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Head of Group Protein X-ray Crystallography & Signal Transduction –  
Institute of Medical Physics and Biophysics  
Dr. rer. nat. (PhD) in Chemistry / Diploma in Biophysics

Additional qualification:

Radiation Protection Manager  
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**Research areas**

Our research focuses on elucidating the molecular details of signal transduction processes in membrane proteins and in metalloenzymes. In particular we are interested on structural investigations of various G-protein-coupled receptor (GPCRs), photoreceptors (e.g. vertebrate cone and rhodopsins, microbial rhodopsins, phytochromes, photolyases, melanopsins), GPCR-related signaling proteins (e.g. G-proteins, arrestins, phosphodiesterases, dishevelled) and several metalloenzymes (e.g. [NiFe]-hydrogenases and lipoygenases). In my lab we apply a wide array of different techniques to study different protein systems, such as membrane and soluble protein production (e.g. different heterologous cell expression systems), molecular biology, biochemical, biophysical (e.g. multi-angle light scattering, differential scanning calorimetry, microscale thermophoresis) and crystallization (using robot-platforms, conventional, lipid cubic phase (LCP), micelle/ bicelle). Our core skills are protein-production and -engineering, protein X-ray crystallography and combined crystallographic-spectroscopic approaches with a broad network of international collaborators and access to several high-end synchrotrons. In the last years, we established also conventional and pump-probe methods for our protein samples at free electron laser facility LCLS-SLAC in Stanford, USA. In parallel, we started a collaboration with our in-house partners on cryo-electron microscopy to investigate several membrane protein and protein-complex targets.

**Research key words**

Protein X-ray crystallography, membrane proteins, signal transduction, X-ray structure analysis, molecular structure, dynamics and function of proteins, molecular modelling, methodological development of a combined crystallographic and spectroscopic approach, free-electron laser techniques, photoreceptors and related signal transduction proteins, G-protein-coupled receptor, GPCR, rhodopsin, arrestin, G-protein, channelrhodopsin, microbial opsins, melanopsin, phytochrome, photolyase, cryptochrome, [NiFe]-hydrogenase, metallo-proteins, Two-component regulatory systems, CpxRAP system, phosphodiesterase, PRG's

### **Funding for approved projects / grants / applications**

**01/2017 – 12/2020 - 2. Period - SFB 1078-B6 Full Project:** "Proton-coupled conformational changes in photoreceptors" shared with Prof. Peter Hildebrandt (TU-Berlin) – [Collaborative Research Center 1078](#) "Protonation Dynamics in Protein Function " supported by the German Research Foundation (DFG) - (Host: Freie Universität Berlin - <http://www.sfb1078.de/index.html>)

**01/2017 – 01/2020** – Industry-Cooperation with Bayer AG

**01/2015 – 12/2018 SFB 740-B6 Full Project:** "Structural elucidation of the GPCR allosteric machine"– [Collaborative Research Center 740](#) "From Molecules to Modules: Organisation and Dynamics of Functional Units in Cells" supported by the German Research Foundation (DFG) - (Host: Charité – University Medicine Berlin - <http://www.sfb740.de/en/>)

**11/2012 – 12/2018 UniCat Full Project - Research area E3-1:** "Structural investigations of oxygen-tolerant [NiFe] hydrogenases" – Cluster of Excellence "Unifying Concepts in Catalysis" supported by the German Research Foundation (DFG) - (Host: Technische Universität Berlin - <http://www.unicat.tu-berlin.de/>)

**01/2013 – 12/2016 - 1. Period - SFB 1078-B6 Full Project:** "Proton-coupled conformational changes in photoreceptors" shared with Prof. Peter Hildebrandt (TU-Berlin) – [Collaborative Research Center 1078](#) "Protonation Dynamics in Protein Function " supported by the German Research Foundation (DFG) - (Host: Freie Universität Berlin - <http://www.sfb1078.de/index.html>)

**01/2013-12/2018 European Synchrotron Radiation Facility (ESRF)** synchrotron beamtime application – shared with Dr. N. Krauss (KIT, Karlsruhe / Prof. A. Zouni (Humboldt Universität Berlin) / Dr. P. Scheerer (Charité – Universitätsmedizin Berlin) - Period: 01/2015-12/2018 (continuation from 2007) - Research topics: G-protein-coupled receptors, rhodopsin, phytochromes, photolyases, photosystems, [NiFe]-hydrogenase etc.

**01/2006-06/2018 Helmholtz-Zentrum Berlin (HZB)-BESSY II** (periods 2006 - 2018) - Synchrotron – beamtime application-grants: Topic: G-protein-coupled receptors, rhodopsin, phytochromes, photolyases, photosystems, [NiFe]-hydrogenase and others.

**2015-2018 - SLAC-LCLS** – Free electron Laser - [Linac Coherent Light Source](#) beamtime application-grants: Topic: Rhodopsin, Phytochrome, [NiFe]-hydrogenase, Metalloproteins

### **Memberships**

[Deutsche Gesellschaft für Biophysik \(DGfB\)](#), [Deutschen Gesellschaft für Kristallographie \(DGK\)](#), [Humboldt-Universitäts-Gesellschaft](#), [Berlin Institute of Health \(BIH\) Young Science](#), [Einstein Centre for Catalysis EC<sup>2</sup>](#)

### **Refereeing Activities**

*e.g. Nature, Nature Communications, Scientific Reports, FASEB Journal etc.*

### **Protein structure database related entries** (<http://www.rcsb.org/>)

(5MDL; 5MDK; 5MDJ; 5MBP; 5MBO; 5T4X; 5L49; 5L48; 5L4D; 5L4A; 5L4B; 5L4C; 5LC8; 5LFA; 5KCM; 5IR4; 5IR5; 5I5L; 5HSQ; 5D51; 5FLX; 3JCI; 3JCN; 5AJ0; 4U63; 4V6T; 4PXF; 4TTT; 4IUB; 4IUC; 4IUD; 4J2Q; 4DJA; 3RGW; 3ITF; 3PXO; 3PQR; 3DQB; 3CAP; 3J18; 3J19; 3RJS; 2OR9; 2ORB; 2I9E; 2OBI; 1ZEA)

**Selected Teaching Activities**

- Supervisions of several PhD, Master and Bachelor students
- Deputy Teaching-Coordination and development of lectures, seminars and practical courses  
Disciplines: Medical Physics and Biophysics, Chemistry and Biochemistry
- 2015 – Deputy Modul-Coordinator at Charité – University Medicine Berlin of Modul-7 of revised *Medical Curriculum* in "Human Medicine"
- 2014 – now Lectureship at faculty of Medicine "Human Medicine" Teaching performance 8 SWS per semester
- 2008 – 2014 Lectureship at faculty of Medicine "Human Medicine" Teaching performance 4 SWS per semester
- 2004 – 2008 Annual Teaching in block course at faculty of biology in biophysics at Humboldt Universität Berlin - Block course: "Practical course on protein crystallography"

## Summary of publications

Source “Google Scholar” – h-index = 25

In “peer-reviewed” scientific journals - period 07/2017-2004 = 61 publications (> 4060 citations)

(+ 3 submitted manuscripts)

(\* These first authors contributed equally to this work)

(<sup>§</sup> Corresponding authors)

### 2017 (9)

- (61) **Scheerer P<sup>\*,§</sup>** and Sommer M<sup>\*,§</sup>. Structural Mechanism of Arrestin Activation. *Current Opinion in Structural Biology* 2017 May 1, 45:160–169. PMID: 28600951 (Review article)
- (60) Kleinau G, Worth LC, Kreuchwig A, Biebermann H, Marcinkowski P, **Scheerer P**, Krause G. Structural-Functional Features of the Thyrotropin Receptor: a Class A GPCR at Work. *Frontiers in Endocrinology* 2017 April 24; 8:86. PMID: 28484426 (Review article)
- (59) Kacprzak S, Nijmona I, Korn A, Feng J, Reijerse E, Lubitz W, Krauß N, **Scheerer P**, Nagano S, Lamparter T, Weber S. Inter-subunit distances in full-length, dimeric, bacterial phytochrome Agp1, as measured by PELDOR between different spin label positions, remain unchanged upon photoconversion. *J Biol Chem*. 2017 May 5; 292(18):7598-7606. PMID: 28289094
- (58) Oberthuer D, Knoska J, Wiedorn M, Beyerlein K, Bushnell D, Kovaleva E, Heymann M, Gumprecht L, Kirian R, Barty A, Mariani V, Tolstikova A, Adriano L, Awel S, Barthelmess M, Dörner K, Xavier L, Yefanov O, James D, Nelson G, Wang D, Calvey G, Chen Y, Schmidt A, Szczepek M, Frielingsdorf S, Lenz O, Snell E, Robinson P, Šarler B, Belšak G, Maček M, Wilde F, Aquila A, Boutet S, Liang M, Hunter M, **Scheerer P**, Lipscomb J, Weierstall U, Kornberg R, Spence J, Pollack L, Chapman H, Bajt S. Double-flow focused liquid injector for efficient serial femtosecond crystallography. *Scientific Reports* 2017 Mar 16; 7:44628. PMID: 28300169
- (57) Lamparter T<sup>§</sup>, Krauss N<sup>§</sup>, **Scheerer P<sup>§</sup>**. Phytochromes from *Agrobacterium fabrum*. *Photochem Photobiol*. 2017 May; 93(3): 642-655. PMID: 28500698 (Review article)
- (56) Velázquez Escobar F, Bührke D, Michael N, Sauthof L, Wilkening S, Tavraz NN, Salewski J, Frankenberg-Dinkel N, Mroginski MA, **Scheerer P**, Friedrich T, Siebert F, Hildebrandt P. Common structural elements in the chromophore binding pocket of the Pfr state of bathy phytochromes. *Photochem Photobiol*. 2017 May; 93(3): 724-732. PMID: 28500706
- (55) Kalms J, Banthiya S, Yoga E, Hamberg M, Holzhutter H-G, Kuhn H<sup>§</sup>, **Scheerer P<sup>§</sup>**. The crystal structure of *Pseudomonas aeruginosa* lipoxxygenase Ala420Gly mutant explains the improved oxygen affinity and the altered reaction specificity *Biochim Biophys Acta. (BBA) - Molecular and Cell Biology of Lipids* 2017, Jan 14; 1862(5):463-473. PMID: 28093240
- (54) Zhang F, Ma H, Bowatte K, Kwiatkowski D, Mittmann E, Qasem H, Krauss N, Zeng X, Ren Z, **Scheerer P<sup>§</sup>**, Yang X<sup>§</sup>, Lamparter T<sup>§</sup>. Crystal Structures of Bacterial (6-4) Photolyase Mutants with Impaired DNA Repair Activity. *Photochem Photobiol*. 2017 Jan 27; 93: 304–314. PMID: 27992645
- (53) Ma H, Zhang F, Ignatz E, Suehnel M, Xue P, **Scheerer P**, Essen L, Krauß N, Lamparter T. Divalent Cations Increase DNA Repair Activities of Bacterial (6-4) Photolyases. *Photochem Photobiol*. 2017 Feb 17; 93: 323–330. PMID: 27992646

### 2016 (6)

- (52) Müller A, Berkmann JC, **Scheerer P**, Biebermann H, Kleinau G. Insights into Basal Signaling Regulation, Oligomerization, and Structural Organization of the Human G-Protein Coupled Receptor 83. *PLoS One*. 2016 Dec 9; 11(12):e0168260. PMID: 27936173


- (51) Banthiya S, Kalms J, Yoga E, Ivanov I, Tauber R, Carpena X, Hamberg M, Kuhn H<sup>§</sup>, **Scheerer P<sup>§</sup>**. Structural and functional basis of phospholipid oxygenase activity of bacterial lipoxygenase from *Pseudomonas aeruginosa*. *Biochim Biophys Acta. (BBA) - Molecular and Cell Biology of Lipids* 2016, Nov; 1861(11):1681-1692. PMID: 27500637
- (50) Nagano S\*, **Scheerer P\***, Zubow K, Michael N, Inomata K, Lamparter T, Krauß N. The Crystal Structures of the N-Terminal Photosensory Core Module of *Agrobacterium* Phytochrome Agp1 as Parallel and Anti-parallel Dimers. *J Biol Chem*. 2016 Sep 23; 291(39):20674-20691. PMID: 27466363
- (49) Sprink T, Ramrath DJ, Yamamoto H, Yamamoto K, Loerke J, Ismer J, Hildebrand PW, **Scheerer P**, Bürger J, Mielke T, Spahn CM. Structures of ribosome-bound initiation factor 2 reveal the mechanism of subunit association. *Science Advances*. 2016 Mar 4; 2(3):e1501502. PMID: 26973877
- (48) Kalms J, Schmidt A, Frielingsdorf S, van der Linden P, von Stetten D, Lenz O, Carpentier P, **Scheerer P<sup>§</sup>**. Krypton Derivatization of an O<sub>2</sub>-Tolerant Membrane-Bound [NiFe] Hydrogenase Reveals a Hydrophobic Tunnel Network for Gas Transport. *Angew Chem Int Ed Engl*. 2016 Apr 25; 55(18):5586-5590. PMID: 26913499
- (47) Kalms J, Schmidt A, Frielingsdorf S, van der Linden P, von Stetten D, Lenz O, Carpentier P, **Scheerer P<sup>§</sup>**. Ein Netzwerk aus hydrophoben Tunneln zum Transport gasförmiger Reaktanten in einer O<sub>2</sub>-toleranten, membrangebundenen [NiFe]-Hydrogenase, aufgedeckt durch Derivatisierung mit Krypton. *Angewandte Chemie* 2016 Apr 25; 128(18):5676–5680.

**2015 (9)**


- (46) Yamamoto H, Collier M, Loerke J, Ismer J, Schmidt A, Hilal T, Sprink T, Yamamoto K, Mielke T, Bürger J, Shaikh TR, Dabrowski M, Hildebrand PW, **Scheerer P**, Spahn CM. Molecular architecture of the ribosome-bound Hepatitis C Virus internal ribosomal entry site RNA. *EMBO Journal*. 2015 Dec 14; 34(24):3042-3058. PMID: 26604301
- (45) Sommer ME, Elgeti M, Hildebrand PW, Szczepek M, Hofmann KP, **Scheerer P**. Structure-based biophysical analysis of the interaction of rhodopsin with G protein and arrestin. *Methods Enzymol*. 2015, 556:563-608. PMID: 25857800 (Review article)
- (44) Behrmann E, Loerke J, Budkevich TV, Yamamoto K, Schmidt A, Penczek PA, Vos MR, Bürger J, Mielke T, **Scheerer P**, Spahn CM. Structural snapshots of actively translating human ribosomes. *Cell* 2015 May 7; 161(4):845-857. PMID: 25957688
- (43) Velazquez Escobar F, Piwowarski P, Salewski J, Michael N, Fernandez Lopez M, Rupp A, **Scheerer P**, Bartl F, Frankenberg-Dinkel N, Siebert F, Mroginski MA, Hildebrandt P. A protonation-coupled feedback mechanism controls the signaling process in bathy phytochromes. *Nature Chemistry* 2015 May; 7(5):423-430. PMID: 2590182
- (42) Kazmin R, Rose A, Szczepek M, Elgeti M, Ritter E<sup>§</sup>, Piechnick R, Hofmann KP, **Scheerer P<sup>§</sup>**, Hildebrand PW, Bartl FJ<sup>§</sup>. The activation pathway of human rhodopsin in comparison to bovine rhodopsin. *J Biol Chem*. 2015 Aug 14; 290(33):20117-20127. PMID: 26105054
- (41) Rose AS, Zachariae U, Grubmüller H, Hofmann KP, **Scheerer P**, Hildebrand PW. Role of Structural Dynamics at the Receptor G Protein Interface for Signal Transduction. *PLoS One*. 2015 Nov 25; 10(11):e0143399. PMID: 26606751
- (40) Graf D, Wesslowski J, Ma H, **Scheerer P**, Krauß N, Oberpichler I, Zhang F, Lamparter T. Key Amino Acids in the Bacterial (6-4) Photolyase PhrB from *Agrobacterium fabrum*. *PLoS One*. 2015 Oct 21; 10(10):e0140955. PMID: 26489006

- (39) Siebert E, Rippers Y, Frielingsdorf S, Fritsch J, Schmidt A, Kalms J, Katz S, Lenz O, **Scheerer P**, Paasche L, Pelmenschikov V, Kuhlmann U, Mroginski MA, Zebger I, Hildebrandt P. Resonance Raman Spectroscopic Analysis of the [NiFe] Active Site and the Proximal [4Fe-3S] Cluster of an O<sub>2</sub>-Tolerant Membrane-Bound Hydrogenase in the Crystalline State. *J Phys Chem B*. 2015 Oct 29; 119(43):13785-13796. PMID: 26201814
- (38) **Scheerer P**<sup>§</sup>, Zhang F, Kalms J, von Stetten D, Krauß N, Oberpichler I, Lamparter T<sup>§</sup>. The class III cyclobutane pyrimidine dimer photolyase structure reveals a new antenna chromophore binding site and alternative photoreduction pathways. *J Biol Chem*. 2015 May 1; 290(18):11504-14. PMID: 25784552

## 2014 (4)

- (37) Szczepek M, Beyrière F, Hofmann KP, Elgeti M, Kazmin R, Rose A, Bartl FJ, von Stetten D, Heck M, Sommer ME, Hildebrandt PW, **Scheerer P**<sup>§</sup>. Crystal structure of a common GPCR binding interface for G protein and arrestin. *Nature Communications* 2014, Sep 10; 5:4801.
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- (36) Rose AS, Elgeti M, Zachariae U, Grubmüller H, Hofmann KP, **Scheerer P**, Hildebrandt PW. Position of Transmembrane Helix 6 Determines Receptor G Protein Coupling Specificity. *J Am Chem Soc*. 2014, Aug 13; 136(32):11244-11247. PMID: 25046433
- (35) Frielingsdorf S, Fritsch J, Schmidt A, Hammer M, Löwenstein J, Siebert E, Pelmenschikov V, Jaenicke T, Kalms J, Rippers Y, Lenzian F, Zebger I, Teutloff T, Kaupp M, Bittl R, Hildebrandt P, Friedrich B, Lenz O, **Scheerer P**<sup>§</sup>. Reversible [4Fe-3S] cluster morphing in an O<sub>2</sub>-tolerant [NiFe] hydrogenase. *Nature Chemical Biology* 2014, May; 10(5):378-85. PMID: 24705592
- (34) Lamparter T, Zhang F, Graf D, Wesslowski J, Oberpichler I, Schünemann V, Krauß N, **Scheerer P**. A prokaryotic (6-4) photolyase with a DMRL chromophore and an iron sulfur cluster. *Encyclopedia of Inorganic and Bioinorganic Chemistry* 2014; 1-13. (Book chapter)

## 2013 (5)

- (33) Kim YJ, Hofmann KP, Ernst OP, **Scheerer P**<sup>§</sup>, Choe HW<sup>§</sup>, Sommer ME<sup>§</sup>. Crystal structure of pre-activated arrestin p44. *Nature* 2013, May 2; 497 (7447):142-6. PMID: 23604253
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- (32) Zhang F\*, **Scheerer P**\*, Oberpichler I, Lamparter T, Krauß N. Crystal structure of a prokaryotic (6-4) photolyase with an Fe-S cluster and a 6,7-dimethyl-8-ribityllumazine antenna chromophore. *Proc Natl Acad Sci U S A* 2013, Apr 30; 110 (18):7217-22. PMID: 23589886
- (31) Salewski J, Velazquez Escobar F, Kaminski S, von Stetten D, Keidel A, Rippers Y, Michael N, **Scheerer P**, Piwowarski P, Bartl F, Frankenberg-Dinkel N, Ringsdorf S, Gaertner W, Lamparter T, Mroginski MA, Hildebrandt P. The structure of the biliverdin cofactor in the Pfr state of bathy and prototypical phytochromes. *J Biol Chem*. 2013, Jun 7; 288(23):16800-14. PMID: 23603902
- (30) Qureshi BM, Hofmann NE, Arroyo-Olarte RD, Nickl B, Hoehne W, Jungblut PR, Lucius R, **Scheerer P**<sup>§</sup>, Gupta N<sup>§</sup>. Dynein light chain 8a of *Toxoplasma gondii*, a unique conoid-localized  $\beta$ -strand-swapped homodimer, is required for an efficient parasite growth. *FASEB J*. 2013, Mar 6; 27(3):1034-47. PMID: 23233536

- (29) Horn T, Ivanov I, Di Venere A, Kakularam KR, Reddanna P, Conrad ML, Richter C, **Scheerer P**, Kuhn H. Molecular basis for the catalytic inactivity of a naturally occurring near-null variant of human ALOX15. *Biochim Biophys Acta. (BBA) - Molecular and Cell Biology of Lipids* 2013, Aug 16. 1831(12):1702-1713. PMID: 23958500

## 2012 (2)

- (28) Ramrath D, Yamamoto H, Rother K, Wittek D, Pech M, Mielke T, Loerke J, **Scheerer P**, Ivanov P, Teraoka Y, Shpanchenko O, Nierhaus K, Spahn CM. The complex of tmRNA•SmpB and EF-G on translocating ribosomes. *Nature* 2012, May 6; 485(7399):526-9. PMID: 22622583



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- (27) Piechnick R, Ritter E, Hildebrand PW, Ernst OP, **Scheerer P**, Hofmann KP, Heck M. The effect of channel mutations on the uptake and release of the retinal ligand in opsin. *Proc Natl Acad Sci U S A* 2012, Apr 3; 109(14):5247-52. PMID: 2243161

## 2011 (5)

- (26) Fritsch J\*, **Scheerer P\***, §, Frielingsdorf S, Kroschinsky S, Friedrich B, Lenz O§, Spahn CM§. The crystal structure of an oxygen-tolerant hydrogenase uncovers a novel iron-sulphur centre. *Nature* 2011, Oct 16; 479(7372):249-52. PMID: 22002606



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- (25) Ivanov I, Di Venere A, Horn T, **Scheerer P**, Nicolai E, Stehling S, Richter C, Skrzypczak-Jankun E, Mei G, Maccarrone M, Kühn H. Tight association of N-terminal and catalytic subunits of rabbit 12/15-lipoxygenase is important for protein stability and catalytic activity. *Biochim Biophys Acta. (BBA) - Molecular and Cell Biology of Lipids* 2011 Dec; 1811(12):1001-10. PMID: 21875687

- (24) Elgeti M, Kazmin R, Heck M, Morizumi T, Ritter E, **Scheerer P**, Ernst OP, Siebert F, Hofmann KP, Bartl FJ. Conserved Tyr223<sup>5,58</sup> plays different roles in the activation and G-protein interaction of rhodopsin. *J Am Chem Soc.* 2011, May 11; 133(18):7159-65. PMID: 21506561

- (23) Choe HW, Kim YJ, Park JH, Morizumi T, Pai EF, Krauß N, Hofmann KP, **Scheerer P**, Ernst OP. Crystal structure of Metarhodopsin II. *Nature* 2011, Mar 31; 471(7340):651-5. PMID: 21389988



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## 2010 (4)

- (21) **Scheerer P**, Michael N, Park JH, Nagano S, Choe H-W, Inomata K, Borucki B, Krauß N, Lamparter T. Light induced conformational changes of the chromophore and the protein in phytochromes: bacterial phytochromes as model systems. *ChemPhysChem* 2010 Apr; 11 (6): 1090-1105. PMID: 20373318 (Review article)

- (20) Winter G, Dökel S, Jones AK, **Scheerer P**, Krauß N, Höhne W, Friedrich B. Crystallization and preliminary X-ray crystallographic analysis of the [NiFe] hydrogenase maturation factor HypF1 from *Ralstonia eutropha* H16. *Acta Crystallogr Sect F Struct Biol Cryst Commun*. 2010 Apr; 66 (Pt 4):452-455. PMID: 20383020
- (19) Piwowarski P, Ritter E, Hofmann KP, Hildebrandt P, von Stetten D, **Scheerer P**, Michael N, Lamparter T, Bartl F. Light Induced Activation of Bacterial Phytochrome Agp1 Monitored by Static and Time Resolved FTIR Spectroscopy, *ChemPhysChem* 2010 Feb, 19 (1):35-48. PMID: 19849721
- (18) Knobloch D, Schmidt A, **Scheerer P**, Krauss N, Wessner H, Scholz C, Küttner G, von Rintelen T, Wessel A, Höhne W. A coleopteran triosephosphate isomerase: X-ray structure and phylogenetic impact of insect sequences. *Insect Mol Biol*. 2010 Feb; 19 (1):35-48. PMID: 19849721

## 2009 (4)

- (17) Hofmann KP, **Scheerer P**, Hildebrand PW, Choe HW, Park JH, Heck M, Ernst OP. A G protein-coupled receptor at work: the rhodopsin model. *Trends Biochem Sci*. 2009 Nov, 34 (11):540-552. PMID: 19836958 (Review article)
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- (14) Hildebrand PW\*, **Scheerer P\***, Park JH, Choe HW, Piechnick R, Ernst OP, Hofmann KP, Heck M. A ligand channel through the G protein coupled receptor opsin. *PLoS One* 2009; 4 (2): e4382. PMID: 19194506

## 2008 (5)

- (13) **Scheerer P\***, Park JH\*, Hildebrand PW, Kim YJ, Krauss N, Choe HW, Hofmann KP, Ernst OP. Crystal structure of opsin in its G-protein-interacting conformation. *Nature* 2008 Sep; 455 (7212):497-502. PMID: 18818650



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- (10) von Stetten D, Günther M, **Scheerer P**, Murgida DH, Mroginski MA, Krauß, N, Lamparter T, Zhang J, Anstrom DM, Vierstra RD, Forest KT, Hildebrandt P. Resonanz-Raman-spektroskopische Untersuchung der Chromophorheterogenität und Photokonversion von Phytochromkristallen und -lösungen. *Angewandte Chemie* 2008; 120, 4831-4833.



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**2007 (3)**

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- (7) **Scheerer P**, Borchert A, Krauss N, Wessner H, Gerth C, Höhne W, Kuhn H. Structural basis for catalytic activity and enzyme polymerization of phospholipid hydroperoxide glutathione peroxidase-4 (GPx4). *Biochemistry* 2007 Aug; 46 (31):9041-9049. PMID: 17630701
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**2006 (3)**

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- (3) **Scheerer P\***, Michael N\*, Park JH\*, Noack S, Förster C, Hammam MA, Inomata K, Choe HW, Lamparter T, Krauss N. Crystallization and preliminary X-ray crystallographic analysis of the N-terminal photosensory module of phytochrome Agp1, a biliverdin-binding photoreceptor from *Agrobacterium tumefaciens*. *J Struct Biol*. 2006 Jan; 153 (1):97-102. PMID: 16377207

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- (2) Park JH, Krauss N, Pulvermüller A, **Scheerer P**, Höhne W, Giessler A, Wolfrum U, Hofmann KP, Ernst OP, Choe HW. Crystallization and preliminary X-ray studies of mouse centrin1. *Acta Crystallogr Sect F Struct Biol Cryst Commun*. 2005 May; 61 (Pt 5):510-513. PMID: 16511082

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- (1) Hilpert K, Wessner H, Scholz C, **Scheerer P**, Volkmer-Engert R, Krauß N. Crystallization and preliminary x-ray analysis of complexes of porcine pancreatic elastase with two natural inhibitors. *Protein Pept Lett*. 2004 Aug; 11 (4):393-399. PMID: 15327373

**Submitted manuscripts**

(1) Kalms J, Schmidt A, Frielingsdorf S, Utesch T, Gotthard G, von Stetten D, van der Linden P, Royant A, Mroginski MA, Carpentier P, Lenz O, and **Scheerer P<sup>§</sup>**. Tracking the route of molecular oxygen in O<sub>2</sub>-tolerant membrane-bound [NiFe] hydrogenase **2017**, submitted.

(2) Biebermann H, Kleinau K, Schnabel D, Bockenbauer D, Wilson LC, Tully I, Kiff S, **Scheerer P**, Reyes M, Paisdzior S, Gregory JW, Allgrove J, Krude H, Mannstadt M, Gardella TJ, Dattani M, Jüppner H, and Grüters A. Hyponatremia, PTH-resistance and precocious puberty due to a novel maternal GNAS mutation. **2017**, submitted.

(3) Qureshi BM, Schmidt A, Behrmann E, Bürger J, Mielke T, Spahn CMT, Heck M, and **Scheerer P<sup>§</sup>**. Mechanistic insights into the role of prenyl binding protein (PrBP/δ) in 3 dissociation of membrane-associated rod phosphodiesterase 6. **2017**, submitted.

## Awards and press releases

- 2016** **Spotlight on Science** at European Synchrotron Radiation Facility (ESRF), Grenoble, France –  
“High-pressure cryocooling of protein crystals reveals gas transport channels in a hydrogen-converting enzyme”
- 2015** **ESRF HIGHLIGHT 2014 in structural biology** at European Synchrotron Radiation Facility ESRF, Grenoble,  
France – Article: “Crystal structure of a common GPCR binding interface for G protein and arrestin”
- 2014** **Hohe Platzierungen für Dr. Patrick Scheerer im Zitations-Ranking des Laborjournals zum Thema  
"Proteinforschung": Publikationsanalyse des Laborjournals (Stichtag 19.05.2014) zum Thema  
"Proteinforschung" im Zeitraum von 2008-2012 für den gesamten deutschsprachigen Raum  
Platz 7 und 9** unter den „meistzitierten Artikeln“  
und **Platz 28** mit insgesamt 1510 Zitationen bei 17 gezählten Publikationen unter den „meistzitierten Köpfen“
- 2014** **ESRF HIGHLIGHT 2013 in structural biology** at European Synchrotron Radiation Facility ESRF, Grenoble,  
France – “Crystal structure of pre-activated arrestin p44” – Article: “How arrestin is activated for GPCR binding”
- 2013** **Webpresentation am Helmholtz-Zentrum Berlin (HZB)** - Das Zentrum im Überblick - Gesundheitsforschung –  
„Wie Proteine das Sehen steuern“
- 2013** **Interview** in der Druckschrift des Helmholtz Zentrums Berlin, Lichtblick: "Wie Proteine das Sehen steuern"
- 2012** **Spotlight on Science** at European Synchrotron Radiation Facility (ESRF), Grenoble, France – “How an oxygen-  
tolerant hydrogenase protects itself from oxygen”
- 2012** **Interview – Special** – Laborpraxis – “Dem Sauerstoff trotzen – Hydrogenasen als Wasserstoffproduzenten”
- 2011** **Current research highlight in structural biology** at European Synchrotron Radiation Facility ESRF, Grenoble,  
France – “The crystal structure of an oxygen-tolerant hydrogenase uncovers a novel iron-sulphur centre”
- 2011** **Interview** – Biotechnologie.de – “Sehrezceptor in Aktion geblitzt“
- 2011** **Structure of the Month** at Bessy II -Helmholtz Zentrum Berlin – “Crystal structure of Metarhodopsin II”
- 2009** **First poster award** – Helmholtz Zentrum Berlin User Meeting at Bessy II, Germany
- 2008** **Interview** – Biotechnologie.de – “Strukturbiologischer Schnappschuss vom Sehen”
- 2008** **Poster award** – Jahrestagung der DGfB (Deutsche Gesellschaft für Biophysik) in Berlin, Germany
- 2008** **Interview** –Sichtbar (Ausgabe 03) – Magazin der Helmholtz-Zentrum Berlin für Materialien und Energie GmbH  
“Rhodopsin – Sehen wie man sieht - Aktive Proteinkristalle”
- 2005** **Shared second poster award** – GBM-Tagung (Gesellschaft für Biochemie und Molekularbiologie) in Berlin,  
Germany
- 2003** **First poster award** – 2.Studententag der Diplomanden und Doktoranden der Lebenswissenschaften in Berlin,  
Germany
- 2003** **First poster award** – 11.Jahrestagung der DGK (Deutsche Gesellschaft für Kristallographie) in Berlin, Germany