

BIOLOGICAL CHEMISTRY

*Founded in 1877 by Felix Hoppe-Seyler as
Zeitschrift für Physiologische Chemie*

Felix Hoppe-Seyler (1825–1895) was a pioneer of biochemistry, remembered not only for his discovery of hemoglobin and his contributions to the chemical characterization of many other biological compounds and processes but also for having been the mentor of Friedrich Miescher and Albrecht Kossel. In his preface to the first issue of *Zeitschrift für Physiologische Chemie*, Felix Hoppe-Seyler coined the term *Biochemistry* ('Biochemie') for the then newly emerging discipline.



Biological Chemistry is associated
with the Gesellschaft für Biochemie und
Molekularbiologie e.V. (GBM)

DE GRUYTER

EDITOR-IN-CHIEF

B. Brüne, Frankfurt/Main

EXECUTIVE EDITORS

S. Ludwig, Münster

H. Sies, Düsseldorf

M. Stoffel, Zürich

B. Turk, Ljubljana

A. Wittinghofer, Dortmund

EDITORIAL BOARD

W. Baumeister, Martinsried

J. Bergeron, Montreal

M. Bogoy, Stanford

A. Bürkle, Konstanz

E. Cadenas, Los Angeles

F. Chiti, Florence

I. Dikic, Frankfurt/Main

C. Dobson, Cambridge

A. Driessen, Groningen

H. Fritz, Munich

K. Gevaert, Ghent

C. Hammann, Bremen

F.U. Hartl, Martinsried

D. Häussinger, Düsseldorf

J. Hiscott, Montreal

Y. Igarashi, Sapporo

L.-O. Klotz, Edmonton

A. Krüger, Munich

V. Magdolen, Munich

M. Müschen, Los Angeles

S. Narumiya, Kyoto

M. Naumann, Magdeburg

G. Pejler, Uppsala

N. Pfanner, Freiburg

R. Pike, Melbourne

J. Potempa, Krakow

P. Saftig, Kiel

K. Sandhoff, Bonn

W. Schaffner, Zürich

I. Sinning, Heidelberg

C. Sommerhoff, Munich

S. Spiegel, Richmond

ASSOCIATE EDITORS (GBM STUDY GROUPS)

C. Blattner, Karlsruhe

K. Giehl, Giessen

D. Heinz, Braunschweig

R. Hell, Heidelberg

J. Herrmann, Kaiserslautern

R. Heumann, Bochum

R. Horstkorte, Halle/Saale

C. Hunte, Freiburg

D. Klostermeier, Münster

S. Knauer, Essen

I. Koch, Frankfurt/Main

P. Rehling, Göttingen

D. Schneider, Mainz


S. Schuchardt, Hannover

C. Seidel, Düsseldorf

R. Sterner, Regensburg

C. Villmann, Würzburg

ABSTRACTED/INDEXED IN Academic OneFile (Gale/Cengage Learning), ASFA1: Biological Sciences & Living Resources, Biochemistry & Biophysics Citation Index, Biological Abstracts, BIOSIS Previews, CAB Abstracts, Calcium and Calcified Tissue Abstracts, Chemical Abstracts and the CAS databases, CSA Illustrata - Natural Sciences, CSA Neurosciences Abstracts, Current Contents/Life Sciences, Elsevier BIOBASE/Current Awareness in Biological Sciences (CABS), EMBASE - the Excerpta Medica database, EMBiology, Index Medicus/MEDLINE, Journal Citation Reports/Science Edition, Reaction Citation Index, Reference Update, Science Citation Index, Science Citation Index Expanded (SciSearch), Scopus, SIIC Data Bases, Zoological Record.

The Journal is associated with the Gesellschaft für Biochemie und Molekularbiologie e.V. 

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions or liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

ISSN 1431-6730 · e-ISSN 1437-4315 · CODEN BICHF3

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at www.degruyter.com/bc.

RESPONSIBLE EDITOR(S) Professor Dr. Bernhard Brüne, Goethe-University, Faculty of Medicine, Biochemistry I, Theodor-Stern-Kai 7, D-60590 Frankfurt/Main, Germany, Tel.: +49-69-6301 7424, Email: B.Bruene@biochem.uni-frankfurt.de

JOURNAL MANAGER Dr. Torsten Krüger, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05 – 176, Fax: +49 (0)30 260 05 – 298, Email: biol.chem.editorial@degruyter.com

RESPONSIBLE FOR ADVERTISEMENTS Panagiota Herbrand, De Gruyter, Mies-van-der-Rohe-Straße 1, 80807 München, Germany, Tel.: +49 (0)89 769 02 – 394, Fax: +49 (0)89 769 02 – 350, Email: panagiota.herbrand@degruyter.com

© 2012 Walter de Gruyter GmbH, Berlin/Boston

TYPESETTING Compuscript Ltd., Shannon, Ireland

PRINTING Franz X. Stückle Druck und Verlag e.K., Ettenheim
Printed in Germany

COVER ILLUSTRATION

MINOS and the mitochondrial membrane labyrinth. The mitochondrial inner membrane organizing system (MINOS) is a large protein complex that controls the morphology of cristae membranes. In MINOS mutant cells, the mitochondrial inner membrane becomes enlarged and forms stacks of lamellar cristae resembling a labyrinth, as demonstrated by the electron microscopic image in the upper part of the cover (see the article by Zerbes et al. in this issue, pp. 1247–1261). The lower part shows a labyrinth sculpture by Leen Kessels, photographed by Hans Splinter.
EM image: Ida J. van der Klei. Cover image design by Maria Bohnert and Ralf M. Zerbes.



Contents

Guest Editorial — 1201

HIGHLIGHT: MEMBRANE TRANSPORT AND BEYOND

Marc Bramkamp

Structure and function of bacterial dynamin-like proteins — 1203

Florian Cymer and Dirk Schneider

Oligomerization of polytopic α -helical membrane proteins: causes and consequences — 1215

Jörg Nikolaus and Andreas Herrmann

Functional relevance of transmembrane domains in membrane fusion — 1231

Ralf M. Zerbes, Ida J. van der Klei, Marten Veenhuis, Nikolaus Pfanner, Martin van der Laan and Maria Bohnert

Mitofilin complexes: conserved organizers of mitochondrial membrane architecture — 1247

Wai-Ling Chang, Jürgen Soll and Bettina Bölter

The gateway to chloroplast: re-defining the function of chloroplast receptor proteins — 1263

Manfred J. Saller, Zht Cheng Wu, Jeanine de Keyzer and Arnold J.M. Driessen

The YidC/Oxa1/Alb3 protein family: common principles and distinct features — 1279

Julian Witan, Christian Monzel, Patrick D. Scheu and Gottfried Unden

The sensor kinase DcuS of *Escherichia coli*: two stimulus input sites and a merged signal pathway in the DctA/DcuS sensor unit — 1291

Reviews

Paulina Galka-Marciniak, Martyna O. Urbanek and Włodzimierz J. Krzyzosiak

Triplet repeats in transcripts: structural insights into RNA toxicity — 1299

Inmaculada García-Robles, Jesús Sánchez-Navarro and Marcos de la Peña

Intronic hammerhead ribozymes in mRNA biogenesis — 1317

Silvia Castelli, Andrea Coletta, Ilda D'Annessa, Paola Fiorani, Cinzia Tesauro and Alessandro Desideri

Interaction between natural compounds and human topoisomerase I — 1327

Research Articles/Short Communications

Protein Structure and Function

Reto Walser, Jörg H. Kleinschmidt, Arne Skerra and Oliver Zerbe

β -Barrel scaffolds for the grafting of extracellular loops from G-protein-coupled receptors — 1341

Membranes, Lipids, Glycobiology

David Damerell, Alessio Ceroni, Kai Maass, Rene Ranzinger, Anne Dell and Stuart M. Haslam

The GlycanBuilder and GlycoWorkbench glycoinformatics tools: updates and new developments — 1357