About the Editors

John Spencer

John Spencer's research covers medicinal chemistry, chemical biology tool generation and the synthesis of drug-like libraries, notably fragments. The synthetic chemistry mainly employs palladium catalysis and is often microwave mediated. He spent 10 years in the industrial medicinal chemistry research field and worked from 2001 to 2006 at the (Nobel Laureate) James Black Foundation. He is coinventor on ten patents and has over 85 publications. He has been a Reader in synthetic chemistry at his *alma mater* (Sussex University) since 2012 after spending 6 years at Greenwich University (2006–2012). His PhD on palladacycle chemistry was under the guidance of Michel Pfeffer, ULP (Strasbourg, France; 1994), and he completed postdoctoral studies on asymmetric catalysis and Josiphos chemistry with Antonio Togni, ETH (Zurich, Switzerland) from 1994 to 1996.

Mark C Bagley

Mark C Bagley is Professor of Organic Chemistry at the Department of Chemistry in the School of Life Sciences at the University of Sussex. He was educated as a Chemist at the University of Oxford (UK), and carried out postdoctoral studies at the Université de Genève (Switzerland) with W Oppolzer and at Loughborough University (UK) and the University of Exeter (UK) with CJ Moody, before being appointed as a lecturer at Cardiff University (UK) in 1999 where he stayed until 2011 before taking up his current position. His research interests include heterocyclic chemistry, microwave-mediated synthetic methods and technology, flow reactors, the synthesis of heterocyclic natural products and the interface of chemistry, tissue engineering and clinical medicine, in particular for the diagnosis of, and chemical intervention in, inflammatory diseases and rapid aging. He has been studying the pathophysiology of Werner syndrome since 2006, in collaboration with David Kipling and Terence Davis at Cardiff University, and has published regularly on microwave-assisted organic synthesis, in particular in heterocyclic chemistry, since 2002.

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Foreword

Microwaves in drug discovery and development: recent advances

John Spencer & Mark C Bagley

There can be little doubt that the introduction of proprietary instrumentation for microwave-assisted synthesis has made a dramatic impact on drug discovery. The uptake of this technology in the field has been rapid and universal, although there remains a number of key challenges, such as difficulties with reaction monitoring, facility for scale-up, and integration with other emerging technologies, as well as key ongoing debates, including the presence (or indeed absence) of specific microwave effects.

This book brings together a series of excellent reviews from world-leading groups in the field of microwave-mediated chemistry. The chapters have been grouped in a logical order; hence, Chapters 1 & 2 by Stadler and Alcazar, respectively, start with very interesting current examples of industrial and technological aspects of microwave chemistry. These are followed by three chapters by Larhed, Boissel and Bagley covering targeted applications of medicinal chemistry, where microwave technology plays a pivotal role in improving reaction efficiency, aimed at drug-like molecules such as anti-infectives, or for respiratory and aging disorders. The next chapter, by a recognized microwave innovator, Nicholas Leadbeater, covers the monitoring of organic reactions mediated by microwaves, setting the tone for a number of chapters by De Luca, Van der Eycken, Spencer and Agrofoglio, focusing on synthetic chemistry in the medicinal chemistry arena or concerning natural products, which are classical, and remain indispensable, sources of new bioactive leads. Finally, the last two chapters by

Sutcliffe and Moneghini are centered on formulation-type chemistries, including the synthesis of an unusual family of supramolecules related to cucurbit[n]urils.

Overall, this collection of articles from leading authors from both academia and industry highlights the vital contribution of microwaves in medicinal chemistry and underpins the progress that this technology has made over the past few decades. With all of these recent and exciting developments, it is our anticipation that this field will continue to develop, both in scope and application, in the next few decades.

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