

Publication list of Prof. Dr. Ulrich Schwaneberg (March 13th 2023)

2023

349. Han, R., Fang, H., Fan, Z., Ji, Y., Schwaneberg, U., Ni, Y. (2023). Coupled reaction of glycosyltransferase and sucrose synthase for high-yielding and cost-effective synthesis of rosin. *Molecular Catalysis*, 540, 113035.
348. Feng, L., Gao, L., Besirlioglu, V., Essani, K., Malte, W., Kurkina, T., Ji, Y., Schwaneberg, U. (2023). A flow cytometry-based ultrahigh-throughput screening method for directed evolution of oxidases. *Angewandte Chemie*, e202214999.
347. Herrmann, K. R., Fees, J., Christ, J. J., Hofmann, I., Block, C., Herzberg, D., Bröring, S., Reckels, B., Visscher, C., Lars, M.B. and Schwaneberg, U., Ruff, A. J. (2023). Biotechnological production of food-grade polyphosphate from deoiled seeds and bran. *EFB Bioeconomy Journal*, 100048.

2022

346. Bauten, W., Nöth, M., Kurkina, T., Contreras, F., Ji, Y., Desmet, C., Serra, MÁ., Gilliland, D., Schwaneberg, U. (2022). Plastibodies for multiplexed detection and sorting of microplastic particles in high-throughput. *Science of The Total Environment*, 160450.
345. Han, R., Gao, K., Jiang, Y., Zhou, J., Xu, G., Dong, J., Schwaneberg, U., Ji, Y., Ni, Y. (2022). Self-Sufficient In Vitro Multi-Enzyme Cascade for Efficient Synthesis of Danshensu from L-DOPA. *ACS Synthetic Biology*. DOI: 10.1021/acssynbio.2c00552
344. Li, Z., Meng, S., Nie, K., Schwaneberg, U., Davari, M. D., Xu, H., Ji, Y., Liu, L. (2022). Flexibility regulation of loops surrounding the tunnel entrance in cytochrome p450 enhanced substrate Access Substantially. *ACS Catalysis*, 12, 12800-12808.
343. Meng, S., Ji, Y., Zhu, L., Dhoke, G. V., Davari, M. D., Schwaneberg, U. (2022). The molecular basis and enzyme engineering strategies for improvement of coupling efficiency in cytochrome P450s. *Biotechnology Advances*, 108051.
342. Lequeue, S., Neuckermans, J., Nulmans, I., Schwaneberg, U., Vanhaecke, T., & De Kock, J. (2022). A robust bacterial high-throughput screening system to evaluate single nucleotide polymorphisms of human homogentisate 1, 2-dioxygenase in the context of alkaptonuria. *Scientific Reports*, 12(1), 1-15.
341. Han, Y., Kinfu, B. M., Blombach, F., Cackett, G., Zhang, H., Pérez-García, P., Krohn, I., Salomon, J., Besirlioglu, V., Mirzaeigarakani, T., Schwaneberg, U., Chow, J., Werner, F., Streit, W. R. (2022). A novel metagenome-derived viral RNA polymerase and its application in a cell-free expression system for metagenome screening. *Scientific Reports*, 12(1), 1-15.
340. Cui, H., Zhang, L., Yildiz, C. B., Eltoukhy, L., Cheng, L., Jaeger, K. E., Schwaneberg, U., Davari, M. D. (2022). Enzyme hydration: how to retain resistance in ionic liquids. *ACS Sustainable Chemistry & Engineering*.
339. Zhou, J., Tian, X., Yang, Q., Zhang, Z., Chen, C., Cui, Z., Ji, Y., Schwaneberg, U., Chen, B., Tan, T. (2022). Three multi-enzyme cascade pathways for conversion of C1 to C2/C4 compounds. *Chem Catalysis*, 2, 2675–2690.
338. Kuhn, T., Möhring, N., Töpel, A., Jakob, F., Britz, W., Bröring, S., Pich, A., Schwaneberg, U., Rennings, M. (2022). Using a bio-economic farm model to evaluate the economic potential and pesticide load reduction of the greenRelease technology. *Agricultural Systems*, 201, 103454.
337. Dittrich, J., Brethauer, C., Goncharenko, L., Bührmann, J., Zeisler-Diehl, V., Pariyar, S., Jakob, F., Kurkina, T., Schreiber, L., Schwaneberg, U. & Gohlke, H. (2022). Rational design yields molecular insights on leaf binding of the anchor peptide Macaque Histatin. *ACS Applied Materials & Interfaces*, 14(25), 28412–28426. DOI: 10.1021/acscami.2c00648
336. Hintzen, K.W., Simons, C., Schaffrath, K., Roessler, G., Johnen, S., Jakob, F., Walter, P., Schwaneberg, U., Lohmann, T. (2022), BioAdhere: tailor-made bioadhesives for epiretinal visual prostheses. *Biomater. Sci.* DOI <https://doi.org/10.1039/D1BM01946E>

335. Körfer, G., Besirlioglu, V., Davari, M.D., Martinez, R., Vojcic, L., Schwaneberg, U. (2022), Combinatorial InVitroFlow-assisted Mutagenesis (ComblMut) yields a 41-fold improved CelA2 cellulase. *Biotechnol Bioeng.* <https://doi.org/10.1002/bit.28110>
334. Corrado, m. L., knaus, t., schwaneberg, u., mutti, f. G. (2022). High-yield synthesis of enantiopure 1, 2-amino alcohols from l-phenylalanine via linear and divergent enzymatic cascades. *Organic Process Research & Development.* <https://doi.org/10.1021/acs.oprd.1c00490>
333. Widderich, N.; Mayer, N.; Ruff, A.J.; Reckels, B.; Lohkamp, F.; Visscher, C.; Schwaneberg, U.; Kaltschmitt, M.; Liese, A.; Bubenheim, P. (2022). Conditioning of feed material prior to feeding: approaches for a sustainable phosphorus utilization. *Sustainability* , 14, 3998. <https://doi.org/10.3390/su14073998>
332. Herrmann, K. R., Brethauer, C., Siedhoff, N. E., Hofmann, I., Eyll, J., Davari, M. D., Schwaneberg, U., Ruff, A. J. (2022). Evolution of *E. coli* phytase towards improved hydrolysis of inositol tetraphosphate (InsP4). *Frontiers in Chemical Engineering*, 4, DOI: 10.3389/fceng.2022.838056
331. Pramanik, S., Cui, H., Dhoke, G. V., Yildiz, C. B., Vedder, M., Jaeger, K. E., Schwaneberg, U., Davari, M. D. (2022). How does surface charge engineering of bacillus subtilis lipase A improve ionic liquid resistance? Lessons learned from molecular dynamics simulations. *ACS Sustainable Chemistry & Engineering*, 10, 8, 2689-2698, DOI: 10.1021/acssuschemeng.1c07332
330. Bienstein, M., Minond, D., Schwaneberg, U., Davari, M. D., Yildiz, D. (2022). In silico and experimental adam17 kinetic modeling as basis for future screening system for modulators. *International Journal of Molecular Sciences*, 23(3), 1368, DOI: 10.3390/ijms23031368
329. Pourhassan N, Z., Cui, H., Khosa, S., Davari, M. D., Jaeger, K. E., Smits, S. H., Schwaneberg, U., Schmitt, L. (2022). Optimized Hemolysin type 1 secretion system in *Escherichia coli* by directed evolution of the Hly enhancer fragment and including a terminator region. *ChemBioChem*, e202100702, DOI: 10.1002/cbic.202100702
328. Rajakumara, E., Abhishek, S., Nitin, K., Saniya, D., Bajaj, P., Schwaneberg, U., & Davari, M. D. (2022). Structure and cooperativity in substrate–enzyme interactions: perspectives on enzyme engineering and inhibitor design. *ACS Chemical Biology*, DOI: 10.1021/acscchembio.1c00500
327. Srdič, M., Fessner, N. D., Yildiz, D., Glieder, A., Spiertz, M., & Schwaneberg, U. (2022). Preparative production of functionalized (n- and o-heterocyclic) polycyclic aromatic hydrocarbons by human cytochrome p450 3a4 in a bioreactor. *Biomolecules*, 12(2), 153, DOI: 10.3390/biom12020153
326. Winnersbach, P., Hosseinejad, A., Breuer, T., Fechter, T., Jakob, F., Schwaneberg, U., Rossaint, R., Bleilevens, C., Singh, S. (2022). Endogenous nitric oxide-releasing microgel coating prevents clot formation on oxygenator fibers exposed to in vitro blood flow. *Membranes*, 12(1), 73, DOI: 10.3390/membranes12010073
325. Cui, H., M., Vedder, M., Zhang, L., Jaeger, K. E., Schwaneberg, U., D. Davari(2022). Polar substitutions on the surface of a lipase substantially improve tolerance in organic solvents. *ChemSusChem*, 15(9), e202102551, DOI: 10.1002/cssc.202102551

2021

324. Meng, S., Ji, Y., Liu, L., Davari, M. D., Schwaneberg, U. (2021). Modulating the coupling efficiency of P450 BM3 by controlling water diffusion through access tunnel engineering *ChemSusChem*, 15(9) e202102434, DOI: 10.1002/cssc.202102434
323. El Harrar, T., Davari, M. D., Jaeger, K. E., Schwaneberg, U., Gohlke, H.(2021). Critical assessment of structure-based approaches to improve protein resistance in aqueous ionic liquids by enzyme-wide saturation mutagenesis *Computational and Structural Biotechnology Journal*, 20, 399-409, DOI: 10.1016/j.csbj.2021.12.018
322. Johann, S., Weichert, F. G., Schröer, L., Stratemann, L., Kämpfer, C., Seiler, T. B., ... & Hollert, H.(2021). A plea for the integration of Green Toxicology in sustainable bioeconomy strategies – Biosurfactants and microgel-based pesticide release systems as examples *Journal of Hazardous Materials*, 426, 127800, DOI: 10.1016/j.jhazmat.2021.127800

321. Infanzón, B., Herrmann, K. R., Hofmann, I., Willbold, S., Ruff, A. J., Schwaneberg, U. (2021). Phytase blends for enhanced phosphorous mobilization of deoiled seeds. *Enzyme and Microbial Technology*, 153, 109953, DOI: 10.1016/j.enzmictec.2021
320. Cui, H., Vedder, M., Schwaneberg, U., Davari, M. D. (2022) using molecular simulation to guide protein engineering for biocatalysis in organic solvents. In: Magnani F., Marabelli C., Paradisi F. (eds) *Enzyme Engineering. Methods in Molecular Biology*, vol 2397. Humana, New York, NY. DOI: 10.1007/978-1-0716-1826-4_10
319. Cui, H., Davari, M. D., Schwaneberg, U. (2022) recombination of compatible substitutions by 2GenReP and InSiReP. In: Magnani F., Marabelli C., Paradisi F. (eds) *Enzyme Engineering. Methods in Molecular Biology*, vol 2397. Humana, New York, NY. DOI: 10.1007/978-1-0716-1826-4_5
318. Kardashliev, T., Weingartner, A., Romero, E., Schwaneberg, U., Fraaije, M., Panke, S., Held, M. (2021). Whole-cell screening of oxidative enzymes using genetically encoded sensors *Chemical Science*, 12, 14766-14772, DOI: 10.1039/D1SC02578C
317. Fessner, N. D., Grimm, C., Srdic, M., Weber, H., Kroutil, W., Schwaneberg, U., Glieder, A. (2021). Natural product diversification by one-step biocatalysis using human P450 3A4. *ChemCatChem*, 13, 1-13, DOI: 10.1002/cctc.202101564
316. Wittwer, M., Markel, U., Schiffels, J., Okuda, J., Sauer, D. F., Schwaneberg, U. (2021). Engineering and emerging applications of artificial metalloenzymes with whole cells. *Nature Catalysis*, 4, 814-827
315. Garay-Sarmiento, M., Witzdam, L., Vorobii, M., Simons, C., Herrmann, N., de los Santos Pereira, A., Heine, E., El-Awaad, I., Lütticken, R., Jakob, F., Schwaneberg, U., Rodriguez-Emmenegger, C. (2021). Kill&Repel coatings: the marriage of antifouling and bactericidal properties to mitigate and treat wound infections. *Advanced Functional Materials*, 2106656, doi: 10.1002/adfm.202106656
314. Schwieters, M., Mathieu-Gaedke, M., Westphal, M., Dalpke, R., Dirksen, M., Qi, D., Grull, M., Bick, T., Taßler, S., Sauer, D. F., Bonn, M., Wendler, P., Hellweg, T., Beyer, A., Götzhäuser, A., Schwaneberg, U., Glebe, U., Böker, A. (2021). Protein nanopore membranes prepared by a simple langmuir-schaefer approach. *Small*, 2102975, doi: 10.1002/smll.202102975
313. Sinelnikov, I., Siedhoff, N., Chulkin, A., Zorov, I., Schwaneberg, U., Davari, M., Sinitsyna, O., Shcherbakova, L., Sinitsyn, A., Rozhkova, A. (2021). Expression and refolding of the plant chitinase from *Drosera capensis* for applications as a sustainable and integrated pest management. *Frontiers in Bioengineering and Biotechnology*, 9:728501., doi: 10.3389/fbioe.2021.728501
312. Pramanik S., Contreras F., Davari M. D., Schwaneberg U. (2021). Protein engineering by efficient sequence space exploration through combination of directed evolution and computational design methodologies. *Protein Engineering: Tools and Applications*, chapter 7, ISBN: 9783527815128/9783527344703, <https://doi.org/10.1002/9783527815128.ch7>
311. Herrmann K. R., Hofmann I., Jungherz D., Wittwer M., Infanzón B., Hamer S. N., Davari M. D., Ruff A. J., Schwaneberg U. (2021). Generation of phytase chimeras with low sequence identities and improved thermal stability. *Journal of Biotechnology*, 339, 14-21, <https://doi.org/10.1016/j.jbiotec.2021.07.005>
310. Siedhoff N. E., Illig A. M., Schwaneberg U., Davari M. D. (2021). PyPEF—an Integrated Framework for Data-Driven Protein Engineering. *Journal of Chemical Information and Modeling*, 61, 7, 3463–3476, DOI: <https://doi.org/10.1021/acs.jcim.1c00099>
309. Harrar T. E., Frieg B., Davaria M. D., Jaeger K. E., Schwaneberg U., Gohlke H. (2021). Aqueous ionic liquids redistribute local enzyme stability via long-range perturbation pathways. *Computational and Structural Biotechnology Journal*, 19, 4248-4264, DOI: <https://doi.org/10.1016/j.csbj.2021.07.001>
308. Zhu C., Chen S., Ji Y., Schwaneberg U., Chi Z. (2021). Progress toward a bicarbonate-based microalgae production system. *Trends in Biotechnology*, DOI: <https://doi.org/10.1016/j.tibtech.2021.06.005>
307. Söder D., Garay-Sarmiento M., Rahimi K., Obstals F., Dedisch S., Haraszti T., Davari M.D., Jakob F., Heß C., Schwaneberg U., Rodriguez-Emmenegger C. (2021). Unraveling the mechanism and kinetics of binding of an LCI-eGFP-Polymer for antifouling coatings. *Macromolecular Bioscience*, DOI: 10.1002/mabi.202100158

306. Hosseinejad A., Fischer T., Jain P., Bleilevens C., Jakob F., Schwaneberg U., Rossaint R., Singh S. (2021). Enzyme mimetic microgel coating for endogenous nitric oxide mediated inhibition of platelet activation. *Journal of Colloid and Interface Science*, DOI: <https://doi.org/10.1016/j.jcis.2021.05.143>
305. Röllén K., Granzin J., Remeeva A., Davari M. D., Gensch T., Nazarenko V. V., Kovalev K., Bogorodskiy A., Borshchevskiy V., Hemmer S., Schwaneberg U., Gordeliy V., Karl-Erich Jaeger K. E., Batra-Safferling R., Gushchin I., Krauss U. (2021). The molecular basis of spectral tuning in blue- and red-shifted flavin-binding fluorescent proteins. *Journal of Biological Chemistry*, DOI: [10.1016/j.jbc.2021.100662](https://doi.org/10.1016/j.jbc.2021.100662)
304. Sauer D. F., Wittwer M., Markel U., Minges A., Spiertz M., Schiffels J., Davari M. D., Groth G., Okuda J., and Schwaneberg U. (2021). Chemogenetic engineering of nitrobindin toward an artificial Epoxygenase. *Catalysis Science & Technology*, DOI: <https://doi.org/10.1039/D1CY00609F>
303. Cui, H., Pramanik S., Jaeger, K. E., Davari, M. D., Schwaneberg, U. (2021). CompassR-guided recombination unlocks design principles to stabilize a lipase in ILs with minimal experimental efforts. *Green Chemistry*, DOI: [10.1039/D1GC00763G](https://doi.org/10.1039/D1GC00763G)
302. Markel, U., Sauer, D. F., Wittwer, M., Schiffels, J., Cui, H., Davari, M. D., Kröckert, K. W., Herres-Pawlis, S., Okuda, J., Schwaneberg, U. (2021). Chemogenetic evolution of a peroxidase-like artificial metalloenzyme. *ACS Catalysis*, DOI: <https://doi.org/10.1021/acscatal.1c00134>
301. Feng, L., Gao, L., Sauer, D. F., Ji, Y., Cui, H., Schwaneberg, U. (2021). Fe(III)-complex mediated bacterial cell surface immobilization of eGFP and enzymes. *Chemical Communications*, DOI: [10.1039/d1cc01575c](https://doi.org/10.1039/d1cc01575c)
300. Meng, s., an, r. P., li, z. Y., schwaneberg, u., ji y., davari m. D., wang f., wang m., qin m., nie k. L., liu l. (2021). Tunnel engineering for modulating the substrate preference in cytochrome p450bs β hi. *Bioresources and Bioprocessing*, DOI: <https://doi.org/10.1186/s40643-021-00379-1>
299. Thiel, A., Sauer, D. F., Markel, U., Mertens, M. A. S., Polen, T., Schwaneberg, U., Okuda, J. (2021). An artificial ruthenium-containing β -barrel protein for alkene-alkyne coupling reaction. *Organic & Biomolecular Chemistry*, DOI: <https://doi.org/10.1039/D1OB00279A>
298. Cui, H., Eltoukhy, L., Zhang, L., Markel, U., Jaeger, K. E., Davari, M. D., Schwaneberg, U. (2021). Less unfavorable salt bridges on the enzyme surface result in more organic cosolvent resistance. *Angewandte Chemie*, DOI: <https://doi.org/10.1002/anie.202101642> (Supplementary information)
297. Brands, S., Brass, H. U. C., Klein, A. S., Sikkens, J. G., Davari, M. D., Pietruszka, J., Ruffa, A. J., Schwaneberg, U. (2021). KnowVolution of prodigiosin ligase PigC towards condensation of short-chain prodiginines. *Catalysis Science & Technology*, DOI: [10.1039/D0CY02297G](https://doi.org/10.1039/D0CY02297G)
296. Cui, H., Zhang, L., Söder, D., Davari, M. D., Schwaneberg, U. (2021). Rapid and Oriented Immobilization of Laccases on Electrodes via a Methionine-Rich Peptide. *ACS Catalysis*, DOI: <https://dx.doi.org/10.1021/acscatal.0c05490>
295. Ji, Y., Lu, Y., Puetz, H., Schwaneberg, U. (2021). Anchor peptides promoted degradation of mixed plastics for recycling. *Methods in Enzymology*, ISSN 0076-6879, DOI: <https://doi.org/10.1016/bs.mie.2020.12.027>
294. Brands, S., Sikkens, J. G., Davari, M. D., Brass, H. U. C., Klein, A. S., Pietruszka, J., Ruffa, A. J., Schwaneberg, U. (2021). Understanding substrate binding and the role of gatekeeping residues in PigC access tunnels. *Chemical Communications*, DOI: [10.1039/d0cc08226k](https://doi.org/10.1039/d0cc08226k)

2020

293. Contreras F., Nutschel C., Beust L., Davari M. D., Gohlke H., Schwaneberg U. (2020). Can constraint network analysis guide the identification phase of knowvolution? A case study on improved thermostability of an endo- β -glucanase. *Computational and Structural Biotechnology Journal*, DOI: <https://doi.org/10.1016/j.csbj.2020.12.034>

292. Kato S., Onoda A., Grimm A. R., Schwaneberg U., Hayashi T. (2020). Construction of a whole-cell biohybrid catalyst using a Cp*Rh(III)-dithiophosphate complex as a precursor of a metal cofactor. *Journal of Inorganic Biochemistry*, DOI:<https://doi.org/10.1016/j.jinorgbio.2020.111352>
291. Nöth M., Zhi Z., El-Awaad I., Celia de Lencastre Novaes L., Dilarri G., Davari M. D., Ferreira H., Jakob F., Schwaneberg U. (2020). A peptide-based coating toolbox to enable click chemistry on polymers, metals, and silicon through sortagging. *Biotechnology and Bioengineering*, DOI:10.1002/bit.27666
290. Neuckermans J., Lequeuea S., Mertens A., Branson S., Schwaneberg U., Kocka J. D. (2020). High-throughput quantification of ochronotic pigment formation in *Escherichia coli* to evaluate the potency of human 4-hydroxyphenylpyruvate dioxygenase inhibitors in multi-well format. *MethodsX*, DOI:<https://doi.org/10.1016/j.mex.2020.101181>
289. Cui, H., Zhang L., Eltoukhy L., Jiang, Q., Korkunc, S. K., Jaeger, K. E., Schwaneberg, U., Davari, M. D. (2020). Enzyme hydration determines resistance in organic cosolvents. *ACS Catalysis*, DOI: : <https://dx.doi.org/10.1021/acscatal.0c03233>
288. Nöth, M., Hussmann L., Belthle T., El-Awaad, I., Davari, M. D., Jakob F., Pich, A., Schwaneberg, U. (2020). MicroGelzymes: pH-independent immobilization of cytochrome p450 bm3 in microgels. *Biomacromolecules*, DOI: : <https://dx.doi.org/10.1021/acs.biomac.0c01262>
287. Cui H., Jaeger K. E., Davari, M. D., Schwaneberg U. (2020). CompassR yields highly organic solvent-tolerant enzymes through recombination of compatible substitutions. *Chemistry - A European Journal*, DOI: 10.1002/chem.202004471
286. Nöth, M., Gau, E., Jung, F., Davari, M. D., El-Awaad, I., Pich, A., Schwaneberg, U. (2020). Biocatalytic microgels (μ -Gelzymes): synthesis, concepts, and emerging applications. *Green Chem.*, DOI: 10.1039/d0gc03229h
285. Bergs, T., Schwaneberg, U., Barth, S., Hermann, L., Grunwald, T., Mayer, S., Biermann, F., Sözer, N. (2020). Application cases of biological transformation in manufacturing technology. *CIRP Journal of Manufacturing Science and Technology*, DOI: 10.1016/j.cirpj.2020.09.010
284. Zou, Z., Nöth, M., Jakob, F., Schwaneberg, U. (2020). Designed *Streptococcus pyogenes* Sortase A accepts branched amines as nucleophiles in sortagging. *Bioconjugate Chem.*, DOI: 10.1021/acs.bioconjchem.0c00486
283. Kato, S., Onoda, A., Taniguchi, N., Schwaneberg, U., & Hayashi, T. (2020). Directed evolution of a Cp* Rh (III)-linked biohybrid catalyst based on a screening platform with affinity purification. *ChemBioChem*, DOI: 10.1002/cbic.202000681.
282. Mirzaei Garakani, T., Sauer, D. F., Mertens, M. S., Lazar, J., Gehrmann, J., Arlt, M., Schiffels, J., Schnakenberg, U., Okuda, J., & Schwaneberg, U (2020). FhuA-Grubbs-Hoveyda biohybrid catalyst embedded in a polymer film enables catalysis in neat substrates. *ACS Catalysis*, 10(19), 10946–10953, DOI: 10.1021/acscatal.0c03055.
281. Markel, U., Lanvers, P., Sauer, D. F., Wittwer, M., Dhoke, G. V., Davari, M. D., Schiffels, J., & Schwaneberg, U. (2020). A photoclick-based high-throughput screening for the directed evolution of decarboxylase OleT. *Chemistry - A European Journal*, DOI: 10.1002/chem.202003637.
280. Kato, S., Onoda, A., Grimm, A. R., Tachikawa, K., Schwaneberg, U., & Hayashi, T. (2020). Incorporation of a Cp* Rh (III)-dithiophosphate cofactor with latent activity into a protein scaffold generates a biohybrid catalyst promoting C (sp²)-H Bond functionalization. *Inorganic Chemistry*, DOI: 10.1021/acs.inorgchem.0c02245.
279. Chung, M. E., Goroncy, K., Kolesnikova, A., Schönauer, D., & Schwaneberg, U. (2020). Display of functional nucleic acid polymerase on *Escherichia coli* surface and its application in directed polymerase evolution. *Biotechnology and Bioengineering*, DOI: 10.1002/bit.27542.
278. Ji, Y., Islam, S., Cui, H., Dhoke, G. V., Davari, M. D., Mertens, A. M., & Schwaneberg, U. (2020). Loop engineering of aryl sulfotransferase B for improving catalytic performance in regioselective sulfation. *Catalysis Science & Technology*, 10(8), 2369–2377., DOI: 10.1039/D0CY00063A.
277. Fessner, N. D., Srdič, M., Weber, H., Schmid, C., Schoenauer, D., Schwaneberg, U., & Glieder, A. (2020). Preparative-scale production of testosterone metabolites by human liver cytochrome p450 enzyme 3a4. *Advanced Synthesis & Catalysis*, 362(13), 2725–2738., DOI: 10.1002/adsc.202000251.

276. Contreras, F., Thiele, M. J., Pramanik, S., Rozhkova, A. M., Dotsenko, A. S., Zorov, I. N., Sinitsyn, A. P., Davari, M. D. & Schwaneberg, U. (2020). KnowVolution of a GH5 cellulase from *Penicillium verruculosum* to improve thermal stability for biomass degradation. *ACS Sustainable Chemistry & Engineering*, 8(33), 12388–12399, DOI: 10.1021/acssuschemeng.0c02465.
275. Zou, Z., Mate, D. M., Nöth, M., Jakob, F., & Schwaneberg, U. (2020). Enhancing robustness of sortase A by loop engineering and backbone cyclization. *Chemistry—A European Journal*, DOI: 10.1002/chem.202002740.
274. Brands, S., Brass, H. U., Klein, A. S., Pietruszka, J., Ruff, A. J., & Schwaneberg, U. (2020). A colourimetric high-throughput screening system for directed evolution of prodigiosin ligase PigC. *Chemical Communications*, DOI: 10.1039/d0cc02181d.
273. Siedhoff, N. E., Schwaneberg, U., & Davari, M. D. (2020). Machine learning-assisted enzyme engineering. in *Methods in Enzymology*, DOI: 10.1016/bs.mie.2020.05.005.
272. Cui, H., Stadtmüller, T. H., Jiang, Q., Jaeger, K. E., Schwaneberg, U., & Davari, M. D. (2020). How to engineer organic solvent resistant enzymes: Insights from combined molecular dynamics and directed evolution study. *ChemCatChem*, DOI: 10.1002/cctc.202000422.
271. Ensari, Y., de Almeida Santos, G., Ruff, A. J., & Schwaneberg, U. (2020). Engineered P450 BM3 and cpADH5 coupled cascade reaction for β -oxo fatty acid methyl ester production in whole cells. *Enzyme and Microbial Technology*, doi: <https://doi.org/10.1016/j.enzmictec.2020.109555>.
270. Remeeva, A., Nazarenko, V. V., Goncharov, I. M., Yudenko, A., Smolentseva, A., Semenov, O., Kovalev, K., Gülbahar, C., Schwaneberg, U., Davari, M.D., Gordeliy, V., Gushchin, I. (2020). Effects of proline substitutions on the thermostable LOV domain from *Chloroflexus aggregans*. *Crystals*, doi:10.3390/cryst10040256.
269. Contreras, F., Pramanik, S., Rozhkova, A. M., Zorov, I. N., Korotkova, O., Sinitsyn, A. P., Schwaneberg, U., Davari, M. D. (2020). Engineering robust cellulases for tailored lignocellulosic degradation cocktails. *International Journal of Molecular Sciences*, doi:10.3390/ijms21051589.
268. Herrmann, K. R., Ruff, A. J., & Schwaneberg, U. (2020). Phytase-based phosphorus recovery process for 20 distinct press cakes. *ACS Sustainable Chemistry & Engineering*, doi:10.1021/acssuschemeng.9b07433.
267. D'Ambrosio, V., Pramanik, S., Goroncy, K., Jakociunas, T., Schönauer, D., Davari, M. D., Schwaneberg, U., Keasling, J.D., & Jensen, M. K. (2020). Directed evolution of VanR biosensor specificity in yeast. *Biotechnology Notes*, doi: 10.1016/j.biotno.2020.01.002.
266. Zhang, L., Cui, H., Dhoke, G.V., Zou, Z., Sauer, D.F., Davari, M.D., Schwaneberg, U. (2020) Engineering of Laccase CueO for improved electron transfer in bioelectrocatalysis by semi-rational design. *Chemistry - A European Journal*, doi: 10.1002/chem.201905598.
265. Nutschel, C., Fulton, A., Zimmermann, O., Schwaneberg, U., Jaeger, K. E., & Gohlke, H. (2020) Systematically scrutinizing the impact of substitution sites on thermostability and detergent tolerance for *Bacillus subtilis* lipase A. *Journal of Chemical Information and Modeling*.
264. Markel, U., Essani, D. K., Besirlioglu, V., Schiffels, J., Streit, W. R., Schwaneberg, U. (2020) Advances in ultrahigh-throughput screening for directed enzyme evolution. *Chemical Society reviews*, DOI: 10.1039/C8CS00981C

2019

263. Gärtner, A., Ruff, A. J., Schwaneberg, U. (2019) A 96-multiplex capillary electrophoresis screening platform for product based evolution of P450 BM3. *Scientific reports*, 9(1), 1-11.
262. Mertens, M. A. S.†, Sauer, D. F.†, Markel, U., Schiffels, J., Okuda, J., Schwaneberg, U. (2019) Chemoenzymatic cascade for stilbene production from cinnamic acid catalyzed by ferulic acid decarboxylase and an artificial metatase. *Catalysis Science & Technology*, DOI: 10.1039/C9CY01412H
261. Gehlen, D.B., De Lencastre Novaes, L.C., Long, W., Ruff, A.J., Jakob, F., Haraszi, T., Chandorkar, Y., Yang, L., van Rijn, P., Schwaneberg, U., De Laporte, L. (2019). Rapid and robust coating method to

- render polydimethylsiloxane surfaces cell adhesive. *ACS applied materials & interfaces*, doi: 10.1021/acsami.9b16025.
260. Dotsenko, A. S., Pramanik, S., Gusakov, A. V., Rozhkova, A. M., Zorov, I. N., Sinitsyn, A. P., Davari M.D. & Schwaneberg, U. (2019). Critical effect of proline on thermostability of endoglucanase II from *Penicillium verruculosum*. *Biochemical Engineering Journal*, 107395.
259. Neuckermans, J., Mertens, A., De Win, D., Schwaneberg, U., De Kock, J. (2019). A robust bacterial assay for high-throughput screening of human 4-hydroxyphenylpyruvate dioxygenase inhibitors. *Scientific reports* doi: 10.1038/s41598-019-50533-1.
258. Zou, Z., Gau, E., El-Awaad, I., Jakob, F., Pich, A., Schwaneberg, U. (2019). Selective functionalization of microgels with enzymes by sortagging. *Bioconjugate chemistry* doi: 10.1021/acs.bioconjchem.9b00568.
257. Dedisch, S., Wiens, A., Davari, M. D., Söder, D., Rodriguez-Emmenegger, C., Jakob, F., Schwaneberg, U. (2019). Matter-tag: A universal immobilization platform for enzymes on polymers, metals, and silicon-based materials. *Biotechnology and Bioengineering* doi: 10.1002/bit.27181.
256. Cui, H., Cao, H., Cai, H., Karl-Erich, J., Davari, M.D., Schwaneberg, U. (2019) Computer-assisted Recombination (CompassR) teaches us how to recombine beneficial substitutions from directed evolution campaigns. *Chemistry - A European Journal*, doi:10.1002/chem.201903994.
255. Schneidewind, J., Krause, F., Bocola, M., Stadler, J. M., Davari, M. D., Schwaneberg, U., Karl-Erich, J., Krauss, U. (2019) Consensus model of a cyanobacterial light-dependent protochlorophyllide oxidoreductase in its pigment-free apo-form and photoactive ternary complex. *Communications Biology*, 2(1): 351.
254. Stadler, A. M., Schneidewind, J., Zamponi, M., Knieps-Grünhagen, E., Gholami, S., Schwaneberg, U., Rivalta, I., Garavelli, M., Davari, M. D., Jaeger, K., Krauss, U. (2019) Ternary complex formation and photoactivation of a photoenzyme results in altered protein dynamics. *The Journal of Physical Chemistry B*, DOI: 10.1021/acs.jpcc.9b06608.
253. Mertens, M. A. S.†, Thomas, F.†, Nöth, M., Moegling, J., El-Awaad, I., Sauer, D. F., Dhoke, G. V., Xu, W., Pich, A., Herres-Pawlis, S., Schwaneberg, U. (2019) One-pot two-step chemoenzymatic cascade for the synthesis of a bis-benzofuran derivative. *European Journal of Organic Chemistry*, DOI: 10.1002/ejoc.201900904.
252. Apitius, L., Buschmann, S., Bergs, C., Schönauer, D., Jakob, F., Pich, A.* , Schwaneberg, U.* (2019) Biadhesive peptides for assembling stainless steel and compound loaded micro-containers. *Macromolecular Bioscience*, DOI: 10.1002/mabi.201900125.
251. Büscher, N., Sayoga, G. V., Rüksam, K., Jakob, F., Schwaneberg, U.*, Kara, S.*, Liese, A.* (2019) Biocatalyst immobilization by anchor peptides on an additively manufacturable material. *Organic Process Research & Development*, DOI: 10.1021/acs.oprd.9b00152.
250. Garakani, T. M., Liu, Z., Glebe, U., Gehrmann, J., Lazar, J., Mertens, S., Möller, M., Hamzelui, N., Zhu, L., Schnakenberg, U., Böker, A., Schwaneberg, U. (2019) In situ monitoring of membrane protein insertion into block copolymer vesicle membranes and their spreading via potential-assisted approach. *ACS Applied Materials and Interfaces*, DOI: 10.1021/acsami.9b09302.
249. Liu, H., Zhu, L., Wallraf, A. M., Räuber, C., Grande, P. M., Anders, N., Gertler, C., Werner, B., Klankermayer, J., Leitner, W., Schwaneberg, U. (2019) Depolymerization of laccase-oxidized lignin in aqueous alkaline solution at 37 °C. *ACS Sustainable Chemistry & Engineering*, 7, 11150-11156.
248. Dedisch, S., Obstals, F., de los Santos Pereira, A., Bruns, M., Jakob, F., Schwaneberg, U., & Rodriguez-Emmenegger, C. (2019). Turning a killing mechanism into an adhesion and antifouling advantage. *Advance materials interfaces* DOI: 10.1002/admi.201900847.
247. Kostina, N., Rahimi, K., Xiao, Q., Haraszti, T., Dedisch, S., Spatz, J. P., Schwaneberg, U., Klein, M.L., Percec, V., Möller, M., Rodriguez-Emmenegger, C. (2019). Membrane-mimetic dendrimersomes engulf living bacteria via endocytosis. *Nano Letters*. DOI: 10.1021/acs.nanolett.9b02349.
246. Santos, G. D. A., Dhoke, G. V., Davari, M. D., Ruff, A. J., Schwaneberg, U. (2019). Directed evolution of P450 BM3 towards functionalization of aromatic O-heterocycles. *International Journal of Molecular Sciences*, 20(13), 3353.

245. Herrmann, K. R., Ruff, A. J., Infanzón, B., Schwaneberg, U. (2019). Engineered phytases for emerging biotechnological applications beyond animal feeding. *Applied microbiology and biotechnology*, DOI: 10.1007/s00253-019-09962-1.
244. Cheng, F., Yang, J., Schwaneberg, U., Zhu, L. (2019). Rational surface engineering of an arginine deiminase (an antitumor enzyme) for increased PEGylation efficiency. *Biotechnology and bioengineering*. DOI: 10.1002/bit.27011.
243. Pramanik, S., Dhoke, G. V., Jaeger, K. E., Schwaneberg, U., Davari, M. (2019) How to engineer ionic liquids resistant enzymes? Insights from combined molecular dynamics and directed evolution study. *ACS Sustainable Chemistry & Engineering*. DOI: 10.1021/acssuschemeng.9b00752.
242. Apitius, L., Rübsam, K., Jakesch, C., Jakob, F., Schwaneberg, U. (2019) Ultra-high-throughput screening system for directed polymer binding peptide evolution *Biotechnology and bioengineering*. DOI: 10.1002/bit.26990
241. Bashirova, A.*, Pramanik, S.*, Volkov, P., Rozhkova, A., Nemashkalov, V., Zorov, I., Gusakov, A., Sinityn, A., Schwaneberg, U., Davari, M. D. (2019). Disulfide bond engineering of an endoglucanase from *Penicillium verruculosum* to improve its thermostability *International journal of molecular sciences*. 20(7), 1602.
240. Nazarenko, V., Remeeva, A., Yudenko, A., Kovalev, K., Dubenko, A., Goncharov, I., Kuzmichev, P., Rogachev, A., Buslaev, P., Borshchevskiy, V., Mishin, A., Dhoke, G. V., Schwaneberg, U., Davari, M. D., Jaeger, K., Krauss, U., Gordeliy, V., Gushchin, I. (2019) Thermostable flavin-based fluorescent protein from *Chloroflexus aggregans*: a framework for ultra-high resolution structural studies *Photochem. Photobiol. Sci.* DOI: 10.1039/C9PP00067D
239. Anand, D., Dhoke, G. V., Kinzel, J., Garakani, T. M., Davari, M. D., Bocola, M., Zhu, L., Schwaneberg, U. (2019). Chiral separation of D/L-arginine with whole cells through an engineered FhuA nanochannel. *Chemical Communications*. DOI: 10.1039/c9cc00154a
238. Schwinges, P., Pariyar, S., Jakob, F., Rahimi, M., Apitius, L., Hunsche, M., Schmitt, L., Noga, G., Langenbach, C., Schwaneberg*, U., Conrath*, U. (2019). A bifunctional dermaseptin–thanatin dipeptide functionalizes the crop surface for sustainable pest management *Green Chem* DOI: 10.1039/c9gc00457b
237. Ji, Y., Islam, S., Mertens, A.M., Sauer, D.F., Dhoke, G.V., Jakob, F., Schwaneberg, U. (2019). Directed aryl sulfotransferase evolution toward improved sulfation stoichiometry on the example of catechols. *Appl. Microbiol. Biotechnol.* DOI: 10.1007/s00253-019-09688-0
236. Novoa, C., Dhoke, G. V., Mate, D. M., Martínez, R., Haarmann, T., Schreiter, M., Eidner, J., Schwerdtfeger, R., Lorenz, P., Davari, M. D., Jakob, F., Schwaneberg, U. (2019). KnowVolution of a fungal laccase toward alkaline pH. *ChemBioChem*. DOI:10.1002/cbic.201800807
235. Zhang, L., Cui, H., Zou, Z., Mirzaeigarakani, T., Novoa-Henriquez, C., Jooyeh, B., Schwaneberg, U. (2019). Directed Evolution of a Bacterial Laccase (CueO) for Enzymatic Biofuel Cells. *Angew. Chem. Int. Ed. Eng.* DOI:10.1002/anie.201814069
234. Grimm, A. R., Sauer, D. F., Mirzaei Garakani, T., Rübsam, K., Polen, T., Davari, M. D., Jakob, F., Schiffels, J., Okuda, J., Schwaneberg, U. (2019). Anchor peptide-mediated surface immobilization of a grubbs-hoveyda type catalyst for ring-opening metathesis polymerization. *Bioconjugate chemistry*. DOI:10.1021/acs.bioconjchem.8b00874
233. Okuda, J., Schwaneberg, U., Polen, T., Schiffels, J., Mertens, S., Qu, Y., Sauer, D. F. (2019). Biohybrid catalysts for sequential one-pot tandem reactions based on an engineered transmembrane protein. *Catalysis Science & Technology*. DOI:10.1039/c8cy02236d
232. Peng, H., Rübsam, K., Hu, C., Jakob, F., Schwaneberg, U., Pich, A. (2019). Stimuli-Responsive poly(N-Vinyl lactams) with glycidyl side groups: synthesis, characterization and conjugation with enzymes. *Biomacromolecules*. doi: 10.1021/acs.biomac.8b01608
231. Bornscheuer, U.T., Hauer, B., Jaeger, K.E., Schwaneberg, U. (2019). Gerichtete Evolution ermöglicht das Design von maßgeschneiderten Proteinen zur nachhaltigen Produktion von Chemikalien und Pharmazeutika. *Angewandte Chemie* 131 (1), 36-41
230. Islam, S.*, Apitius, L.*, Jakob, F., Schwaneberg, U. (2019). Targeting microplastic particles in the void of diluted suspensions. *Environ. Int.* 123: 428-435. *shared first authorship

229. Meng, S., Guo, J., Nie, K., Schwaneberg, U., Tan, T., Xu, H., Liu, L. (2019). High throughput screening method for engineering P450 towards terminal hydroxylation of fatty acids. *J. Biobased Mater. Bioenergy*, 13, 79-85.

2018

228. Bornscheuer, U.T., Hauer, B., Jaeger, K.-E., Schwaneberg U. (2018). Directed evolution empowered redesign of natural proteins for the sustainable production of chemicals and pharmaceuticals. *Angew. Chem. Int. Ed.*, 57, 2–7.
227. Sauer, D.F., Schiffels, J., Hayashi, T., Schwaneberg U., Okuda, J. (2018). Olefin metathesis catalysts embedded in β -barrel proteins: creating artificial metalloproteins for olefin metathesis. *Beilstein J. Org. Chem.* 2018, 14, 2861–2871.
226. Markel, U., Sauer, D.F., Schiffels, J., Okuda, J., Schwaneberg U. (2018). Towards evolution of artificial metalloenzymes – A protein engineer’s perspective. *Angew. Chem. Int. Ed. Eng.*, first published online Nov 15 2018, DOI:10.1002/anie.2018110425.
225. Thiele, M.J., Davari, M.D., König, M., Hofmann, I., Junker, N., Mirzaei Garakani, T., Vojcic, L., Fitter, J., Schwaneberg U. (2018). Enzyme-polyelectrolyte complexes boost the catalytic performance of enzymes. *ACS Catal.*, 8, 10876–10887.
224. Mirzaei Garakani, T., Grull, M., Anand, D., Albarghash, A., Janßen, D., Mathieu, M., Schwieters, M., Glebe, U., Böker, A., Fitter, J., Groth, G., Schwaneberg, U. (2018). Towards the preparation of chiral membranes based on β -barrel proteins. In: Beckmann, D., Kaufhold, S. (Ed.) *Technische Systeme für die Lebenswissenschaften. 19. Heiligenstädter Kolloquium*. ISBN 978-3-00-060656-4
223. Zhou, J., Wang, Y., Xu, G., Wu, L., Han, R., Schwaneberg, U., Rao, Y., Zhao, Y.L., Zhou, J., Ni, Y. (2018). Structural insight into enantioselective inversion of an alcohol dehydrogenase reveals a "polar gate" in stereorecognition of diaryl ketones. *J. Am. Chem. Soc.*, 140, 12645-12654.
222. Sauer, D.F., Schwaneberg, U., Okuda, J. (2018). Künstliche Metalloproteine für die Olefinmetathese. *Nachrichten aus der Chemie*, 66, 857-861.
221. Zou, Z., Alibiglou, H., Mate, D.M., Davari, M.D., Jakob, F., Schwaneberg, U. (2018). Directed sortase A evolution for efficient site-specific bioconjugations in organic co-solvents. *Chem. Commun.*, 54, 11467-11470.
220. Weingartner, A.M., Sauer, D.F., Dhoke, G.V., Davari, M.D., Ruff, A.J., Schwaneberg, U. (2018). A hydroquinone-specific screening system for directed evolution. *Appl. Microbiol. Biotechnol.*, 102, 9657-9667.
219. Islam, S., Laaf, D., Infanzón, B., Pelantová, H., Davari, M.D., Jakob, F., Křen, V., Elling, L., Schwaneberg, U. (2018). KnowVolution campaign of an aryl sulfotransferase increases activity toward cellobiose. *Chem. Eur. J.*, 24, 17117-17124.
218. Ji, Y., Mertens, A.M., Gertler, C., Fekiri, S., Keser, M., Sauer, D.F., Smith, K.E.C., Schwaneberg, U. (2018). Directed OmniChange evolution converts P450 BM3 into an alkyl-trimethylammonium hydroxylase. *Chem. Eur. J.*, 24, 16865-16872.
217. Körfer, G., Novoa, C., Kern, J., Balla, E., Grütering, C., Davari, M.D., Martinez, R., Vojcic, L., Schwaneberg, U. (2018) Directed evolution of an acid *Yersinia mollaretii* phytase for broadened activity at neutral pH. *Appl. Microbiol. Biotechnol.*, 102, 9607-9620.
216. Gutierrez, E.A., Wallraf, A.M., Balaceanu, A., Bocola, M., Davari, M.D., Meier, T., Duefel, H., Schwaneberg, U. (2018). How to engineer glucose oxidase for mediated electron transfer. *Biotechnol. Bioeng.*, 115, 2405-2415.
215. Jaeger, K.-E., Fulton, A., Schwaneberg, U., Pietruszka, J., Kovacic, F. (2018). Identification of stable and enantioselective lipases for biotechnological applications. *Croat. Chem. Acta*, 91, 249-253.
214. Thiel, A., Sauer, D.F., Mertens, S., Polen, T., Chen, H., Schwaneberg, U., Okuda, J. (2018). Cyclotrimerization of phenylacetylene catalyzed by a cobalt half-sandwich complex embedded in an engineered variant of transmembrane protein FhuA. *Org. Biomol. Chem.*, 16, 5452-5456.
213. Thiele, M.J., Davari, M.D., Hofmann, I., König, M., Lopez, C.G., Vojcic, L., Richtering, W., Schwaneberg, U., Tsarkova, L.A. (2018). Enzyme-compatible dynamic nanoreactors from electrostatically bridged like-charged surfactants and polyelectrolytes. *Angew. Chem. Int. Ed. Eng.*, 57, 9402 – 9407.

212. Fladischer, P., Weingartner, A., Blamauer, J., Darnhofer, B., Birner-Gruenberger, R., Kardashliev T., Ruff, A. J., Schwaneberg, U., Wiltschi, B. (2018). Semi-rationally engineered bacterial pyrrolysyl-tRNA synthetase genetically encodes phenyl azide chemistry. *Biotechnol J.*, 2018, 1800125.
211. Fulton, A., Kovacic, F., Schwaneberg, U., Pietruszka, J., Jaeger, K.-E. (2018). Bestimmung der Stabilität und Enantioselektivität von Lipasen. *BIOspektrum*, 24, 156 – 159.
210. Ensari, Y., Dhoke, G. V., Davari, M. D., Ruff, A. J., Schwaneberg, U. (2018). A comparative reengineering study of cpADH5 through iterative and simultaneous multi-site saturation mutagenesis. *ChemBioChem.*, 19, 1563 – 1569.
209. Wallraf, A. M., Liu, H., Zhu, L., Khalfallah, G., Simons, C., Alibiglou, H., Davari, M. D., Schwaneberg, U. (2018). A loop engineering strategy improves laccase lcc2 activity in ionic liquid and aqueous solution. *Green Chem.*, 20, 2801-2812.
208. Dai, X., Mate, D. M., Glebe, U., Mirzaei Garakani, T., Körner, A., Schwaneberg, U., Böker, A. (2018) Sortase-mediated ligation of purely artificial building blocks. *Polymers*, 10, 151.
207. Rübsam, K., Davari, M. D., Jakob, F., Schwaneberg, U. (2018). KnowVolution of the polymer binding peptide LCI for improved polypropylene binding. *Polymers*, 10, 423.
206. Eck, A., Schmidt, M., Hamer, S., Ruff, A. J., Förster, J., Schwaneberg, U., Blank, L. M., Wiechert, W., Oldiges, M. (2018). Improved microscale cultivation of *Pichia pastoris* for clonal screening. *Fungal Biol. Biotechnol.*, 5, 8.
205. Mandawe, J., Infanzon, B., Eisele, A., Zaun, H., Kuballa, J., Davari, M. D., Jakob, F., Elling, L., Schwaneberg, U. (2018). Directed evolution of hyaluronic acid synthase from *Pasteurella multocida* towards high molecular weight hyaluronic acid. *ChemBioChem.*, 19, 1414-1423.
204. Cheng F., Yang, J., Bocola, M., Schwaneberg U., Zhu, L. (2018). Loop engineering reveals the importance of active-site-decorating loops and gating residue in substrate affinity modulation of arginine deiminase (an anti-tumor enzyme). *Biochem. Biophys. Res.*, 499, 233-238.
203. Hanke, R., Bailly, N., Demling, P., Gohr, F. N., Opdensteinen, P., Osthege, M. J., Joppich, M., Sudarsan, S., Schwaneberg, U., Wiechert, W., Blank, L.M. (2018). Development of a modular biosensor system for rapid pathogen detection. In: Rincken., T., Kivirand, K. Biosensing technologies for the detection of pathogens – A prospective way for rapid analysis, 89 – 110. In tech D.O.O., Rijeka, Croatia. **(Book chapter)**
202. Grimm, A. R.* , Sauer, D. F.* , Davari, M. D., Zhu, L., Bocola, M., Kato, S., Onoda, A., Hayashi, T., Okuda, J., Schwaneberg, U. (2018). Cavity size engineering of a beta-barrel protein generates efficient biohybrid catalysts for olefin metathesis. *ACS Catal.*, 8, 3358-3364. *shared first authorship
201. Zhao, J., Frauenkron - Machedjou, V. J., Fulton, A., Zhu, L., Davari, M. D., Jaeger, K.-E., Schwaneberg, U., Bocola, M. (2018). Unraveling the effects of amino acid substitutions enhancing lipase resistance to an ionic liquid: a molecular dynamics study. *Phys. Chem. Chem. Phys.* 20, 9600-9609.
200. Grimm, A. R., Sauer, D. F., Polen, T., Zhu, L., Hayashi T., Okuda J., Schwaneberg, U. (2018). A whole cell *E. coli* display platform for artificial metalloenzymes: polyphenylacetylene production with a rhodium-nitrobindin metalloprotein. *ACS Catal.*, 8, 2611-2613.
199. Frauenkron-Machedjou, V. J., Fulton, A., Zhao, J., Weber, L., Jaeger K.-E., Schwaneberg, U., Zhu, L. (2018). Exploring the full natural diversity of single amino acid exchange reveals that 40–60% of BSLA positions improve organic solvents resistance. *Biores Bioprocess.* 5, 2.
198. Zou, Z., Mate, D. M., Rübsam, K., Jakob, F., Schwaneberg, U. (2018). A sortase-mediated high-throughput screening platform for directed enzyme evolution. *ACS Comb. Sci.* 20, 203-211. 197. Islam, S., Mate, D. M., Martínez, R., Jakob, F., Schwaneberg, U. (2018). A robust protocol for directed aryl sulfotransferase evolution toward the carbohydrate building block GlcNAc. *Biotechnol. Bioeng.*, 115, 1106-1115.
196. Fulton, A., Hayes, M. R., Schwaneberg, U., Pietruszka, J., Jaeger, K.-E. (2018) High-throughput screening assays for lipolytic enzymes. In: Bornscheuer U., Höhne M. (eds) *Protein Engineering*. 196. Fulton, A., Hayes, M.R., Schwaneberg, U., Pietruszka, J., Jaeger, K.-E. (2018) High-throughput screening assays for lipolytic enzymes. In: Bornscheuer U., Höhne M. (eds) *Protein*

Engineering. Methods in Molecular Biology, vol 1685, 209-231. Humana Press, New York, NY.
(Book chapter)

2017

195. Liu, Z., Ghai, I., Winterhalter, M., Schwaneberg, U. (2017). Engineering enhanced pore sizes using FhuA Δ 1-160 from *E. coli* outer membrane as template. *ACS Sens.*, 2, 1619-1626.
194. Rüksam*, K., Weber*, L., Jakob, F., Schwaneberg, U. (2017). Directed evolution of polypropylene and polystyrene binding peptides. *Biotechnol. Bioeng.*, 115, 321–330. *shared first authorship
193. Kopka, B., Magerl, K., Savitsky, A., Davari, M. D., Röllen, K., Bocola, M., Dick, B., Schwaneberg, U., Jaeger, K.-E., Krauss, U. (2017). Electron transfer pathways in a light, oxygen, voltage (LOV) protein devoid of the photoactive cysteine. *Sci. Rep. UK*, 7, 1-16.
192. Dennig[^], A., Weingartner*, A. M., Kardashliev, T., Müller, C. A., Tassano, E., Schürmann, M., Ruff**, A. J., Schwaneberg**, U. (2017). An enzymatic route to α -tocopherol synthons: Aromatic hydroxylation of pseudocumene and mesitylene with P450 BM3. *Chem. Eur. J.*, 23, 17981. *shared first authorship **shared corresponding authorship
191. Kammoonah, S., Prasad, B., Balaraman, P., Mundhada, H., Schwaneberg, U., Plettner, E. (2017). Selecting of a cytochrome P450cam SeSaM library with 3-chloroindole and endosulfan – identification of mutants that dehalogenate 3-chloroindole. *Biochim. Biophys. Acta*, 1866, 68-79.
190. Kinfu, B. M., Köster, M., Janus, M., Besirlioglu, V., Roggenbuck, M., Meurer, R., Vojcic, L., Borchert, M., Schwaneberg, U., Chow, J., Streit, W. R. (2017). Recombinant RNA polymerase from *Geobacillus* sp. GHH01 as tool for rapid generation of metagenomic RNAs using *in vitro* technologies. *Biotechnol. Bioeng.*, 114, 2739-2752.
189. Ensari*, Y., Dhoke*, G. V., Davari, M. D., Bocola, M., Ruff, A. J., Schwaneberg, U. (2017). Inversion of cpADH5 enantioselectivity and altered chain length specificity for methyl 3-hydroxyalkanoates. *Chem. Eur. J.*, 23, 12636-12645. *shared first authorship
188. Gau*, E., Mate*, D. M., Zou, Z., Oppermann, A., Töpel, A., Jakob, F., Wöll, D., Schwaneberg**, U., Pich**, A. (2017). Sortase-mediated surface functionalization of stimuli-responsive microgels. *Biomacromolecules*, 18, 2789-2798. *shared first authorship **shared corresponding authorship
187. Panneerselvam, S., Shehzad, A., Mueller-Dieckmann, J., Wilmanns, M., Bocola, M., Davari, M. D., Schwaneberg, U. (2017). Crystallographic insights into a cobalt (III) sepulchrate based alternative cofactor system of P450 BM3 monooxygenase. *Biochim. Biophys. Acta*, 1866, 134-140.
186. Kinzel*, J., Sauer*, D. F., Bocola, M., Arlt, M., Mirzaei Garakani, T., Thiel, A., Beckerle, K., Polen, T., Okuda, J., Schwaneberg, U. (2017). 2-Methyl-2,4-pentanediol (MPD) boosts as detergent-substitute the performance of β -barrel hybrid catalyst for phenylacetylene polymerization. *Beilstein J. Org. Chem.*, 13, 1498-1506. *shared first authorship
185. Picart, P., Liu, H., Grande, P. M., Anders, N., Zhu, L., Klankermayer, J., Leitner, W., Domínguez de María, P., Schwaneberg*, U., Schallmeyer*, A. (2017). Multi-step biocatalytic depolymerization of lignin. *Appl. Microbiol. Biotechnol.*, 101, 6277-6287. *shared corresponding authorship
184. Meurer, R. A., Kemper, S., Knopp, S., Eichert, T., Jakob, F., Goldbach, H. E., Schwaneberg*, U., Pich*, A. (2017). Biofunctional microgel-based fertilizers for controlled foliar delivery of nutrients to plants. *Angew. Chem. Int. Ed. Eng.*, 56, 7380-7386. *shared corresponding authorship
183. Markel*, U., Zhu*, L., Frauenkron-Machedjou, V. J., Zhao, J., Bocola, M., Davari, M. D., Jaeger, K.-E., Schwaneberg, U. (2017). Are directed evolution approaches efficient in exploring nature's potential to stabilize a lipase in organic cosolvents? *Catalysts*, 7, 142. *shared first authorship
182. Cao, H., Wang, M., Deng, L., Luo, L., Schwaneberg, U., Tan, T., Wang, F., Nie, K. (2017). Sugar-improved enzymatic synthesis of biodiesel with *Yarrowia lipolytica* Lipase 2. *Energ. Fuels*, 31, 6248-6256.
181. Yang, J., Ruff, A. J., Arlt, M., Schwaneberg, U. (2017). Casting epPCR (cepPCR): A simple random mutagenesis method to generate high quality mutant libraries. *Biotechnol. Bioeng.*, 114, 1921-1927.
180. Rüksam, K., Stomps, B., Böker, A., Jakob, F., Schwaneberg, U. (2017). Anchor peptides: A green and versatile method for polypropylene functionalization. *Polymer*, 116, 124-132.

179. Charan, H., Glebe, U., Anand, D., Kinzel, J., Zhu, L., Bocola, M., Mirzaei Garakani, T., Schwaneberg, U., Böker, A. (2017). Nano-thin walled micro-compartments from transmembrane protein-polymer conjugates. *Soft matter*, 13, 2866-2875.
178. Shivange, A. V., Schwaneberg, U. (2017). Recent advances in directed phytase evolution and rational phytase engineering. In: Alcalde, M. (ed) *Directed Enzyme Evolution: Advances and Applications*, 145-172. Springer, Cham. **(Book chapter)**
177. Mühlmann, M., Kunze, M., Ribeiro, J., Geinitz, B., Lehmann, C., Schwaneberg, U., Commandeur, U., Büchs, J. (2017). Cellulolytic RoboLector – towards an automated high-throughput screening platform for recombinant cellulase expression. *J. Biol. Eng.*, 11, 1-18.
176. Zhao, J., Frauenkron-Machedjou, V. J., Kardashliev, T., Ruff, A. J., Zhu, L., Bocola, M., Schwaneberg, U. (2017). Amino acid substitutions in random mutagenesis libraries: lessons from analyzing 3000 mutations. *Appl. Microbiol. Biotechnol.*, 101, 3177-3187.

2016

175. Belsare, K. D., Horn, T., Ruff, A. J., Martínez, R., Magnusson, A., Holtmann, D., Schrader, J., Schwaneberg, U. (2016). Directed evolution of P450cin for mediated electron transfer. *Protein Eng. Des. Sel.*, 30, 119-127.
174. Shivange*, A. V., Hoeffken, H. W., Haefner, S., Schwaneberg, U. (2016). Protein consensus-based surface engineering (ProCoS): a computer-assisted method for directed protein evolution. *Biotechniques*, 61, 305-314. *corresponding author
173. Welters, T., Horn, T., Ruff, A. J., Schwaneberg, U., Büchs, J. (2016). Novel technique for high throughput measurement of active monooxygenase concentration. *Biotechnol. Bioeng.*, 114, 929–933.
172. Ruff*, A. J., Arlt*, M., van Ohlen, M., Kardashliev, T., Konarzycka-Bessler, M., Bocola, M., Dennig, A., Urlacher**, V. B., Schwaneberg**, U. (2016). An engineered outer membrane pore enables an efficient oxygenation of aromatics and terpenes. *J. Mol. Catal. B: Enzymatic*, 134, 285-294. *shared first authorship, **shared corresponding authorship
171. Yang, J., Ruff, A. J., Hamer, S. N., Cheng, F., Schwaneberg, U. (2016). Screening through the PLICable promoter toolbox enhances protein production in *Escherichia coli*. *Biotechnol. J.*, 11, 1639-1647.
170. Müller*, C. A., Weingartner*, A. M., Dennig, A., Ruff, A. J., Gröger, H., Schwaneberg, U. (2016). A whole cell biocatalyst for double oxidation of cyclooctane. *J. Ind. Microbiol. Biotechnol.*, 43, 1641-1646. *shared first authorship
169. Engel, S., Höck, H., Bocola, M., Keul, H., Schwaneberg, U., Möller, M. (2016). CaLB catalyzed conversion of ϵ -caprolactone in aqueous medium. Part 1: Immobilization of CaLB to microgels. *Polymers*, 8, 372-388.
168. Vojcic*, L., Jakob*, F., Martínez, R., Hellmuth, H., O'Connell, T., Mühl, H., Lorenz, M. G., Schwaneberg, U. (2016). Engineering proteases for industrial applications. In: Hilterhaus, L., Liese, A., Kettling, U., Antranikian, G. (eds) *Applied Biocatalysis - From Fundamental Science to Industrial Applications*, 101-120. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany. *shared first authorship **(Book chapter)**
167. Peng, H., Rübsam, K., Jakob, F., Schwaneberg, U., Pich, A. (2016). Tunable enzymatic activity and enhanced stability of cellulase immobilized in biohybrid nanogels. *Biomacromolecules*, 17, 3619-3631.
166. Peng, H., Rübsam, K., Huang, X., Jakob, F., Karperien, M., Schwaneberg, U., Pich, A. (2016). Reactive copolymers based on *N*-vinyl lactams with pyridyl disulfide side groups via RAFT polymerization and postmodification via thiol–disulfide exchange reaction. *Macromolecules*, 49, 7141-7154.
165. Peng, H., Rübsam, K., Jakob, F., Pazdzior, P., Schwaneberg, U., Pich, A. (2016). Reversible deactivation of enzymes by redox-responsive nanogel carriers. *Macromol. Rapid Commun.*, 37, 1765-1771.
164. Charan*, H., Kinzel*, J., Glebe, U., Anand, D., Mirzaei Garakani, T., Zhu, L., Bocola, M., Schwaneberg**, U., Böker**, A. (2016). Grafting PNIPAAm from β -barrel shaped transmembrane

- nanopores. *Biomaterials*, 107, 115-123. *shared first authorship, **shared corresponding authorship
163. Jakob, F., Musset, A., Kremer, K., Schwaneberg, U. (2016). Wie Enzym-Engineering das Waschen optimiert. *Naturwissenschaften im Unterricht Chemie*, 152, 44-48. (not peer-reviewed)
 162. Dhoke, G. V., Ensari, Y., Davari, M. D., Ruff, A. J., Schwaneberg, U., Bocola, M. (2016). What's my substrate? Computational function assignment of *Candida parapsilosis* ADH5 by genome database search, virtual screening, and QM/MM calculations. *J. Chem. Inf. Model.*, 56, 1313-1323.
 161. Osseili, H., Sauer, D., Beckerle, K., Arlt, M., Himiyama, T., Polen, T., Onoda, A., Schwaneberg, U., Hayashi, T., Okuda, J. (2016). Artificial Diels–Alderase based on the transmembrane protein FhuA. *Beilstein J. Org. Chem.*, 12, 1314–1321.
 160. Schatte, M., Bocola, M., Roth, T., Martínez, R., Kopetzki, E., Schwaneberg, U., Bonitz-Dulat, M. (2016). Reporter immobilization assay (REIA) for bioconjugating reaction. *Bioconjugate Chem.*, 27, 1484-1492.
 159. Körfer, G., Pitzler, C., Vojcic, L., Martínez, R., Schwaneberg, U. (2016). *In vitro* flow cytometry-based screening platform for cellulase engineering. *Sci. Rep. UK*, 32, 629-634.
 158. Davari, M. D., Kopka, B., Wingen, M., Bocola, M., Drepper, T., Jaeger, K.-E., Schwaneberg, U., Krauss, U. (2016). Photophysics of the LOV-based fluorescent protein variant iLOV-Q489K determined by simulation and experiment. *J. Phys. Chem. B.*, 120, 3344-3352.
 157. Leissing, F., Nomoto, M., Bocola, M., Schwaneberg, U., Tada, Y., Conrath, U. and Beckers, G. J. M. (2016). Substrate thiophosphorylation by *Arabidopsis* mitogen-activated protein kinases. *BMC Plant Biol.*, 16, 1-11.
 156. Verma, R., Schwaneberg, U., Holtmann, D., Roccatano, D. (2016). Unraveling binding effects of cobalt(II) sepulchrate with the monooxygenase P450 BM-3 heme domain using molecular dynamics simulations. *J. Chem. Theory Comput.*, 12, 353-363.
- 2015**
155. Sauer, D. F., Himiyama, T., Tachikawa, K., Fukumoto, K., Onoda, A., Mizohata, E., Inoue, T., Bocola, M., Schwaneberg, U., Hayashi, T., Okuda, J. (2015). A highly active biohybrid catalyst for olefin metathesis in water: impact of a hydrophobic cavity in a β -barrel protein. *ACS Catal.*, 5, 7519-7522.
 154. Dhoke, G. V., Loderer, C., Davari, M. D., Ansorge-Schumacher, M., Schwaneberg, U., Bocola, M. (2015). Activity prediction of substrates in NADH-dependent carbonyl reductase by docking requires catalytic constraints and charge parameterization of catalytic zinc environment. *J. Comput. Aided Mol. Des.*, 29, 1057-1069.
 153. Bocola, M., Schwaneberg, U., Jaeger, K.-E., Krauss, U. (2015). Light-induced structural changes in a short light, oxygen, voltage (LOV) protein revealed by molecular dynamics simulations — implications for the understanding of LOV photoactivation. *Front. Mol. Biosci.*, 2, 1-17.
 152. Shivange, A., Roccatano, D., Schwaneberg, U. (2015). Iterative key-residues interrogation of a phytase with thermostability increasing substitutions identified in directed evolution. *Appl. Microbiol. Biotechnol.*, 100, 227-242.
 151. Zhao, J., Jia, N., Jaeger, K.-E., Bocola, M., Schwaneberg, U. (2015). Ionic liquid activated *Bacillus subtilis* lipase A variants through cooperative surface substitutions. *Biotechnol. Bioeng.*, 112, 1997-2004.
 150. Peng, H., Kather, M., Rübsam, K., Jakob, F., Schwaneberg, U., Pich, A. (2015). Water-soluble reactive copolymers based on cyclic *N*-vinylamides with succinimide side groups for bioconjugation with proteins. *Macromolecules*, 48, 4256-4268.
 149. Rehdorf, J., Meinhardt, S., Heinze, B., Liebeton, K., Niehaus, F., Blanusa, M., Schwaneberg, U., Eck, J. (2015). Directed evolution processes. *BLICKWINKEL*, 2, 6-13.
 148. Sauer, D. F., Bocola, M., Broglia, C., Arlt, M., Zhu, L., Broucker, M., Schwaneberg, U., Okuda, J. (2015). Hybrid ruthenium ROMP catalysts based on an engineered variant of β -barrel protein FhuA Δ CVFtev: effect of spacer length. *Chem. Asian J.*, 10, 177-182.

147. van Summeren-Wesenhagen, P. V., Voges, R., Dennig, A., Sokolowsky, S., Noack, S., Schwaneberg, U., Marienhagen, J. (2015). Combinatorial optimization of synthetic operons for the microbial production of p-coumaryl alcohol with *Escherichia coli*. *Microb. Cell Fact.*, 14, 1-10.
146. Loderer, C., Dhoke, G. V., Davari, M. D., Kroutil, W., Schwaneberg, U., Bocola, M., Ansorge-Schumacher, M. B. (2015). Investigation of structural determinants for the substrate specificity in the zinc-dependent alcohol dehydrogenase CPCR2 from *Candida parapsilosis*. *ChemBioChem*, 16, 1512-1519.
145. Lülldorf, N., Vojcic, L., Hellmuth, H., Weber, T., Mußmann, N., Martínez, R., Schwaneberg, U. (2015). A first continuous 4-aminoantipyrine (4-AAP)-based screening system for directed esterase evolution. *Appl. Microbiol. Biotechnol.*, 99, 5237-5246.
144. Cheng*, F., Zhu*, L., Schwaneberg, U. (2015). Directed evolution 2.0: improving and deciphering enzyme properties. *Chem. Commun.*, 51, 9760-9772. *shared first authorship
143. Dhoke, G. V., Davari, M. D., Schwaneberg, U., Bocola, M. (2015). QM/MM calculations revealing the resting and catalytic states in zinc-dependent medium-chain dehydrogenases/reductases. *ACS Catal.*, 5, 3207-3215.
142. Lülldorf*, N., Pitzler*, C., Biggel, M., Martínez, R., Vojcic, L., Schwaneberg, U. (2015). A flow cytometer-based whole cell screening toolbox for directed hydrolase evolution through fluorescent hydrogels. *Chem. Commun.*, 51, 8679-8682. *shared first authorship
141. Frauenkron-Machedjou, V. J., Fulton, A., Zhu, L., Bocola, M., Zhu, L., Jaeger, K.-E., Schwaneberg, U. (2015). Towards understanding directed evolution: more than half of all amino acid positions contribute to ionic liquid resistance of *Bacillus subtilis* lipase A. *ChemBioChem*, 16, 937-945.
140. Fulton, A., Frauenkron-Machedjou, V. J., Skoczinski, P., Wilhelm, S., Zhu, L., Schwaneberg, U., Jaeger, K.-E. (2015). Exploring the protein stability landscape: *Bacillus subtilis* lipase A as a model for detergent tolerance. *ChemBioChem*, 16, 930-936.
139. Cheng, F., Kardashliev, T., Pitzler, C., Shehzad, A., Lue, H., Bernhagen, J., Zhu, L., Schwaneberg, U. (2015). A competitive flow cytometry screening system for directed evolution of therapeutic enzyme. *ACS Synth. Biol.*, 4, 768-775.
138. Vojcic*, L., Pitzler*, C., Wirtz*, G., Jakob*, F., Martínez, R., Maurer, K.-H., Schwaneberg, U. (2015). Advances in protease engineering for laundry detergents. *N. Biotechnol.*, 32, 629-634. *shared first authorship

2014

137. Tosstorff, A., Dennig, A., Ruff, A. J., Schwaneberg, U., Sieber, V., Mangold, K.-M., Schrader, J., Holtmann, D. (2014). Mediated electron transfer with monooxygenases - insight in interactions between reduced mediators and the co-substrate oxygen. *J. Mol. Catal. B: Enzym.*, 108, 51-58.
136. Pitzler, C., Wirtz, G., Vojcic, L., Hiltl S., Böker, A., Martínez, R., Schwaneberg, U. (2014). A fluorescent hydrogel-based flow cytometry high-throughput screening platform for hydrolytic enzymes. *Chem. Biol.*, 21, 1733-1742.
135. Harwardt, N., Stripling, N., Roth, S., Liu, H., Schwaneberg, U., Spiess., A. C. (2014). Effects of ionic liquids on the reaction kinetics of a laccase-mediator system. *RSC Adv.*, 4, 17097-17104.
134. Spickermann, D., Hausmann, S., Degering, C., Schwaneberg, U., Leggewie, C. (2014). Engineering of highly selective variants of *Parvibaculum lavamentivorans* alcohol dehydrogenase. *ChemBioChem*, 15, 2050-2052.
133. Cheng, F., Zhu, L., Lue, H., Bernhagen, J., Schwaneberg, U. (2014). Directed arginine deiminase evolution for efficient inhibition of arginine-auxotrophic melanomas. *Appl. Microbiol. Biotechnol.*, 99, 1237-1247.
132. Verma, R., Wong, T. S., Schwaneberg, U., Roccatano, D. (2014). The Mutagenesis Assistant Program. *Methods Mol. Biol.*, In: Gillam, E., Copp, J., Ackerley, D. (eds) *Directed Evolution Library Creation. Methods in Molecular Biology (Methods and Protocols)*, vol 1179, 279-290. Springer, New York, NY 1179. **(Book chapter)**
131. Dennig, A., Marienhagen, J., Ruff, A. J., Schwaneberg, U. (2014). OmniChange: simultaneous site saturation of up to five codons. In: Gillam, E., Copp, J., Ackerley, D. (eds) *Directed Evolution Library*

- Creation. *Methods in Molecular Biology (Methods and Protocols)*, vol 1179, 139-149. Springer, New York, NY 1179. **(Book chapter)**
130. Ruff, A. J., Kardashliev, T., Dennig, A., Schwaneberg, U. (2014). The Sequence Saturation Mutagenesis (SeSaM) method. In: Gillam, E., Copp, J., Ackerley, D. (eds) *Directed Evolution Library Creation. Methods in Molecular Biology (Methods and Protocols)*, vol 1179, 45-68. Springer, New York, NY 1179. **(Book chapter)**
 129. Belsare, K. D., Ruff, A. J., Martínez, R., Shivange, A. V., Mundhada, H., Holtmann, D., Schrader, J., Schwaneberg, U. (2014). P-Link: a method for generating multicomponent cytochrome P450 fusions with variable linker length. *Biotechniques*, 57, 13-20.
 128. Spickermann, D., Kara, S., Barackov, I., Hollmann, F., Schwaneberg, U., Duenkelmann, P., Leggewie, C. (2014). Alcohol dehydrogenase stabilization by additives under industrially relevant reaction conditions. *J. Mol. Catal. B: Enzymatic*, 103, 24-28.
 127. Müller, C. A., Dennig, A., Welters, T., Winkler, T., Ruff, A. J., Hummel, W., Gröger, H., Schwaneberg, U. (2014). Whole-cell double oxidation of *n*-heptane. *J. Biotechnol.*, 191, 196-204.
 126. Zhao, J., Kardashliev, T., Ruff, A. J., Bocola, M., Schwaneberg, U. (2014). Lessons from diversity of directed evolution experiments by an analysis of 3000 mutations. *Biotechnol Bioeng*, 111, 2380-2389.
 125. Lehmann, C., Bocola, M., Streit, W. R., Martínez, R., Schwaneberg, U. (2014). Ionic liquid and deep eutectic solvent-activated CelA2 variants generated by directed evolution. *Appl. Microbiol. Biotechnol.*, 98, 5775-5785.
 124. Plum, L. M., Brieger, A., Engelhardt, G., Hebel, S., Nessel, A., Arlt, M., Kaltenberg, J., Schwaneberg, U., Huber, M., Rink, L., Haase, H. (2014). PTEN-inhibition by zinc ions augments interleukin-2-mediated Akt phosphorylation. *Metallomics*, 6, 1277-1287.
 123. Fukumoto, K., Onoda, A., Mizohata, E., Bocola, M., Inoue, T., Schwaneberg, U., Hayashi, T. (2014). Rhodium-complex-linked hybrid biocatalyst: stereo-controlled phenylacetylene polymerization within an engineered protein cavity. *ChemCatChem*, 6, 1229-1235. (cover page)
 122. Kardashliev, T., Ruff, A. J., Zhao, J., Schwaneberg, U. (2014). A high-throughput screening method to reengineer DNA polymerases for random mutagenesis. *Mol. Biotechnol.*, 56, 274-283.
 121. Zhu, L., Cheng, F., Piatkowski, V., Schwaneberg, U. (2014). Protein engineering of the antitumor enzyme PpADI for improved thermal resistance. *ChemBioChem*, 15, 276-283.
 120. Shivange, A., Dennig, A., Schwaneberg, U. (2014). Multi-site saturation by OmniChange yields a pH- and thermally improved phytase. *J. Biotechnol.*, 170, 68-72.
 119. Li, Z., Roccatano, D., Lorenz, M., Martínez, R., Schwaneberg, U. (2014). Insights on activity and stability of subtilisin E towards guanidinium chloride and sodium dodecylsulfate. *J. Biotechnol.*, 169, 87-94.
 118. Dudek, H. M., Fink, M. J., Shivange, A., Dennig, A., Mihovilovic, M., Schwaneberg, U., Fraaije, M. W. (2014). Extending the substrate scope of a Baeyer-Villiger monooxygenase by multiple-site mutagenesis. *Appl. Microbiol. Biotechnol.*, 98, 4009-4020.
 117. Verma, R., Schwaneberg, U., Roccatano, D. (2014). Insight into the redox partner interaction mechanism in cytochrome P450 BM-3 using molecular dynamics simulations. *Biopolymers*, 101, 197-209.

2013

116. Martínez, R. and Schwaneberg, U. (2013). A roadmap to directed enzyme evolution and screening systems for biotechnological applications, *Biol. Res.*, 46, 395-405.
115. Neufeld, K., Marienhagen, J., Schwaneberg, U., Pietruszka, J. (2013). Benzylic hydroxylation of aromatic compounds by P450 BM-3. *Green Chem.*, 15, 2408-2421.
114. Tenne, S. J., Kinzel, J., Arlt, M., Sibilla, F., Bocola, M., Schwaneberg, U. (2013). 2-Methyltetrahydrofuran and cyclopentylmethylether: two green solvents for efficient purification of membrane proteins like FhuA. *J. Chromatogr. B*, 937, 13-17.
113. Despotovic, D., Vojcic, L., Blanusa, M., Maurer, K.-H., Zacharias, M., Bocola, M., Martínez, R., Schwaneberg, U. (2013). Redirecting catalysis from proteolysis to perhydrolysis in subtilisin Carlsberg. *J. Biotechnol.*, 167, 279-286.

112. Jakob, F., Lehmann, C., Martínez, R., Schwaneberg, U. (2013). Increasing protein production by directed vector backbone evolution. *AMB Express*, 3, 39.
111. van Rijn, P., Tutus, M., Kathrein, C., Zhu, L., Wessling, M., Schwaneberg, U., Böker, A. (2013). Challenges and advances in the field of self-assembled membranes. *Chem. Soc. Rev.*, 42, 6578-6592 (cover page).
110. Arango Gutierrez, E., Meier, T., Duefel, H., Mundhada, H., Bocola, M., Schwaneberg, U. (2013). Reengineered glucose oxidase for amperometric glucose determination in diabetes analytics. *Biosens. Bioelectron.*, 50, 84-90.
109. Philippart, F., Arlt, M., Gotzen, S., Tenne, J., Bocola, M., Chen, H.H., Zhu, L., Schwaneberg, U., Okuda, J. (2013). A hybrid ring-opening metathesis polymerization catalyst based on engineered β -barrel protein FhuA. *Chem. Eur. J.*, 19, 13865-13871.
108. Dennig, A., Lülsdorf, N., Liu, H., Schwaneberg, U. (2013). Regioselective o-hydroxylation of monosubstituted benzenes by P450 BM-3. *Angew. Chem. Int. Ed. Engl.*, 53, 8459-8462.
107. Ruff, A. J., Dennig, A., Schwaneberg, U. (2013). To get what we aim for: progress in diversity generation methods. *FEBS J.*, 280, 2961-2978.
106. Müller, C. A., Akkapurathua, B., Winkler, T., Staudt, S., Hummel, W., Gröger, H., Schwaneberg, U. (2013). *In vitro* double-oxidation of *n*-heptane with direct co-factor regeneration. *Adv. Synth. Catal.*, 355, 1787-1798.
105. Ströhle, F. W., Cekic, S. Z., Magnusson, A. O., Schwaneberg, U., Roccatano, D., Schrader, J., Holtmann, D. (2013). A computational protocol to predict suitable redox mediators for substitution of NAD(P)H in P450 monooxygenases. *J. Mol. Catal. B Enzym.*, 88, 47-51.
104. Verma, R., Schwaneberg, U., Roccatano, D. (2013). Conformational dynamics of the FMN-binding reductase domain of monooxygenase P450 BM-3. *J. Chem. Theory Comput.*, 9, 96-105.
103. Shehzad, A., Panneerselvam, S., Linow, M., Bocola, M., Roccatano, D., Mueller-Dieckmann, J., Wilmanns, M., Schwaneberg, U. (2013). P450 BM-3 crystal structures reveal the role of the charged surface residue Lys/Arg184 in inversion of enantioselective styrene epoxidation. *Chem. Commun.*, 49, 4694-4696.
102. Liu, H.F., Zhu, L.L., Bocola, M., Chen N., Spiess, A. C., Schwaneberg, U. (2013). Directed laccase evolution for improved ionic liquid resistance. *Green Chem.*, 15, 1348-1355.
101. Ley, C., Schewe, H., Ströhle, F. W., Ruff, A. J., Schwaneberg, U., Schrader, J., Holtmann, D. (2013). Coupling of electrochemical and optical measurements in a microtiter plate for the fast development of electro enzymatic processes with P450s. *J. Mol. Catal. B Enzym.*, 92, 71-78.
100. Jakoblinnert, A., van der Wittenboer, A., Shivange, A., Bocola, M., Heffele, L., Ansorge-Schumacher, M., Schwaneberg, U. (2013). Design of an activity and stability improved carbonyl reductase from *Candida parapsilosis*. *J. Biotechnol.*, 165, 52-62.
99. Jakoblinnert, A., Wachtmeister, J., Schukur, L., Shivange, A., Bocola, M., Ansorge-Schumacher, M., Schwaneberg, U. (2013). Reengineered carbonyl reductase for reducing methyl-substituted cyclohexanones. *Protein Eng. Des. Sel.*, 26, 291-298.
98. Niehaus, F., Blanusa, M., Schwaneberg, U. (2013). Durchflußzytometrie-Systeme zum Auffinden verbesserter und neuer Enzyme. *BIOspektrum*, 1, 45-48.
97. Ley, C., Zengin Çekiça, S., Kochiusa, S., Mangold, K.-M., Schwaneberg, U., Schrader, J., Holtmann, D. (2013). An electrochemical microtiter plate for parallel spectroelectrochemical measurements. *Electrochim. Acta*, 89, 98-105.
96. Martínez, R., Jakob, F., Tu, R., Siegert, P., Maurer, K.-H., Schwaneberg U. (2013). Increasing activity and thermal resistance of *Bacillus gibsonii* alkaline protease (BgAP) by directed evolution. *Biotechnol. Bioeng.*, 110, 711-720.
95. Vojcic, L., Despotovic, D., Maurer, K.-H., Zacharias, M., Bocola, M., Martínez, R., Schwaneberg, U. (2013). Reengineering of subtilisin Carlsberg for oxidative resistance. *Biol. Chem.*, 394, 79-87.
94. Staudt, S., Burda, E., Giese, C., Müller, C. A., Marienhagen, J., Schwaneberg, U., Hummel, W., Drauz, K., Groeger, H. (2012). Direktoxidation von Cycloalkanen zu Cycloalkanonen mit Sauerstoff in Wasser. *Angew. Chem.*, 52, 2359-2363.

2012

93. Schulz, A., Fioroni, M., Linder, M. B., Nessel, A., Bocola, M., Subkowski, T., Schwaneberg, U., Böker, A., Rodríguez-Roper, F. (2012). Exploring the mineralization of hydrophobins at a liquid interface. *Soft Matter*, 8, 11343-11352.
92. Onoda, A., Fukumoto, K., Arlt, M., Bocola, M., Schwaneberg, U., Hayashi, T. (2012). A rhodium complex-linked β -barrel protein as a hybrid biocatalyst for phenylacetylene polymerization. *Chem. Commun.*, 48, 9756-9758.
91. Lehmann, C., Sibilla, F., Maugeri, Z., Streit, W. R., de María, P. D., Martínez, R., Schwaneberg, U. (2012). Reengineering CelA2 cellulase for hydrolysis in aqueous solutions of deep-eutectic-solvents and concentrated seawater. *Green Chem.*, 14, 2719-2726 (cover page).
90. Jakob, F., Martínez, R., Mandawe, J., Hellmuth, H., Siegert, P., Maurer, K.-H., Schwaneberg, U. (2013). Surface charge engineering of a *Bacillus gibsonii* subtilisin protease. *Appl. Microbiol. Biotechnol.*, 97, 6793-6802.
89. Kuper, J., Tee, K. L., Wilmanns, M., Roccatano, D., Schwaneberg, U., Wong, T. S. (2012). The role of active-site Phe87 in modulating the organic co-solvent tolerance of cytochrome P450 BM-3 monooxygenase. *Acta Crystallogr. Sect. F Struct. Biol. Cryst. Commun.*, 68, 1013-1017.
88. Prodanovic, R., Ostafe, R., Blanusa, M., Schwaneberg, U. (2012). Vanadium bromoperoxidase-coupled fluorescent assay for flow cytometry sorting of glucose oxidase gene libraries in double emulsions. *Anal. Bioanal. Chem.*, 404, 1439-1447.
87. Braun, A., Halwachs, B., Geier, M., Weinhandl, K., Guggemos, M., Marienhagen, J., Ruff, A. J., Schwaneberg, U. (2012). MuteinDB: the mutein database linking substrates, products and enzymatic reactions directly with genetic variants of enzymes. *Database (Oxford)*, 2012, bas028.
86. Ruff, A. J., Dennig, A., Wirtz, G., Blanusa, M., Schwaneberg, U. (2012). Flow cytometer-based high throughput screening system for accelerated directed evolution of P450 monooxygenases. *ACS Catal.*, 2, 2724-2728.
85. Ruff, A. J., Marienhagen, J., Verma, R., Roccatano, D., Genieser, H. G., Niemann, P., Shivange, A., Schwaneberg, U. (2012). dRTP and dPTP: a complementary nucleotide couple for the Sequence Saturation Mutagenesis (SeSaM) method. *J. Mol. Catal. B Enzym.*, 84, 40-47.
84. Dennig, A., Marienhagen, J., Ruff, A. J., Guddat, L., Schwaneberg, U. (2012). Directed evolution of P450 BM-3 into a p-xylene hydroxylase. *ChemCatChem*, 4, 771-773.
83. Verma, R., Schwaneberg, U., Roccatano, D. (2012). MAP2.03D: a sequence/structure based server for protein engineering. *ACS Synth. Biol.*, 1, 139-150.
82. Vojcic, J., Despotovic, D., Martínez, R., Maurer, K.-H., Schwaneberg, U. (2012). An efficient transformation method for *Bacillus subtilis* DB104. *Appl. Microbiol. Biotechnol.*, 94, 487-493.
81. Tenne, S. J. and Schwaneberg, U. (2012). First insights on organic cosolvent effects on FhuA wildtype and FhuA Δ 1-159. *Int. J. Mol. Sci.*, 13, 2459-2471.
80. Li, Z., Roccatano, D., Lorenz, M., Schwaneberg, U. (2012). Directed evolution of subtilisin E into a highly active and guanidinium chloride- and sodium dodecylsulfate-tolerant protease. *ChemBioChem*, 13, 691-699.
79. Despotovic, D., Vojcic, J., Prodanovic, R., Martínez, R., Maurer, K.-H., Schwaneberg, U. (2012). Fluorescent assay for directed evolution of perhydrolases. *J. Biomol. Screen.*, 17, 796-805.
78. Marienhagen, J., Dennig, A., Schwaneberg, U. (2012). Phosphorothioate-based DNA Recombination: an enzyme-free method for the combinatorial assembly of multiple DNA fragments. *BioTechniques Rapid Dispatches*, May 2012, 1-6.
77. Jakoblinnert, A., Bocola, M., Steinsiek, S., Bhattacharjee, M., Boenitz-Dulat, M., Schwaneberg, U., Ansorge-Schumacher, M. (2012). Who's Who? – Allocation of carbonyl reductase isoenzymes of *Candida parapsilosis* by combination of bio- and computational chemistry. *ChemBioChem*, 13, 803-809.
76. Staudt, S., Müller, C. A., Marienhagen, J., Böing, C., Buchholz, S., Schwaneberg, U., Gröger, H. (2012). Biocatalytic hydroxylation of *n*-butane with in situ cofactor regeneration at low temperature and under normal pressure. *Beilstein J. Org. Chem.*, 8, 186-191.
75. Shivange, A., Serwe, A., Dennig, A., Roccatano, D., Haefner, S., Schwaneberg, U. (2012). Directed evolution of a highly active *Yersinia mollaretii* phytase. *Appl. Microbiol. Biotechnol.*, 95, 405-418.

74. Noor, M., Dworeck, T., Schenk, A., Shinde, P., Fioroni, M., Schwaneberg, U. (2012). Polymersome surface decoration by an EGFP fusion protein employing Cecropin A as peptide "anchor". *J. Biotechnol.*, 157, 31-37.

2011

73. Jakoblinnert, A., Mladenov, R., Paul, A., Sibilla, F., Schwaneberg, U., Ansorge-Schumacher, M. B., de María, P. D. (2011). Asymmetric reduction of ketones with recombinant *E. coli* whole cells in neat substrates. *Chem. Commun.*, 47, 12230-12232.
72. Dennig, A., Shivange, A. V., Marienhagen, J., Schwaneberg, U. (2011). OmniChange: the sequence independent method for simultaneous site-saturation of five codons. *PLoS ONE*, 6, e26222.
71. Yu, E. H., Prodanovic, R., Güven, G., Ostafe, R., Schwaneberg, U. (2011). Electrochemical oxidation of glucose using mutant glucose oxidase from directed protein evolution for biosensor and biofuel cell applications. *Appl. Biochem. Biotechnol.*, 165, 1448-1457.
70. Güven, A., Dworeck, T., Fioroni, M., Schwaneberg, U. (2011). Residue K556 - A light triggerable gatekeeper to sterically control translocation in FhuA. *Adv. Eng. Mater.*, 13, 324-329.
69. Dworeck, T., Tenne, S. J., Schwaneberg, U. (2011). Schaltbare Proteine für interaktive Materialien. *BIOspektrum*, 3, 247-277.
68. Mundhada, H., Marienhagen, J., Scacioc, A., Schenk, A., Roccatano, D., Schwaneberg, U. (2011). SeSaM-Tv-II generates a protein sequence space that is unobtainable by epPCR. *ChemBioChem*, 12, 1595-1601.
67. Zhao, L., Güven, G., Li, Y., Schwaneberg U. (2011). First steps towards a Zn/Co(III)sep-driven P450 BM-3 reactor. *Appl. Microbiol. Biotechnol.*, 91, 989-999.
66. Martínez, R., Schwaneberg, U., Roccatano, D. (2011). Temperature effects on structure and dynamics of the psychrophilic protease subtilisin S41 and its thermostable mutants in solution. *Protein Eng. Des. Sel.*, 24, 533-544.
65. Liang, C., Fioroni, M., Rodríguez-Ropero, F., Xue, Y., Schwaneberg, U., Ma, Y. (2011). Directed evolution of a thermophilic endoglucanase (Cel5A) into highly active Cel5A variants with an expanded temperature profile. *J. Biotechnol.*, 154, 46-53.
64. Muhammad, N., Dworeck, T., Fioroni, M., Schwaneberg, U. (2011). Engineering of the *E. coli* outer membrane protein FhuA to overcome the hydrophobic mismatch in thick polymeric membranes. *J. Nanobiotechnology*, 9, 8.
63. Ihle, S., Onaca, O., Rigler, P., Hauer, B., Rodríguez-Ropero, F., Fioroni, M., Schwaneberg, U. (2011). Nanocompartments with a pH release system based on an engineered OmpF channel protein. *Soft Matter*, 7, 532-539.
62. Prodanovic, R., Ostafe, R., Scacioc, A., Schwaneberg, U. (2011). Ultrahigh throughput screening system for directed glucose oxidase evolution in yeast cells. *Comb. Chem. High T. Scr.*, 14, 55-60.
61. Tu, R., Martínez, R., Prodanovic, R., Klein, M., Schwaneberg, U. (2011). A flow cytometry-based screening system for directed evolution of proteases. *J. Biomol. Screen.*, 16, 285-294.
60. Ni, Y., Liu, Y., Schwaneberg, U., Zhu, L., Li, N., Li, L., Sun, Z. (2011). Rapid evolution of arginine deiminase for improved anti-tumor activity. *Appl. Microbiol. Biotechnol.*, 90, 193-201.
59. Dworeck, T., Petri, A. K., Muhammad, N., Fioroni, M., Schwaneberg, U. (2011). FhuA deletion variant Δ 1-159 overexpression in inclusion bodies and refolding with polyethylene-poly(ethylene glycol) diblock copolymer. *Protein Expr. Purif.*, 77, 75-79.

2010

58. Liang, C., Xue, Y., Fioroni, M., Rodríguez-Ropero, F., Schwaneberg, U., Ma, Y. (2010). Cloning and characterization of a thermostable and halo-tolerant endoglucanase from *Thermoanaerobacter tengcongensis* MB4. *Appl. Microbiol. Biotechnol.*, 89, 315-326.
57. Cekic, S. Z., Holtmann, D., Guven, G., Mangold, K. M., Schwaneberg, U., Schrader, J. (2010). Mediated electron transfer with P450cin. *Electrochem. Commun.*, 12, 1547-1550.
56. Zhu, L., Verma, R., Roccatano, D., Ni, Y., Sun, Z. H., Schwaneberg, U. (2010). A potential antitumor drug (arginine deiminase) reengineered for efficient operation under physiological conditions. *ChemBioChem*, 11, 2294-2301. (cover page)

55. Güven, G., Prodanovic, R., Schwaneberg, U. (2010). Protein engineering, an option for enzymatic biofuel cell design. *Electroanal.*, 22, 765-775.
54. Blanusa, M., Schenk, A., Sadeghi, H., Marienhagen, J., Schwaneberg, U. (2010). Phosphorothioate-based ligase-independent gene cloning (PLICing): an enzyme-free and sequence-independent cloning method. *Anal. Biochem.*, 406, 141-146.
53. Güven, A., Fioroni, M., Hauer, B., Schwaneberg, U. (2010). Molecular understanding of sterically controlled compound release through an engineered channel protein. *J. Nanobiotechnology*, 8:14, 1-9.
52. Shivange, A. V., Roccatano, D., Schwaneberg, U. (2010). Conformational dynamics of active site loop in *Escherichia coli* phytase. *Biopolymers*, 93, 994-1002.
51. Lucas, D., Goulitquer, S., Marienhagen, J., Fer, M., Dreano, Y., Schwaneberg, U., Amet, Y., Corcos L. (2010). Stereoselective epoxidation of the last double bond of polyunsaturated fatty acids by human cytochromes P450. *J. Lipid Res.*, 51, 1125-1133.
50. Zheng, Y., Xue, Y., Zhang, Y., Zhou, C., Schwaneberg, U., Ma, Y. (2010). Cloning, expression, and characterization of a thermostable glucoamylase from *Thermoanaerobacter tengcongensis* MB4. *Appl. Microbiol. Biotechnol.*, 87, 225-233.
49. Zhu, L., Tee, K. L., Roccatano, D., Sonmez, B., Ni, Y., Sun, Z. H., Schwaneberg U. (2010). Directed evolution of an antitumor drug (arginine deiminase PpADI) for increased activity at physiological pH. *ChemBioChem*, 11, 691-697.
48. Lee, W., Vojcic, L., Despotovic, D., Prodanovic, R., Maurer, K. H., Schwaneberg, U., Zacharias M. (2010). Rationalizing perhydrolase activity of aryl-esterase and subtilisin Carlsberg mutants by molecular dynamics simulations of the second tetrahedral intermediate state. *Theoretical Chem. Acc.*, 125, 375-386.

2009 At RWTH Aachen University

47. Pottkämper, J., Barthen, P., Ilmberger, N., Schwaneberg, U., Schenk, A., Schulte, M., Ignatiev, N., Streit, W. R. (2009). Applying metagenomics for the identification of bacterial cellulases that are stable in ionic liquids. *Green Chem.*, 11, 691-697.
46. Shivange, A. V., Marienhagen, J., Mundhada, H., Schenk, A., Schwaneberg, U. (2009). Advances in generating functional diversity for directed protein evolution. *Curr. Opin. Chem. Biol.*, 13, 19-25.
45. Ni, Y., Li, Z., Sun, Z., Zheng, P., Liu, Y., Zhu, L., Schwaneberg, U. (2009). Expression of arginine deiminase from *Pseudomonas plecoglossicida* CGMCC2039 in *Escherichia coli* and its anti-tumor activity. *Curr. Microbiol.*, 58, 593-598.
44. Marienhagen, J. und Schwaneberg, U. (2009). *Biochemie und Molekularbiologie 2008, Nachrichten aus der Chemie*, 3, 278-286.

2008

43. Tee, K. L., Roccatano, D., Stolte, S., Arning, J., Jastorff, B., Schwaneberg, U. (2008). Ionic liquid effects on the activity of monooxygenase P450 BM-3. *Green Chem.*, 10, 117-123.
42. Ni, Y., Schwaneberg, U., Sun, Z. H. (2008). Arginine deiminase, a potential anti-tumor drug, *Cancer Lett.*, 261, 1-11.
41. Nazor, J., Dannenmann, S., Adjei, R. O., Fordjour, Y. B., Ghampson, I. T., Blanusa, M., Roccatano, D., Schwaneberg, U. (2008). Laboratory evolution of P450 BM-3 for mediated electron transfer yielding an activity-improved and reductase-independent variant. *Protein Eng. Des. Sel.*, 21, 29-35.
40. Wong, T. S., Roccatano, D., Loakes, D., Tee, K. L., Schenk, A., Hauer, B., Schwaneberg, U. (2008). Transversion-enriched Sequence Saturation Mutagenesis (SeSaM-Tv+): a random mutagenesis method with consecutive nucleotide exchanges that complements the bias of error-prone PCR. *Biotechnol. J.*, 3, 74-82.
39. Tee, K. L., Dmytrenko, O., Otto, K., Schmid, A., Schwaneberg, U. (2008). A p-nitrothiophenolate screening system for the directed evolution of a two-component epoxygenase (StyAB). *J. Mol. Catal. B Enzym.*, 50, 121-127.

38. Onaca, O., Sarkar, P., Roccatano, D., Friedrich, T., Hauer, B., Grzelakowski, M., Güven, A., Fioroni, M., Schwaneberg, U. (2008). Functionalized nanocompartments (synthosomes) with a reduction-triggered release system. *Angew. Chem. Int. Ed. Eng.*, 47, 7029-7031.

2007

37. Wong, T. S., Roccatano, D., Schwaneberg, U. (2007). Steering directed protein evolution: strategies to manage combinatorial complexity of mutant libraries. *Environ. Microbiol.*, 9, 2645-2659.
36. Kuper, J., Wong, T. S., Roccatano, D., Wilmanns, M., Schwaneberg, U. (2007). Understanding a mechanism of organic co-solvent inactivation in heme monooxygenase P450 BM-3. *J. Am. Chem. Soc.*, 129, 5786-5787.
35. Zhu, Z., Momeu, C., Nazor, G., Prodanovic, R., Schwaneberg, U. (2007). Directed evolution of glucose oxidase for mediated electron transfer. *Biotechnol. J.*, 2, 241-248.
34. Tee, K. L. and Schwaneberg, U. (2007). Directed evolution of oxygenases: screening systems, success stories and challenges. *Comb. Chem. High T. Screen.*, 10, 197-217.
33. Wong, T. S., Roccatano, D., Schwaneberg, U. (2007). Challenges of the genetic code for exploring sequence space in directed protein evolution. *Biocatal. Biotrans.*, 25, 229-241.
32. Wong, T. S., Roccatano, D., Schwaneberg, U. (2007). Are transversion mutations better? A Mutagenesis Assistant Program analysis on P450 BM-3 heme domain. *Biotechnol. J.*, 2, 133-142.

2006

31. Tee, K. L. and Schwaneberg, U. (2006). A screening system for directed evolution of epoxygenases: validation reveals importance of position 184 in P450 BM-3 for stereoselective styrene epoxydation. *Angew. Chem. Int. Ed. Eng.*, 45, 5380-5383.
30. Tee, K. L. und Schwaneberg, U. (2006). Gelenkte Evolution von Epoxygenasen. *Chemie Ingenieur Technik*, 78, 1438-1439.
29. Roccatano, D., Wong, T. S., Schwaneberg, U., Zacharias, M. (2006). Toward understanding the inactivation mechanism of monooxygenase P450 BM-3 by organic cosolvents: a molecular dynamics simulation study. *Biopolymers*, 83, 467-476. (cover page)
28. Onaca, O., Nallani, M., Ihle, S., Schenk, A., Schwaneberg, U. (2006). Functionalized nanocompartments (Synthosomes): limitations and prospective applications in industrial biotechnology. *Biotechnol. J.*, 7-8, 795-805.
27. Nallani, M., Onaca, O., Hoheisel, W., Schwaneberg, U. (2006). A nanophosphors based method for selective DNA recovery in Synthosomes. *Biotechnol. J.*, 7-8, 828-834.
26. Schenk, A., Wong, T. S., Roccatano, D., Hauer, B., Schwaneberg, U. (2006). SeSaM (Sequence Saturation Mutagenesis): Eine Methode zur Sättigungsmutagenese eines Genes, *BIOspektrum*, 3, 277-279.
25. Nazor, J. and Schwaneberg, U. (2006). Laboratory evolution of P450 BM-3 for mediated electron transfer. *ChemBioChem*, 7, 638-644.
24. Nallani, M., Graf, A., Onaca, O., Lindemann, M., Winterhalter, M., Meier, W., Schwaneberg, U. (2006). A nanocompartment (Synthosome) system suitable for biotechnological applications. *J. Biotechnol.*, 123, 50-59.
23. Wong, T. S., Roccatano, D., Zacharias, M., Schwaneberg, U. (2006). A statistical analysis of current random mutagenesis methods for directed protein evolution. *J. Mol. Biol.* 355, 858-871. (cover page)
22. Zhu, Z., Momeu, C., Zakhartsev, M., Hernandez, J. C., Schwaneberg, U. (2006). Making glucose oxidase fit for biofuel cell applications by directed protein evolution. *Biosens. Bioelectron.*, 21, 2046-2051.
21. Wong, T. S., Zhurina, D., Schwaneberg, U. (2006). The diversity challenge in directed protein evolution. *Comb. Chem. High T. Screen.*, 9, 271-289.
20. Wong, T. S., Schwaneberg, U., Hauer, B., Breuer, B. (2006). A filter-paper based assay for laboratory evolution of hydrolases and dehydrogenases. *Comb. Chem. High T. Screen.*, 9, 289-293.

2005

19. Roccatano, D., Wong, T. S., Schwaneberg, U., Zacharias, M. (2005). Structural and dynamic properties of cytochrome P450 BM-3 in pure water and in dimethylsulphoxide/water mixture. *Biopolymers*, 78, 259-267.
18. Wong, T. S., Wu, N., Roccatano, D., Zacharias, M., Schwaneberg, U. (2005). Sensitive assay for laboratory evolution of hydroxylases toward aromatic and heterocyclic compounds. *J. Biomol. Screen.*, 10, 246-252. (cover page)
17. Wong, T. S., Tee, K. L., Hauer, B., Schwaneberg, U. (2005). Sequence Saturation Mutagenesis with tuneable mutation frequencies. *Anal. Biochem.*, 341, 187-189. .

2004

16. Wong, T. S., Tee, K. L., Schwaneberg, U. (2004). Sequence Saturation Mutagenesis (SeSaM): a novel method for directed evolution. *Nucleic Acids Res.*, 32, e26. .
15. Wong, T. S., Arnold, F. H., Schwaneberg, U. (2004). Laboratory evolution of cytochrome P450 BM-3 monooxygenase for organic co-solvents. *Biotechnol. Bioeng.*, 85, 351-358.

2003

14. Wong, T. S. and Schwaneberg, U. (2003). Protein engineering in bioelectrocatalysis, *Curr. Opin. Biotechnol.*, 14, 590-596.

1995-2001 before Jacobs University

13. Farinas, E., Schwaneberg, U., Anton, G., Arnold, F. H. (2001). Directed evolution of a cytochrome P450 monooxygenase for alkane oxidation. *Adv. Synth. Catal.*, 343, 601-606.
12. Appel, D., Lutz-Wahl, S., Fischer, P., Schwaneberg, U., Schmid, R. D. (2001). Hydroxylation of alkanes, cycloalkanes, arenes and heteroarenes by a P450 BM-3 mutant, evolved by directed evolution. *J. Biotechnol.*, 88, 167-171.
11. Lentz, O., Li, Q.-S., Schwaneberg, U., Lutz-Wahl, S., Fischer, P., Schmid, R. D. (2001). Modification of the fatty acid specificity of cytochrome P450 BM-3 from *Bacillus megaterium* by directed evolution: a validated assay. *J. Mol. Catal. B: Enzym.*, 629, 1-11.
10. Schwaneberg, U., Cirino, P. C., Otey, C., Farinas, E., Arnold, F. H. (2001). Cost-effective whole cell assay for laboratory evolution of hydroxylases in *E. coli*. *J. Biomol. Screen.*, 6, 111-118.
9. Li, Q.-S., Schwaneberg, U., Fischer, M., Schmitt, J., Pleiss, J., Schmid, R. D. (2000). Rational evolution of a medium chain-specific cytochrome P450 BM-3 variant. *Biochem. Biophys. Acta*, 1545, 114-121.
8. Schwaneberg, U., Appel, D., Schmitt, J., Schmid, R. D. (2000). P450 in biotechnology. Zinc driven ω -hydroxylation of p-nitrophenoxydodecanoic acid using P450 BM-3 F87A. *J. Biotechnol.*, 84, 249-257.
7. Schwaneberg, U., Bornscheuer, U. (2000) Fatty acid hydroxylations using P450 monooxygenase. In: Bornscheuer, U. (ed) *Enzymes in Lipid Modification*, 396-416. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany. **(Book chapter)**
6. Li, Q.-S., Schwaneberg, U., Fischer, P., Schmid, R. D. (2000). Directed evolution of the fatty-acid hydroxylase P450 BM-3 into an indole-hydroxylating catalyst. *Chem. Eur. J.*, 6, 1531-1536.
5. Schwaneberg, U., Sprauer, A., Schmidt-Dannert, C., Schmid, R. D. (1999). P450 monooxygenase in biotechnology. 1. Single step, large scale purification method for cytochrome P450 BM-3 by anion exchange chromatography. *J. Chromatogr. A*, 848, 149-159.
4. Schwaneberg, U., Schmidt-Dannert, C., Schmitt, J., Schmid, R. D. (1999). A continuous spectrophotometric assay for P450 BM-3, a fatty acid hydroxylating enzyme, and its mutant F87A. *Anal. Biochem.*, 269, 359-366.
3. Trummler, K., Roos, J., Schwaneberg, U., Effenberger, F., Förster, S., Pfizenmaier, K., Wajant, H. (1998). Expression of the Zn²⁺-containing hydroxynitrile lyase from Flax (*Linum usitatissimum*) in *Pichia pastoris*. *Plant Sci.*, 139, 19-27.

2. Wünsche, K., Schwaneberg, U., Bornscheuer, U., Meyer, H. H. (1996). Chemoenzymatic route to β -blockers via 3-hydroxy esters. *Tetrahedron Asymmetr.*, 7, 2017-2022.
1. Lau, R., Schüle, G., Schwaneberg, U., Ziegler, T. (1995). Intramolecular glycosylation of prearranged saccharides as a novel strategy for the construction of β -L-rhamnosidic linkages. *Liebigs Ann.*, 10, 1745-1754.