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Publications 2006-2014

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André N, Cherouati N, Prual C, Steffan T, Zeder-Lutz G, Magnin T, Pattus F, **Michel H**, Wagner R, Reinhart C (2006) Enhancing functional production of G protein-coupled receptors in *Pichia pastoris* to levels required for structural studies via a single expression screen. *Protein Sci* 15:1115-1126

Baier J, Gabrielsen M, Oellerich S, **Michel H**, van Heel M, Cogdell RJ, Kohler J (2009) Spectral diffusion and electron-phonon coupling of the B800 BChl a molecules in LH2 complexes from three different species of purple bacteria. *Biophys J* 97:2604-2612

Buschmann S, Richers S, Ermler U, **Michel H** (2014) A decade of crystallization drops: Crystallization of the cbb3 cytochrome c oxidase from *Pseudomonas stutzeri*. *Protein Sci* 23:411-422

Buschmann S, Warkentin E, Xie H, Langer JD, Ermler U, **Michel H** (2010) The structure of cbb3 cytochrome oxidase provides insights into proton pumping. *Science* 329:327-329

Chillakuri CR, Reinhart C, **Michel H** (2007) C-terminal truncated cannabinoid receptor 1 coexpressed with G protein trimer in Sf9 cells exists in a precoupled state and shows constitutive activity. *FEBS J* 274:6106-6115

Clason T, Ruiz T, Schägger H, Peng G, Zickermann V, Brandt U, **Michel H**, Radermacher M (2010) The structure of eukaryotic and prokaryotic complex I. *J Struct Biol* 169:81-88

Dürr KL, Koepke J, Hellwig P, Müller H, Angerer H, Peng G, Olkhova E, Richter OMH, Ludwig B, **Michel H** (2008) A d-pathway mutation decouples the *Paracoccus denitrificans* cytochrome c oxidase by altering the side-chain orientation of a distant conserved glutamate. *J Mol Biol* 384:865-877

Farver O, Grell E, Ludwig B, **Michel H**, Pecht I (2006) Rates and equilibrium of CuA to heme a electron transfer in *Paracoccus denitrificans* cytochrome c oxidase. *Biophys J* 90:2131-2137

Gao Y, Meyer B, Sokolova L, Zwicker K, Karas M, Brutschy B, Peng GH, **Michel H** (2012) Heme-copper terminal oxidase using both cytochrome c and ubiquinol as electron donors. *P Natl Acad Sci USA* 109:3275-3280

Goswami D, Kaur J, Surade S, Grell E, **Michel H** (2012) Heterologous production and functional and thermodynamic characterization of cation diffusion facilitator (CDF) transporters of mesophilic and hyperthermophilic origin. *Biol Chem* 393:617-629

Hedderich T, Marcia M, Kopke J, **Michel H** (2011) PICKScreens, a new database for the comparison of crystallization screens for biological macromolecules. *Cryst Growth Des* 11:488-491

Hilbers F, von der Hocht I, Ludwig B, **Michel H** (2013) True wild type and recombinant wild type cytochrome c oxidase from *Paracoccus denitrificans* show a 20-fold difference in their catalase activity. *BBA-Bioenergetics* 1827:319-327

Jaehme M, **Michel H** (2013) Evaluation of cell-free protein synthesis for the crystallization of membrane proteins a case study on a member of the glutamate transporter family from *Staphylothermus marinus*. *FEBS J* 280:1112-1125

Kaur J, Olkhova E, Malviya VN, Grell E, **Michel H** (2014) A l-lysine transporter of high stereoselectivity of the amino acid-polyamine-organocation (APC) superfamily production, functional characterization, and structure modeling. *J Biol Chem* 289:1377-1387

Kirchberg K, **Michel H**, Alexiev U (2012) Net proton uptake is preceded by multiple proton transfer steps upon electron injection into cytochrome c oxidase. *J Biol Chem* 287:8187-8193

- Kirchberg K, **Michel H**, Alexiev U (2013) Exploring the entrance of proton pathways in cytochrome c oxidase from *Paracoccus denitrificans*: surface charge, buffer capacity and redox-dependent polarity changes at the internal surface. *BBA-Bioenergetics* 1827:276-284
- Klammt C, Srivastava A, Eifler N, Junge F, Beyermann M, Schwarz D, **Michel H**, Dötsch V, Bernhard F (2007) Functional analysis of cell-free-produced human endothelin B receptor reveals transmembrane segment 1 as an essential area for ET-1 binding and homodimer formation. *FEBS J* 274:3257-3269
- Koepke J, Olkhova E, Angerer H, Muller H, Peng GH, **Michel H** (2009) High resolution crystal structure of *Paracoccus denitrificans* cytochrome c oxidase: New insights into the active site and the proton transfer pathways. *BBA-Bioenergetics* 1787:635-645
- Kozuch J, von der Hocht I, Hilbers F, **Michel H**, Weidinger IM (2013) Resonance raman characterization of the ammonia-generated oxo intermediate of cytochrome c oxidase from *Paracoccus denitrificans*. *Biochemistry* 52:6197-6202
- Lopez JJ, Shukla AK, Reinhart C, Schwalbe H, **Michel H**, Glaubitz C (2008) The structure of the neuropeptide bradykinin bound to the human G-protein coupled receptor bradykinin B2 as determined by solid-state NMR spectroscopy. *Angew Chem Int Edit* 47:1668-1671
- Ludwig B, **Michel H**, Brandt U (2009) Structures and mechanisms in molecular bioenergetics preface. *BBA-Bioenergetics* 1787:561-562
- Lundstrom K, Wagner R, Reinhart C, Desmyter A, Cherouati N, Magnin T, Zeder-Lutz G, Courtot M, Prual C, André N, Hassaine G, **Michel H**, Cambillau C, Pattus F (2006) Structural genomics on membrane proteins: comparison of more than 100 GPCRs in 3 expression systems. *J Struct Funct Genomics* 7:77-91
- MacMillan F, Budiman K, Angerer H, **Michel H** (2006) The role of tryptophan 272 in the *Paracoccus denitrificans* cytochrome c oxidase. *FEBS Lett* 580:1345-1349
- MacMillan F, Kacprzak S, Hellwig P, Grimaldi S, **Michel H**, Kaupp M (2011) Elucidating mechanisms in haem copper oxidases: The high-affinity Q(H) binding site in quinol oxidase as studied by DONUT-HYSCORE spectroscopy and density functional theory. *Faraday Discuss* 148:315-344
- Marcia M, Ermler U, Peng GH, **Michel H** (2009) The structure of *Aquifex aeolicus* sulfide:quinone oxidoreductase, a basis to understand sulfide detoxification and respiration. *P Natl Acad Sci USA* 106:9625-9630
- Marcia M, Ermler U, Peng GH, **Michel H** (2010) A new structure-based classification of sulfide:quinone oxidoreductases. *Proteins* 78:1073-1083
- Marcia M, Langer JD, Parcej D, Vogel V, Peng G, **Michel H** (2010) Characterizing a monotopic membrane enzyme. Biochemical, enzymatic and crystallization studies on *Aquifex aeolicus* sulfide:quinone oxidoreductase. *BBA-Biomembranes* 1798:2114-2123
- Olkhova E, Hunte C, Screpanti E, Padan E, **Michel H** (2006) Multiconformation continuum electrostatics analysis of the NhaA Na⁺/H⁺ antiporter of *Escherichia coli* with functional implications. *P Natl Acad Sci USA* 103:2629-2634
- Olkhova E, Kozachkov L, Padan E, **Michel H** (2009) Combined computational and biochemical study reveals the importance of electrostatic interactions between the "pH sensor" and the cation binding site of the sodium/proton antiporter NhaA of *Escherichia coli*. *Proteins* 76:548-559
- Olkhova E, Padan E, **Michel H** (2007) The influence of protonation states on the dynamics of the NhaA antiporter from *Escherichia coli*. *Biophys J* 92:3784-3791
- Peng GH, Bostina M, Radermacher M, Rais I, Karas M, **Michel H** (2006) Biochemical and electron microscopic characterization of the F1F0 ATP Synthase from the hyperthermophilic eubacterium *Aquifex aeolicus*. *FEBS Lett* 580:5934-5940

- Rajendran C, Ermler U, Ludwig B, **Michel H** (2010) Structure at 1.5 angstrom resolution of cytochrome c(552) with its flexible linker segment, a membrane-anchored protein from *Paracoccus denitrificans*. *Acta Crystallogr D* 66:850-854
- Rimon A, Hunte C, **Michel H**, Padan E (2008) Epitope mapping of conformational monoclonal antibodies specific to NhaA Na⁺/H⁺ antiporter: Structural and functional implications. *J Mol Biol* 379:471-481
- Roy A, Shukla AK, Haase W, **Michel H** (2008) Employing *Rhodobacter sphaeroides* to functionally express and purify human G protein-coupled receptors. *Biol Chem* 389:69-78
- Ruehrer S, **Michel H** (2013) Exploiting *Leishmania tarentolae* cell-free extracts for the synthesis of human solute carriers. *Mol Membr Biol* 30:288-302
- Rycovska A, Hatahet L, Fendler K, **Michel H** (2012) The nitrite transport protein NirC from *Salmonella typhimurium* is a nitrite/proton antiporter. *BBA-Biomembranes* 1818:1342-1350
- Screpanti E, Padan E, Rimon A, **Michel H**, Hunte C (2006) Crucial steps in the structure determination of the Na⁺/H⁺ antiporter NhaA in its native conformation. *J Mol Biol* 362:192-202
- Shukla AK, Haase W, Reinhart C, **Michel H** (2006) Biochemical and pharmacological characterization of the human bradykinin subtype 2 receptor produced in mammalian cells using the Semliki Forest virus system. *Biol Chem* 387:569-576
- Shukla AK, Haase W, Reinhart C, **Michel H** (2006) Functional overexpression and characterization of human bradykinin subtype 2 receptor in insect cells using the baculovirus system. *J Cell Biochem* 99:868-877
- Shukla AK, Haase W, Reinhart C, **Michel H** (2007) Heterologous expression and characterization of the recombinant bradykinin B-2 receptor using the methylotrophic yeast *Pichia pastoris*. *Protein Express Purif* 55:1-8
- Shukla AK, Haase W, Reinhart C, **Michel H** (2007) Heterologous expression and comparative characterization of the human neuromedin U subtype II receptor using the methylotrophic yeast *Pichia pastoris* and mammalian cells. *Int J Biochem Cell B* 39:931-942
- Shukla AK, Reinhart C, **Michel H** (2006) Comparative analysis of the human angiotensin II type 1a receptor heterologously produced in insect cells and mammalian cells. *Biochem Bioph Res Co* 349:6-14
- Shukla AK, Reinhart C, **Michel H** (2006) Dimethylsulphoxide as a tool to increase functional expression of heterologously produced GPCRs in mammalian cells. *FEBS Lett* 580:4261-4265
- Srinivasan V, Netz DJA, Webert H, Mascarenhas J, Pierik AJ, **Michel H**, Lill R (2007) Structure of the yeast WD40 domain protein Cia1, a component acting late in iron-sulfur protein biogenesis. *Structure* 15:1246-1257
- Surade S, Klein M, Stolt-Bergner PC, Muenke C, Roy A, **Michel H** (2006) Comparative analysis and "expression space" coverage of the production of prokaryotic membrane proteins for structural genomics. *Protein Sci* 15:2178-2189
- Thielmann Y, Koepke J, **Michel H** (2012) The ESFRI Instruct Core Centre Frankfurt: automated high-throughput crystallization suited for membrane proteins and more. *J Struct Funct Genomics* 13:63-69
- von der Hocht I, van Wonderen JH, Hilbers F, Angerer H, MacMillan F, **Michel H** (2011) Interconversions of P and F intermediates of cytochrome c oxidase from *Paracoccus denitrificans*. *P Natl Acad Sci USA* 108:3964-3969
- Wang T, Langer JD, Peng GH, **Michel H** (2012) Isolation, functional characterization and crystallization of Aq_1259, an outer membrane protein with porin features, from *Aquifex aeolicus*. *BBA-Proteins Proteom* 1824:1358-1365

Wedemeyer U, Peng GH, **Michel H**, Hartung K (2007) Protein AQ_1862 from the hyperthermophilic bacterium *Aquifex aeolicus* is a porin and contains two conductance pathways of different selectivity. *Biophys J* 93:2667-2677

Xia HY, Liu LH, Reinhart C, **Michel H** (2008) Heterologous expression of human Neuromedin U receptor 1 and its subsequent solubilization and purification. *BBA-Biomembranes* 1778:2203-2209

Xie H, Buschmann S, Langer JD, Ludwig B, **Michel H** (2014) Biochemical and biophysical characterization of the two isoforms of cbb(3)- type cytochrome c oxidase from *Pseudomonas stutzeri*. *J Bacteriol* 196:472-482

Zhang CL, Allegretti M, Vonck J, Langer JD, Marcia M, Peng GH, **Michel H** (2014) Production of fully assembled and active *Aquifex aeolicus* F1FO ATP synthase in *Escherichia coli*. *Biochim Biophys Acta-Gen Subj* 1840:34-40

Zhang CL, Marcia M, Langer JD, Peng GH, **Michel H** (2013) Role of the N-terminal signal peptide in the membrane insertion of *Aquifex aeolicus* F1FO ATP synthase c-subunit. *FEBS J* 280:3425-3435