

Moritz Senger

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Personal Information

Born 16.08.1985 in Berlin, Germany

Education and Background

2018 – today

Freie Universität Berlin

Postdoctoral researcher

Department of Physics, Experimental Molecular Biophysics, Prof. Joachim Heberle

2013 – 2018

Freie Universität Berlin

PhD in Physics

“Protonation and Reduction Dynamics in [FeFe]-Hydrogenases”

Department of Physics, Experimental Molecular Biophysics, Prof. Joachim Heberle

2008 – 2013

Freie Universität Berlin

Diploma in Physics (2.0)

“Light-driven Hydrogen Production by a Photosystem-Hydrogenase Hybrid Complex.”

Department of Physics, Experimental Molecular Biophysics, Prof. Joachim Heberle

Humboldt Universität Berlin, Dr. Oliver Lenz

Research Profile

Main research interests include

- proton-coupled electron transfer (PCET) in enzymes
- photo- and redoxchemistry of bioinorganic cofactors
- enzymatic activation of small molecules (H₂, CO, O₂)
- interplay of protein fold and cofactor catalysis

Investigated enzymes

- [FeFe]-, [NiFe]- and [Fe] only hydrogenases
- photosystem I
- Cytochrome c Oxidase

Spectroscopic expertise

- attenuated total reflection Fourier-transform IR spectroscopy (ATR FTIR) with focus on novel techniques for *in situ* modification of sample matter
- ATR FTIR spectro-electrochemistry on bulk protein
- surface-enhanced IR absorption spectroscopy (SEIRAS) on protein thin films
- rapid-scan FTIR spectroscopy
- quantum cascade laser (QCL) IR spectroscopy

Further experience

- step-scan FTIR spectroscopy
- steady-state and flash photolysis UV/vis spectroscopy
- quantum mechanical (QM) and molecular mechanical (MM) simulations with Gaussian

External Funding

International Max Plank Research School (IMPRS on Multiscale Bio-Systems)

Ph.D. Fellowship (2013-2016):

“Vibrational Spectroscopy of Light-activated Membrane Proteins”

Publications

1. Wittkamp, F.; Senger, M.; Stripp, S. T.; Apfel, U. P., *Chemical communications* **2018**, 54 (47), 5934-5942.
2. Senger, M.; Mebs, S.; Duan, J.; Shulenina, O.; Laun, K.; Kertess, L.; Wittkamp, F.; Apfel, U. P.; Happe, T.; Winkler, M.; Haumann, M.; Stripp, S. T., *Phys Chem Chem Phys* **2018**, 20 (5), 3128-3140.
3. Mebs, S.; Kositzki, R.; Duan, J.; Kertess, L.; Senger, M.; Wittkamp, F.; Apfel, U. P.; Happe, T.; Stripp, S. T.; Winkler, M.; Haumann, M., *Biochimica et biophysica acta* **2018**, 1859 (1), 28-41.
4. Winkler, M.; Senger, M.; Duan, J.; Esselborn, J.; Wittkamp, F.; Hofmann, E.; Apfel, U. P.; Stripp, S. T.; Happe, T., *Nat Commun* **2017**, 8, 16115.
5. Senger, M.; Stripp, S. T.; Soboh, B., *The Journal of biological chemistry* **2017**, 292 (28), 11670-11681.
6. Senger, M.; Stripp, S., *Nachrichten aus der Chemie* **2017**, 65 (2), 123-127.
7. Senger, M.; Laun, K.; Wittkamp, F.; Duan, J.; Haumann, M.; Happe, T.; Winkler, M.; Apfel, U. P.; Stripp, S. T., *Angewandte Chemie* **2017**, 56 (52), 16503-16506.
8. Mebs, S.; Senger, M.; Duan, J.; Wittkamp, F.; Apfel, U. P.; Happe, T.; Winkler, M.; Stripp, S. T.; Haumann, M., *J Am Chem Soc* **2017**, 139 (35), 12157-12160.
9. Senger, M.; Mebs, S.; Duan, J.; Wittkamp, F.; Apfel, U. P.; Heberle, J.; Haumann, M.; Stripp, S. T., *Proceedings of the National Academy of Sciences of the United States of America* **2016**, 113 (30), 8454-9.

Conferences

Hydrogenase 16 (2016, Marseilles, FR): "Stepwise Isotope Editing of [FeFe] Hydrogenases" (poster)

ECSBM 15 (2015, Bochum): "Isotope Labeling Reveals Insight in Catalytic Mechanism of [FeFe]-Hydrogenase" (poster)

ISF1 (2015, Uppsala, SWE): "Isotope Labeling Reveals Insight in Catalytic Mechanism of [FeFe]-Hydrogenase" (poster)

PCET (2014 Skokloster, SWE): "Proton-coupled Electron Transfer in Hydrogenases" (poster)

German Biophysical Society Meeting (2012, Göttingen): "Light-driven Hydrogen Production by a Hybrid Complex of Photosystem I and [NiFe]-Hydrogenase" (poster)

IMPRS (annually: 2013-2016, Potsdam): (poster+talk)

Klosters Winter Seminar (annually: 2012-2017, Klosters, CH) (poster)