

**KATHARINA L. DÜRR, Ph.D.**

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**EDUCATION AND RESEARCH EXPERIENCE**

- Since 2016 **Structural Genomics Consortium Oxford**  
Nuffield Department of Medicine, Oxford University, Oxford, United Kingdom  
Principal Investigator, Membrane Protein Structure & Function Group
- 2010 – 2016 **Vollum Institute**  
Oregon Health and Science University, Portland, OR, USA  
Postdoctoral fellow with Dr. Gouaux. Structural biology and biophysics of full-length ionotropic glutamate receptors: X-ray structures of GluA2 in resting and desensitized states, single particle analysis of heteromeric GluA1/GluA2 receptor/Fab complexes by cryo-electron microscopy.
- 2006 – 2010 **Max-Volmer-Laboratory for Biophysical Chemistry**  
Institute of Chemistry, Technical University of Berlin, Germany  
Ph.D. scholar with Prof. Dr. Friedrich. Continued studies of ion transport mechanisms of oligomeric P-type ATPases.  
Ph.D., Chemistry (summa cum laude), September 2009  
Thesis title: "Functional significance of Na<sup>+</sup>, K<sup>+</sup>- and H<sup>+</sup>, K<sup>+</sup>-ATPase  $\beta$ -subunits studied by Voltage-Clamp Fluorometry"
- 2004 – 2006 **Max-Planck-Institute of Biophysics**  
Department of Biophysical Chemistry, Frankfurt am Main, Germany  
Ph.D. scholar with Dr. Friedrich and Prof. Dr. Bamberg. Initial biophysical studies on Na,K- and H,K- ATPase.
- 2003 – 2004 **University Children's Hospital, Ulm, Ulm University, Germany**  
Research scholar in the group of Prof. Dr. Fulda. Perturbation of expression of the anti-apoptotic factor XIAP and its role in pancreatic cancer using retroviral delivery of RNAi vectors.
- 2003 **Johann Wolfgang Goethe-University, Frankfurt am Main, Germany**  
Master studies with Prof. Dr. Ludwig. Purification and liposomal reconstitution of cytochrome c oxidase for electron/proton transport flux assay using stopped-flow kinetical studies.  
M.S., Biochemistry (with honors), September 2003  
Thesis title: "Site-directed mutagenesis in the D-pathway of subunit I of the *aa<sub>3</sub>* cytochrome c oxidase from *Paracoccus denitrificans*"

**COURSES**

- 2015 EMBO practical course "**Image processing for cryo-electron microscopy**", Birkbeck University of London, UK
- 2012 Cold Spring Harbor course "**X-ray methods in structural biology**"
- 2005 **Computational Biophysics Workshop** at the Max-Planck-Institute of Biophysics (Dr. Klaus Schulten, University of Illinois at Urbana-Champaign)

## TEACHING EXPERIENCE

- 2014            Mentored two summer students in the Gouaux lab (bacterial expression, purification, crystallization and structure determination of soluble proteins)
- 2006 – 2010    **Physical Chemistry I** seminar and lab class for chemistry students at the Technical University of Berlin (basic electrochemistry)
- Physical Chemistry II** lab class for chemistry students at the Technical University of Berlin (electrophysiological characterization of KCNQ potassium channels)
- Physical Chemistry II** lab class for chemistry students at the Technical University of Berlin (Michaelis-Menten kinetics of acetylcholinesterase)
- 2005 – 2006    **Biophysical Chemistry II** lab class for biochemistry students at the Max-Planck-Institute of Biophysics (atomic absorption spectroscopy)

## REVIEWER EXPERIENCE

- Journal of the American Chemical Society
- Journal of Molecular Biology
- Biochimica et Biophysica Acta (Biomembranes)

## MEMBERSHIP OF SCIENTIFIC SOCIETIES

- 2009, 2015    Biophysical Society, USA
- 2008 - 2015    German Biophysical Society, Germany

## INVITED TALKS

- 2016            Invited lecture at the **University of Pennsylvania** Department of Physiology in Philadelphia, PA (USA), April 28th. "Mechanistic insights into AMPA receptor activation and desensitization from X-ray crystallography, cryo-EM and DEER spectroscopy."
- 2015            **Frontiers in Integral Membrane Protein Structural Biology** at the Oxford Mathematical Institute, Oxford (UK), October 6th. "Structural insights into activation and desensitization of AMPA receptors".
- 2015            **Gordon Research Seminar on Mechanisms of Membrane Transport** at the Bates College in Lewiston, ME (USA), June 28th. "Structure and Dynamics of AMPA Receptor GluA2 in Resting, Pre-Open, and Desensitized States".
- 2015            New and Notable Symposium at the 59th **Annual Meeting of the Biophysical Society** in Baltimore, MD (USA), February 8th. "Mechanisms of AMPA receptor Activation and Desensitization investigated by X-ray Crystallography, DEER and Cryo-electron Microscopy."
- 2014            **EMBO US Fellows Meeting 2014** at the Salk Institute in San Diego, CA (USA), November 9th, 2014. "Structure and Dynamics of AMPA Receptor GluA2 in Resting, Pre-Open, and Desensitized States."
- 2005            **Annual Meeting on Membrane Transport Proteins** (Göttinger Transporttage 2005) in Göttingen (Germany), December 3rd 2005. "Functional Significance of the Na,K-ATPase  $\beta$ -Subunit studied by Voltage-Clamp Fluorometry in *Xenopus* oocytes."

## HONORS AND AWARDS

- 2012 – 2015 **Ruth L. Kirschstein National Research Service Award (NRSA)** of the National Institute of Mental Health (NIMH): "Structure-function studies on the mechanism of AMPA receptor desensitization"
- 2010 – 2012 **Long-term Fellowship of the European Molecular Biology Organization (EMBO):** "Studying the atomic structure of AMPA receptor/TARP complexes by X-ray diffraction methods"
- 2009 Ph.D. thesis awarded summa cum laude
- 2005 **Symposium Award (Travel Fellowship)** of the 11<sup>th</sup> international ATPase conference and 59<sup>th</sup> Annual Meeting of the Society of General Physiologists, Woods Hole, MA, USA

## PEER-REVIEWED PUBLICATIONS

1. **Katharina L. Dürr**<sup>1</sup>, Lei Chen<sup>1</sup>, Richard A. Stein, Rita De Zorzi, I. Mihaela Folea, Thomas Walz, Hassane S. Mchaourab and Eric Gouaux<sup>2</sup> "Structure and Dynamics of AMPA Receptor GluA2 in Resting, Pre-Open, and Desensitized States" **Cell** 158 (4) 778–792, (2014).
2. Lei Chen, **Katharina L. Dürr** and Eric Gouaux<sup>2</sup> "X-ray structures of AMPA receptor-cone snail toxin complexes illuminate activation mechanism." **Science** 345 1021-1026 (2014).
3. **Katharina L. Dürr**, Neslihan N. Tavraz, Susan Spiller and Thomas Friedrich<sup>2</sup> "Measuring cation transport by Na,K- and H,K-ATPase in *Xenopus* oocytes by atomic absorption spectrophotometry: an alternative to radioisotope assays." **J Vis Exp** 72 (2013).
4. **Katharina L. Dürr**, Neslihan N. Tavraz and Thomas Friedrich<sup>2</sup>. "Control of Gastric H,K-ATPase Activity by Cations, Voltage and Intracellular pH Analyzed by Voltage Clamp Fluorometry in *Xenopus* Oocytes." **PLoS ONE** 7 (3) (2012).
5. **Katharina L. Dürr**<sup>2</sup>, Ina Seuffert and Thomas Friedrich. "Deceleration of the E<sub>1</sub>P-E<sub>2</sub>P Transition and Ion Transport by Mutation of Potentially Salt Bridge forming Residues Lys-791 and Glu-820 in Gastric H/K-ATPase." **J. Biol. Chem.** 285 39366–39379 (2010).
6. Susan Meier, Neslihan N. Tavraz, **Katharina L. Dürr** and Thomas Friedrich<sup>2</sup>. "Hyperpolarisation-activated inward Na<sup>+</sup> leakage currents caused by deletion or mutation of carboxy-terminal tyrosines of the Na,K-ATPase  $\alpha$ -subunit." **J. Gen. Physiol.** 135 115–134 (2010).
7. **Katharina L. Dürr**<sup>2</sup>, Kazuhiro Abe, Neslihan N. Tavraz and Thomas Friedrich. "E<sub>2</sub>P-state stabilization by the N-terminal tail of the H,K-ATPase  $\beta$ -subunit is critical for efficient proton pumping under *in vivo* conditions." **J. Biol. Chem.** 284, 20147–20154 (2009).
8. Neslihan N. Tavraz, **Katharina L. Dürr**, Jan B. Koenderink, Tobias Freilinger, Ernst Bamberg, Martin Dichgans and Thomas Friedrich<sup>2</sup>. "Impaired plasma membrane targeting or protein stability by certain ATP1A2 mutations identified in sporadic or familial hemiplegic migraine." **Channels Landes Bioscience** 1, 82-87 (2009).
9. **Katharina L. Dürr**<sup>2</sup>, Neslihan N. Tavraz, Robert E. Dempksi, Ernst Bamberg and Thomas Friedrich. "Functional significance of E<sub>2</sub>-state stabilization by specific  $\alpha/\beta$ -Subunit interactions of Na,K- and H,K-ATPase." **J. Biol. Chem.** 284, 3842–3854 (2009).
10. Neslihan N. Tavraz, Thomas Friedrich<sup>2</sup>, **Katharina L. Dürr**, Jan B. Koenderink, Ernst Bamberg, Tobias Freilinger and Martin Dichgans. "Diverse functional consequences of mutations in the Na<sup>+</sup>/K<sup>+</sup>-ATPase  $\alpha_2$ -subunit causing familial hemiplegic migraine type 2." **J. Biol. Chem.** 283, 31097–31106 (2008).
11. **Katharina L. Dürr**<sup>2</sup>, Juergen Koepke, Petra Hellwig, Hannelore Müller, Heike Angerer, Guohong Peng, Elena Olkhova, Oliver-Matthias H. Richter, Bernd Ludwig and Hartmut Michel. "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 (2008).
12. **Katharina L. Dürr**<sup>2</sup>, Neslihan N. Tavraz, Dirk Zimmermann, Ernst Bamberg and Thomas Friedrich. "Characterization of Na,K-ATPase and H,K-ATPase enzymes with glycosylation-deficient  $\beta$ -subunit variants by voltage-clamp fluorometry in *Xenopus* oocytes." **Biochemistry** 47, 4288–4297 (2008).
13. Meike Vogler, **Katharina Dürr**, Marjana Jovanovic, Klaus M. Debatin and Simone Fulda<sup>2</sup>. "Regulation of TRAIL-induced apoptosis by XIAP in pancreatic carcinoma cells." **Oncogene** 26, 248–257 (2007).
14. Oliver-M. H. Richter<sup>2</sup>, **Katharina L. Dürr**, Aimo Kannt, Bernd Ludwig, Francesca M. Scandurra, Alessandro Giuffrè, Paolo Sarti and Petra Hellwig. "Probing the access of protons to the K-pathway in the *Paracoccus denitrificans* cytochrome c oxidase." **FEBS J.** 272, 404–412 (2005).

<sup>1</sup>co-first author<sup>2</sup>corresponding author