



**Name:** Johann Deisenhofer, Ph.D.

**Endowed Title:** Virginia and Edward Linthicum Distinguished Chair in Biomolecular  
Science  
Regental Professor

**Academic Title:** Professor

**Primary Appointment:** Biochemistry

**School:** [Graduate School of Biomedical Sciences](#)

**Degree Program:** Biological Chemistry  
Molecular Biophysics

**Affiliations:** Howard Hughes Medical Institute

**Department Website:** [Department of Biochemistry](#)

**Lab Website:** [JD lab](#)

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## EDUCATION

1971 Technical University of Munich  
Diploma Physics

1974 Technical University of Munich  
Ph.D. Experimental Physics

## HONORS AND AWARDS

1986 Biological Physics Prize of the American Physical Society  
(shared with H. Michel)

1988 Otto-Bayer-Preis  
(shared with H. Michel)

1988 Nobel Prize in Chemistry  
(shared with R. Huber and H. Michel)

## PROFESSIONAL ASSOCIATIONS / AFFILIATIONS

National Academy of Sciences (1997)

American Association for the Advancement of Science (Fellow 1992)

German Academy of Natural Scientists Leopoldina (2003)

Academia Europaea (1989)

American Crystallographic Association

## RESEARCH OVERVIEW

Crystallography is the predominant method by which structural information at atomic resolution on large (> 40 kD) protein molecules can be obtained. Such information is key to understanding the function of proteins, and a basis for the design of mutants and drugs.

We have crystallized and determined the 3-D structures of water-soluble proteins and integral membrane proteins. Main criteria for selection of proteins are their biological significance, unusual amino acid sequences, and involvement in electron transfer or energy transfer processes. Current projects include: iron transporters from the outer membrane of gram-negative bacteria, HMG-CoA reductase, the extracellular portion of the LDL receptor, proteins related to the control of gene expression in response to intracellular cholesterol levels, the light activated DNA repair enzyme photolyase in a complex with a substrate, photolyase-related blue light photoreceptors, the neural proteins synapsin and neurexin 1, the mitochondrial processing peptidase from yeast.

## RECENT PUBLICATIONS

A.D. Ferguson, C.A. Amezcua, N.M. Halabi, Y. Chelliah, M.K. Rosen, R. Ranganathan, J. Deisenhofer, "Signal transduction pathway of TonB-dependent transporters." *Proc. Natl. Acad. Sci. USA*, 104 (2):513-518, January 2007

Y. Huang, R. Baxter, B. Smith, C. Partch, C. Colbert, J. Deisenhofer, "Crystal structure of cryptochrome 3 from *Arabidopsis thaliana* and its implications for photolyase activity." *Proc. Natl. Acad. Sci. USA*, 103 (47):17701-17706, November 2006

C.-I. Chang, Y. Chelliah, D. Borek, D. Mengin-Lecreulx & J. Deisenhofer, "Structure of tracheal cytotoxin in complex with a heterodimeric pattern-recognition receptor." *Science*, 311 (5768):1761-1764, March 2006

A.D. Ferguson, V.M. Labunskyy, D.E. Fomenko, Y. Chelliah, D. Arac, C.A. Amezcua, J. Rizo, V.N. Gladyshev & J. Deisenhofer, "NMR structures of the selenoproteins Sep15 and SelM reveal redox activity of a new thioredoxin-like family." *J. Biol. Chem*, 281 (6):3536-3543, February 2006

R. H. G. Baxter, C.-I. Chang, Y. Chelliah, S. Blandin, E. A. Levashina, J. Deisenhofer, "Structural basis for conserved complement factor-like function in the antimalarial protein TEP1." *Proc. Natl. Acad. Sci. USA*, 104 (28):11615-11620, July 2007

## SIGNIFICANT PUBLICATIONS

Rudenko, G., Henry, L., Henderson, K., Ichtchenko, K., Brown, M.S., Goldstein, J.L., and Deisenhofer, J., "Structure of the LDL receptor extracellular domain at endosomal pH." *Science*, 298:2353-2358, 2002

D. Xia, C.-A. Yu, H. Kim, J.-Z. Xia, A.M. Kachurin, L. Zhang, L. Yu & J. Deisenhofer, "The crystal structure of the cytochrome bc1 complex from bovine heart mitochondria." *Science*, 277:60-66, 1997

B. Kobe & J. Deisenhofer, "Crystal structure of porcine ribonuclease inhibitor, a protein with leucine-rich repeats." *Nature*, 366:751-756, 1993

J. Deisenhofer & H. Michel, "The photosynthetic reaction centre from the purple bacterium *Rhodospseudomonas viridis*." *EMBO J*, 8 (8):2149-2170, 1989

Deisenhofer, J., and Steigemann, W., "Crystallographic refinement of the structure of bovine pancreatic trypsin inhibitor at 1.5 Å resolution." *Acta Crystallographica*, B31:238-250, 1975

## INTERESTING LINKS

**Department Website:** [Department of Biochemistry](#)

**Lab Website:** [JD lab](#)

## OFFICE INFORMATION

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