

Conference Call

Environmental and Development Conference in Kenya

by Joseph O. Lalah, John Unsworth,
Paul Njiru, and Hesbon Nyagowa

Kenya has put in place a national long-term development blueprint, "Vision 2030," to create a globally competitive and prosperous nation with a high quality of life and a clean and secure environment. The country is currently experiencing rapid growth in its population and its economy, including agriculture, industries, and infrastructure, which in turn are leading to increased exploitation of natural resources such as energy and water. In order to address issues of sustainable development, a conference entitled **Linking Environmental Research to Kenya's Development Agenda and Vision 2030** was held 9–12 April 2013 in Nairobi. Organized by J.O. Lalah, P. Njiru, and H. Nyagowa of the Technical University of Kenya, the conference attracted 90 delegates, including seven participants from outside of Kenya. It was organized in conjunction with the Alexander von Humboldt Foundation and with support from IUPAC and the German Academic Exchange Service. The program included keynote presentations and five simultaneous technical sessions dealing with environmental and human health, environmental conservation and technologies, environmental monitoring and impact assessment, industry and water, and all other topics.

The objective of the conference was to bring together key researchers and stakeholders involved in environmental research and management in the east African region to review the current status of environmental research, monitoring, and capacity in Kenya as they pertain to "Vision 2030." Keynote presentations were made by the vice chancellor of the Technical University of Kenya, Ing. Francis Aduol, who also officially opened the conference, and representatives and CEOs of the Kenyan government from various ministries and parastatals, including the Ministries of Energy, Higher Education Science and Technology and Environment and Mineral Resources, the Kenya Bureau of Standards, the National Environment Management Authority, The Kenya Vision 2030, Multimedia University, Technical University of Kenya, the National Biosafety Authority, and the Institute of Climate Change of the University of Nairobi. These presentations focused on the state of environmental research and technology in Kenya and also looked at what is needed to ensure that the current progress is maintained in protecting the environment and health, particularly in the areas of agriculture, education, communications, environmental pollution, and waste management.

Other topics that were covered included potential areas of student funding and cooperation, the role of the Kenyan Bureau of Standards and the National Environment Management Authority, the relevant statutes pertaining to environmental laws, conventional and alternative energies, electronic technologies, water treatment and management, GMO

foods, and the possible effects of climate change. Invited speakers also gave general presentations on "Environmental Chemistry, Industrial Progress and Sustainability for Societal Development" (H. Frank, University of Bayreuth, Germany); "Molecular Exposomics: Status, Perspectives and Challenges" (K-W. Schramm-Helmholtz Zentrum, Munich, Germany); "Organic and Inorganic Trace Contaminants in Water: Analysis, Existing and Advanced Technologies" (S. Küppers, Forschungszentrum Jülich, Germany); and



“Pesticides: Exploring their Risks and Benefits” (J. B. Unsworth, Chelmsford, UK). The Alexander von Humboldt Foundation and DAAD were represented by Thomas Scheidtweiler (head of division for Africa and Middle East) and Jutta Quade (deputy director, DAAD Regional Office for Africa), respectively. IUPAC was represented by John B. Unsworth (chair, IUPAC Advisory Committee on Crop Protection Chemistry).

Overall, participants indicated that the conference was very successful and met most of its objectives. In particular, the conference provided an opportunity for many young scientists drawn mainly from the public universities, Kenya Agricultural Research Institute and Kenya Industrial Research and Development Institute, to listen to the keynote presentations and present their research work.

For further information on the conference, consult Prof. J.O. Lalah (lalahjoseph@yahoo.com), Dr. P. Njiru (njirupaul@gmail.com) or Dr. H. Nyagowa (nyagowa_hesbon@yahoo.co.uk).

Plant Protection Chemistry in China and the Asian Pacific Region

by Wenlin Chen, John Unsworth, and He Xiongkui

The **8th IUPAC International Workshop on Crop Protection Chemistry and Regulatory Harmonization** was held jointly with the 4th China International Symposium on Pesticide and Environmental Safety and the 5th Japan Pan-Pacific Conference on Pesticide Chemistry in Beijing, China, 15–20 September 2012. This was the second time that the IUPAC workshop was held in Beijing; the first was in 2007. Over 600 researchers of pesticide science, students, and business and government representatives from 30 countries attended the triple, joint meeting, making it the largest conference on plant protection chemistry ever held in the country.

The large gathering provided a unique forum for scientists, technologists, and regulators to exchange and discuss the latest developments and future needs in plant protection chemistry, safety evaluation, and regulatory harmonization amid the rapid expansion in global trade of agricultural commodities and the increasing demands for greater food safety in the region. More than 300 papers were presented and published in the proceedings of the conference,¹ including

8 plenary presentations, 177 session speeches, and 150 posters covering topics from product discovery, application technologies, safety assessment, and global regulatory harmonization.

The joint meeting was organized by the Beijing Pesticide Society, IUPAC Division of Chemistry and the Environment, Pesticide Science Society of Japan, China Agricultural University, and Institute for the Control of Agrochemicals of the Ministry of Agriculture, China. Financial sponsorship and support were received from the Ministry of Education, China Association for Science and Technology, China National Science Foundation, Beijing National Science Foundation, IUPAC, and business and industrial organizations. The joint conference was co-chaired by Zhang Zhongning, president of BPS and Institute of Zoology of Chinese Academy of Sciences; John Unsworth, chair of the IUPAC Advisory Committee for Plant Protection Chemistry; and Hiroshi Matsumoto, president of PSSJ and Nagoya University. IUPAC contributions were coordinated by John Unsworth, Wenlin Chen, Ken Racke, and Laura McConnell. Local leadership to the organizing team was provided by He Xiongkui, professor and director of the Research Center for Pesticide Application Technologies of CAU.

Scientific presentations were organized around six major topics briefly summarized below.

Global Views and Harmonized Approaches to Regulation

Globally harmonized regulatory approaches for crop protection chemicals are becoming more critical as international trade becomes more interconnected. Lois Rossi of the U.S. Environmental Protection Agency reviewed current efforts to conduct global, joint reviews of pesticide active ingredients, with examples from the NAFTA and OECD countries, and from the broader collaboration within the Codex Committee on Pesticide Residues. Rossi emphasized the importance of global collaboration for efficient regulation, when global information can be shared to inform safety assessments for a local regulatory decision such as to align maximum residue limits (MRLs). From the perspective of China, Gu Baogen, deputy director of ICAMA shared the progress China has made in adapting MRLs and refining the country's pesticide registration and management systems, using more science-based approaches and effective farmer training to safeguard safety and meet product manufacturing standards for both domestic use and exports. Ken Racke of Dow AgroSciences presented a set of universally applicable regulatory principles such that regulation

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“should provide incentives for innovation but also safeguard against unacceptable risks.” Representatives from Japan, Thailand, and many other countries shared their views, ideas and practices in adapting globally harmonized regulatory approaches such as GLP management and mutual acceptance of data.

Residues in Food and International Trade Standards

A very rich set of session speeches and posters were devoted to the food residue and international trade standard symposium. Scientists and regulatory practitioners from many different countries gathered to deliver a total of 46 presentations covering residue analytical methodology, regulation of consumer safety, chiral pesticide residues, trade standards on food quality, MRLs, and mutual acceptance of data.

Environmental Fate, Exposure Modeling, and Risk Assessment

Research on the fate and transport of plant protection chemistry in the environment has elevated the predictive capability for new products, as presented in the plenary speech by James N. Seiber of the University of California-Davis. Examples were given to illustrate new methods for measuring air and deposition samples of rainfall, fog water, and the mass exchange processes on the soil and plant surfaces. John B. Unsworth described the best use of the internet as a global information resource for crop protection chemistry and introduced the recently developed IUPAC web site (<http://pesticides.iupac.org>), which covers a wide range of technical and regulatory topics, including a comprehensive database containing records for about 1800 active ingredients and metabolites. A total of 53 presentations were delivered to the session, with topics covering fate and exposure studies and modeling in the air, water, soil and sediments; ecological effects on various species; human risk assessment; environmental residue analytical methods; and mitigation/remediation approaches.

Pesticide Quality, Formulation and Application Technologies

Andrew Landers of Cornell University presented the challenges and opportunities in pesticide application technology development, such as precision farming with in-field sensors and GPS and better-designed sprayers and improved operator training to meet the increasing demand for food on less land while conserving the environment. A total of 46 presentations were contributed to this session covering standards

and regulations on application equipment, precision chemical application technologies, new equipment development, and new formulations.

New Pesticide Discovery and Synthesis

On new product discovery, Toshio Fujita, world-renowned scientist and professor emeritus of Kyoto University, delivered a stimulating overview of the fundamental research on quantitative structure-activity relationship and his own groundbreaking studies of the past half century, and its application to targeted molecular design and future research.

President of East China University of Technology, Qian Xuhong, summarized the Chinese progress in research and development of novel green pesticides, using several examples of new molecule leads through fundamental approaches of chemo- and bio-informatics, molecular design, new modes of action, and target-based discovery. A total of 85 presentations were received by this symposium, covering natural product-based discovery, chemistry-based discovery, targeted molecular design, reduce risk pesticides/biopesticides, and new techniques and methodologies in discovery and synthesis.

Mode of Action, Metabolism, and Resistance Mechanisms

Stephen O. Duke of USDA-ARS elaborated on the reason why the discovery of new herbicides appears to be declining over the last two decades and pointed out recent opportunities for new research due to the rapid development of resistance to glyphosate and other older chemistry. Advancements in biotechnology and genomics were reviewed that are expected to aid new product discoveries and commercialization in the next decade. A total of 44 presentations were contributed to this session, covering mode of action, mechanism of resistance, and methods and approaches for model of action discovery.

Outcomes and Conclusions

At the conclusion of the conference, several awards were presented. Lois Rossi of the U.S. EPA received the prestigious 2012 IUPAC International Award for Advances in Harmonized Approaches to Crop Protection Chemistry. This award recognizes her excellent leadership and outstanding contributions to international harmonization for the regulation of crop protection chemistry. The biennial award is administered by the IUPAC Advisory Committee on Crop Protection Chemistry. Other awards were presented

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for the best posters, excellent conference volunteers, and special contributors.

Tangible outcomes of the joint conference include the published *Proceedings of 4th International Symposium on Pesticide and Environmental Safety & 5th Japan Pan Pacific Conference on Pesticide Chemistry & 8th IUPAC International Workshop on Crop Protection Chemistry and Regulatory Harmonization* by China Agricultural University Press.¹

References

1. Z. Zhang, J.B. Unsworth, and H. Matsumoto, *Proceedings of 4th International Symposium on Pesticide and Environmental Safety & 5th Japan Pan Pacific Conference on Pesticide Chemistry & 8th IUPAC International Workshop on Crop Protection Chemistry and Regulatory Harmonization*. Beijing, China, 15-20 September 2012. China Agricultural University Press.
2. X. He, Z. Shao, Z. Zhang, H. Ganzelmeier, *Proceedings of 2nd International Workshop of Plant Protection Machinery and Application Techniques*. Beijing, China, 15-17 September 2010. China Agricultural University Press.
3. S. Jiang, K.D. Racke, *Proceedings of 3rd International Symposium on Pesticide and Environmental Safety & 7th IUPAC International Workshop on Crop Protection Chemistry and Regulatory Harmonization*. Beijing, China, 9-13 October 2007. China Agricultural University Press.

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Organic and Biomolecular Chemistry 2012 Travel Highlights

by Mary Garson

The work of the IUPAC Organic and Biomolecular Chemistry Division (i.e., Division III) is centered on six subcommittees built around the themes of Organic Synthesis, Biomolecular Chemistry, Photochemistry, Green Chemistry, Structural and Mechanistic Chemistry, and Biotechnology. Their activities include organizing conferences that have become flagships of the division and generating projects on emerging topics within the ambit of IUPAC goals. Each of the confer-

ences that were organized in 2012 drew worldwide participants and included not only eminent speakers, but also young research students in large numbers. Many of the topics also broke down the barriers of chemistry, encompassing interdisciplinary areas such as chemical biology and materials science.

The **19th International Conference on Organic Synthesis** was held jointly with the 24th national meeting of the organic division of the Royal Australian Chemical Institute at the Melbourne Convention and Exhibition Centre (Australia) from 1-6 July 2012. There were close to 500 delegates drawn from over 15 countries.

Nobel laureate Ei-Ichi Negishi (Purdue University, USA) opened the symposium with an overview of his research into palladium catalyzed cross-couplings in organic chemistry. There were 11 other plenary lectures (Peter Wipf, Antonio Echavarren, Daiwei Ma, Amos Smith, Ian Paterson, Tohru Fukuyama, John Hartwig, Ben Feringa, Janine Cossy [former Division III titular member], Huw Davies, and Brian Stoltz) plus 18 invited lectures (including Margaret Brimble, current titular member), 60 contributed lectures, and more than 250 posters. Stephen Pyne presented the Birch lecture of RACI, while Professor Melanie Sanford gave a lecture on C-H bond activation as the 11th recipient of the prestigious Thieme prize of IUPAC. The next meeting in the ICOS series will be held in Budapest from 29 June-4 July 2014. The co-chairs of the Organizing Committee are Péter Mátyus and János Wölfling.

The **24th International Symposium on Photochemistry** took place in Coimbra, Portugal, in the historical buildings of the University. (See Jan-Feb 2013 CI, p. 29; www.



Division President Krishna Ganesh (3rd from left) with Nobel Laureate Ei-ichi Negishi (2nd from left) flanked by Martin Banwell and Tony Barrett at ICOS-19 (1st and 4th from left).

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iupac.org/publications/ci/2013/3501/cc3_150712.html) Photochemistry is nowadays employed in very different areas, such as new materials for medical applications, solar cells, photoremediation of contaminated water, photodynamic therapy, manipulation of nanostructures, mimicking of biofunctionality, restoration and conservation of art objects, and more. For all these applications, basic research and theoretical understanding is a prerequisite and that was well demonstrated in lectures such as the plenary by G. Scholes on “Quantum Mechanisms for Light Harvesting in Photosynthesis.” Other plenary lecturers were given by A. Harriman, B. L. Feringa, F. Scandola, G. Bazan, T. Majima, S. J. Formosinho and L. Arnaut (jointly), and V.W.W. Yam. The Porter medal was awarded to Tom J. Meyer (Univ. North Carolina at Chapel Hill) who gave an account on “ $\text{Ru}(\text{bipy})_3^{2+}$ and other remarkable MLCT states.”



The Opening Ceremony at the XXIVth IUPAC Symposium on Photochemistry, Coimbra, Portugal.

Among the 640 participants from 53 countries, there were many young scientists who either contributed short communications organized in three parallel sessions, or presented more than 400 posters. Several awards for oral or poster presentations were given to these young colleagues. A remarkable session was that on solar energy conversion, which included contributions on material science and engineering for solar energy conversion. Many contributions on nanoparticles, nanocrystallites and nanocomposites, and the application of novel techniques to monitor photochemical reactions in complex materials were presented. The symposium was inaugurated by fados beautifully sung by a Tuna from Coimbra and closed by a banquet at Quinta do Sobreiro, an impressive setting. The General Assembly of the European Photochemical Association and a meeting of the

IUPAC subcommittee were held during the symposium. The next IUPAC Symposium on Photochemistry is planned to be in Bordeaux (France) in July 2014; the scientific chair is Dario Bassani.

The **4th International IUPAC Conference on Green Chemistry** (4th ICGC) took place at Foz do Iguaçu, Brazil—whose falls are considered one of the seven natural wonders of the world—from 25-29 August, 2012. Organized under the auspices of IUPAC and the Brazilian Chemical Society, the conference had as its theme “Exchanging experiences towards a sustainable society taking care of natural resources in their socio-economic development” (See Mar-Apr 2013 *CI*, p. 32; www.iupac.org/publications/ci/2013/3502/cc4_250812.html).

There were around 600 participants from up to 40 countries representing all areas of chemistry as well as academic, industrial, and government sectors. More than 35 sponsors from different governmental and industrial sectors supported the event. The 4th ICGC focused on topics such as benign synthesis/process, green chemistry for energy/production, chemicals from renewable resources, green engineering, education in green chemistry, and engineering and policy. Ten senior researchers and professionals of green chemistry presented plenary lectures: Paul Anastas, Pietro Tundo, Adelio Machado, James Clark, Jairton Dupont, Buxing Han, Rajender Varma, Anita Marsaioli, Roger Sheldon, and Robin Rogers. There were 15 invited lectures.

Apart from the lectures, roundtables, and two poster sessions (>300 posters), the book titled *Contribution from Brazilian Postgraduate Studies to*



Pietro Tundo, past president of Division III, during his plenary lecture at ICGC4.

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Sustainable Development: CAPES at Rio +20 published by Coordination for the Improvement of Higher Education Personnel, was launched. There were four poster awards, one of which was sponsored by the Royal Society of Chemistry (UK). The next meeting in this series will be held in Durban, South Africa from 17–21 August 2014.

The growth of biomolecular chemistry in China, and the opportunity to join with the 8th International Symposium for Chinese Medicinal Chemists, led to the **9th International Symposium on Biomolecular Chemistry** (ISBOC9) held at the Beijing Conference Center in August 2012. Two Nobel Laureates crowned the scientific program. Ada Yonath (Weizmann Institute, Israel) delivered the opening lecture on her work on the structure and function of the ribosome that merited the Nobel Prize in 2009. Robert Huber (MPI for Biochemistry, München, Nobel Prize for Chemistry in 1988) opened the final day of the conference with a wide-ranging and authoritative description of the cell's molecular equipment for the destruction of proteins that have served their purpose: the proteasome. He showed how this work also is being applied to understanding the structures and mechanisms of these digestive machines and its application to new drug development.

Within the six parallel sessions, the ACS endorsed a MEDI symposium headed by a plenary lecture from Jon Clardy (Harvard Medical School) giving a description of the discovery of new biologically active compounds from bacteria. Plenary Lectures from Marv Caruthers, Vern Schramm, Shaomeng Wang, Pan-Chyr Yang, Zheng Yang, and Junying Yuan held the rapt attention of the audience and covered the full spectrum of biomedical science from bench to clinic, from cell death to drug discovery. Finally, He Chuan closed the conference with a stunning presentation of how the enzymatic methylation and demethylation of nucleic acids, both for chromosomal DNA and also for RNA, impact on human diseases, in part using a bisulfite deamination reaction discovered over forty years ago.

From an IUPAC standpoint, the tremendous success of this meeting was two fold. First, it harmoniously juxtaposed biomolecular and medicinal chemistry communities and activities in a seamless presentation of the awesome progress of these two different disciplines, and second, it delivered world leading research on these twin themes to a truly international audience, whose core was hundreds of young, enthusiastic, exuberant, indefatigable Chinese students.



The ICPOC 21 logo was the minimal saddle trefoil, created by Carlo Séquin (U.C. Berkeley).

The **21st International Conference on Physical Organic Chemistry** (ICPOC 21) was organized by the RSC Physical Organic Chemistry Group at the University of Durham from 9–13 September (see May–Jun 2013 *CI*, p. 29; www.iupac.org/publications/ci/2013/3503/cc1_090912.html).

ICPOC-21 brought together the organic chemistry, catalysis and physical chemistry communities from academia and industry to discuss the current state of the art, the development and future of physical organic chemistry. The conference consisted of 9 plenary, 14 invited and many contributed lectures, as well as poster sessions. Although traditionally considered as the study of mechanism, reactivity, structure and binding in organic systems, especially leading to the quantitative, molecular level understanding of their properties, physical organic chemistry nowadays also encompasses a wider range of contexts (such as biology and materials) than ever before. Conference themes included Physical Underpinnings (dynamics in solution, scope and limitations of transition state theory, advances in reaction monitoring, new approaches to aromaticity), Mechanisms and Catalysis (homogenous and heterogenous, mechanistic enzymology) and Supramolecular/Systems/Non-covalent interactions (molecular self-assembly, gel-forming materials).

The **International Biotechnology Symposium** (IBS) and exhibition series is a premier international biotechnology event held every two years in different parts of the world. The 15th IBS was held 16–21 September 2012 in Daegu, Korea, and was hosted by The Korean Society

Mark Your Division III Calendar

20th International Conference on Organic Synthesis

29 June–4 July 2014, Budapest, Hungary
www.icos20.hu

XXVth Symposium on Photochemistry

13–18 July 2014, Bordeaux, France
www.photoiupac2014.fr

5th International Conference on Green Chemistry

17–21 August 2014, Durban, South Africa
www.saci.co.za/greenchem2014

22nd International Conference on Physical Organic Chemistry

10–15 August 2014, Ottawa, Canada
<http://events.science.uottawa.ca/icpoc22/welcome.html>

16th International Conference on Biotechnology

14–19 September 2014, Fortaleza, Brazil
<http://ibs2014.org>

for Biotechnology and Bioengineering and co-hosted by The Korean Institute of Chemical Engineers, The Korean Society for Microbiology and Biotechnology, Korean Society of Food Science and Technology, and The Pharmaceutical Society of Korea. The Committee Chair Yoon-Mo Koo and Secretary General Tai Hyun Park arranged a most successful conference. The symposium was attended by 2208 participants from 53 different countries. The program included 4 plenary lectures, 161 invited lectures, 415 oral presentations, and 1012 poster presentations. The 16th IBS meeting will be held in Fortaleza, Brazil, from 14–19 September 2014.

The **27th International Symposium on the Chemistry of Natural Products** (ISCNP27), held jointly with the 7th International Conference on Biodiversity (ICOB7) was held in July 2011 in Brisbane, Australia. The division hopes to confirm the venue for ISCNP28/ICOB8 at its meeting in Istanbul in August 2013.

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Metal Ions in Biology and Medicine

by *María H. Torre*

The **12th International Symposium on Metal Ions in Biology and Medicine** took place in Punta del Este, Uruguay, from 11–13 March 2013. The symposium featured 2 plenary lectures, 18 keynote lectures, 41 oral presentations, and 73 poster presentations. The sessions were organized around the following topics: Metal-Based Drugs, Toxicological Effects of Metal Ions on Biological Systems, Radiometals in Nuclear Medicine, Nutritional Aspects of Trace and Major Elements, Metal Ions in Environmental Health, Advanced Analytical Methods for Metal Ions in Biochemical and Biological Systems and Structural Biology of Metalloproteins and Metal-Based Redox Processes. About 150 researchers and students of different countries (Argentina, Brazil, Chile, China, Czech Republic, Colombia, France, Germany, Hungary, Italy, Japan, México, Poland, Spain, Switzerland, Uruguay, USA, Venezuela) participated in the meeting. The symposium proceedings can be downloaded from www.metal-ions2013.fq.edu.uy.

The event was preceded by a course for high school teachers in Uruguay. The lectures were given by Enrique J. Baran of Universidad Nacional de La Plata, Argentina, and Patrick Moyna of Universidad de la República, Uruguay.

IUPAC's sponsorship was advertised on symposium materials and during the inauguration of the symposium. The materials provided by IUPAC (periodic tables, *Chemistry International* magazine) were given to attendees. The funds that IUPAC provided were used to support the attendance of Baran and Moyna, as well as to provide "travel awards" to eight students in the region.

María H. Torre is a professor of inorganic chemistry in the Faculty of Chemistry, UDELAR, Montevideo, Uruguay. She was a cochair of the 12th International Symposium on Metal Ions in Biology and Medicine.