

Report to Council, General Assembly, San Juan, August 2011

IUPAC Division VII (Chemistry and Human Health)

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Part I - Summary of Division Activities

This report presents an update of activities in Division VII (DVII) since the last General Assembly (GA) in Glasgow (August, 2009). The Division has met twice in the interim, graciously hosted by the European Environmental Agency in Copenhagen (March 2010) and at the Academy of Medical Sciences in London (Nov. 2010). Here I address business arising from these meetings and highlight initiatives being targeted in this Biennium and during IYC. This report presents Division initiatives and structure, membership, budget, projects, highlights of Subcommittee activities, adherence to IUPAC goals, and current and future initiatives.

1. Structure of the Division

DVII is organized into four Subcommittees (SCs), three of which deal with technical aspects of our mission. These are the SCs on *Medicinal Chemistry and Drug Development* (MCDD); *Nomenclature for Properties and Units* (NPU); and *Toxicology and Risk Assessment* (TRA). The fourth SC manages our *Public Relations and Elections* (PRE). The SCs are chaired by Robin Ganellin (MCDD), Françoise Pontet (NPU), John Duffus (TRA), and Tom Perun (PRE). Detailed reports from the technical SCs presented in Part III of this report. NPU was formerly called *Nomenclature, Properties and Units in Laboratory Medicine*. The name change was unanimously approved at the last GA and has now been adopted.

Our executive positions consist of a President, Past President or President-elect, and Secretary. Our operating procedures mandate a four-year term for the Division President with the role, effectively of Vice President, being served for the first two years of that term by the Past President and in the last two years by the President-elect (currently Françoise Pontet, who will assume the Presidency in 2012).

2. Operating procedures and rules of DVII

DVII filed rules and operating procedures with the Secretariat, which were approved by the GA in Glasgow. Two initiatives specific to DVII were presented in that document; they are rules for declaring DVII Emeritus Fellowship, and for granting IUPAC Sponsorship on a limited Divisional basis. Both have now been implemented successfully. A link has now been added to our Divisional web site with biographies of our Emeritus Fellows and highlighting contributions to IUPAC. We regret to report the death of Emeritus Fellow Prof. F. William Sunderman in April 2011. Bill was a founding member of the IUPAC Division of Clinical Chemistry in 1972 served as Division President from 1981-1985.

The operating procedures have also helped clarify to our membership and Division Executive, streamlined procedures for reviewing Project Applications, Technical Reports, and Recommendations.

3. Membership

We have had a significant rejuvenation of the Division Committee, notably with five new TMs beginning terms in Jan. 2010. In addition, our Division operating procedures, approved in Glasgow 2009, permit us to remove non-performing TMs, and we exercised this procedure for one TM in 2010, subsequently promoting one of our AMs to a 6th new TM spot and adding a new NR to our AM roster. Three of the new TMs are already actively involved as Task Group chairs, and one has begun serving as Division Secretary. Our current membership (2011) is reported in the Annex. It represents diversity of gender, geography, and expertise with respect to our technical SCs.

4. Budget

The Division received a budgetary increase of \$2,000 for the 2010/2011 Biennium. Since Glasgow, we have funded 7 new projects (5 in the current budget) with an additional one under review. A complete list of projects is given in Part IV. Operations have consumed 39% of the current budget, in part due to a high level of participation of our new TMs in Division activities and inauguration of the Emeritus Fellows program.

5. Projects

Together the three technical SCs are currently involved in 25 ongoing projects (see Part IV). These, together with projects submitted or under discussion, are described in the individual SC reports. A classification of our current projects shows the following balance (number of projects in parentheses):

Terms and Glossaries (7)
Data Bases (4)
Drug Discovery (5)
Clinical Chemistry (6)
Toxicology and Health (3)

Nine projects have been completed since the Glasgow GA.

6. Highlights of the Technical SCs' activities (See Part III for detailed SC reports)

6.1. MCDD - This SC remains very active, meeting approximately four times in each Biennium, in addition to regular DVII meetings. They currently manage 17 projects, all of which have arisen within the SC. The IUPAC-Richter prize is awarded by this SC every two years, and was awarded again in 2010 to Arun Ghosh (see point 7.6). An IYC initiative is to make videotapes of lectures in lay terminology available to the public online. For a pilot from Prof. Ghosh, see <http://vimeo.com/19567220>. The successful book "Analogue-based Drug Discovery" which went to a second printing in 2008, was

followed by a second volume at the request of the publisher, and was published in summer 2010. A third volume is planned. Meetings in Rhajkot and Nagpur, India, were held in Feb. 2011, organized by DVII Committee member M. Chorghade and attended by Prof. Nicole Moreau (IUPAC President) and Dr. Francoise Pontet (Division VII President-elect). They highlighted biotechnology and drug development, and are promising to forge strong links between India and the Division that have not existed up to now.

6.2. NPU - The SC has close contacts with the International Federation of Clinical Chemistry (IFCC) in maintaining a web-based generic database (NPU), of which they share ownership. They are collaborating on mapping of the database to the Systematized Nomenclature of Medicine - Clinical Terms (SNOMED-CT) through contact with the International Health Terminology Standards Development Organization (IHTSDO) in Copenhagen, and with the Logical Observation Identifiers Names and Codes (LOINC) at Indiana University. Legal arrangements continue to be negotiated for joint ownership of the harmonized database. These initiatives were first presented to the Bureau in Bratislava, and are progressing both on the legal and project sides. A major initiative with IFCC to update the IUPAC Silver Book (Compendium of Terminology and Nomenclature of Properties in Clinical Laboratory Sciences) is underway. NPU maintains representation on both Joint Committee for Guides in Metrology (JCGM) working groups WG1 (GUM – Guidelines for Uncertainty in Measurement) and WG2 (VIM - International Vocabulary of Metrology). René Dybkaer's book "An Ontology on Property" has been published on the IUPAC website.

6.3. TRA - Projects on childhood education, and several glossaries are underway. Contacts with the WHO and its International Program in Chemical Safety (IPCS) are being established in collaboration with COCI. Participation in a Biomonitoring Equivalents Workshop established contacts with the US Environmental Protection Agency, Health Canada, and the American Petroleum Institute, among others. I met with Herman Autrup, President-elect of IUTOX, in Washington DC in early March 2011 to discuss closer links between IUPAC and IUTOX, through ongoing collaboration as well as in the contexts of ICSU and IYC. The first phase of the Toxicology in the Classroom (Toxiclaro) project has been completed with the construction of a successful interactive website for children (see Chem. Int., Vol. 31 No. 6, November-December 2009). The current website is http://www.prn.usm.my/toxicology_2010/. The Toxiclaro initiative originated from the IUPAC Chemistry and Human Health Division and the IUPAC Committee on Chemistry Education (CCE), which formally met to plan the project in May 2005 at the Federal Agency for Risk Assessment, Berlin, Germany. The project is managed by a task group of professionals from the World Health Organization (WHO), IUPAC, and the National Poison Centre of Malaysia.

Part II - Meeting IUPAC's Goals

1. Leadership in global chemical issues

Recent highlights include ongoing revision of the *Glossary of terms used in toxicology*, whose predecessor was adopted by a number of legislative bodies. As this expands and incorporates more terminology (e.g. from the glossaries in Ecotoxicology (2009) and Immunotoxicology (under review, Jan. 2011)), plans are underway to make an inclusive glossary available on-line with frequent updates by the authors. The NPU database and ongoing revision of the Silver Book are also noteworthy. Harmonization of terminology with the Danish IHSTDO/SNOMED-CT and the American LOINC is a major undertaking described in more detail in the NPU-LM report. The book *Concepts in Toxicology* published by the Royal Society of Chemistry (UK) is intended to clarify a number of issues relevant to risk assessment for legislators, and to the basic science of toxicology for chemists. The involvement of our SC-NPU-LM representing IUPAC as one of eight international bodies in the production of the 3rd revision of the Vocabulaire Internationale de Metrologie (VIM3) is a highlight.

2. Provision of tools

As noted above, about a dozen glossaries of terminology have recently been published or are currently under construction, including three new projects for a glossary in immunotoxicology, revision of terms in clinical chemistry, and terms in computational drug design, which are underway.

3. Assistance to the chemical industry in sustainable development, wealth creation, and improving quality of life

The PRE SC is active in COCI and the TRA is forging links with external bodies in collaboration with COCI. The MCDD has a long-standing association with industry, and its projects on natural products with medicinal value, nutraceuticals in Latin American Plants, and the volume 2 of the very successful book “Analogue-based Drug Discovery” are examples of current projects with immediate value to the chemical industry.

4. Fostering communication

Examples of particular relevance to this goal are the NPU-LM projects *Internationally agreed terminology for observations in scientific communication*, *Mapping of IFCC-IUPAC laboratory coding system to SNOMED-CT*, and *Translation of NPU database elements and properties into French*; and the TRA publication *Concepts in Toxicology*, and recent glossaries bridging chemical toxicology with ecology and the environment (Ecotoxicology) and chemistry with the field of immunology (Immunotoxicology, now under review).

5. Education

Of significant note is the completion of the first phase of Toxiclaro described in section 6.3 above. Other examples are the recently published *Fundamental Toxicology, 2nd Edition*, *Analogue-based Drug Discovery*, and *Concepts in Toxicology*. Ongoing projects include *Training of School Children on Pesticides and Health* (TRA), *Research and Training in Medicinal Chemistry in the Indian Subcontinent* (MCDD), and *Practical*

Studies for Medicinal Chemistry Students (MCDD). TRA Chair John Duffus has close links with CCE and participates globally in designing and delivering toxicology curricula. He is a major contributor to the US Society of Toxicology (SOT) initiative for on-line chemical toxicology curricula (ToxNet).

6. Public relations

The PRE SC is active in improving the visibility of DVII and of IUPAC. “Limited DVII sponsorship” is used to distribute IUPAC material and make an oral presentation on DVII activities. An example was the “Advances in Chemical Sciences Symposium” held in Boston, which was heavily attended by members of the pharmaceutical industry, who heard a presentation by the DVII Secretary. Details of this process for limited sponsorship are now formalized in the DVII operating procedures, and have been implemented successfully on two occasions. Two DVII posters have been produced to complement the individual SC posters, and these are presented by presentation at international meetings by the DP and SC Chairs. The IUPAC-Richter Prize adjudicated through the MCDD SC is gaining prestige, and provides an international forum for scientific presentation by the winner, with IUPAC’s name associated. The winner for 2010 was Arun Ghosh, the inventor of Darunavir (already approved as a first line defense against drug-resistant AIDS) and new β -secretase inhibitors for Alzheimer disease are under development, using protein backbone-based structural design. A video of high school students touring his lab and a subsequent Q & A session on how new drugs are “built” is posted on the Web as part of our IYC activity. It is available at <http://vimeo.com/19567220>.

Part III - Detailed Subcommittee Summaries

1. Medicinal Chemistry and Drug Discovery (MCDD)

Meetings and membership

The Subcommittee has continued to meet biannually alongside suitable ACS meetings, or International Symposia on Medicinal Chemistry (ISMC) in Europe. Thus, meetings were held in Glasgow (August 2009 with the IUPAC General Assembly, 11 attendees), San Francisco (March 2010, ACS National Meeting, 10 participants), Brussels (September 2010, ISMC, 12 attendees), Anaheim (March 2011, ACS National Meeting, 8 attendees). These meetings are important for group discussions in developing ideas for the various projects. The Minutes of meetings are posted on the IUPAC home page. Funding to attend the Subcommittee meetings remains an ongoing issue. Attempts to use a conference telephone at meetings have been very expensive. Although this saves fare money for participants, they have not been able to pay for the rental cost of equipment at the meetings.

New members attending are Yvonne Martin (TM, USA), Johan Ulander (Astra-Zeneca, Sweden), Yao Zhu-Jun (NR, China), Peter Matyus (Hungary). Invitations have

been accepted by Hill (TM for 2012, UK) and Mignani (NR, France) and they will attend the Subcommittee in Puerto Rico.

Resignations: Gaviraghi (Italy), Proudfoot as Secretary but continuing on the Subcommittee.

R. Ganellin has signalled that, after being in the Chair for more than a decade, (since 2000, initially as President of the Medicinal Chemistry Section) it is time to seek a replacement. Also, since J. Proudfoot has resigned as Secretary, a new Honorary Secretary is required. To facilitate replacements, Ganellin has written job descriptions for the two positions which have been circulated to the Subcommittee members.

IUPAC-Richter Prize in Medicinal Chemistry

The prize is awarded biennially in even years. The 2010 Prize recipient was Prof. Arun K. Ghosh (Purdue University, USA) from a list of 10 outstanding candidates, for his structure-based design of novel HIV protease and β -secretase inhibitors, and for the drug, Darunavir. IUPAC was given very good publicity among medicinal chemists by his lectures at the ACS 32nd National Medicinal Chemistry meeting in Minneapolis and the 21st ISMC meeting in Brussels.

Emeritus Fellows

A plaque was presented to Camille Wermuth at the Brussels ISMC meeting in front of 1000 medicinal chemists (September 2010). John Topliss and Les Mitscher will receive their plaques in August 2011 during the ACS Division of Medicinal Chemistry Hall of Fame reception in Denver, Colorado. This gives IUPAC and the Emeritus Fellows very good publicity.

IYC 2011

As a contribution to the International Year of Chemistry we asked the three past IUPAC-Richter-Prize winners to provide a video suitable for non-expert audiences. Arun Ghosh (2010 Prize) provided a video of a discussion he had with some students. Jan Heeres (2008 Prize) submitted a series of slides relating to the many discoveries of Paul Janssen but, unfortunately, it is not yet up to web standard. Malcolm Stevens (2006 Prize) did not reply.

IUPAC World Chemistry Congress (Puerto Rico, 2011)

The Subcommittee is providing 5-7 speakers for the Division's one day conference under the umbrella title of "Chemistry of Life".

Selected Project updates

As part of project 2001-048-2-700, Research and Training in Medicinal Chemistry in the Indian Sub-continent (Mukund Chorghade), a five-day Medicinal Chemistry Workshop was held in New Delhi during January 2010. Two Medicinal Chemistry workshops were

held in February in Rajkot and Nagpur (India); five SC members lectured and IUPAC President Nicole Moreau attended.

Practical Studies for Medicinal Chemistry Students, 2004-028-1-700 (Antonio Monge) produced an e-book (Eds. C.R. Ganellin and A. Monge) which is on the IUPAC home page and has had 83,000 successful hits during the first 6 months. All of the described experiments had been accessed. A printed version (539 pages) in Spanish/Portuguese/English languages, generated directly from the web version was produced in April 2011 by Dr. Rosa Cattana, Universidad Nacional de Rio Cuarto, Cordoba, Argentina.

A Survey of Research into New Drugs for Neglected Diseases in Latin America , 2009-033-1-700 (Antonio Monge) has established a network of 42 researchers from 30 institutions in 10 different Latin American countries, which identifies people, diseases and universities in which they are working. The next stage is to identify their facilities and what they are doing.

2. Nomenclature for Properties and Units (NPU)

The SC met in Glasgow, UK Aug. 2009, Corfu, Greece April 2010, Linköping, Sweden Nov. 2010, and Berlin, Germany May 2011. In addition, it participated in IHTSDO negotiations in Bethesda, MD, USA, Nov. 2009.

Ongoing projects include:

- Mapping of the IFCC-IUPAC laboratory coding system to SNOMED CT (IUPAC 2006-008-1-700) Chair: Ulla Magdal, and Demonstration of NPU – SNOMED CT mapping/harmonization of terms used in Clinical Laboratory Sciences (IUPAC 2009-005-1-700) Chair : Urban Forsum. This awaits the end of LOINC mapping.

- International vocabulary for nominal examinations in scientific communication. (2008-019-1-700) Chair: Françoise Pontet. Milestones were presented as a document published in the IFCC journal (CCLM) and as a poster at the IFCC joint World and European Congress. A final manuscript for an IFCC-IUPAC recommendation was to be submitted by 30 June 2011.

- Silver Book (Compendium of Terminology and Nomenclature of Properties in Clinical Laboratory Sciences) revision (joint IUPAC 2008-033-3-700 + IFCC CPD project) Co-Chairs : Françoise Pontet, Georges Férard. An extension of the deadline and budget were accepted by IUPAC and IFCC, including support for a new chapter on nominal properties and providing a summary leaflet.

- Recent advances in Nomenclature, Properties and Units: strategy for promoting SC-NPU achievements (IUPAC 2006-048-1-700) Chair: Françoise Pontet. Several communications are listed above and a folder for wide distribution has been issued.

- Securing and structural updating of information in the NPU coding system and its environment (IUPAC 2006-012-1-700) Chair: Ulla Magdal. Part XXIII “The NPU terminology, principles, and implementation – a user’s guide“ of the series “Properties and units in the clinical laboratory sciences“ has been submitted to IUPAC review process, as an outcome of the project.

- The NPU terminology in its English version, “generic data base“, is published on the net at: <http://www.sst.dk/EnglishNPU>. Updated versions of the NPU terminology available for download (.csv files) at <http://iupac.org> and <http://ifcc.org>. An agreement draft is under discussion for the organisation of the management on the future IFCC website.

- HbA1c: Ccontinuous education for health professionals is ongoing.
- Translation of the NPU coding system into French (F. Pontet). A second version is intended to be posted on the SFBC (French Society of Clinical Biology) website as an Excel format, with instructions for use in French (which delayed the website publication).

A number of invited lectures at international meetings, e-publications, and articles have been presented by members. These include:

1. Férard G, Giroud C, Pontet F. Glossaire des acronymes d’institutions relevant de la métrologie. *Ann Biol Clin* 2009;67(2):233-8.

2. Férard G, Pontet F. Quelques nouvelles de l’IFCC (Fédération internationale de chimie clinique et de biologie médicale) et de l’IUPAC (Union internationale de chimie pure et appliquée). *Ann Biol Clin* 2009;67(3):364.

3. Nordin G. "The National Patient Summary" - a final test for the NPU system. Swedish Society for Clinical Chemistry, Springmeeting, Kalmar, Sweden 14 May 2009.

4. Joint Committee on Nomenclature, Properties and Units (C-SC-NPU) of the IFCC and IUPAC- Pontet F, Bruunshuus I, Dybkaer R, Férard G, Forsum U, Fuentes-Arderiu X, Hill G, Ihalainen J, Kang D, Karlsson D, Kuelpmann W, Magdal U, McDonald C, Nordin G, Schadow G. Health informatics : the NPU coding system. 42nd IUPAC Congress : Chemistry Solutions, Glasgow, UK, 2 – 7 Aug. 2009. (Poster and flash oral presentation).

5. Joint Committee on Nomenclature, Properties and Units (C-SC-NPU) of the IFCC and IUPAC- Pontet F, Magdal Petersen U, Fuentes-Arderiu X, Nordin G, Bruunshuus I, Ihalainen J, Karlsson D, Forsum U, Dybkaer R, Schadow G, Kuelpmann W, Férard G, Kang D, McDonald C, Hill G. Clinical laboratory sciences data transmission : the NPU coding system. XXII International Conference of the european federation for medical informatics, Sarajevo, Bosnia, 30 Aug.-2 Sept. 2009. (Poster).

6. Nordin G. Use of NPU terminology in the Health Care Information Systems. NML Congress, Visby, Sweden, 9 Sept. 2009.

7. Pontet F, on behalf of C-NPU. The NPU coding system : basics and progress. 17th Meeting of Balkan Clinical Laboratory Federation & 5th Macedonian National Congress of Medical Biochemists, Ohrid, Macedonia, 16-19 Sept. 2009. (Invited lecture).

8. Magdal U on behalf of C-NPU. The NPU terminology in national use : managing laboratory results on a national scale. 17th Meeting of Balkan Clinical Laboratory Federation & 5th Macedonian National Congress of Medical Biochemists, Ohrid, Macedonia, 16-19 Sept. 2009. (Invited lecture).

9. Alía P. Nomenclature and computerized reporting of molecular genetics results. AACC Congress : Molecular Pathology Essentials: Diagnosis and Targeted, Copenhagen, Oct. 1-2, 2009. (Invited lecture).

10. Férard G, Pontet F, Giroud C, Dumontet M. Présentation du nouveau Vocabulaire international de métrologie. *Ann Biol Clin* 2009;67(5):591-4.

11. Fuentes-Arderiu X, Mestre M. Description of flow cytometry examinations related to human cell differentiation molecules in clinical immunology. *Cytometry: Part B - Clinical Cytometry* 2009;76B:291-3.
12. Dybkaer R. WHO International standards and international units. Workshop on physiological quantities and SI units. BIPM. Nov.16-17, 2009. (Invited lecture).
13. Nordin G. Consequences of the new standardization of HbA1c. Swedish Medical Society, Riksstämman 2009, Stockholm 26 Nov, 2009.
14. Nordin G, Dybkaer R, Forsum U, Fuentes-Arderiu X, Schadow G and Pontet F on behalf of the IFCC-IUPAC Committee on Nomenclature, Properties and Units (C-NPU). An outline for a vocabulary of nominal properties and examinations – basic and general concepts and associated terms. *Clin Chem Lab Med* 2010;48(11):1553-66.
15. Landin-Olsson M, Jeppsson J-O, Nordin G. HbA1c – ny standardisering införs i Sverige. *Läkartidningen* 2010;51-52(107):3282-5.
16. Dybkaer R. ISO terminological analysis of the VIM3 concepts 'quantity' and 'kind-of-quantity'. *Metrologia* 2010;47:127-34.
17. Solé Enrech G, Fuentes Arderiu X. Estimació de límits d'inversemblança. *In vitro veritas* 2010;11: <<http://www.acclc.cat/invitroveritas/vol11/art116.pdf>>.
18. Fuentes-Arderiu X. The term prostate specific antigen should be abandoned in favour of semenogelase. *eJIFCC* 2010;21: <http://www.ifcc.org/PDF/publications/eJIFCC/vol21/01/eJIFCC_v21_01_05.pdf>.
19. Vilanova Navarro A, Fuentes Arderiu X, Castiñeiras Lacambra MJ, Jardí Baiges A, Martínez Casademont M, Miró Balagué J, et al. Guia per a la verificació dels sistemes de mesura de magnituds biològiques ordinals per a l'acreditació segons la norma ISO 15189. *In vitro veritas* 2010;11: <<http://www.acclc.cat/invitroveritas/vol11/art118.html>>.
20. Fuentes-Arderiu X. Remembering the "Stockholm consensus". *Accred Qual Assur* 2010;15: 581-584.
21. Solé-Enrech G, Fuentes-Arderiu X. Unlikelihood limits estimation. *eJIFCC* 2010;21: <http://www.ifcc.org/PDF/publications/eJIFCC/vol21/03/eJIFCC_v21_03_05.pdf>.
22. Pontet F. Health informatics : the NPU coding system. Indian Society of Chemists and Biologists 15th International Conference on “Bridging gaps in discovery and development : Chemical & Biological Sciences for affordable health, wellness & sustainability“(ISCB 2011). Rajkot, India, 4-7 Feb. 2011 (invited lecture).
23. Pontet F. The NPU coding system : a recommended terminology. International Conference on Chemistry for Mankind : innovative ideas in life (ICCM-2011). Nagpur, India, 09-11 Feb. 2011 (invited plenary lecture).
24. Pontet F, Nordin G, Dybkaer R, Forsum U, Fuentes-Arderiu X, on behalf of the IFCC-IUPAC Joint Committee-Subcommittee on Nomenclature for Properties and Units (C-SC-NPU). What are nominal properties and examinations ? IFCC--WorldLab--EuroMedLab Berlin.15-19 May 2011 (poster)

3. Toxicology and Risk Assessment (TRA)

The TRA SC hosted a Mini-Symposium (Bioinorganic Toxicity, Poison or Cure) during the Chemical Congress in Glasgow in Aug. 2009. Although it was held at the

very end of the Congress, it was well attended and the interest of the audience was shown by their questions and discussion.

A major activity in the current Biennium has been the continuing development of existing glossaries and revision of the original Glossary of Terms used in Toxicology which has been adopted by the U.S. National Library of Medicine as the most authoritative and complete glossary of its kind available. It has also been incorporated as an Annex in the Encyclopedia of Toxicology. As the glossary expands and incorporates more terminology (e.g. from the glossaries in Ecotoxicology (2009) and Immunotoxicology (under review, March 2011), a major task for 2012, it is the intention to make the inclusive glossary available on-line with regular update by the authors.

The Royal Society of Chemistry published the book, "Concepts in Toxicology" in November 2009. This book is intended to clarify a number of issues relevant to risk assessment for legislators as well as to the basic science of toxicology for chemists. The book received good reviews and the senior author has recently received a proposal to derive internet-available educational modules built on the concept diagrams which provide the structure of the book and which relate the concepts to their usage in the hierarchy of toxicological terms. In other words, the concept diagrams show the relationships between concepts and how concepts can be combined to generate higher order concepts.

Project 2004-045-1-700, "Training of school children on pesticides and health" which is part of the larger project, Toxiclaro "Toxicology in the classroom", with Wayne Temple as chair, has reached its final stage (see Chem. Int., Vol. 31 No. 6, November-December 2009). An interactive website for schoolchildren with animations based on the original text has been produced in Universiti Sains, Malaysia. The program is now available as CD and accessible via the internet (http://www.prn.usm.my/toxicology_2010/). The website works best with MS Windows but can be viewed with Apple Macintosh computers with occasional problems which may be browser related. Wayne Temple is presently organizing a follow-up project as part of IYC activity, seeking funding from various institutions, including IUPAC, WHO, UNEP, Universiti Sains Malaysia, University of Otago New Zealand, and ISDE/AAMMA. Testing of the product is continuing, and there are initiatives for translation to platforms for other developing countries. This project has been managed by a task group of professionals from the World Health Organization (WHO), UNEP Chemicals, IUPAC, and the National Poison Centre of Malaysia.

Several projects have been completed or are nearing completion. In particular, the immunotoxicology glossary project is on the IUPAC website for public comment. The next stage is to integrate the newer glossaries with the current Glossary of Terms Used in Toxicology and this should be a priority. It may be that there are still areas of toxicology where glossaries could be useful and this must be considered.

A characteristic of toxicology is that there is overlap with most, perhaps all, other scientific disciplines. Thus, there is scope for projects at the interfaces and collaboration is an essential part of such projects. Participation in the Biomonitoring Equivalents

Workshop in 2008 established contacts with the US Environmental Protection Agency, Health Canada, and the American Petroleum Institute, among others. These links have been maintained and could lead to further developments. The Chair of TRA and the Division President met with Professor Herman Autrup, President-elect of IUTOX, in Washington DC in early March 2011 to discuss closer links between IUPAC and IUTOX, through ongoing collaboration as well as in the contexts of ICSU and IYC. It was identified that there were mutual interests in education in toxicology and possible involvement in an international conference were discussed. Since TRA Chair, John Duffus, is a member of CCE and participates in the U.S. Society of Toxicology (SOT) initiative for on-line chemical toxicology curricula (ToxNet), it may be possible to build further on this connection. In addition, there is a continuing effort in collaboration with COCI to establish a working relationship with SAICM (Strategic Action in International Chemical Management) managed by UNEP Chemicals in collaboration with WHO and the International Programme on Chemical Safety.

4. Public Relations and Elections (PRE)

The election of new titular members of the Chemistry and Human Health Division began in 2010 with the selection of a Nominating Committee comprised of Thomas Perun, (Chair), Derek Buckle, John Duffus, Xavier Fuentes-Arderiu, and Birger Heinzow. Five candidates were chosen to represent a diversity of disciplines and geographic locations. All of the candidates had contributed to IUPAC projects or had expressed interest in participating in IUPAC activities. Three new TMs were elected to take office in the 2012-2013 term. The terms for TMs have been changed from four years to two years, so all current and new TMs will end their terms in 2013. Those with years of eligibility remaining will have the possibility of being re-elected.

The current summary of Division VII activities has been updated, and has been used by Division members in talks given to other organizations. A poster depicting the organizational structure of the Division, its major accomplishments, and current projects has been prepared and will be exhibited in Puerto Rico. A talk about the Division and activities of its subcommittees will be presented as part of a symposium at the World Chemistry Congress in Puerto Rico.

Part IV - Projects and Publications

1. List of current projects

2000-009-1-700 Glossary of Drug Metabolism Terms (Paul Erhardt)

2000-010-1-700 Project on Human Drug Metabolism Database (Paul Erhardt)

2001-050-2-700 Natural Products with Medicinal and Nutritional Value (Mukund Chorghade)

2001-070-1-700 Properties and Units for Urinary Calculi (Gunnar Nordin)

2002-001-1-700 Compendium of Glossaries (Robin Ganellin)

2003-044-1-700 Glossary of Combinatorial Chemistry Terms (A. Ganesan)

2004-023-1-700 Internationally Agreed Terminology for Observations in Scientific Communication (Françoise Pontet)

2005-049-1-700 Biological Context by Data Mining (Michael Liebman)

2005-050-1-700 Prototype Analysis of Molecular Biomarkers in Cancer (Michael Liebman)

2006-008-1-700 Mapping of IFCC-IUPAC Laboratory Coding System to SNOMED CT (Ulla Magdal)

2006-012-1-700 Securing and Structural Updating of Information in the NPU Coding System and its Environment (Ulla Magdal)

2006-020-1-700 Explanatory Dictionary of Terms in Toxicology - Part 2 (Monica Nordberg)

2006-048-1-700 Recent Advances in Nomenclature, Properties and Units : strategy for promoting SC-NPU achievements (Françoise Pontet)

2007-033-3-700 Revision of the "Silver Book" : Compendium of Terminology and Nomenclature of Properties in Clinical Laboratory Sciences (Georges Férard)

2007-053-1-700 Glossary of Terms Used In Immunotoxicology (Doug Templeton)

2008-010-1-700 Glossary of Terms in Medicinal Chemistry Updated (Derek Buckle)

2008-033-3-700 Silver Book (Compendium of Terminology and Nomenclature of Properties in Clinical Laboratory Sciences) revision (Joint project with IFCC) (Françoise Pontet, Georges Férard)

2009-005-1-700 Demonstration of NPU – SNOMED CT mapping/harmonization of terms used in Clinical Laboratory Sciences (Urban Forsum)

2009-033-1-700 A Survey of Research into New Drugs for Neglected Diseases in Latin America (Antonio Monge)

2009-034-2-700 Risk Assessment of Effects of Cadmium on Human Health (Gunnar Nordberg)

2010-035-3-700 Establishing definitions for non-referenced terms in the NPU terminology (Helle Møller Johannessen)

2010-057-3-700 Update of Glossary Terms used in Computational Drug Design (Yvonne Martin)

2010-051-1-700 Advances in Immunochemistry and Applications to Human Health (Michael Schwenck)

2011-002-1-700 Extension of Revision of the Silver Book (Georges Férard)

2011-011-1-700 Analogue-based Drug Discovery - Vol. III (Janos Fisher)

2. Projects completed in the current Biennium

1999-047-1-700 Immunochemistry of Metal Sensitization (Doug Templeton)

2001-048-2-700 Research and Training in Medicinal Chemistry in the Indian Subcontinent (Mukund Chorghade)

2001-049-2-700 Glossary of Terms in Pharmaceutical Technology (Eli Breuer)

2004-019-3-700 Glossary of Terms for Biomolecular Screening (John Proudfoot)

2004-028-1-700 Practical Studies for Medicinal Chemistry Students (Antonio Monge)

2004-045-1-711 Training of School Children on Pesticides and Health - "Toxiclaro" (Wayne Temple)

2005-031-2-700 Latin American Plants as Sources for Nutraceuticals (Antonio Monge)

2005-032-1-700 Stand-Alone Drugs (Janos Fischer)

2008-013-1-700 Analogue-Based Drug Discovery (Janos Fisher)

3. Publications 2009-2011 (partial)

Breuer, E. et al., Glossary of Terms in Pharmaceutics, PAC, 81: 971-999 (2009).

Schwenk, M., Klein, R., & Templeton, D.M., Immunological effects of mercury, Pure Appl. Chem. 81: 153-167 (2009).

Nordbeg, M., Templeton, D.M., Andersen, O., & Duffus, J.H., Glossary of terms used in ecotoxicology, Pure Appl. Chem. 81: 829-970 (2009).

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- Duffus, J.H., Templeton, D.M. & Nordberg, M., Concepts in Toxicology, Royal Society of Chemistry, Cambridge, U.K, 2009. 179 pp.
- Férard G., Giroud C. & Pontet F. Glossaire des acronymes d'institutions relevant de la métrologie. *Ann. Biol. Clin.* 67:233-8 (2009).
- Férard G. & Pontet F. Quelques nouvelles de l'IFCC (Fédération internationale de chimie clinique et de biologie médicale) et de l'IUPAC (Union internationale de chimie pure et appliquée). *Ann. Biol. Clin.* 67:364 (2009).
- Férard G., Pontet .F, Giroud C. & Dumontet M. Présentation du nouveau Vocabulaire international de métrologie. *Ann. Biol. Clin.* 67:591-4 (2009).
- Fuentes-Arderiu X. & Mestre M. Description of flow cytometry examinations related to human cell differentiation molecules in clinical immunology. *Cytometry: Part B - Clinical Cytometry* 76B:291-3 (2009).
- Fischer, J. & Ganellin, C.R. (Eds.) *Analogue-based Drug Discovery*, Vol II, Wiley-VCH, 2011. 560 pp.
- Monge, A., Traditional foods as a source of functional foods, *Cyta*, 8: 159-167 (2010).
- Nordin G., Dybkaer R., Forsum U., Fuentes-Arderiu X., Schadow G. & Pontet F., on behalf of the IFCC-IUPAC Committee on Nomenclature, Properties and Units (C-NPU). An outline for a vocabulary of nominal properties and examinations – basic and general concepts and associated terms. *Clin. Chem. Lab. Med.* 48: 1553-66 (2010).
- Dybkaer R. ISO terminological analysis of the VIM3 concepts 'quantity' and 'kind-of-quantity'. *Metrologia* 47:127-34 (2010).
- Fuentes-Arderiu X. Remembering the "Stockholm consensus". *Accred. Qual. Assur.* 15: 581-584 (2010).
- Nordberg, M., Duffus, J.H. & Templeton, D.M., Explanatory dictionary of key terms in toxicology: Part II, *Pure Appl. Chem.* 82: 679-751 (2010).
- Proudfoot, J. et al., Glossary of Terms for Biomolecular Screening. PAC (In Press, approved for publication 18.8.10).

Annex - Current membership of the Division (2011)

Name	Status	Term	NAO
Prof. Douglas M. Templeton	TM-President	2008-2011	Canada
Prof. Michael Schwenk	TM-Secretary	2010-2013	Germany
Dr. Françoise Pontet	TM-President-elect	2008-2011	France
Dr. Ole Andersen	TM	2008-2011	Denmark
Prof. Sergey O. Bachurin	TM	2010-2013	Russia
Dr. Derek R. Buckle	TM	2010-2013	United Kingdom
Prof. Xavier Fuentes-Arderiu	TM	2008-2011	Spain
Dr. Paul A. Illing	TM	2010-2011	United Kingdom
Dr. Yvonne C. Martin	TM	2010-2013	USA
Prof. Tetsuo Nagano	TM	2010-2013	Japan
Dr. Mukund Chorgade	AM	2010-2011	USA
Dr. Janos Fischer	AM	2010-2011	Hungary
Dr. Toivo Halonen	AM	2010-2011	Finland
Dr. Mirja Kiilunen	AM	2010-2011	Finland
Prof. Monica Nordberg	AM	2010-2011	Sweden
Dr. Wayne Temple	AM	2010-2011	New Zealand
Prof. Georg Becher	NR	2010-2011	Norway
Dr. Cheng-Hock Chua	NR	2010-2011	Malaysia
Dr. Mercedes González	NR	2010-2011	Uruguay
Dr. Hyun-Joon Ha	NR	2010-2011	Korea
Dr. Rabiul Islam	NR	2010-2011	Bangladesh
Prof. Peter Nedekov	NR	2010-2011	Bulgaria
Prof. Zhu-Jun Yao	NR	2010-2011	China/Beijing
	10 TM, 6 AM, 10 NR		

AM = Associate Member
 NR = National Representative
 TM = Titular Member