



Johann P. Klare

 **Work:** Osnabrück (Germany)

WORK EXPERIENCE

 **University of Osnabrück** – Osnabrück, Germany

City: Osnabrück | Country: Germany

Associate Professor (Privatdozent)

[2017 – Current]

Group leader, Macromolecular Structure Group, Institute of Physics

 **University of Osnabrück** – Osnabrück, Germany

City: Osnabrück | Country: Germany

Assistant Professor (Akad. Rat a.Z.)

[2011 – 2017]

 **University of Osnabrück** – Osnabrück, Germany

City: Osnabrück | Country: Germany

Postdoctoral Fellow

[2006 – 2011]

 **Max Planck Institute for Molecular Physiology** – Dortmund, Germany

City: Dortmund | Country: Germany

Postdoctoral Fellow

[2003 – 2006]

EDUCATION AND TRAINING

Habilitation in Physics

University of Osnabrück [2024]

City: Osnabrück | Country: Germany

Doctor of Philosophy (Ph.D.)

University of Dortmund and Max Planck Institute for Molecular Physiology [1999 – 2003]

City: Dortmund | Country: Germany

Bachelor and Master of Chemistry

University of Dortmund [1993 – 1999]

City: Dortmund | Country: Germany

PUBLICATIONS

- Bookholt, T., Qin, X., Lilli, B., Enke, D., Huck, M., Balkenhohl, D., Rüwe, K., Brune, J., Klare, J.P., Küpper, K. and Schuster, A., 2024. Increased Readiness for Water Splitting: NiO-Induced Weakening of Bonds in Water Molecules as Possible Cause of Ultra-Low Oxygen Evolution Potential. *Small*, 20(30), p.2310665.
- Peulen, T.O., Hengstenberg, C.S., Biehl, R., Dimura, M., Lorenz, C., Valeri, A., Folz, J., Hanke, C.A., Ince, S., Vöpel, T., Farago, B., Gohlke, H., Klare, J. P., Stadler, A. M., Seidel, C. A. M., and Herrmann, C., 2023. Integrative dynamic structural biology unveils conformers essential for the oligomerization of a large GTPase. *Elife*, 12, p.e79565.
- Klare, J.P., 2023. Chemistry of spin labeling. In *Encyclopedia of Biophysics* (pp. 1-9). Springer, Berlin, Heidelberg.
- Schumacher, M., Klare, J.P., Bamann, C. and Steinhoff, H.J., 2021. DEER Spectroscopy of Channelrhodopsin-2 Helix B Movements in Trapped Photocycle Intermediates. *Applied Magnetic Resonance*, pp.1-13.
- Rai, A., Klare, J.P., Reinke, P.Y., Englmaier, F., Fohrer, J., Fedorov, R., Taft, M.H., Chizhov, I., Curth, U., Plettenburg, O. and Manstein, D.J., 2021. Structural and biochemical characterization of a dye-decolorizing peroxidase from *Dictyostelium discoideum*. *International journal of molecular sciences*, 22(12), p.6265.
- Rudack, T., Teuber, C., Scherlo, M., Güldenhaupt, J., Schartner, J., Lübben, M., Klare, J., Gerwert, K. and Kötting, C., 2021. The Ras dimer structure. *Chemical Science*, 12(23), pp.8178-8189.
- Schneider, L., Wehmeier, J., Wiedwald, U., Rodewald, J., Galakhov, V.R., Udintseva, M.S., Mesilov, V., Radu, F., Luo, C., Klare, J.P. and Steinhoff, H.J., 2020. Magnetic and electronic properties of highly Mn-doped β -NaGdF₄ and β -NaEuF₄ nanoparticles with a narrow size distribution. *The Journal of Physical Chemistry C*, 124(33), pp. 18194-18202.
- Colbasevici, A., Voskoboinikova, N., Orekhov, P.S., Bozdaganyan, M.E., Karlova, M.G., Sokolova, O.S., Klare, J.P., Mulkidjanian, A.Y., Shaitan, K.V. and Steinhoff, H.J., 2020. Lipid dynamics in nanoparticles formed by maleic acid-containing copolymers: EPR spectroscopy and molecular dynamics simulations. *Biochimica et Biophysica Acta (BBA)-Biomembranes*, 1862(5), p.183207.
- Kupke, T., Klare, J.P. and Brügger, B., 2020. Heme binding of transmembrane signaling proteins undergoing regulated intramembrane proteolysis. *Communications Biology*, 3(1), p.73.
- Finkenwirth, F., Sippach, M., Pecina, S.N., Gäde, M., Ruta, J., Ricke, A., Bondarenko, E., Klare, J.P., Zinke, M., Lange, S. and Lange, A., 2020. Dynamic interactions of CbiN and CbiM trigger activity of a cobalt energy-coupling-factor transporter. *Biochimica et Biophysica Acta (BBA)-Biomembranes*, 1862(2), p.183114.
- Kucher, S., Korneev, S., Klare, J.P., Klose, D. and Steinhoff, H.J., 2020. In cell Gd 3+-based site-directed spin labeling and EPR spectroscopy of eGFP. *Physical Chemistry Chemical Physics*, 22(24), pp.13358-13362.
- Huck, M., Ring, L., Küpper, K., Klare, J., Daum, D. and Schäfer, H., 2020. Water splitting mediated by an electrocatalytically driven cyclic process involving iron oxide species. *Journal of Materials Chemistry A*, 8(19), pp.9896-9910.
- Hervis, Y.P., Valle, A., Dunkel, S., Klare, J.P., Canet, L., Lanio, M.E., Alvarez, C., Pazos, I.F. and Steinhoff, H.J., 2019. Architecture of the pore forming toxin sticholysin I in membranes. *Journal of Structural Biology*, 208(1), pp.30-42.

Mosslehy, W., Voskoboinikova, N., Colbasevici, A., Ricke, A., Klose, D., Klare, J.P., Mulkidjanian, A.Y. and Steinhoff, H.J., 2019. Conformational dynamics of sensory rhodopsin II in nanolipoprotein and styrene-maleic acid lipid particles. *Photochemistry and Photobiology*, 95(5), pp.1195-1204.

Büldt, G., Gordeliy, V., Klare, J.P. and Engelhard, M., 2013. Sensory Rhodopsin II: Signal Development and Transduction. In *Encyclopedia of Biophysics* (pp. 2312-2315). Springer, Berlin, Heidelberg.

Orekhov, P., Bothe, A., Steinhoff, H.J., Shaitan, K.V., Raunser, S., Fotiadis, D., Schlesinger, R., Klare, J.P. and Engelhard, M., 2017. Sensory rhodopsin I and sensory rhodopsin II form trimers of dimers in complex with their cognate transducers. *Photochemistry and photobiology*, 93(3), pp.796-804.

Hendgen-Cotta, U.B., Esfeld, S., Rudi, K., Miinalainen, I., Klare, J.P. and Rassaf, T., 2017. Cytosolic BNIP3 dimer interacts with mitochondrial BAX forming heterodimers in the mitochondrial outer membrane under basal conditions. *International journal of molecular sciences*, 18(4), p.687.

Ishchenko, A., Round, E., Borshchevskiy, V., Grudinin, S., Gushchin, I., Klare, J.P., Remeeva, A., Polovinkin, V., Utrobin, P., Balandin, T. and Engelhard, M., 2017. New insights on signal propagation by sensory rhodopsin II/ transducer complex. *Scientific reports*, 7(1), p.41811.

Kucher, S., Korneev, S., Tyagi, S., Apfelbaum, R., Grohmann, D., Lemke, E.A., Klare, J.P., Steinhoff, H.J. and Klose, D., 2017. Orthogonal spin labeling using click chemistry for in vitro and in vivo applications. *Journal of Magnetic Resonance*, 275, pp.38-45.

Kozuleva, M., Goss, T., Twachtmann, M., Rudi, K., Trapka, J., Selinski, J., Ivanov, B., Garapati, P., Steinhoff, H.J., Hase, T., Scheibe, R., Klare, J. P. and Hanke G. T., 2016. Ferredoxin: NADP (H) oxidoreductase abundance and location influences redox poise and stress tolerance. *Plant Physiology*, 172(3), pp.1480-1493.

Klare, J.P., 2016. Application of site-directed spin labelling for studying conformational changes in the catalytic cycle of G proteins activated by dimerization.

Ortiz de Orué Lucana, D., Hickey, N., Hensel, M., Klare, J.P., Geremia, S., Tiufiakova, T. and Torda, A.E., 2016. The crystal structure of the C-terminal domain of the *Salmonella enterica* PduO protein: an old fold with a new heme-binding mode. *Frontiers in Microbiology*, 7, p.1010.

Peulen, T.O., Hengstenberg, C.S., Biehl, R., Dimura, M., Valeri, A., Ince, S., Vöpel, T., Farago, B., Gohlke, H., Herrmann, C. and Klare, J., 2016. Mapping Motions and Structure to a State Necessary for Oligomerization of a Large GTPase: A Joint SAXS, NSE, EPR and FRET Study. *Biophysical Journal*, 110(3), p.514a.

Gölz, J.P., Bockelmann, S., Mayer, K., Steinhoff, H.J., Wieczorek, H., Huss, M., Klare, J.P. and Menche, D., 2016. EPR Studies of V-ATPase with Spin-Labeled Inhibitors DCC and Archazolid: Interaction Dynamics with Proton Translocating Subunit c. *ChemMedChem*, 11(4), pp.420-428.

Klare, J.P., 2016. Electron paramagnetic resonance of membrane proteins. *Encyclopedia of Spectroscopy and Spectrometry*.

Schneider, L., Rinkel, T., Voß, B., Chrobak, A., Klare, J.P., Neethling, J., Olivier, J., Schaniel, D., Bendeif, E.E., Bondino, F. and Magnano, E., 2016. Characterization of multifunctional β -NaEuF₄/NaGdF₄ core-shell nanoparticles with narrow size distribution. *Nanoscale*, 8(5), pp.2832-2843.

Orekhov, P.S., Klose, D., Mulkidjanian, A.Y., Shaitan, K.V., Engelhard, M., Klare, J.P. and Steinhoff, H.J., 2015. Signaling and adaptation modulate the dynamics of the photosensory complex of *Natronomonas pharaonis*. *PLOS Computational Biology*, 11(10), p.e1004561.

Rudi, K., Ho, F.Y., Gilsbach, B.K., Pots, H., Wittinghofer, A., Kortholt, A. and Klare, J.P., 2015. Conformational heterogeneity of the Roc domains in *C. tepidum* Roc-COR and implications for human LRRK2 Parkinson mutations. *Bioscience reports*, 35(5), p.e00254.

Dunkel, S., Pulagam, L.P., Steinhoff, H.J. and Klare, J.P., 2015. In vivo EPR on spin labeled colicin A reveals an oligomeric assembly of the pore-forming domain in *E. coli* membranes. *Physical Chemistry Chemical Physics*, 17(7), pp.4875-4878.

Klose, D., Voskoboynikova, N., Orban-Glass, I., Rickert, C., Engelhard, M., Klare, J.P. and Steinhoff, H.J., 2014. Light-induced switching of HAMP domain conformation and dynamics revealed by time-resolved EPR spectroscopy. *FEBS letters*, 588(21), pp.3970-3976.

Orban-Glaß, I., Voskoboynikova, N., Busch, K.B., Klose, D., Rickert, C., Mosslehy, W., Roder, F., Wilkens, V., Piehler, J., Engelhard, M., Steinhoff, H.J., and Klare, J. P., 2015. Clustering and dynamics of phototransducer signaling domains revealed by site-directed spin labeling electron paramagnetic resonance on SRII/HtrII in membranes and nanodiscs. *Biochemistry*, 54(2), pp.349-362.

Klare, J.P. and Steinhoff, H.J., 2015. Spin labeling studies of transmembrane signaling and transport: applications to phototaxis, ABC transporters and symporters. In *Methods in Enzymology* (Vol. 564, pp. 315-347). Academic Press.

Klose, D., Voskoboynikova, N., Orban-Glass, I., Rickert, C., Engelhard, M., Klare, J.P. and Steinhoff, H.J., 2014. Light-induced switching of HAMP domain conformation and dynamics revealed by time-resolved EPR spectroscopy. *FEBS letters*, 588(21), pp.3970-3976.

Vöpel, T., Hengstenberg, C.S., Peulen, T.O., Ajaj, Y., Seidel, C.A., Herrmann, C. and Klare, J.P., 2014. Triphosphate induced dimerization of human guanylate binding protein 1 involves association of the C-terminal helices: a joint double electron-electron resonance and FRET study. *Biochemistry*, 53(28), pp. 4590-4600.

Sippach, M., Weidlich, D., Klose, D., Abé, C., Klare, J., Schneider, E. and Steinhoff, H.J., 2014. Conformational changes of the histidine ATP-binding cassette transporter studied by double electron-electron resonance spectroscopy. *Biochimica et Biophysica Acta (BBA)-Biomembranes*, 1838(7), pp.1760-1768.

Gruian, C., Boehme, S., Simon, S., Steinhoff, H.J. and Klare, J.P., 2014. Assembly and function of the tRNA-modifying GTPase MnmE adsorbed to surface functionalized bioactive glass. *ACS Applied Materials & Interfaces*, 6(10), pp.7615-7625.

Raba, M., Dunkel, S., Hilger, D., Lipiszko, K., Polyhach, Y., Jeschke, G., Bracher, S., Klare, J.P., Quick, M., Jung, H. and Steinhoff, H.J., 2014. Extracellular loop 4 of the proline transporter PutP controls the periplasmic entrance to ligand binding sites. *Structure*, 22(5), pp.769-780.

Gast, P., Herbonnet, R.T.L., Klare, J., Nalepa, A., Rickert, C., Stellinga, D., Urban, L., Möbius, K., Savitsky, A., Steinhoff, H.J. and Groenen, E.J.J., 2014. Hydrogen bonding of nitroxide spin labels in membrane proteins. *Physical Chemistry Chemical Physics*, 16(30), pp.15910-15916.

Klare, J.P., 2013. Site-directed spin labeling EPR spectroscopy in protein research. *Biological chemistry*, 394(10), pp.1281-1300.

Ishchenko, A., Round, E., Borshchevskiy, V., Grudinin, S., Gushchin, I., Klare, J.P., Balandin, T., Remeeva, A., Engelhard, M., Büldt, G. and Gordeliy, V., 2013. Ground state structure of D75N mutant of sensory rhodopsin II in complex with its cognate transducer. *Journal of Photochemistry and Photobiology B: Biology*, 123, pp. 55-58.

Brandt, R., Klare, J., Steinhoff, H.J. and Ungermann, C., 2013. Highlight: the physiology and dynamics of cellular microcompartments. *Biological chemistry*, 394(2), pp.149-150.

Büldt, G., Gordeliy, V., Klare, J.P. and Engelhard, M., 2013. Sensory Rhodopsin II: Signal Development and Transduction. In *Encyclopedia of Biophysics* (pp. 2312-2315). Springer, Berlin, Heidelberg.

Goss, T., Twachtmann, M., Mulkidjanian, A., Steinhoff, H.J., Klare, J.P. and Hanke, G.T., 2012. Impact of ferredoxin: NADP (H) oxidoreductase on redox poise of the glutathione pool and Fenton reaction capacity of thylakoid membranes: A connection to pre-acquired acclimation in Arabidopsis. *Free Radical Biology and Medicine*, 53, p.542.

Totzeck, M., Hendgen-Cotta, U.B., Luedike, P., Berenbrink, M., Klare, J.P., Steinhoff, H.J., Semmler, D., Shiva, S., Williams, D., Kipar, A. and Gladwin, M.T., 2012. Nitrite regulates hypoxic vasodilation via myoglobin-dependent nitric oxide generation. *Circulation*, 126(3), pp.325-334.

Komban, R., Klare, J.P., Voss, B., Nordmann, J., Steinhoff, H.J. and Haase, M., 2012. An electron paramagnetic resonance spectroscopic investigation on the growth mechanism of NaYF₄: Gd nanocrystals. *Angewandte Chemie International Edition*, 51(26), pp.6506-6510.

Klare, J.P., 2012. Biomedical applications of electron paramagnetic resonance (EPR) spectroscopy. *Biomedical Spectroscopy and Imaging*, 1(2), pp.101-124.

Klare, J.P. and Ortiz de Oru  Lucana, D., 2012. Conformational changes in the novel redox sensor protein HbpS studied by site-directed spin labeling and its turnover in dependence on the catalase-peroxidase CpeB. *Antioxidants & Redox Signaling*, 16(7), pp.639-648.

Butala, M., Klose, D., Hodnik, V., Rems, A., Podlesek, Z., Klare, J.P., Anderluh, G., Busby, S.J., Steinhoff, H.J. and  gur-Bertok, D., 2011. Interconversion between bound and free conformations of LexA orchestrates the bacterial SOS response. *Nucleic acids research*, 39(15), pp.6546-6557.

Grohmann, D., Klose, D., Klare, J.P., Kay, C.W., Steinhoff, H.J. and Werner, F., 2010. RNA-binding to archaeal RNA polymerase subunits F/E: a DEER and FRET study. *Journal of the American Chemical Society*, 132(17), pp. 5954-5955.

Verhoeven, M.K., Lenz, M.O., Amarie, S., Klare, J.P., Tittor, J., Oesterheld, D., Engelhard, M. and Wachtveitl, J., 2009. Primary reaction of sensory rhodopsin II mutant D75N and the influence of azide. *Biochemistry*, 48(40), pp.9677-9683.

B hme, S., Padmavathi, P.V., Holterhues, J., Ouchni, F., Klare, J.P. and Steinhoff, H.J., 2009. Topology of the amphipathic helices of the colicin A pore-forming domain in E. coli lipid membranes studied by pulse EPR. *Physical Chemistry Chemical Physics*, 11(31), pp.6770-6777.

Hendgen-Cotta, U.B., Merx, M.W., Shiva, S., Schmitz, J., Becher, S., Klare, J.P., Steinhoff, H.J., Goedecke, A., Schrader, J., Gladwin, M.T. and Kelm, M., 2008. Nitrite reductase activity of myoglobin regulates respiration and cellular viability in myocardial ischemia-reperfusion injury. *Proceedings of the National Academy of Sciences*, 105(29), pp.10256-10261.

Moukhametzianov, R., Klare, J.P., Efremov, R., Baeken, C., G ppner, A., Labahn, J., Engelhard, M., B ldt, G. and Gordeliy, V.I., 2006. Development of the signal in sensory rhodopsin and its transfer to the cognate transducer. *Nature*, 440(7080), pp.115-119.

Gordeliy, V.I., Labahn, J., Moukhametzianov, R., Efremov, R., Granzin, J., Schlesinger, R., Büldt, G., Savopol, T., Scheidig, A.J., Klare, J.P. and Engelhard, M., 2002. Molecular basis of transmembrane signalling by sensory rhodopsin II-transducer complex. *Nature*, 419(6906), pp.484-487.

NETWORKS AND MEMBERSHIPS

Gesellschaft für Biochemie und Molekularbiologie e.V. (GBM)

Deutsche Biophysikalische Gesellschaft (DGfB)

Society for Free Radical Research International (SFRI)

PROJECTS

[2022 – Current]

Joint Application (Physics, Mathematics/Informatics, Biology, Cognitive Sciences) Massive parallel CPU/GPU Compute Cluster, DFG INST 190/197-1 FUGG

[2021 – 2023]

Research Cooperation Lower Saxony – Israel, “Vorab”, “Spin-Based Quantum Sensing with Endohedral Fullerenes”, VW-Stiftung/MWK Lower Saxony (11 – 76251-14-3/20 (ZN 3627))

[2020 – 2022]

DFG-Sachbeihilfe „ Structural basis of signal transduction in archaeal phototaxis“, DFG (KL2077/2-1)

[2015 – 2020]

DFG-Sachbeihilfe „Structure, dynamics and function of spin labeled G proteins activated by dimerization studied by multi-frequency cw and pulsed EPR“, follow-up application, DFG (KL2077/1-2)

[2012 – 2015]

Co-Project Leader in the DFG priority program “New frontiers in EPR spectroscopy: from biological cells to nano materials” with the project “Site-directed spin labelling EPR spectroscopy in vivo”

[2011 – 2014]

Co-Project Leader in the SFB 944, TP10 „Physiology and dynamics of cellular microcompartments“

[2010 – 2014]

DFG-Sachbeihilfe „Structure, dynamics and function of spin labeled G proteins activated by dimerization studied by multi-frequency cw and pulsed EPR“, DFG (KL2077/1-1)

Updated to 02.07.2025