

# Editorial

## Chemistry in China



China is one of the most rapidly developing countries in the world. Economic growth has also translated into tremendous progress in many fields, including technology and science. In the last few years, chemistry research in China has grown significantly and continues to expand rapidly. Today, Chinese research institutes, universities and chemical industries are heavily involved in basic and applied research including all main branches of chemistry, such as organic chemistry (e.g. cross-coupling reactions, asymmetric synthesis, natural product chemistry, process chemistry), physical chemistry, inorganic chemistry, materials synthesis and characterization (e.g. nano-materials, highly efficient metathesis polymerization), analytical chemistry and structure determination (e.g. for Chinese medicine), computational chemistry, environmental chemistry, applied chemistry and most importantly life science R&D. Recent articles on innovations in methodology, the life sciences, green chemistry and techniques and instrumentation bear witness to the enormous progress in chemistry research which has been achieved over the last few years.

While admittedly starting from a low baseline, China has become a leading nation in publishing papers in chemistry-related journals. In 1997, only about 5% of the world's publications came from Chinese authors. Since then, China's world share of publications in chemistry has significantly increased, reaching 16% by 2007, a figure which favourably compares with other leading industrial countries: USA 18%, Japan 9%, Germany 7%, India, France and the UK 5% each (*Chemistry Today*, **2009**, Vol. 27, pp 19–20).

Although China has for years been a major force in the manufacture of chemical intermediates, drugs and pesticide active ingredients, its role in the discovery of novel compounds is more recent and relatively less well known. Investments in life science R&D with double-digit annual growth rates have been evident for more than ten years. In June 2007, the Chinese government published its five-year plan to accelerate domestic life science R&D, which emphasized the need for growth of innovation, the generation of intellectual property and the discovery of novel drugs and crop protection agents. A key component of this plan was the national 'New Drug Creation and Development program' launched in 2008 with the aim of providing 6.6 billion Yuan (US\$ 960 million) to domestic R&D (*Nature Reviews, Drug Discovery*, Vol. 9, August **2010**, p 581). This initiative supports both academic groups and life science companies. This investment by the Chinese government is also thought to have increased the discovery research activities of multinational life science companies in China, such as AstraZeneca, GlaxoSmithKline, Johnson & Johnson, Novartis, Pfizer, Roche, Sanofi-Aventis and Syngenta. In addition to investing in life science R&D, China continues to build upon its low-cost manufacturing capabilities and foreign companies have also been and still are increasing their production capabilities in China.

The support from the Chinese government, coupled with a flourishing chemistry research community have made China an increasingly important global contributor to basic chemical research and the life sciences. There seems little doubt that China will continue to improve its chemical research activities further and can be expected to make a large number of important contributions to chemistry research during the 21<sup>st</sup> century.

The aim of this issue of CHIMIA is to inform the reader of some selected current trends in chemistry in China. It presents a unique look into selected research areas, including organofluorine chemistry, asymmetric synthesis, organocatalysis, heterogeneous asymmetric catalysis, metal-catalyzed coupling reactions, multicomponent reactions, microwave reactions, green chemistry, anion recognition, quality control of Chinese medicines, antitumor cyclic hexapeptides from plants, *cis*-neonicotinoid insecticides and novel herbicidal PPO inhibitors. This collection of articles is neither complete nor perfectly balanced, but attempts to highlight many recent chemistry research developments from China.

I wish you an enjoyable and informative read of this issue of CHIMIA.

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**Peter Maienfisch** studied chemistry at the ETH in Zürich, Switzerland, where he received his Diploma in 1979 and his Ph.D. in 1983. After a post-doctoral stay with Robert E. Ireland at Caltech (Pasadena, CA, USA) he joined Animal Health Research of Ciba-Geigy in Basel in 1984 and became group leader in Insecticide Research in 1988. Following the creation of Novartis in 1996, he was appointed Head of Chemistry 2 in Crop Protection Research and with the creation of Syngenta in 2000 he became Group Leader Insecticide Chemistry, Analytics & Automation. In 2007 he took over the responsibility for portfolio management of the insecticide research projects and since May 2011 he is Research Portfolio Manager for Insecticides & SeedCare. His track record of innovation and successful introduction of new technologies includes authorship of more than 140 scientific papers and patents. Furthermore he is the inventor of thiamethoxam (Actara<sup>®</sup>, Cruiser<sup>®</sup>), the world's biggest Seed Care product, and a co-organizer and subtopic organizer of many international congresses, including IUPAC Crop Protection congresses and the International Symposium on Fluorine in the Life Sciences, Bürgenstock, 2003.

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It is with great pleasure that the Editorial Board of CHIMIA thanks the guest editor Dr. Peter Maienfisch for the successful realisation of this special issue on Chemistry in China, providing an insight into a flourishing chemistry community.