

Report of Organic and Biomolecular Chemistry Division (III)

September 2004

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Members:

New term of IUPAC Division of Organic and Biomolecular Chemistry (2004-2005) been supported by the members of Division III Committee and 6 Subcommittees, and further details are available at <http://www.iupac.org/divisions/III/index.html>.

Prof. D. StC. Black had been elected as the Secretary General of IUPAC at the close of the Ottawa Meeting to leave a vacancy in the Division-III Presidency. After due consultation within the Division, I (Minoru Isobe) had been elected to this position. Prof. Vadim Ivanov continues as Vice-President and Prof. G. M. Blackburn as Secretary. Subcommittee of Biotechnology has been reconstructed. You can find the updated activity of this Division in this report, and more details at the URL about items such as Recent Report, Subcommittees, Current Project, Conferences, etc.

Former executives have done well in geographic diversity, with 29 countries represented on our Division Committee. However our inclusion of female members is low (6), and we hope this will improve in the future.

IUPAC former Division Vice-President David Black (new Secretary General of IUPAC), former Division President Torbjorn Norin (still on Interdivisional Subcommittee on Biological Chemistry), and Titular Members Norma Nudelman (now on CHEMRAWN Committee), Silvia Braslavsky (now National Representative from Germany and still Chair of the Photochemistry Subcommittee), Milton Hearn, and Govardhan Mehta.

The Division Committee Meeting was held in Sheffield (Part 1) on July 1 and in Nagoya (Part 2) on Aug. 4, 2004. President report was followed by the Division Aims, Officers 2004-5, Nomination of Officers 2006-7, Future Membership of the committee, Reports from the Subcommittees, Discussion of Existing Projects, and New Proposals.

Division Aims and Rules

The Mission of the Division of Organic and Biomolecular Chemistry is to promote the goals of IUPAC in the field of organic and biomolecular chemistry in the broadest sense. To this end the Division consists of a Division Committee and six Subcommittees. Together these promote the formulation and execution of Projects on relevant chemical problems, the staging of chemical conferences on important areas of chemistry, the education and professional development of chemists worldwide, the advancement of chemical industry, and the application of chemistry to meet the world's needs. The Division is committed to utilizing the talents of chemists from around the world in these activities, and promoting diversity in our membership.

Provisional Division Rules and Subcommittee Mission Statements were adopted year 2003, and are posted on the Division website. Subcommittees may wish to consider if these accurately reflect their activities.

Subcommittees and Conferences:

Organic and Biomolecular Chemistry Division has the following 6 Subcommittees to cover most of the organic and biomolecular area concerned. Subcommittee has organized the face-to-face Subcommittee Meeting mostly in the occasion of the IUPAC Sponsoring Conferences.

Subcommittee on Organic Synthesis

Synthesis covers a central part of the organic chemistry spectrum and ethos. The mission of the Sub-committee on Organic Synthesis is to provide a focus for the dissemination of current knowledge and the development of future directions in all aspects of organic synthesis, including:

1. The development of new molecular transformations
2. The development of new reagents
3. The development of environmentally benign synthetic processes
4. The synthesis of new types of organic structures
5. The synthesis of target molecules for specific applications
6. The total synthesis of natural products
7. Combinatorial and high throughput techniques

IUPAC ICOS-15 was held in Nagoya, Japan from Aug. 1 to 6, 2004 by co-organizers Minoru Isobe and Hisashi Yamamoto in collaboration with Chemical Society of Japan. There were 10 Plenary Lectures, 3 Award Lectures (Thime Award and Nagoya Medal Award), 20 Invited Lectures, 2 afternoon sessions for parallel short oral presentation of all the 460 poster presentation. The 980 registration was recorded.

ICOS-16 will be held in Merida, Yucatan, Mexico during June 11-15, 2006 by organizer Eusebio Juaristi.

Further ICOS-17 was proposed to be held at Daejeon in Korea during Aug 17-23, 2008; ICOS-18 (2010) in Bergen, Norway; ICOS-19 (2012) in Taiwan.

Subcommittee on Biomolecular Chemistry

The Subcommittee will seek to deliver the long-range goals of IUPAC, particularly within the vital interfacial area of molecular science that lies between organic chemistry and biology. It will support the application of the powerful methods of chemistry to current and emerging problems in biology to achieve understanding and, where appropriate, modification of the systems of living organisms at the molecular level.

To that end, the Sub-Committee will provide a focus for the dissemination of current knowledge and the development of future directions in the following fields:

1. Structure, function and applications of biomolecules and their analogues.
2. Molecular mechanisms of biological processes and their modulation.
3. Molecular engineering via chemo-enzymatic processes.
4. Analysis, manipulation and application of biomolecular information systems.

The 7th International Symposium on Biomolecular Chemistry - ISBOC-7 - was held at the University of Sheffield, UK from 27 June to 1 July 2004. The previous descriptor "Bioorganic", has been replaced deliberately by the word "Biomolecular" in order to broaden the scope and embrace the introduction of "bioinorganic" chemistry. The Sheffield conference was master-minded by Professor Michael Blackburn and his local committee, in collaboration with the Royal Society of Chemistry. There were 7 plenary, 5 keynote, and 23 invited lectures, 38 contributed oral presentations, and 86 poster presentations.

In the Subcommittee Meeting on June 29, and further discussion of the proposed Project from Prof. Mosihuzzaman was generally critical of its narrowness. The motion: "That this committee rejects the proposal as submitted by Prof. Mosihuzzaman. It recommends the organization of a Symposium in Print and suggests a sum of USD1000 to support that activity" was proposed, seconded and carried unanimously.

Subcommittee on Photochemistry

Implementation of the overall goals and objectives of IUPAC in the multidisciplinary area of photochemistry and its links to the photosciences (e. g., materials sciences, photobiology, photolithography, photography) can be accomplished only with the inputs of a broad spectrum of experts in the field, including those with ancillary interests in areas covered by all Divisions within IUPAC.

1. Renewable energy sources
2. green chemistry
3. atmospheric photochemistry
4. new analytical methods in the biosciences including trace analysis of proteins, nucleic acids, and small bioregulators, both in vivo and in vitro
5. industrial photochemistry
6. advanced spectroscopic methods in ultra-fast time and ultra-small space resolution
7. methods for identifying material fatigue and temporal changes

The Subcommittee will work in close contact with the three major Photochemical Societies of the world, i. e., the Inter-American Photochemical Society, IAPS, The European Photochemical Association, EPA, and the Japanese Photochemical Association.

A meeting of the Sub-Committee on Photochemistry, plus colleagues participating in or chairing projects, was organized by Miguel Miranda during the XX-IUPAC Sponsored symposium of Photochemistry in Granada, Spain during July 17-23, 2004.

The 21 Symposium (2006) is planned to be for the first time outside Europe, *i.e.*, in Kyoto, Japan, on April 2-6, 2006. Scientific Chair is Masahiro Irie, Kyushu University.

Subcommittee on Structural and Mechanistic Chemistry

The Subcommittee should handle problems concerning the many aspects of structural and mechanistic organic chemistry. Specific examples include:

- Environmentally friendly chemical processes and degradative pathways of organic contaminants
- Reactions in solution, gas phase, and solid state
- Solvents for organic reactions
- Acidity and basicity of organic compounds
- Supramolecular chemistry

The 17th IUPAC Conference on Physical Organic Chemistry was held at Academy of Sciences in Shanghai, China from August 15 to 20, 2004.

The 5th Florida Heterocyclic Conference was held in Gainesville at Univ. Florida from March 8 to 10, 2004 with attendance of 170 delegates. This included 11 Plenary, 11 short lectures and a short course on heterocyclic chemistry.

Subcommittee on Green Chemistry

The aim of this Subcommittee is to develop actions devoted to the cause of green chemistry for its wider benefit to the future of chemistry and society as whole.

Activities are introduced in *Chemistry International*, Vo. 26, No. 2, March-April, 2004 by Pietro Tundo and Mohamed Tawfic Ahmed as follows. "Green Chemistry is an emerging field concerned with the safe practice of chemistry—a goal that people all over the world are interested in attaining. Green chemistry addresses some of our most precious values; human well-being, environmental sustainability, integrity, and safety, and the worldwide need for green chemistry practices should allow human development and prosperity, along with environmental ethics. The IUPAC working party on Synthetic Pathways and Processes in Green Chemistry defined Green Chemistry (2000) as *The invention, design, and application*

of chemical products and processes to reduce or to eliminate the use and generation of hazardous substances.

Subcommittee on Biotechnology

Projects:

Current projects supported by the Division are listed in <http://www.iupac.org/divisions/III/cp3.html>

Budget of Division III for 2004-2005 is allocated to the 6 Subcommittees in part, and the rest are available for projects. Further funding is available for good proposals. The generation of new projects remains the most urgent business of the Division.

Many potential proposals have been discussed among the subcommittee meetings to generate most important and timely projects.

Representation on other IUPAC Bodies

Committee on Chemical Education (CCE) M. Fatima d. G. F. da Silva.

Interdivisional Committee on Nomenclature, Terms, and Symbols (ITCNS) Gerrit Koomen.

Subcommittee on Materials Chemistry Shunichi Fukuzumi and Istvan Horvath.

Division VIII Nomenclature Warren Powell.

Recent Reports from ORGANIC AND BIOMOLECULAR CHEMISTRY DIVISION (III)

Phane nomenclature. Part II. Modification of the degree of hydrogenation and substitution derivatives of phane parent hydrides (IUPAC Recommendations 2002) (III)

Pure Appl. Chem. **74**(5), 809-834 (2002)

Molecular basis of biodiversity, conservation, and sustained innovative utilization

Pure Appl. Chem. **74**(4), 697-702 (2002)

Nomenclature for the C₆₀-I_h and C₇₀-D_{5h}(6) fullerenes (IUPAC Recommendations 2002) (III.1)

Pure Appl. Chem. **74**(4), 629-695 (2002)

Critical evaluation of proven chemical weapon destruction technologies

Pure Appl. Chem. **74**(2), 187-316 (2002)

Organic photochromism (IUPAC Technical Report) (III.3)

Pure Appl. Chem. **73**(4), 639-665 (2001)

Figures-of-merit for the technical development and application of advanced oxidation technologies for both electric- and solar-driven systems (IUPAC Technical Report) (III.3)

Pure Appl. Chem. **73**(4), 627-637 (2001)

Synthetic Pathways and Processes in Green Chemistry. Introductory Overview (III.2)
Pure Appl. Chem. **72**(7), 1207-1228 (2000)
That is the *Introductory Overview* to the *PAC* special topic issue on Green Chemistry.

Organic and Biomolecular Chemistry Division (III) Current Projects

- 2000-012-1-300 - Single molecule spectroscopy*
- 2001-005-1-300 - Post-genomic chemistry*
- 2001-018-1-300 - Space- and time-resolved fluorescence spectroscopy and photochemistry
- 2001-020-1-300 - Glossary of terms and basic protocols used in photodynamic therapy
- 2001-036-1-300 - Glossary of terms in photocatalysis and radiation catalysis*
- 2002-008-1-300 - Chemical actinometry*
- 2002-024-1-300 - Glossary of terms used in photochemistry (3rd version)*
- 2002-028-1-300 - South East Asian, and neighbouring countries, Green Chemistry Network
- 2002-029-1-300 - A IUPAC coordinated web page on Green/Sustainable Chemistry
- 2002-030-1-300 - Fighting microbial resistance through development of new antimicrobial agents, directed against new specific targets
- 2002-064-1-300 - Green Chemistry in Latin America
- 2003-026-1-300 - Green chemistry in Russia
- 2003-043-1-300 - Green chemistry in the Arab region
- 2003-046-1-300 - Workshop for formulation of plans for the establishment of a "Center of Natural Products Research (CNPR)"
- 2004-021-1-300 - Reference methods, standards and applications of photoluminescence*

* Interdivisional project

OTHER INTERDIVISIONAL PROJECTS

- 2001-014-1-800- Fullerene nomenclature - part II
- 2001-031-1-800 - Alignment of nomenclature in areas of overlap between the preferred names for organic nomenclature and the revision of the nomenclature of inorganic chemistry
- 2001-043-1-800 - Preferred names in the nomenclature of organic compounds
- 2002-010-1-050 - Toward a core organic chemistry curriculum for Latin American universities

2003-006-1-100 - NMR chemical shifts: updated conventions

PROJECTS NEAR COMPLETION / IN PRESS

301/1/93 - Development of guidelines for the transmission of information on organic synthesis (Abbreviation guidelines and glossary of terms for protecting groups in synthesis)