

**Confirmed Minutes.**  
**IUPAC Division of Chemistry and Human Health**  
**Subcommittee on Medicinal Chemistry and Drug Development**

February 13th, 2005  
 Rio de Janeiro, Brazil.

**Meeting Attendees:** Eli Breuer, Mukund Chorghade, Paul Erhardt, Janos Fischer, Robin Ganellin, Antonio Monge, John Proudfoot, Jörg Senn-Bilfinger.

1. Philippe Barthelemy, John Bremner, Gerhard Ecker, Giovanni Gaviraghi, Stefan Jaroch, Toshi Kobayashi, Michael Liebman, Per Lindberg, Derek Maclean, Nikolai Nifantiev, Tom Perun, Henk Timmerman, John Topliss and Camille Wermuth conveyed apologies at being unable to attend.
2. **Matters arising from the Minutes.**
3. **Membership.**

<a href="#">Bremner, John</a>	University of Wollongong, Australia
<a href="#">Breuer, Eli</a>	Hebrew University of Jerusalem, Israel
<a href="#">Chorghade, Mukund</a>	Chorghade Enterprises, USA
<a href="#">Ecker, Gerhard</a>	University of Vienna, Austria
<a href="#">Erhardt, Paul</a>	University of Toledo, USA
<a href="#">Fischer, Janos</a>	Gedeon Richter, Hungary
<a href="#">Ganellin, Robin</a>	University College London, United Kingdom
<a href="#">Gaviraghi, Giovanni</a>	Sienabiotech, Italy
<a href="#">Jaroch, Stefan</a>	Schering AG, Germany
<a href="#">Kobayashi, Toshi</a>	Pharmaceutical Manufacturers Association (Japan) Technical Committee
<a href="#">Liebman, Michael</a>	Windber Research Institute, USA
<a href="#">Lindberg, Per</a>	AstraZeneca, Sweden
<a href="#">Maclean, Derek</a>	Kai Pharmaceuticals, USA
<a href="#">Monge, Antonio</a>	Universad de Navarra, Spain
<a href="#">Nifantiev, Nikolay</a>	Zelinsky Institute of Organic Chemistry, Russia
<a href="#">Perun, Tom</a>	Abbott Labs, USA (retired)
<a href="#">Proudfoot, John</a>	Boehringer Ingelheim Pharmaceuticals, USA
<a href="#">Senn-Bilfinger, Jörg</a>	Altana Pharma, Germany
<a href="#">Timmerman, Henk</a>	Universiteit Leiden, The Netherlands
<a href="#">Topliss, John</a>	University of Michigan, USA
<a href="#">Wermuth, Camille G</a>	Prestwick Chemical, France

The subcommittee recognizes the outstanding service of several past and present members - Camille Wermuth, Nao Koga, John Topliss and Les Mitscher. Mukund suggested that they be proposed for "Fellow of IUPAC"

or emeritus status and Robin will follow up with the appropriate nominations.

*Post meeting note: IUPAC Fellow is currently used to designate all who have served IUPAC on Committees or projects but have now retired from working with IUPAC. What we had in mind was something more special. We shall have to think up a different title.*

#### **4.1 Nomenclature and Terminology.**

##### **4.1.2 Glossary of Combinatorial Chemistry Terms** (Derek Maclean). IUPAC Project [2003-044-1-700](#).

Derek was unable to attend this meeting, he circulated an e-mail message the subcommittee members indicating that work had begun to revise the published glossary. He is especially interested in achieving a "Recommendation" status. As indicated previously, Derek would like to expand membership to include more European representation.

##### **4.1.3 Generic Structures** (Derek Maclean). No new information.

##### **4.1.4 Glossary of Drug Metabolism Terms.** (Paul Erhardt). IUPAC Project [2000-009-1-700](#)

Paul presented a poster on IUPAC drug metabolism projects at meeting of the International Society for the Study of Xenobiotics (also see Section 4.3.2).

The draft glossary is complete and ready to be sent for external review. Meanwhile the terms Phase 0 to Phase 4 will also be sent to certain scientists for consideration.

##### **4.1.5 Compendium of Glossaries.** (Robin Ganellin). IUPAC Project [2002-001-1-700](#)

Mukund indicated that Wiley may be interested in publishing the Compendium of Glossaries and he and Paul will follow up with the publisher during the ACS meeting in San Diego.

##### **4.1.6 Glossary of Terms in Pharmaceutical Technology.** (Eli Breuer). IUPAC Project [2001-049-2-700](#)

Suggestions from an external reviewer have been recently received. Some of them will be adopted and incorporated after appropriate rephrasing.

##### **4.1.7 Glossary of Terms in Pharmaceutical Process Chemistry.** (Mukund Chorghade). IUPAC Project [2001-049-2-700](#) (shares the project number of 4.1.6)

above). There was a discussion about the difference in format for a glossary or a compendium required for PAC. Paul will investigate.

#### **4.1.8 Glossary of Chemical Biomarkers for Therapeutic and Diagnostic Use.**

**Prototype Analysis of Molecular Biomarkers in Cancer.** (Michael Liebman).

No additional information. Robin to write to Michael and ask him to submit the project for IUPAC and to extend the time for completion to two years.

#### **4.1.9 Compendium of Molecular Targets for Drugs.** (John Proudfoot).

IUPAC Project [2004-025-1-700](#)

The list of targets for the top 100 commercial drugs has been compiled and draft analyses of three targets have been completed – two by colleagues of Janos (Erika Alapi and A. Szemzo). Project team members have committed to analysis of nuclear receptor targets (Stefan), antibacterial targets (Tom), targets for protein therapeutics (Susan Dana Jones).

*Post meeting note: the Division Committee requests that the compendium should include a short section highlighting the context since IUPAC should be considering all countries and many socially important drug treatments are not addressed by commercially important drugs.*

#### **4.1.10 Glossary of Terms for Biomolecular Screening** (John Proudfoot).

IUPAC Project [2004-019-3-700](#)

A list of around 175 terms has been compiled by the project team. At a team meeting held in conjunction with the annual meeting of the Society for Biomolecular screening in Orlando, it was decided that three sub-teams, now chaired by Jan Blanchard, Olivier Nosjean and John Wang, would work on the definitions with a targeted completion date of early Summer.

Professor Larry Walker, editor of the Journal of Biomolecular Screening has joined the project team.

#### **4.1.11 Glossary of Terms in Medicinal Chemistry.** (Mukund Chorghade).

Mukund is in the process of writing a project proposal to update the medicinal chemistry glossary. Currently Ralph Scannell (UCB Pharma), Gurmit Grewal (Astra Zeneca) and John Amedio (Epix) have agreed to participate. In addition, members of the original glossary project team and current subcommittee members will be invited to contribute.

## **4.2 Training and Development.**

#### 4.2.1 Research and Training in Medicinal Chemistry in Latin America.

(Antonio Monge).

Antonio has taught the following courses over the past 6 months:

- |                 |   |
|-----------------|---|
| Oct 10-14, 2004 | Project Manager in Medicinal Chemistry, Research in Forgotten Diseases<br>Universidad de San Marcos, Lima, Peru.                  |
| Oct 28, 2004    | Research in Forgotten Diseases.<br>Spanish Royal Academy of Pharmacy.   |
| Nov 30 – Dec 2  | The University–Enterprise Relationship in the discovery of Medicinal agents.<br>Universidad de la Republica, Montevideo, Uruguay. |

In conjunction with the subcommittee meeting, seven members each presented one or two lectures at the [XI ESCOLA DE VERÃO EM QUÍMICA FARMACÊUTICA MEDICINAL](#) which was held for postgraduates and postdoctoral researchers in the Federal University of Rio de Janeiro. A report about these lectures was written for Chemistry International by Janos and Robin and submitted just in time (28 Feb) for the next issue.

*Post meeting note: the article has appeared in print – Chemistry International, 2005, Vol 27, May-June, (N° 3), page 17.*

Lecture topics were as follows:

Past Approaches to Drug Discovery (an historical survey).  
Robin Ganellin.

Drug Discovery in Traditional Medicine  
Mukund Chorghade.

The Discovery of Viramune, a marketed anti-Aids Drug.  
John Proudfoot.

Process Research in Drug Discovery.  
Mukund Chorghade.

Current AIDS Therapeutics - Modern Drug Discovery at work.  
John Proudfoot

Design of a Peptidase Inhibitor.  
Robin Ganellin.

Esmolol Stat (the birth of soft drug technology) and beyond.  
Paul Erhardt.

Medicinal Chemistry of anti-Ulcer Agents.  
Jörg Senn-Bilfinger.

Analog Based Drug Discovery.  
Janos Fischer.

Matrix Metalloproteinases: Damage and the Efforts for their Inhibition.  
Eli Breuer.

#### **4.2.2 Research and Training in Medicinal Chemistry in the Indian Subcontinent.** (Mukund Chorghade).

IUPAC project [2001-048-2-700](#).

A proposed curriculum for medicinal chemistry training has been sent to 17 universities that participated in the survey portion of the project. A manuscript on "The training of Medicinal Chemists in India" is complete and will be submitted to Pure and Applied Chemistry.

Planning for the time and location of the first course, projected to occur in late 2005 or Q1 2006, is under way. Mukund acknowledged assistance from Dr. Faizul Kathawala (formerly of Sandoz) and Professor David Triggle, (SUNY, Buffalo).

#### **4.2.5 Practical Studies for Medicinal Chemistry Students.** (Antonio Monge).

IUPAC project [2004-028-1-700](#).

Antonio plans to have 30 studies in hand by the end of July and reported excellent progress with participation from colleagues in Chile, Spain, Peru, Venezuela, Cuba, Argentina, Columbia and Portugal. Additional contributions from Uruguay and Brazil are in progress.

Members requested that any safety hazards in the experiments should be highlighted.

### **4.3 New Technologies and Special Topics.**

#### **4.3.2 Project on Human Drug Metabolism Database** (Paul Erhardt).

IUPAC project [2000-010-1-700](#)

The project is on-hold at present pending identification of additional funding. Paul presented a poster entitled "*A Human Drug Metabolism Database*" at the International Society for the Study of Xenobiotics (ISSX) meeting held August 29 to September 2, 2004 in Vancouver, Canada. The poster was extremely well received and over 75 scientists requested a copy of the material. Paul plans to attempt to garner further financial support for this project during his sabbatical that will take place this Spring and Summer.

#### 4.3.3 Natural Products with Medicinal and Nutritional Value (Mukund Chorghade).

IUPAC project [2001-050-2-700](#).

The draft manuscript is undergoing review at the divisional level in preparation for publication in Pure and Applied Chemistry.

#### 4.3.4 Nutraceuticals Derived from Plant Sources in Latin America (Antonio Monge).

A project proposal on "Plants as Sources for Nutraceuticals in Latin America" was presented by Antonio. Robin will assist Antonio in completing the submission form.

The objective is to provide an analysis of the importance and economic opportunity of Nutraceuticals in health care in Latin America. Possibilities for research, development and innovation in Nutraceuticals will be explored.

Project team members include Robin Ganellin, Dr. Mahabir Gupta, Dr. Roberto Pinzón, Dr. E. Barreiro, Dr. Armando Cáceres, Dr. Rolando Pellón, Dr. Esteban A. Ferro, Dra. Olga Lock, Dr. Néstor O. Caffini

#### 4.3.5 Analogue-based Drug Discovery (Janos Fischer).

IUPAC project [2002-051-1-700](#)

Janos reported twenty manuscripts are complete or under final review and that six additional manuscripts are expected in final form by the end of February / March. The current publisher (Wiley) deadline for completed manuscripts is 30 April, 2005. Robin Ganellin has accepted to be a coeditor. Manuscripts denoted by \* are with the Publisher. Subjects denoted by # are in synopsis so far. All other manuscripts are with the editors.

Current list of topics / contributors: (number of m/s pages in parenthesis)

- I. Introduction (J. Fischer and R. Ganellin)
- II. Optimising Drug Therapy by Analogs (pp 60) (Janos Fischer)
- Subchapters:
  - Statins (S. Kerpel-Fronius and J. Fischer) (28)
  - ACE-inhibitors (S. Alföldi and J. Fischer) (20)
  - AT1-antagonists (C. Farsang and J. Fischer) (20)
  - Calcium channel blockers (G. Gaviraghi) (16)
  - Case Study: Lacidipine (G. Gaviraghi)
  - Beta-blocking agents (P. Erhardt, L. Matos)
  - Case Study: Esmolol (P. Erhardt)
  - Organic nitrates (L. Dezsi) #
  - H<sub>2</sub> antagonists (R. Ganellin) (19)
  - Proton-pump inhibitors (P. Lindberg and E. Carlsson)
  - Case Study: Pantoprazole (J. Senn-Bilfinger)
  - Coxibs (K.D. Rainsford) #

- Antipsychotics (I. Bitter, B. Kiss)
- Quinolones
  - Case Study: Moxifloxacin (U. Petersen) \* (52)
  - Platinum Compounds (S. Kerpel-Fronius) (12)
  - Bisphosphonates (E. Breuer) (19)
  - Corticosteroids (Z. Tuba) #
  - H1-antagonists (H. Timmerman) #
  - Case Study of Drospirenone (R. Wiechert) (6)
  - Stigmines (Z. Tashma) (manuscript) (25)
  - Opiates (C. McCurdy) #
- III. Drug Likeness and Analog-based Drug Discovery (J. Proudfoot) \* (39)
- IV. Computational Methods in Analog-based Drug Discovery (G. Ferenczy) (18)
- V. Analogs as a Means of Discovering New Drugs (C. G. Wermuth) (19)
- VI. Privileged Structures and Analog-based Drug Discovery (H. Kubinyi) (16)
- VII. Table of Structural and Functional Analogs
  - Analogs from the Top500 drugs (E. M. Alapi and J. Fischer)
- VIII. Subject Index

#### 4.3.7 Bioinformatics (Michael Liebman).

No new information. Robin to write to Michael and ask him to submit the project for IUPAC approval and to extend the proposed project duration to two years.

#### 4.3.8 Trends in Patenting Drug-Related Technologies (Paul Erhardt, Per Lindberg).

A project proposal has been prepared and is ready for submission.

#### 4.4 New Projects.

- (i) John Bremner had made a couple of suggestions which he is working on to define more clearly.
- (ii) Mukund proposed a new project on natural products of medicinal value for treating HIV, diabetes and CNS disorders.
- (iii) Mukund suggested a project on the stability of compounds relating to the prediction of shelf life.

### 5 Division Committee

#### Division Nominating Committee (Tom Perun).

Membership for the Division Nominating Committee has been finalized.

Rita Cornelis (Ghent University, Belgium)

Monica Nordberg (Karolinska Institute, Sweden)

Hugo Kubinyi (University of Heidelberg, Germany)

Giorgio Tarzia (University of Urbino, Italy)

### 6 European Federation for Medicinal Chemistry (EFMC).

The next Symposia will take place in Istanbul (2006) and Vienna (2008). A joint meeting of the Medicinal Chemistry Societies of Austria, Germany, Hungary, Poland, Italy and Spain will be held in Vienna (20-23 June 2005) under the auspices of the EFMC

**7 Asian Federation for Medicinal Chemistry (AFMC)** (Toshi Kobayashi).

No new information.

A joint China / Japan Symposium is planned for 2005.

The next AFMC meeting will take place in Korea, 2005.

**8 Other Business.**

**8.1 General Assembly in Beijing.**

**8.2** Janos reported that there is an agreement under preparation between the NAO and Gedeon Richter Ltd, Hungary to sponsor a Richter-IUPAC Prize in Medicinal Chemistry. The proposal is very generous since it has been suggested that a prize of \$ 10,000 plus travel expenses will be awarded on five occasions. Robin to draft details and circulate these to the Subcommittee members for comment.

**9 Next Meeting.**

Modena, Italy on Sunday 11 September 2005 in conjunction with 2<sup>nd</sup> joint Italian-Swiss Meeting on Medicinal Chemistry Modena (12 – 16 September) [www.scifar.unimo.it/itchmc2005](http://www.scifar.unimo.it/itchmc2005).

For those members of the Subcommittee who will be attending the General Assembly in Beijing there will be an interim Subcommittee Meeting chaired by Paul Erhardt; details to follow.