In-cell NMR Spectroscopy
From Molecular Sciences to Cell Biology

New Developments in NMR

Editor-in-chief:
William S. Price, *Western Sydney University, Australia*

Series editors:
Bruce Balcom, *University of New Brunswick, Canada*
István Furó, *Industrial NMR Centre at KTH, Sweden*
Masatsune Kainosho, *Tokyo Metropolitan University, Japan*
Maili Liu, *Chinese Academy of Sciences, Wuhan, China*

Titles in the series:
1: Contemporary Computer-Assisted Approaches to Molecular Structure Elucidation
2: New Applications of NMR in Drug Discovery and Development
3: Advances in Biological Solid-State NMR
4: Hyperpolarized Xenon-129 Magnetic Resonance: Concepts, Production, Techniques and Applications
5: Mobile NMR and MRI: Developments and Applications
6: Gas Phase NMR
7: Magnetic Resonance Technology: Hardware and System Component Design
8: Biophysics and Biochemistry of Cartilage by NMR and MRI
9: Diffusion NMR of Confined Systems: Fluid Transport in Porous Solids and Heterogeneous Materials
10: NMR in Glycoscience and Glycotechnology
11: Fast NMR Data Acquisition: Beyond the Fourier Transform
12: Cross-relaxation and Cross-correlation Parameters in NMR: Molecular Approaches
13: Contrast Agents for MRI: Experimental Methods
14: NMR-based Metabolomics
15: Modern Methods in Solid-state NMR: A Practitioner's Guide
16: Paramagnetism in Experimental Biomolecular NMR
17: Optimizing NMR Methods for Structure Elucidation: Characterizing Natural Products and Other Organic Compounds

18: Field-cycling NMR Relaxometry: Instrumentation, Model Theories and Applications
19: Hybrid MR-PET Imaging of the Brain: Systems, Methods and Applications
20: NMR Methods for Characterization of Synthetic and Natural Polymers
21: In-cell NMR Spectroscopy: From Molecular Sciences to Cell Biology

How to obtain future titles on publication:
A standing order plan is available for this series. A standing order will bring delivery of each new volume immediately on publication.

For further information please contact:
Book Sales Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK
Telephone: +44 (0)1223 420066, Fax: +44 (0)1223 420247
Email: booksales@rsc.org
Visit our website at www.rsc.org/books

In-cell NMR Spectroscopy
From Molecular Sciences to Cell Biology

Edited by

Yutaka Ito
Tokyo Metropolitan University, Japan
Email: ito-yutaka@tmu.ac.jp

Volker Dötsch
Goethe University, Germany
Email: vdoetsch@em.uni-frankfurt.de

and

Masahiro Shirakawa
Kyoto University, Japan
Email: shirakawa@moleng.kyoto-u.ac.jp

New Developments in NMR No. 21

Print ISBN: 978-1-78801-217-1
PDF ISBN: 978-1-78801-307-9
EPUB ISBN: 978-1-83916-093-6
Print ISSN: 2044-253X
Electronic ISSN: 2044-2548

A catalogue record for this book is available from the British Library

The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 20 7437 8656.

For further information see our web site at www.rsc.org

Printed in the United Kingdom by CPI Group (UK) Ltd, Croydon, CR0 4YY, UK