Final Report on the Activities of the Medicinal Chemistry Section from August 1999 to 31 December 2001

The Section continued to be very active and met twice yearly at locations in association with International Symposia on Medicinal Chemistry or at IUPAC General Assemblies. Attendance ranged from 10 to 16. After 31 December 2001 the Section was dissolved and absorbed entirely in Division VII, Chemistry and Human Health.

Location	Date	Associated Meeting	Attendance
Berlin, Germany	August 8, 1999	IUPAC General Assembly	10
San Francisco, USA	March 25, 2000	ACS National Meeting	12
Bologna, Italy	September 17, 2000	*EFMC International Symposium	16
San Diego, USA	March 31, 2001	ACS National Meeting	13
Brisbane, Australia	July 2, 2001	IUPAC General Assembly	11

Many of the attendees work in industry and their travel expenses were paid for by their companies.

The activities were divided among three Commissions:

VII. M.I Commission on Nomenclature and Terminology

Terms Used in Combinatorial Chemistry

Combinatorial chemistry involving the rapid synthetic assembly of structural building blocks in various possible combinations to produce large libraries of compounds for drug screening purposes is a rapidly expanding field of medicinal chemistry which is also generating a new vocabulary to describe the various operations and components. To assist medicinal chemists in their understanding of this field and to help with the acceptance of a universally understood language, the medicinal chemistry section initiated a project led by Dr. D. Maclean on Nomenclature and Publication Guidelines for Combinatorial Chemistry in the Synthesis and Screening of Compound Libraries. This led to the publication of a "Glossary of Combinatorial Chemistry Terms" by D. Maclean et al., Pure Appl. Chem. 1999, 71, 2349-2365 and subsequently, in the ACS journal J. Combinatorial Chem. 2000, 2, 562-578. This will ensure its use within the ACS as a standard glossary of terms. Further work is focused on producing an opinion document on the legal implications of patenting virtual libraries. This is a very important issue which has profound implications for R&D in the pharmaceutical industry.

*EFMC = European Federation of Medicinal Chemistry

Glossary of Drug Metabolism Terms

A Working Party led by Professor Erhardt on a Glossary of Drug Metabolism Terms was on hold for a while awaiting approval for project status. This has now been granted. There are 15 project members and they plan to review approximately 150 terms.

Other Glossaries

Working Parties have been initiated on Glossaries of Terms in Pharmaceutical Process Chemistry (Drs Gavaraghi and Chorghade) and on Terms in Pharmaceutical Technology (Professor Breuer). Preliminary drafts are being reviewed and a submission will be made for project status. The Organic Process Chemistry journal has agreed to publish the final version.

VII. M.2 Commission on Training and Development

Training of Medicinal Chemists

Medicinal chemists are critically important scientists involved in the design, discovery and synthesis of new chemical entities in the pharmaceutical industry. Without them there would be no successful research for new drugs as new medicines. The path for chemists to become medicinal chemists is, however, often indirect and training is commonly 'on the job'. As a contribution to the discussion about suitable formal training, the Medicinal Chemistry Section has published a series of papers on this subject (in the period 1993-2001) based on the information received in answers to questionnaires sent internationally (Europe, Japan and the USA) to leading pharmaceutical research companies and to Universities where Medicinal Chemistry is taught.

A Working Party chaired by Professor Ganellin on a Medicinal Chemistry Curriculum was established in 1992 and initiated two major surveys from the pharmaceutical industry and academia, respectively, on what training was preferred for medicinal chemists entering research in the pharma industry. The results were analysed and discussed and have given rise to nine publications, three of which are in Chemistry International (1995, 17, 212; 1999, 21, 138; 2001, 23, 43). Surveys from US and Japan had been published in 1998. The survey from Europe was recently published in Eur. J. Med. Chem. 2000, 35, 163-174.

With regard to training medicinal chemists in Latin American countries, medicinal chemistry courses have been organised in Montevideo, Uraguay (Sept 99), and Rio di Janeiro, Brazil (August 01). Through the efforts of Professor A. Monge, several Societies of Medicinal Chemistry for Latin American countries have been established, and a Research Symposium organised in Cuba, April 2001.

Training in medicinal chemistry in the Indian subcontinent has been pursued by Dr. M. Chorghade and he has stimulated the Indian CSIR to run courses in four different cities in India.

A Working Party on "Medicinal Chemistry in the Development of Societies : Biodiversity and Natural Products" led by Professor Monge has given rise to publication of an article in the various Latin American countries, in Eur. J. Med. Chem. 2000, 35, 1121-1125, and also appears in Chem. Internat. 2001, 23, 39-43.

VII. M.3 Commission on New Technologies and Special Topics

Metabolism Databases and their Potential Utility in the Development of New Drugs

Predicting the likely metabolic transformations of candidate drugs is a critical problem for Pharmaceutical Companies engaged in the development of new compounds as potential drugs for use as new medicines. Knowledge of likely metabolism is valuable for prediction of the likely half-life of drug duration and for assessing potential side effects which may have adverse toxicological consequences. What then is predictable from structure-mechanism relationships? Past experience has not been well publicized so that databases of compilations of experimental information or predictive modelling would be very useful. Current models are, however, of limited applicability and this book identifies their potential uses and limitations; the book also reports some case studies by various practitioners from the pharmaceutical industry. "Drug Metabolism: Databases and High Throughput testing During Drug design and Development" Ed. P. W. Erhardt, Blackwell, Oxford, 1999. ISBN 0632054329.

IUPAC Handbook of Pharmaceutically Acceptable Salts

Many drug substances are acids or bases and it is convenient to convert them into salts to improve stability and increase water solubility. Of course the counter ion must be suitable, non-toxic, and not interfere with the desired biological action of the drug. This aspect of drug presentation is of fundamental importance for drug development and yet there is very little helpful literature for guidance. Preparation of the optimal pharmaceutically acceptable salt form of a new drug substance is a problem frequently faced by medicinal chemists who could greatly benefit from a convenient, comprehensive and authoritative source of information concerning the full range of possibilities including the more unusual salts. Such an information source is not currently available. The Section has produced a book which reviews the literature and generates a critical compilation of information in this subject area which is definitive and will have international stature. It has been published at the beginning of 2002 by Verlag Helvetica Chimica Acta " Pharmaceutical Salts: Properties, Selection and Use- A Handbook", by C. G. Wermuth and P.H. Stahl, ISBN 3-906390-26-8.

Human Metabolism Database

A project proposal by Professor P.W. Erhardt has been accepted for a joint venture with IUPHAR, supported with funding of $50,000 from ICSU, on a human drug metabolism database. The project aims to establish a human metabolism database that can be accessed around the world for specific applications that directly affect human welfare. The availability of such a searchable database would be potentially very valuable in the design and development of new therapeutics drugs.

Other Projects

A Working Party on "Natural and Non-natural Substances Related to Human Health", led by Professor J.G. Topliss has produced a draft manuscript to provide an information source for helping to answer the lay misconception about synthetic versus natural drugs.

A Working Party has recently been established with Dr. J. Fischer on the "Evolution of Drug Discovery and the Timing of Analogue Research". The output could be a book on the productivity of me-too drug research.

International Connections

The section has continued to have strong connections with the European Federation of Medicinal Chemistry (EFMC) and the Asian Federation of Medicinal Chemistry (AFMC), and to participate in their meetings

C. Robin Ganellin, 14 January 2002