



International Organization
for
Chemical Sciences in
Development

**Namur Research College (NARC)
and
International Organization for Chemical Sciences in Development (IOCD)**

Joint International Symposium and Public Seminar

**University of Namur
5 July 2012**

Meeting Report¹

On 5 July 2012, the International Organization for Chemical Sciences in Development (IOCD)² co-organized a 1-day meeting in Namur, Belgium in collaboration with the Namur Research College (NARC)³ at Namur University, gathering around 180 scientists mainly from European countries.

The first part of the day was an International Symposium entitled '**Chemical Development: Chemistry, a Crossway Towards Interdisciplinary Science**'. It featured lectures by the chemistry Nobel Laureate **Ryoji Noyori** (RIKEN and Nagoya University, Japan) and several European scientists: These highlighted some of the many ways that chemistry, working at the interfaces with other sciences including biology and physics, is contributing new insights and new materials with important applications of global significance. The speakers described very recent results from their research laboratories covering quite a broad array of organic as well as inorganic chemistry involving enzymes and abzymes and fine-tuning of their properties using, for example directed evolution (**Don Hilvert**; ETH, Zurich, Switzerland) or producing chemicals with unusual properties by self assembly (**Luisa De Cola**: University of Munster, Munster, Germany). **Klaus Mullen** (Max Planck Institute for Polymer Research, Mainz, Germany) offered a fascinating incursion into the world of carbon allotropes, focusing on their structures and properties. Synthetic aspects were described in almost all the presentations, especially those of Noyori and Seeberger. **Ryoji Noyori** presented the genesis of the enantioselective reductions of the C=C and C=O double bond by hydrogenation using rhodium and ruthenium catalysts, a powerful synthetic method which led to his Nobel prize. **Peter Seeberger** (Max Planck Institute of Colloids and Interfaces, Postdam, Germany) described an efficient and cost-effective synthesis of artemisinin an antimalarial drug, using as starting material artemisinic acid produced by engineered yeast. Central to the synthesis is a continuous photochemical transformation involving a singlet-oxygen induced ene reaction and the addition of triplet oxygen, which triggers the reaction cascade that incorporates the essential endoperoxide group. This technically simple, efficient, and inexpensive synthesis is readily scalable by virtue of the continuous-flow process, and does not require isolation and purification of intermediates.

This was followed by a Public Seminar on the theme "**New challenges in chemical sciences for development**", with lectures by the chemistry Nobel Laureate Prof. Ryoji Noyori, Prof. **Stephen Matlin** Institute of Global Health Innovation, Imperial College, London, UK and IOCD and **Gerhard Bringman** (University of Würzburg, Germany), reflecting on the vital contributions that science research and education make to national and global development.

Opening the Public Seminar, **Alain Krief** described the purpose of IOCD – the first international non-governmental organization devoted to enhancing the role of the chemical sciences in development. He focused particularly on one of IOCD's three strategic priorities, to strengthen chemical education and to facilitate global access to high-quality knowledge in the chemical sciences.

Stephen Matlin emphasised that the chemical sciences had made major contributions to human health, wellbeing and wealth during the last two centuries – but not all populations had benefitted equally from this, resulting in some stark inequalities between richer and poorer nations. In addition to these persisting inequities, in the 21st century the world was faced with a number of new challenges as the population of the planet continued to grow and there were pressures on energy, material resources and the quality of the environment. He spoke about the changing role of IOCD and especially the contribution it was seeking to make at the critical interface between science and policy. **Gerhard Bringman** gave a short talk in which he outlined his success in supporting efforts to improve school education in the Congo and to assist young scholars there to pursue advanced learning.



Professor **Ryoji Noyori**, President of RIKEN and University Professor at Nagoya University, Japan, during his visit to Namur on 5 July 2012.

Professor Noyori, shared the 2001 Nobel Prize in Chemistry for the development of chiral catalysts for asymmetric synthesis.

The chemistry Nobel Laureate **Ryoji Noyori** reflected on the challenges he had faced and lessons learned during his long career working on asymmetric catalysis. He noted that science is inevitably closely intertwined with society and there are now many opportunities for chemistry to contribute to 'green' issues and assist in areas such as the more efficient, cleaner production of energy. The Japanese organization RIKEN, of which Noyori is currently President, pursues innovative basic science and aims to return the results of research to society. Noyori observed that there have been many benefits of S&T to society, including helping to secure adequate food sources, enhancing life expectancy and quality of life and providing means for high-speed communication globally. But there are many new challenges in the modern world – including water, energy, health, agriculture, biodiversity, environment and poverty - and a better prioritization and balancing of culture and technology is required. Noyori ended his talk with a call for scientists and technologists to help create a civilization that respects cultures and works through international cooperation.

Acknowledgements

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⁴ V Köster. *J.-M. Lehn and A. Krief on Science and Responsibility*. ChemistryViews 2012. DOI: 10.1002/chemv.201200060.

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