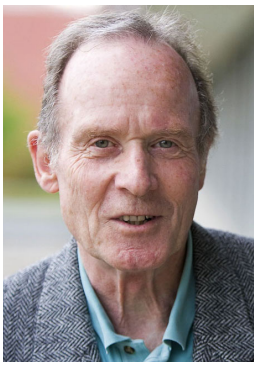
Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Ernst Bamberg



Name: **Ernst Bamberg**
Born: **9 November 1940**

Research Priorities: Channelrhodopsins (transport proteins), light-gated ions, information transfer between nerve cells, optogenetics

Ernst Bamberg is a German biophysicist. His research priority are channelrhodopsins. The discovery of these special light-gated ion channels in cell membranes has enabled researchers to intervene in the transfer of information between nerve cells. The discovery that light can reversibly activate and deactivate nerve cells both in cell cultures and in the brains of living animals with high temporal and spatial accuracy, has opened up a variety of new study possibilities in neurosciences.

Academic and Professional Career

since 1993	Director, Department of Biophysical Chemistry, and Scientific Member, Max Planck Institute of Biophysics, Frankfurt am Main, Germany
1993 - 2009	Professor, Biophysical Chemistry, Goethe University Frankfurt, Frankfurt am Main, Germany
1983	Head of working group, Max Planck Institute of Biophysics, Frankfurt am Main, Germany
1979 - 1983	Heisenberg Fellow, German Research Foundation (DFG), Germany
1977	Habilitation, University of Konstanz, Konstanz, Germany
since 1971	University of Konstanz, Konstanz, Germany
1971	Promotion, University of Basel, Basel, Switzerland
	Studies of Physical Chemistry, University of Basel, Basel, Switzerland

Honours and Awarded Memberships

2019	Rumford Prize, American Academy of Arts and Sciences, USA
2019	Clarivate Citation Laureate, Clarivate
2013	The Brain Prize, Grete Lundbeck European Brain Research Foundation, Copenhagen, Denmark
2012	K. J. Zülch Prize, Gertrud Reemtsma Foundation, Cologne, Germany
since 2011	Member, German National Academy of Sciences Leopoldina, Germany
2010	Karl Heinz Beckurts Preis, Karl Heinz Beckurts-Stiftung, Essen, Germany
2010	Wiley Prize in Biomedical Sciences, together with Georg Nagel and Peter Hegemann, Wiley Foundation, John Wiley & Sons, Hoboken, USA
2009	Stifterverband Prize, Donors' Association for the Promotion of Humanities and Sciences in Germany, Essen, Germany
1987	Boris Rajewsky Preis für Biophysik, Max Planck Institute of Biophysics, Frankfurt am Main, Germany
1979	Heisenberg Fellow, German Research Foundation (DFG), Germany

Research Priorities

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Together with Georg Nagel and Peter Hegemann, Ernst Bamberg discovered the channelrhodopsine (ChR1, 2) in the single-cell freshwater alga Chlamydomonas reinhardtii. Using them as light-gated ion channels in combination with the light-driven Cl-pump Halorhodopsin (NphR) from halophilic bacteria in electrically excitable cells has led to the development of optogenetics, a method which is now used around world. In the future, this could help recover sight in certain types of sight loss. Thus, this development has triggered a revolution in neurobiology in particular, as light can now reversibly activate (ChR2) or deactivate (NphR) nerve cells both in cell cultures and in the brains of living animals with high temporal and, especially, previously unknown spatial accuracy.

Optogenetics offers possible biomedical approaches for the treatment of neurodegenerative diseases such as macular degeneration and Parkinson's disease. Ernst Bamberg develops new optogenetic tools for neurobiological and potential biomedical applications.