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## Curriculum Vitae Professor Dr Dorothee Kern

**Name:** Dorothee Kern  
**Born:** 19 January 1966



Image: Markus Scholz | Leopoldina

**Research Priorities: Protein dynamics in atomic resolution, evolution of enzyme catalysis, allostery and biological regulation, protein dynamics-based development of medicines**

Dorothee Kern is a biochemist and works on the dynamic nature of proteins. She substantially contributed to the experimental characterization of protein dynamics both during the catalysis of enzymes and during signal transmission. The goal of her research is to further unveil the complex interplay between structure, dynamics, and function to develop new medicines.

### Academic and Professional Career

- since 2005 Investigator, Howard Hughes Medical Institute, Chevy Chase, USA
- since 2004 Professor, Department of Biochemistry, Brandeis University, Waltham, USA
- since 1998 Assistant Professor, Department of Biochemistry, Brandeis University, Waltham, USA
- 1995 - 1998 Postdoctoral Fellow, Department of Chemistry and Biology Division, Lawrence Berkeley National Laboratory, University of California (UC) Berkeley, Berkeley, USA
- 1994 PhD in Biochemistry, Martin-Luther-Universität Halle-Wittenberg, Halle (Saale), Germany
- 1989 Diplom in Biochemie, Martin-Luther-Universität Halle-Wittenberg, Halle (Saale), Germany

### Honours and Awarded Memberships

- since 2023 Member, American Academy of Arts and Sciences (AAAS), USA
- since 2017 Member, German National Academy of Science Leopoldina, Germany

- 2011 G. Robert Greenberg Lectureship, University of Michigan, Ann Arbor, USA
- 2011 Robert Ross Lectureship, The Ohio State University, Columbus, USA
- 2010 Charles Slichter Lecture, Brandeis University, Waltham, USA
- 2009 National Lecturer, Biophysical Society, Rockville, USA
- 2009 Goodman Lecture, Oregon Health and Science University Foundation, Portland, USA
- 2004 Margaret Oakley Dayhoff Award, Biophysical Society, Rockville, USA
- 2003 Alberta Gotthardt and Henry Strage Award for Aspiring Young Science, Brandeis University, Waltham, USA
- 2003 Pfizer Award in Enzyme Chemistry, American Chemical Society, USA
- 2002 Young Investigator Award, International Association for Protein Structure Analysis and Proteomics, USA
- 1995 Dorothea-Erxleben-Award, Cluster of Excellence Precision Medicine in Chronic Inflammation (PMI), Kiel, Germany
- 1995 Martin Luther Medal, Martin-Luther-Universität Halle-Wittenberg, Halle (Saale), Germany
- 1991 - 1993 Doctoral Scholarship, Studienstiftung des deutschen Volkes, Germany
- 1989 Most-Valuable-Player-Award, Basketball National Championship, GDR

## Research Priorities

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The research group of Dorothee Kern employs biophysical techniques of analysis to investigate the dynamics of enzymes as well as the signalling proteins and molecules which influence them. Here, the focus lies especially on the catalysis of enzymes, the evolution of complex signalling functions and the fundamental biophysical principles for developing highly selective drugs.

Many of the biological processes in higher organisms are shaped by a myriad of proteins and molecules that have a signalling function. Here, change over time is a key feature of life. The team around Dorothee Kern investigates the changes of the proteins' atomic architectures on a molecular scale. For this purpose, they employ methods such as NMR (nuclear magnetic resonance spectroscopy), x-ray crystallography, single-molecule FRET (Fluorescence-Resonance-Energy-Transfer), EM, simulations of molecular dynamics, bioinformatics, and AI. These techniques provide real-time visibility of the proteins' functioning in atomic resolution: enzymes during catalysis,

signalling proteins in action, and proteins or medicines connecting to target molecules. With this advancement in knowledge the team hopes to develop novel medicines such as specific inhibitors, and to develop novel green biocatalysts in form of evolved enzymes.