor studies in biochemistry (B.Sc.)**
Ruhr-University Bochum
Final grade: 1.3

Jun. 2006 – May 2014 **Highschool**
Leibniz-Gymnasium Remscheid
Final Grade: 1.5

Expertise

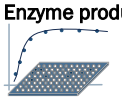
Biocatalyst design and genome mining

- Generation of structural models by AlphaFold and homology modeling
- Docking of ligands and cofactor with subsequent structure analysis
- Molecular dynamic simulations for structure refinement
- Genome mining and phylogenetic analysis

Cultivation and manipulation of microorganisms

- PCR and modern cloning procedures including all standard techniques
- (Site-directed) mutagenesis by QuikChange and error prone PCR
- Generation of GMOs by transformation and electroporation
- Aerobic and anaerobic cultivation of bacterial strains in scales up to 5 L

Enzyme production, characterization and application



- Heterologous production and purification of proteins by all common techniques
- Enzyme assays and Michaelis-Menten kinetics
- Covalent and non-covalent immobilization of proteins
- Hereto- and homogeneous catalysis in batch and flow reactions in scales up to 250 mL

Analytic of small molecules

- Method development for compound quantification and enantiomeric separation in liquid and gas chromatography
- Compound identification by UV/VIS, FTIR, mass, and NMR spectroscopy (^{1}H and ^{13}C)
- Application and development of high throughput screenings in 96-well format

Programming and data handling

- Highly experienced in Microsoft office, LaTex, Origin and ChemDraw
- Advanced coding in R, basic coding in Python, Java and XML
- Experienced in semi-automatized workflows and handling larger amounts of data

Teaching and advising

- Conceptualization, organization, lecturing and supervision of eleven practical courses
- Supervision of sixteen bachelor and master students (since 2020)

Publications

Dehydrogenase versus oxidase function: the interplay between substrate binding and flavin microenvironment
T. B. Guerriere, A. Vancheri, I. Ricotti, S. A. Serapian, **D. Eggerichs**, D. Tischler, G. Colombo, M. L. Mascotti, M. W. Fraaije, A. Mattevi
ACS catalysis (2025), 15, 1046-1060

Substrate scope expansion of 4-phenol oxidases by rational enzyme selection and sequence-function relations
D. Eggerichs, N. Weindorf, H. G. Weddeling, I. M. Van der Linden, D. Tischler
Communications Chemistry (2024) 7.1, 123

Vanillyl alcohol oxidase from Diplodia corticola: Residues Ala420 and Glu466 allow for efficient catalysis of syringyl derivatives
D. Eggerichs, N. Weindorf, M. L. Mascotti, N. Welzel, M. W. Fraaije, D. Tischler
Journal of Biological Chemistry (2023) 299.7, 104898

Large scale production of vanillin using an eugenol oxidase from Nocardioides sp. YR527
D. Eggerichs, K. Zilske, D. Tischler
Molecular Catalysis (2023) 546, 113277

Amino Acid Cluster Analysis (A2CA)
D. Eggerichs, D. Tischler
Science Data Bank (2023), DOI: 10.57760/sciencedb.09549

Structural and mechanistical studies on substrate and stereo selectivity of the indole monooxygenase VpIndA1: New avenues for biocatalytic epoxidations and sulfoxidations
J. Kratky, **D. Eggerichs**, T. Heine, S. Hofmann, P. Sowa, R.H. Weiße, D. Tischler, N. Sträter
Angewandte Chemie International Edition (2023), e202300657

Flavoprotein monooxygenases: Versatile biocatalysts
C.E. Paul, **D. Eggerichs**, A.H. Westphal, D. Tischler, W.J.H. van Berkel
Biotechnology Advances (2021), 51, 107712

Myxococcus xanthus predation of Gram-positive or Gram-negative bacteria is mediated by different bacteriolytic mechanisms
K.I. Arend, J.J. Schmidt, T. Bentler, C. Lüchtefeld, **D. Eggerichs**, H.M. Hexamer, C. Kaimer
Applied and Environmental Microbiology (2021), 5, 87

Styrene monooxygenases, indole monooxygenases and related flavoproteins applied in bioremediation and biocatalysis
D. Tischler, A. Kumpf, **D. Eggerichs**, T. Heine
The Enzymes, Academic Press (2020), 47, 399-425

Enantioselective epoxidation by flavoprotein monooxygenases supported by organic solvents
D. Eggerichs, C. Mügge, J. Mayweg, U.-P. Apfel, D. Tischler
Catalysts (2020), 5.10, 568

Asymmetric reduction of (R)-carvone through a thermostable and organic-solvent-tolerant ene-reductase
D. Tischler, E. Gädke, **D. Eggerichs**, A. Gomez Baraibar, C. Mügge, A. Scholtissek, C.E. Paul
ChemBioChem (2019), 21, 1217

Chirale Epoxidierung von Aryl-Alkyl-Ethern aus Lignin
D. Eggerichs, A.C. Lienkamp, T. Heine, C. Mügge, D. Tischler
Biospektrum (2019) 6.25, 680-682

Teaching and advising

Jun./Jul. 2022 Jun. 2021	**Industrial biotechnology practical course** (4 weeks) Bioinformatic analysis of enzyme structures to select amino acids for side-saturation mutagenesis; Screening of mutant libraries and product identification by HPLC and GC Conceptualization, Organization, Lecturing, Bioinformatics, Lab supervision
Jan. 2023 Jan. 2022	**Modular advanced practical** (2 x 2 weeks) Screening of mutant side-saturation libraries and bioinformatic rationalization of the results Conceptualization, Organization, Lecturing, Bioinformatics
Mar. 2023 Feb. 2022 Mar. 2021 Mar. 2020	**Biochemical elective internship** (2 x 2 days) Methods for enzyme purification, free and immobilized application, and reaction monitoring by spectroscopy, HPLC and GC Conceptualization, Organization, Lab supervision
May 2022 May 2021 May 2020	**Microscopy course** (1 day) Basic techniques of light microscopy Lab supervision
Since Jun. 2021	**Master thesis** (6 month) Conceptualization of projects and individual supervision 5 students (3 Biology, 2 Biochemistry)
Since Mar. 2020	**Bachelor thesis** (3 month) Conceptualization of projects and individual supervision 6 students (3 Biology, 2 Biochemistry, 1 Chemistry)
Since Jun. 2019	**Student internships** (6 to 8 weeks) Individual supervision 16 students