



Contents lists available at ScienceDirect

Biochimica et Biophysica Acta

journal homepage: www.elsevier.com/locate/bbambio



Preface

Structures and mechanisms in molecular bioenergetics

“Molecular Bioenergetics” has been our focus since 1997 when around 20 research groups in Frankfurt am Main, mostly from Goethe University and the Max Planck Institute of Biophysics in Frankfurt gathered to address the molecular basis of photosynthesis, of respiration under aerobic and anaerobic conditions, and of coupled substrate or ion transport. Building on earlier successful initiatives in membrane protein research, the late Achim Kröger was the initiator and first speaker of this Collaborative Research Centre (SFB) that was generously funded by Deutsche Forschungsgemeinschaft over a period of 12 years. During this time, numerous fruitful interactions across department and discipline boundaries have created a unique and highly productive research environment. This resulted in a number of achievements greatly appreciated by the bioenergetics community and made Frankfurt an internationally recognized and leading center in the field of molecular bioenergetics.

Instead of reflecting on our research in a closing symposium, we gladly take the opportunity to present a series of mostly review-type papers in *BBA-Bioenergetics* to give a comprehensive account of more than a decade of active and successful research in our field.

We are especially grateful to Giorgio Lenaz who as external contributor accepted our invitation to write a review article on the function of ubiquinone in the memory of our founding speaker Achim Kröger and the fundamental contributions he made in this field.

We would also like to thank the publisher and the staff of *BBA-Bioenergetics* for their great support in preparing this special issue.

Bernd Ludwig*
Hartmut Michel
Ulrich Brandt

Department of Biochemistry, Chemistry, and Pharmacy,
Institute of Biochemistry, Biozentrum Frankfurt, Max-von-Laue-Str. 9,
D-60438 Frankfurt am Main, Germany
E-mail address: ludwig@em.uni-frankfurt.de.

* Corresponding author.



Dr. Bernd Ludwig

Professional Experience

Since 1992–	Professor of Biochemistry, Institute of Biochemistry, Molecular Genetics, Biozentrum, Goethe University, Frankfurt
1983–1992	Assistant Professor, Institute of Biochemistry, Medical University of Lübeck
1983	Habilitation in Biochemistry, University of Basel
1978–1983	Research Associate with Jeff Schatz, Biocenter, University of Basel
1976–1978	Post-doctoral Fellow with Rod Capaldi, University of Oregon, Eugene

Education Background

1973–1976	Ph.D. thesis on plant peroxisomal membrane proteins, Institute of Biochemistry, Philipps University Marburg
1968–1973	Studies in chemistry, Philipps University Marburg

Research Interests

Structure and function of membrane proteins
Mechanisms of electron transfer and energy transduction
Cytochrome complexes and terminal oxidases
Bacterial redox chains and their genetic organization and regulation



Dr. Hartmut Michel

Dr. rer. nat. (Biochemistry), University of Würzburg, 1977

Postdoc (Biochemistry), University of Würzburg, 1977 – 1979

Group Leader (Membrane Biochemistry), Max-Planck-Institute of Biochemistry, Martinsried, 1979 – 1987

Habilitation (Biochemistry), University of Munich, 1986

Director, Department of Molecular Membrane Biology, MPI of Biophysics, since 1987

Nobel Prize in Chemistry 1988

Adjunct Professor (Biochemistry), University of Frankfurt, since 1988



Ulrich Brandt is a Professor of Biochemistry and Molecular Bioenergetics at the Centre for Biological Chemistry in Frankfurt am Main. He graduated in biochemistry from the Eberhard-Karls University in Tübingen and obtained his Ph.D. from the Ludwig-Maximilians University in Munich for his research on specific inhibitors of the mitochondrial cytochrome *bc₁* complex and functional aspects of cytochrome *c* oxidase.

Between 1991 and 1993, Dr. Brandt was a Feodor-Lynen fellow of the Humboldt Foundation in the laboratory of Bernard L. Trumpower at the Dartmouth Medical School, New Hampshire, where he started working in the field of yeast genetics. Late in 1993, he returned to Germany to the Johann-Wolfgang-Goethe University in Frankfurt am Main, where he became a Docent in 1994 and a professor of biochemistry in 1996. Since 1997, Dr. Brandt is the Vice-Director of the Centre of Biological Chemistry at the Medical Faculty, Goethe-University. In the same year, he was elected Secretary General of the German Society for Biochemistry and Molecular Biology. He is also a founding member of the Cluster of Excellence "Macromolecular Complexes" of the Goethe-University.

His research interest focuses on the structure and function of respiratory chain complexes. Dr. Brandt's group has established the strictly aerobic yeast *Yarrowia lipolytica* as a powerful model to study mitochondrial complex I. Taking advantage of versatile yeast genetics, a broad range of biochemical and biophysical approaches is applied. His current projects are

- 1) Crystallization of affinity purified complex I to solve its 3D structure
- 2) Site directed mutagenesis of complex I for structure/function analysis
- 3) Functional analysis of wild-type and mutant analysis, including the measurement of proton translocation and ROS formation.

More recently, Dr. Brandt has expanded his studies to mitochondria as a whole and redox-signaling in order to bridge classical bioenergetics and the exciting developments in cell biology and the central role of mitochondria in apoptosis, degenerative disorders, and ageing that has been emerging in recent years.