Curriculum Vitae

Prof. Dr. Karl-Peter Hopfner

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Citations	29264
h-index	84
i10-index	182

Research Interests

We aim to uncover how cells protect and shape their genome, fundamental processes that have profound implications for human health. A central focus of our work is DNA double-strand break repair, chromatin remodeling and the recognition of pathogenic nucleic acids. Our approach is to reconstitute complex biochemical systems and to reveal their structures and mechanisms through high-resolution structural biology techniques, particularly cryo-electron microscopy (cryo-EM) and functional approaches. We take a highly integrative and insterdisciplinary approach spanning structural biology, molecular biology, biochemistry, and functional cell based analysis. Ultimately, we seek to help translate our discoveries in DSB repair, innate immune DNA sensing and protein engineering into clinical applications and contribute to the development of novel tools for precision medicine.

Current Position

Director, Gene Center Munich, Director Department of Biochemistry,

Chair of Biochemistry, Department Biochemistry, Faculty of Chemistry and Pharmacy

University Education

1993 –1994:	Diploma Thesis "Allosteric Transitions of Thrombin" in the Department of Biochemistry and Molecular Biophysics, Washington University School of Medicine in St. Louis, USA
1990 – 1991	Biophysics (exchange year), Washington University St. Louis Medical School, USA
1988 – 1994	Biology (Diploma), University of Regensburg, Germany

Scientific Degrees

1997	Dr. rer. nat., Technical University Munich
1994 – 1997	Doctoral research, Max-Planck-Institute of Biochemistry, Martinsried

Professional Experience

2023 – 2025	Director, Department Biochemistry, Germany
2015 – today	Director, Gene Center Munich, Germany
2016 – 2019	Director, Department of Biochemistry, Ludwig Maximilian University Munich, Germany
2013 – 2015	Dean, Faculty of Chemistry and Pharmacy, Ludwig Maximilian University Munich, Germany
2007 – date	Full Professor (W3), Gene Center, Dept. Chemistry and Biochemistry, Ludwig Maximilian University Munich, Germany
2005 – 2007	Associate Professor (C3), Gene Center, Dept. Chemistry and Biochemistry, Ludwig Maximilian University Munich, Germany
2001 – 2005	Tenure-track Associate Professor (C3), Gene Center, Dept. Chemistry and Biochemistry, Ludwig Maximilian University Munich, Germany
1999 – 2001	Postdoctoral Research Assistant, The Scripps Research Institute, La Jolla, USA
1998 – 1999	Postdoctoral Research Assistant, Max Planck Institute for Biochemistry, Martinsried, Germany

Honours and Awards

2026	Elected into the Bavarian Academy of Sciences and Humanities
2022	Visiting Scholar, University of California, San Diego
2018	European Research Council (ERC) Advanced Grant
2017	Gottfried Wilhelm Leibniz-Prize of the DFG
2015	Member of the Max Planck Society
2015	External scientific member of the Max Planck Institute for Biochemistry
2015	m4-Award for Personalised Medicine (2)
2014	Elected into the National Academy of Sciences (Leopoldina)
2012	European Research Council (ERC) Advanced Grant
2011	m4-Award for Personalised Medicine
2010	EMBO member
2003	EMBO Young Investigator Award
1999 – 2001	BASF Postgraduate Fellowship
1997	Young Investigator Prize, National Academy of Sciences Leopoldina
1994 – 1997	PhD Fellowship, German Academic Scholarship Foundation
1991 – 1992	German Academic Exchange Programme (DAAD) Fellowship
1991 – 1994	Fellow, Studienstiftung des deutschen Volkes

Selected Publications (out of >200)

1. Shukla, S., Ngubo, M., Paul, S., Kunert, F., Persinger, J., Garcia Serrano, J., Hopfner, K.P.*, and Bartholomew, B* (2025). INO80's Unique Mechanism for Mobilizing Nucleosomes

Determines Its DNA-Shape Specificity. *Molecular Cell* 85(23):4318-4332.e9. doi: 10.1016/j.molcel.2025.10.010.

2. Fan Y, Kuybu F, Cui H, Lammens H, Chen JX, Kugler M, Jung C, Hopfner KP (2025). Structural basis for DNA double-strand break sensing by human MRE11-RAD50-NBS1 and its TRF2 complex *Nature Commun* 16(1):8320. doi: 10.1038/s41467-025-64082-x
3. M Bérouti, Wagner M, Greulich W, Piseddu, I, Gärtig J, Hansbauer L, Müller-Hermes, C Heiss, M, Pichler A, Tölke A, Witte G, Hopfner KP, Anz, D, Sattler M, Carell T, Hornung V (2025). Pseudouridine-RNA evades TLR7 and TLR8 by suppressing agonist generation and receptor engagement. Cell. 188(18):4880-4895.e15. doi: 10.1016/j.cell.2025.05.032.
4. Ren M, Gut F, Fan Y, Ma J, Shan X, Yikilmazsoy A, Likhodeeva M, Hopfner KP*, Zhou C* (2024). Structural basis for human OGG1 processing 8-oxodGuo within nucleosome core particles. *Nature Commun.* 2024 15(1):9407. doi: 10.1038/s41467-024-53811-3.
5. Zhang M, Jungblut A, Kunert F, Hauptmann L, Hoffmann T, Kolesnikova O, Metzner F, Moldt M, Weis F, DiMaio F, Hopfner KP, Eustermann S (2023). Hexasome-INO80 complex reveals structural basis of noncanonical nucleosome remodeling. *Science* 381(6655):313-319. doi: 10.1126/science.adf6287.
6. Rotheneder M, Stakyte K, van de Logt E, Bartho JD, Lammens K, Fan Y, Alt A, Kessler B, Jung C, Roos WP, Steigenberger B, Hopfner KP (2023). Cryo-EM structure of the Mre11-Rad50-Nbs1 complex reveals the molecular mechanism of scaffolding functions. *Mol Cell.* S1097-2765(22)01138-8. doi: 10.1016/j.molcel.2022.12.003.
7. Kunert F, Metzner FJ, Jung J, Höpfler M, Woike S, Schall K, Kostrewa D, Moldt M, Chen JX, Bantele S, Pfander B, Eustermann S, Hopfner KP (2022). Structural mechanism of extranucleosomal DNA readout by the INO80 complex. *Sci Adv.* 2022 8(49):eadd3189. doi: 10.1126/sciadv.add3189.
8. Gut F, Käshammer L, Lammens K, Bartho JD, Boggusch AM, van de Logt E, Kessler B, Hopfner KP (2022). Structural mechanism of endonucleolytic processing of blocked DNA ends and hairpins by Mre11-Rad50. *Mol Cell* 82(18):3513-3522.e6. doi: 10.1016/j.molcel.2022.07.019.
9. Basu A, Bobrovnikov DG, Qureshi Z, Kayikcioglu T, Ngo TTM, Ranjan A, Eustermann S, Cieza B, Morgan MT, Hejna M, Rube HT, Hopfner KP, Wolberger C, Song JS, Ha T (2021). Measuring DNA mechanics on the genome scale. *Nature* 589(7842):462-467. doi: 10.1038/s41586-020-03052-3.
10. Michalski S, de Oliveira Mann CC*, Stafford CA, Witte G, Bartho J, Lammens K, Hornung V, Hopfner KP (2020). Structural basis for sequestration and autoinhibition of cGAS by chromatin. *Nature 587*: 678-682. doi: 10.1038/s41586-020-2748-0
11. Käshammer L, Saathoff JH, Lammens K, Gut F, Bartho J, Alt A, Kessler B, Hopfner KP (2019). Mechanism of DNA End Sensing and Processing by the Mre11-Rad50 Complex. *Mol Cell 76*: 382-394. doi: 10.1016/j.molcel.2019.07.035
12. Eustermann, S, Schall K, Kosterawa D, Lakomek K, Strauss M, Moldt M and Hopfner KP (2018) Structural basis for ATP-dependent chromatin remodelling by the INO80 complex. *Nature* 556: 386–390. doi: 10.1038/s41586-018-0029-y
13. Andreeva L, Hiller B, Kostrewa D, Lässig C, de Oliveira Mann CC, Jan Drexler D, Maiser A, Gaidt M, Leonhardt H, Hornung V and Hopfner KP (2017) cGAS senses long and HMGB/TFAM-bound U-turn DNA by forming protein–DNA ladders. *Nature* 549: 394–398. doi: 10.1038/nature23890.
14. Civril F, Deimling T, De Oliveira Mann CC, Ablasser A, Moldt M, Witte G, Hornung V and Hopfner KP (2013) Structural mechanism of cytosolic DNA sensing by cGAS. *Nature* 498: 332–337. doi: 10.1038/nature12305.

15. Motz C, Schuhmann KM, Kirchhofer A, Moldt M, Witte G, Conzelmann KK and Hopfner KP (2013) Paramyxovirus V proteins disrupt the fold of the RNA sensor MDA5 to inhibit antiviral signaling. *Science* 339: 690–693. doi: 10.1126/science.1230949.

16. Tosi A, Haas C, Herzog F, Gilmozzi A, Berninghausen O, Ungewickell C, Gerhold CB, Lakomek K, Aebersold R, Beckmann R and Hopfner KP (2013) Structure and subunit topology of the INO80 chromatin remodeler and its nucleosome complex. *Cell* 154: 1207–1219. doi: 10.1016/j.cell.2013.08.016.

17. K. Lammens, D. J. Bemeleit, C. Mockel, E. Clausing, A. Schele, S. Hartung, C. B. Schiller, M. Lucas, C. Angermuller, J. Soding, K. Strasser, K. P. Hopfner, The Mre11:Rad50 structure shows an ATP-dependent molecular clamp in DNA double-strand break repair. Cell 145, 54-66 (2011).