

CURRICULUM VITAE

Matthias Elgeti, Ph.D.

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ACADEMIC APPOINTMENTS

- 7/2021 **Research Scientist & Principal Investigator**, Stein Eye Institute, University of California, Los Angeles
- present *Exploring the conformational landscape of G protein coupled receptors.*
- 11/2018 **Project Scientist**, Hubbell Laboratory, University of California, Los Angeles
- 6/2021 *Conformational dynamics of membrane proteins and their transducer complexes investigated by SDSL/EPR spectroscopy.*

EDUCATION & TRAINING

- 11/2013 **Postdoctoral Training**, Hubbell Laboratory, University of California, Los Angeles
- 11/2018 *Elucidation of common structure/function relationships of GPCR signaling based on the rhodopsin model system by means of EPR spectroscopy.*
- 11/2012 **Postdoctoral Training**, Hofmann/Heck Laboratory, Charité – Universitätsmedizin Berlin
- 10/2013 *Development of a titration assay to determine binding affinities of conformational states in equilibrium.*
- 11/2006 **Ph.D. in Biophysics**, Humboldt Universität zu Berlin – *summa cum laude*
- 10/2012 Advisors: Drs. KP Hofmann/ FJ Bartl. Thesis title: “*Spectroscopic investigations of visual rhodopsin*”
- 10/2005 **Diploma in Physics** (minor in Mathematics), Freie Universität Berlin – *very good*
- 9/2006 Advisor: Dr. M Heyn. Thesis title: “*Investigation of the effect of UV light on the conformation of light-activated rhodopsin.*”
- 2002 **Pre-diploma in Physics** (minor in Chemistry), Georg August Universität Göttingen

GRANTS, FELLOWSHIPS & AWARDS

- 4/2021 [R01 GM137081](#), Principal Investigator, Total \$1,599,000 (\$319.800/year)
12/2025 National Institute of General Medical Sciences (NIGMS)
 “*Exploring the Conformational Landscape of G protein Coupled Receptors*”
- 2018 **Travel Award**, 18th International Conference on Retinal Proteins
 Toronto, Canada
- 2014 [Postdoctoral Research Fellowship](#), German Research Foundation (DFG),
-2015 “*Developing a common framework of structure/function relationships for G protein coupled receptors using site-directed spin labeling and EPR-spectroscopy*”.
- 2012 **Poster Prize**, 15th International Conference on Retinal Proteins
 Monte Verita – Ascona, Switzerland
- 2006 **Student Research Fellowship**, Charité - Universitätsmedizin Berlin
 “*Time-resolved FTIR spectroscopy of rhodopsin deactivation*”

PUBLICATIONS (*co-first author, ‡corresponding author)

- Elgeti, M[‡]** and Hubbell, W.L. (2021) DEER Analysis of GPCR Conformational Heterogeneity. *Biomolecules*, 11:778.
- Lerch, MT, Matt RA, Masureel M, **Elgeti M**, Kumar KK, Hilger D, Foys B, Kobilka BK, Hubbell WL (2020) Viewing Rare Conformations of the β_2 -Adrenergic Receptor with Pressure-Resolved DEER Spectroscopy. *Proceedings of the National Academy of Sciences of the U.S.A.* 117:31824–31.
- McMahon C, Staus DP, Wingler LM, Wang J, Skiba MA, **Elgeti M**, Hubbell WL, Rockman HA, Kruse AC, Lefkowitz RJ (2020). Synthetic Nanobodies as Angiotensin Receptor Blockers. *Proceedings of the National Academy of Sciences of the U.S.A.* 117:20284–91.
- Hellwig S, Grittner U, **Elgeti M**, Wyschkon S, Fiebach JB, Krause T, Herm J, Scheitz JF, Endres M, Nolte CH, Haeusler KG, Elgeti T (2020) Evaluation of left ventricular function in patients with acute ischaemic stroke using cine cardiovascular magnetic resonance imaging. *ESC Heart Failure* 7: 2572–2580.
- Schaafs LA, Wyschkon S, **Elgeti M**, Nagel SN, Knebel F, Steffen IG, Makowski MR, Hamm B, Elgeti T (2020) Diagnosis of Left Ventricular Diastolic Dysfunction Using Cardiac Magnetic Resonance Imaging: Comparison of Volume-Time Curves Derived from Long- and Short-Axis Cine Steady-State Free Precession Datasets. *Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren* 192: 764–775.
- Wingler LM, **Elgeti, M***, Hilger, D, Latorraca, NR, Lerch, MT, Staus, DP, Dror, RO, Kobilka, BK, Hubbell, WL, Lefkowitz, RJ (2019). Angiotensin Analogs with Divergent Bias Stabilize Distinct Receptor Conformations. *Cell* 176:468–78.
- Elgeti, M[‡]**, Kazmin, R, Rose, AS, Szczepek, M, Hildebrand, PW, Bartl, FJ, Scheerer, P, Hofmann, KP (2018). The Arrestin-1 Finger Loop Interacts with Two Distinct Conformations of Active Rhodopsin. *The Journal of Biological Chemistry* 293:4403–10.
- Dacquay, Y, Lee, JR, Govetto, A, **Elgeti, M**, Hubbell, WL, Kavehpour, P, Hubschman, J-P (2016). Condensation on Intraocular Lenses During Vitrectomy: Effect of Perfluorocarbon Liquids. *Journal for Modeling in Ophthalmology* 1:71–79.
- Kazmin R, Rose, AS, Szczepek, M, **Elgeti, M**, Ritter, E, Piechnick, R, Hofmann, KP, Scheerer, P, Hildebrand, PW, Bartl, FJ (2015). The Activation Pathway of Human Rhodopsin in Comparison to Bovine Rhodopsin. *The Journal of Biological Chemistry* 290:20117–27.
- Sommer ME, **Elgeti, M**, Hildebrand, PW, Szczepek, M, Hofmann, KP, Scheerer, P (2015). Structure-Based Biophysical Analysis of the Interaction of Rhodopsin with G protein and Arrestin. *Methods in Enzymology* 556:563–608.
- Szczepek, M, Beyrière, F, Hofmann, KP, **Elgeti, M**, Kazmin, R, Rose, AS, Bartl, FJ, von Stetten, D, Heck, M, Sommer, ME, Hildebrand, PW, Scheerer, P (2014). Crystal Structure of a Common GPCR-Binding Interface for G protein and Arrestin. *Nature Communications* 5:4801.
- Rose AS, **Elgeti, M**, Zachariae, U, Grubmüller, H, Hofmann, KP, Scheerer, P, Hildebrand, PW (2014). Position of Transmembrane Helix 6 Determines Receptor G protein Coupling Specificity. *Journal of the American Chemical Society* 136:11244–7.
- Elgeti, M[‡]**, Rose, AS, Bartl, FJ, Hildebrand, PW, Hofmann, KP, Heck, M (2013). Precision vs Flexibility in GPCR Signaling. *Journal of American Chemical Society* 135:12305–12.
- Elgeti, M[‡]**, Kazmin, R, Heck, M, Morizumi, T, Ritter, E, Scheerer, P, Ernst, OP, Siebert, F, Hofmann, KP, Bartl, FJ (2011). Conserved Tyr223(5.58) Plays Different Roles in the Activation and G-protein Interaction of Rhodopsin. *Journal of the American Chemical Society* 133:7159–65.
- Ritter E, **Elgeti, M**, Bartl FJ (2008). Activity Switches of Rhodopsin. *Photochemistry Photobiology* 84:911–20.
- Elgeti, M**, Ritter E, Bartl FJ (2008). New Insights into Light-Induced Deactivation of Active Rhodopsin by SVD and Global Analysis of Time-Resolved UV/Vis- and FTIR-Data. *Zeitschrift für Physikalische Chemie* 222:1117–29.

Ritter E, **Elgeti, M***, Hofmann KP, Bartl FJ (2007). Deactivation and Proton Transfer in Light-Induced Metarhodopsin II/Metarhodopsin III Conversion: A Time-Resolved Fourier Transform Infrared Spectroscopic Study. *The Journal of Biological Chemistry* 282:10720–30.

MANUSCRIPTS IN PREPARATION (*co-first author, ‡corresponding author)

Elgeti M, Wingler LM, Lefkowitz RJ, Hubbell WL. Segmental Coupling in G protein Coupled Receptors Revealed by Pressure-Resolved DEER.

Elgeti M. The Affinity Framework of Molecular Efficacy.

Zhao J, **Elgeti M***‡, O'Brien E, Chen C, Hubbell WL, Kobilka BK. Structural Dynamics of μ -Opioid Receptor Activation.

Khan F, **Elgeti M***‡, Grandfield S, Paz A, Marcoline FV, Wright EM, Grabe M, Hubbell WL, Abramson J. Membrane Potential Increases Outward-facing Accessibility and Transport Rate of the Sodium-Glucose Transporter.

INVITED TALKS

- 11/2020 *GPCR conformational dynamics investigated by double electron-electron resonance (DEER)*
Institute for Drug Discovery (virtual)
University of Leipzig
- 10/2019 *Structural underpinnings of biased agonism in G protein coupled receptors*
Symposium Collaborative Research Center 1078
Free University Berlin, Germany
- 9/2018 *A structure/function framework of GPCR activation based on the rhodopsin model*
18th International Conference on Retinal Proteins
Hockley Valley Resort, Toronto, Canada
- 1/2018 *Protein flexibility and its important role in signal transduction*
Basic Sciences Noon Seminars
University of California, Los Angeles, United States
- 7/2015 *Precision vs. flexibility in GPCR signaling: A case study of visual rhodopsin*
"Unifying Concepts in Catalysis" Colloquium
Technical University Berlin, Germany
- 10/2012 *GPCR signaling investigated by FTIR spectroscopy*
15th International Conference on Retinal Proteins
Monte Verita – Ascona, Switzerland
- 10/2010 *Signal transfer from rhodopsin to its G protein: Insights from spectroscopic and structural studies*
14th International Conference on Retinal Proteins
University of California, Santa Cruz, United States
- 6/2010 *The different roles of Tyr223^{5.58} for the activation and G protein interaction of bovine rhodopsin*
Symposium Collaborative Research Center 498
Free University Berlin, Germany

TEACHING & MENTORING

- Summer 2017 **Supervision of Undergraduate Student Research Project** (Chem99)
"Conformational equilibria of a ligand-free GPCR investigated by EPR spectroscopy"
University of California, Los Angeles
- Summer 2017 **Entering Mentoring Training Program**
University of California, Los Angeles
<https://bioscience.ucla.edu/ucla-entering-mentoring-training-program/>

Spring 2017	Course Development and Educational Leadership Training Program University of California, Los Angeles https://www.biomedpostdoc.ucla.edu/bioscience-postdoc-educational-leadership-program/
11/2006 - 11/2012	Teaching Assistant , Biophysics (M.Sc. program) Humboldt University Berlin <i>Biophysics of signal transduction (Laboratory course)</i>
11/2006 - 05/2012	Teaching Assistant , Medical School Charité – Universitätsmedizin Berlin <i>Introduction to experimental physics (Lecture and Laboratory course)</i> Maintenance of the online learning platform Blackboard
2011	Author/Instructor , www.chemgapedia.de <i>“Analysis of a protein microswitch using FTIR difference spectroscopy “</i> Course available online at www.chemgapedia.de (in German)

ACADEMIC SERVICE

Ad hoc reviewer: *Biomolecules*; *Journal of Biological Chemistry (JBC)*; *Journal of Physical Chemistry B*; *Proceedings in the National Academy of Sciences of the U.S.A (PNAS)*

eLife - Early Career Reviewer in Structural Biology and Molecular Biophysics