

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)

EDITOR-IN-CHIEF

D. Thomas, Chicago

EXECUTIVE EDITORS

*J. Buchner, Munich
J. Herrmann, Kaiserslautern
M. Lei, Shanghai
S. Ludwig, Münster
B. Turk, Ljubljana
A. Wittinghofer, Dortmund*

EDITORIAL BOARD

*P. Agostinis, Leuven
L. Banks, Trieste
A.G. Beck-Sickinger, Leipzig
L. Bosca, Madrid
B. Brüne, Frankfurt/Main
E. Cadenas, Los Angeles
H. Cheng, Shanghai
O. Daumke, Berlin
I. Dikic, Frankfurt/Main
W.-X. Ding, Kansas City
N. Gekara, Stockholm
F.U. Hartl, Martinsried
D. Häussinger, Düsseldorf
L.-O. Klotz, Jena
V. Magdolen, Munich
M. Müschen, San Francisco
G. Pejler, Uppsala
N. Pfanner, Freiburg
J. Potempa, Krakow
R. Rosenzweig, Rehovot
K. Sandhoff, Bonn
J. Scheller, Düsseldorf
H. Sies, Düsseldorf
K. Winkhofer, Bochum*

ASSOCIATE EDITORS (GBM STUDY GROUPS)

*J.W. Bartsch, Marburg
S. Clemens, Bayreuth
A. Ebert, Göttingen
R. Erdmann, Bochum
K. Giehl, Giessen
S. Hiller, Basel
B. Höcker, Bayreuth
I. Koch, Frankfurt/Main
T. Proikas-Cezanne, Tübingen
J. Riemer, Cologne
C. Seidel, Düsseldorf
C. Villmann, Würzburg
J. Weigand, Marburg
V. Zickermann, Frankfurt/Main*

DE GRUYTER

ABSTRACTED/INDEXED IN AGRICOLA (National Agricultural Library) · Baidu Scholar · Cabells Journalytics · CABI (over 50 subsections) · Case · Chemical Abstracts Service (CAS): CAPlus; SciFinder · CNKI Scholar (China National Knowledge Infrastructure) · CNPIEC: cnpLINKer · Dimensions · EBSCO (relevant databases) · EBSCO Discovery Service · EMBASE · Genamics JournalSeek · Google Scholar · ICAP Alcohol Information Databases · Japan Science and Technology Agency (JST) · J-Gate · Journal Citation Reports/Science Edition · JournalGuide · JournalTOCs · KESLI-NDSL (Korean National Discovery for Science Leaders) · Medline · MyScienceWork · Naver Academic · Naviga (Softweco) · Norwegian Register for Scientific Journals, Series and Publishers · Pathway Studio · Primo Central (ExLibris) · ProQuest (relevant databases) · Publons · PubMed · QOAM (Quality Open Access Market) · ReadCube · Reaxys · SCImago (SJR) · SCOPUS · Semantic Scholar · Sherpa/RoMEO · SIIC Data Bases · Summon (ProQuest) · TDNet · Text Mining · Ulrich's Periodicals Directory/ulrichsweb · WanFang Data · Web of Science; Biological Abstracts; BIOSIS Previews; Current Contents/Life Sciences; Prous Science Integrity; Reaction Citation Index; Science Citation Index; Science Citation Index Expanded · WorldCat (OCLC) · X-MOL · Yewno Discover

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) Douglas D. Thomas, Department of Medicinal Chemistry and Pharmacognosy, University of Illinois at Chicago, College of Pharmacy, 900 S. Ashland Avenue (M/C 870), Chicago, IL 60607, USA, e-mail: ddthomas@uic.edu.

JOURNAL COORDINATOR Dr. Torsten Krüger, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05-176, Fax: +49 (0)30 260 05-352, e-mail: biol.chem.editorial@degruyter.com

ADVERTISEMENTS e-mail: anzeigen@degruyter.com

© 2023 Walter de Gruyter GmbH, Berlin/Boston

TYPESETTING TNQ Technologies, Chennai, India

PRINTING Franz X. Stücker Druck und Verlag e.K., Ettenheim



Contents

Highlight: Chemical Biology of Ion Channels

Guest Editorial — 239

Maurice Dellin, Ina Rohrbeck, Purva Asrani, Julian A. Schreiber, Nadine Ritter, Frank Glorius, Bernhard Wünsch, Thomas Budde, Louisa Temme, Timo Strünker, Birgit Stallmeyer, Frank Tüttelmann, Sven G. Meuth, Marc Spehr, Johann Matschke, Andrea Steinbicker, Christos Gatsogiannis, Raphael Stoll, Nathalie Strutz-Seeböhm and Guiscard Seeböhm
The second PI(3,5)P₂ binding site in the S0 helix of KCNQ1 stabilizes PIP₂-at the primary PI1 site with potential consequences on intermediate-to-open state transition — 241

Elena Bechthold, Lucie Grey, Emil Diamant, Judith Schmidt, Ruben Steigerwald, Fabao Zhao, Kasper B. Hansen, Lennart Bunch, Rasmus P. Clausen and Bernhard Wünsch
***In vitro* ADME characterization of a very potent 3-acylamino-2-aminopropionic acid-derived GluN2C-NMDA receptor agonist and its ester prodrugs — 255**

Paul Disse, Isabel Aymanns, Nadine Ritter, Stefan Peischarde, Lisanne Korn, Heinz Wiendl, Matthias Pawlowski, Stjepana Kovac, Sven G. Meuth, Thomas Budde, Nathalie Strutz-Seeböhm, Bernhard Wünsch and Guiscard Seeböhm
A novel NMDA receptor test model based on hiPSC-derived neural cells — 267

Marvin Korff, Ruben Steigerwald, Elena Bechthold, Dirk Schepmann, Julian A. Schreiber, Sven G. Meuth, Guiscard Seeböhm and Bernhard Wünsch
Chemical, pharmacodynamic and pharmacokinetic characterization of the GluN2B receptor antagonist 3-(4-phenylbutyl)-2,3,4,5-tetrahydro-1H-3-benzazepine-1,7-diol – starting point for PET tracer development — 279

Afsaneh Labbaf, Maurice Dellin, Marlene Komadowski, Dane M. Chetkovich, Niels Decher, Hans-Christian Pape, Guiscard Seeböhm, Thomas Budde and Mehrnoush Zobeiri
Characterization of Kv1.2-mediated outward current in TRIP8b-deficient mice — 291

Nicole Rychlik, Petra Hundehege and Thomas Budde
Influence of inflammatory processes on thalamocortical activity — 303

Héctor Noguera Hurtado, Anne Gresch and Martina Düfer
NMDA receptors – regulatory function and pathophysiological significance for pancreatic beta cells — 311

Thorsten Loeck and Albrecht Schwab
The role of the Na⁺/Ca²⁺-exchanger (NCX) in cancer-associated fibroblasts — 325

Benjamin Soret, Jurek Hense, Simon Lüdtkke, Insa Thale, Albrecht Schwab and Martina Düfer
Pancreatic K_{Ca}3.1 channels in health and disease — 339

Christina B. Schroeter, Christopher Nelke, Marcus Schewe, Lucas Spohler, Alexander M. Herrmann, Thomas Müntefering, Niklas Huntemann, Maria Kuzikov, Philip Gribbon, Sarah Albrecht, Stefanie Bock, Petra Hundehege, Lea Christine Neelsen, Thomas Baukrowitz, Guiscard Seeböhm, Bernhard Wünsch, Stefan Bittner, Tobias Ruck, Thomas Budde and Sven G. Meuth
Validation of TREK1 ion channel activators as an immunomodulatory and neuroprotective strategy in neuroinflammation — 355