# **EDITORIAL**

Current challenges in drug discovery and development are the overcoming of the relative lack of success in launching new drugs to the market, the need of reducing, or at least stabilising, the ever increasing cost and time required for the discovery and development of a new medicine, the necessity of facing the pharmacological treatment of orphan diseases, as well as the interest in coping with the development of personalised pharmacotherapies taking into account the interindividual genetic variability.

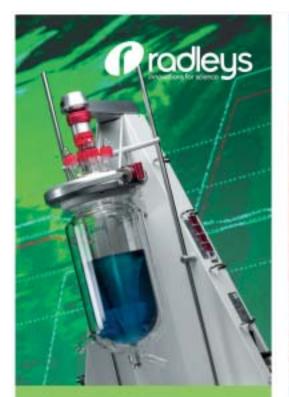
On the other hand, the drug discovery and development activities currently have great opportunities for improvement on the basis of the consideration of the new genomic and proteomic knowledge, the exploitation of molecular diversity, the understanding of the therapeutic (as well as the side-effects and the toxicological) mechanisms from molecular and structural perspectives, and the intensive use of information technologies, among other issues.

The aforementioned challenges and opportunities require collaborative efforts of many scientific disciplines, from genetics and bioinformatics to clinical pharmacology. Among these disciplines, medicinal chemistry has a key role to play, since it is specially focussed on the chemical part of the pharmaceutical R&D, and effective and efficient medicines research requires a great amount of molecular knowledge. It is an obvious evidence that both biological targets and drugs are molecular entities that require to be studied from the chemical perspective. Thus, ratio-

nal drug design is based on the structures and physico-chemical properties of both targets and drugs, and both the drug activity and the ADMET properties are driven by physico-chemical features. For this reason, the optimisation of the efficacy and ADMET profile of a hit or lead compound always implies the introduction of relevant modifications in the chemical structure of such a compound.

The European Federation for Medicinal Chemistry (EFMC) is a key instrument to stand for and coordinate the efforts of the European medicinal chemistry community to better face the current challenges and opportunities of the drug discovery R&D. The EFMC links 23 scientific organisations from 20 countries, representing about seven thousands scientists from both industry and academia. It has a growing activity as forum for scientific discussion and dissemination by means of the organisation and sponsorship of relevant scientific events, the most important of which are the EFMC International Symposia on Medicinal Chemistry (EFMC-ISMC). Last but not least, the EFMC is increasing its dialogue and collaboration with the other European institutions and organisations playing a significant role in the pharmaceutical research and development, in agreement with the collaborative and interdisciplinary approaches that are required for an efficient generation of new useful and safe medicines

> Prof. Ferran Sanz President of the EFMC





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### **Directory of Companies**

Directory of Companies 66

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The Council consists of the members of the EC and one delegate of each Adhering Organisation. The details of each delegate can be found within the National Organisations pages.

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ro@unipa\_it



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elected 01.01.2005 – 31.12.2006, 2nd term
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elected 01.01.2005 – 31.12.2006, 2nd term
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blesur@cephalon.fr



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### Council

The Council consists of the members of the EC and one delegate of each Adhering Organisation.

The details of each delegate can be found within the National Organisations pages.

# EFMC OBJECTIVES

The European Federation for Medicinal Chemistry (EFMC) is an independent association founded in 1970. Free from any political convictions, it represents the scientific organisations from 20 European countries and covers a geographical area, the size of the USA with a similar scientific population. Its objective is to advance the science of medicinal chemistry by promoting cooperation and encouraging strong links between the national adhering organisations, in order to promote contacts and exchanges between medicinal chemists in Europe and around the World.

Moreover, it offers medicinal chemists an opportunity to publish their work internationally by organising the biennial International Symposium on Medicinal Chemistry (ISMC). ISMC meetings have been held in many different European countries since 1970: Israel, Italy, Germany, France, Spain, Sweden, UK, Netherlands. Switzerland. Hungary, Denmark and even Canada. These symposia, with an average attendance of 1,400 delegates, are highly international with a broad range of speakers and attendees representing well in excess of 40 countries.

The EFMC has very strong links with the Medicinal Chemistry Division of the American Chemical Society. Not only does the EFMC have a permanent representative from this division, who attends its management meetings, but also the EFMC now has a permanent representative on the Long Range Planning Committee of The ACS Medicinal Chemistry Division. Through this collaboration the ACS convenes sessions for the biennial ISMC Symposia, the flagship symposia of the EFMC, and conversely the EFMC convenes sessions for ACS National meetings. This relationship is being continually strengthened.

European scientists are currently contributing some 40% of the total published manuscripts of The Journal of Medicinal Chemistry. Indeed, the EFMC has a specific representative on the Editorial Advisory Board of the Journal of Medicinal Chemistry. Thus demonstrating the quality of European science and its scientists.

Strong links are also established with the Asian Federation of Medicinal Chemistry: participating in meetings organised by the AFMC and vice versa. This collaboration gives the EFMC a strong international flavour.

Another important part of the EFMC activities is conferring its sponsorship on national scientific meetings. There are a number of scientific meetings organised between two or more countries for which the EFMC confers its sponsorship. More recently it has also awarded bursaries for younger scientists to attend meetings that the EFMC has sponsored.

The EFMC also acknowledges the excellence of medicinal chemists' work, it confers three major awards: the Nauta Award, the UCB Award and the Prous Award. They are given every two years for outstanding achievements in the field of Medicinal Chemistry.

The EFMC homepage is now hot-wired to the web sites of many national organisations, thus facilitating the flow of information, and the new yearbook "Medicinal Chemistry in Europe" should help to further develop cooperation between member organisations as well as their industrial partners and therefore advance medicinal chemistry in Europe, and by extension around the globe.

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Corporate Members will be acknowledged by the Federation in its primary literature and website and, more importantly, they will have the opportunity to actively contribute to the long range planning of EFMC activities. Thus, Corporate Members will be invited to nominate a scientist from their organization to liaise directly with appropriate members of the Federation's Executive Committee. In this manner they will have an opportunity to suggest topics, and even individual speakers, for forthcoming EFMC-ISMC Symposia.

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UCB PHARMA



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# EFMC Awards 2004

The Awards have been presented during the Opening Session of the

XVIIIth EFMC International Symposium on Medicinal Chemistry,

August 15, in Copenhagen, Denmark.



# The Nauta Award

# on Pharmacochemistry 2004

for Prof. C. Robin Ganellin

This award is granted to Prof. C. Robin Ganellin, University College London, on the basis of his impressive career in both industry, academia and scientific organisations, as well as for his efforts to internationally promote Medicinal Chemistry as a chemical discipline. His key contribution to the discovery of histamine antagonists as a novel class of antiuloer drugs with a major clinical impact is especially recognised.

The "Nauta Award on Pharmacochemistry" has been established to honour the memory of Prof. Dr. W. Th. Nauta, whose activities have been very important for the advancement of Medicinal Chemistry in general, and for the development of international organizational structures for this discipline. The prize is awarded once every two years to an outstanding European medicinal chemist or to a non-European scientist working in Europe. The prize was given for the first time in 1992.



## The UCB Award

## for Excellence in Medicinal Chemistry 2004

for Prof. Jesper Wenge

This award is granted to Prof. Jesper Wengel, University of Southern Denmark, Odense, on the basis of his outstanding scientific contributions. In particular, his discovery of Locked Nucleic Acids (LNA) has been highly significant in the discovery of effective antisense oligonucleotides, a discovery that has greatly enhanced the chances of a successful development of oligonucleotide-based therapeutic agents.

The "UCB Award for Excellence in Medicinal Chemistry" has been established by UCB S.A. in order to increase the awareness of the important role played by Medicinal Chemistry in the discovery of new medicines. The prize is awarded once every two years to a scientist, not exceeding the age of 45 years, without restrictions regarding nationality, to acknowledge and recognize outstanding research in the field of Medicinal Chemistry in its broadest sense. The first UCB Award was given in 2002.

# The Prous Science Award for New Technologies in Drug Discovery 2004

for Prof. C. Oliver Kappe

This award is granted to Prof. C. Oliver Kappe, Karl-Franzens University, Graz, on the basis of his outstanding and innovative scientific contributions in the field of microwave-assisted combinatorial chemistry.

The Prous Science Award for New Technologies in Drug Discovery has been established by Prous Science S.A and is given for the first time this year. This prize is awarded once every two years to encourage research and innovation in technological developments related to the drug discovery process, and is given to a scientist, without restrictions regarding nationality, to acknowledge the invention, evaluation or innovative use of new technologies for drug discovery.



### **EFMC EVENTS 2004**



**The XVIIIth International Symposium on Medicinal Chemistry (ISMC)** has been held in Copenhagen, Denmark (August 15-17 and 19) and Malmö, Sweden (August 18), 2004 under the auspices of EFMC.

1200 participants from 54 countries participated in this symposium focused on medicinal chemistry as a scientific discipline undergoing rapid development. The molecular biological revolution, new drug design technologies and the progressing mapping of the human genome have created a new exciting working field for scientists in these research areas. These developments are continuously broadening the borderlines between chemistry, informatics and biology and provide new opportunities for drug design on a rational basis. ISMC 2004 illustrated the integration of the complementary industrial and academic drug design approaches.

The abstracts of EFMC 2004 have been published as a supplement to Drugs of the Future, Volume 29, Suppl. A, August 2004 and copies are still available <a href="http://www.prous.com/journals/orderMedChem.html">http://www.prous.com/journals/orderMedChem.html</a>



The Symposium on Advances in Synthetic, Combinatorial and Medicinal Chemistry (ASCMC), organized under the auspices of the EFMC, by the Medicinal Chemistry Section of the D.I. Mendeleev Russian Chemical Society & ChemBridge Corporation, took place in Moscow, Russia, From May 5 until May 8, 2004.

The topics which were covered during this symposium included: New Synthetic Methodologies, Total Synthesis of Natural Products and Heterocyclic Chemistry, Combinatorial Chemistry, Diversity- and Target-Oriented Synthesis, Medicinal Chemistry and Drug Discovery & Development. The program also included a half-day Business Mini-Symposium "Discovery Chemistry Outsourcing Opportunities in Russia". 600 participants from outside Russia were joined by 400 Russian scientists for the first two days of the symposium.

Abstract books are still available via the symposium secretariat:

ascmc@LDOrganisation.com



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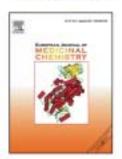
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#### organised by the National Adhering Organisations 2004/2005

EFMC sponsored events highlighted in orange

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Lead Profiling, Myth or Reality? UGent -Het Pand, Ghent, Belgium KVCV & SRC Medicinal Chemistry Divisions

> LD Organisation Tel: +32 10 45 47 77 Fax: +32 10 45 97 19 secretariat@LDOrganisation.com www.LDOrganisation.com

#### December 2, 2004

Trends in Medicinal Chemistry
National Heart and Lung Institute, Kensington,
London, UK
SMR
SMR Secretariat

Tel: +44 870 833 2431 Fax: +44 870 833 2434 secretariat@smr.org.uk www.smr.org.uk

#### January 19, 2005

Danish Pharmacology 2005 University of Southern Denmark, Odense

> Prof. Michael J. Mulvany Tel: +45 8942 1711 Fax: +45 8612 8804

> > mm@farm.au.dk www.dsft.dk

#### March 8, 2005

Journée commune SFC-SCT-Académie de Pharmacie Paris, Institut Curie

Société de Chimie Thérapeutique, Société Française de Chimie, Académie de Pharmacie

ociété Française de Chimie, Académie de Pharma Pierre Roger Tel : +33 1 45 36 29 49

Fax: +33 1 45 36 29 49 Fax: +33 1 45 36 20 13 Pierre.roger@sanofi-synthelabo.com www.sct.asso.fr

#### November 26-28, 2004

Liblice 2004 - Advances in Organic, Bioorganic and Pharmaceutical Chemistry Nymburk, Czech Republic

Division of Organic, Bioorganic and Pharmaceutical Chemistry of the Czech Chemical Society Prof. Pavel Drašar

Tel: +420 224 354 283 Fax: +420 224 310 859 Pavel.Drasar@vscht.cz http://uoch.vscht.cz/orbifachos/Liblice2004.html

#### December 9, 2004

New Research Strategies in Medicinal Chemistry
Paris, Institut Curie

Pierre Roger
Tel: +33 1 45 36 29 49
Fax: +33 1 45 36 20 13
Pierre.roger@sanofi-synthelabo.com
www.sct.asso.fr

#### March 4, 2005

Annual Scientific Symposium Solvay Pharmaceuticals, Weesp Medicinal Chemistry Section of the Royal Dutch

Society of Chemistry
Dr. H. Coolen
Tel: +31 294 479183
Fax: +31 294 477138
hein.coolen@solvay.com
www.kncv.nl

#### March 10, 2005

Chemical Genetics and Genomics: What are they and are they helping drug discovery? National Heart and Lung Institute,

Kensington, London, UK SMR Secretariat Tel: +44 870 833 2431 Fax: +44 870 833 2434 secretariat@smr.org.uk www.smr.org.uk March 10, 2005

Spring Meeting of the Swiss Chemical Society Universität Bern

SCS Division of Chemical Research

Prof. Philippe Renaud Tel: +41 31 631 43 59 Fax: +41 31 631 34 26 Philippe.renaud@ioc.unibe.ch http://www.swiss-chem-soc.ch/DCR March 13-16, 2005

2<sup>nd</sup> Anglo-Swedish Medicinal Chemistry Symposium Are, Sweden

BMCS/Apotekare Sweden

Jeanette Jansson Tel: +46 8 723 50 84 Fax: +46 8 20 55 11 jeanette.jansson@swepharm.se

March 14 - 16, 2005

Annual Meeting of the GDCh Division of Medicinal Chemistry Leipzig, Germany

> Congress Department Tel: +49 7917 358/360/366 Fax: +49 60 7917 470 tq@gdch.de

http://www.gdch.de/vas/tagungen/tagungen2005.html

March 17, 2005

Cukrblik - Current Chemistry and Biochemistry of Saccharides Prague, Czech Republic,

Division of Organic, Bioorganic and Pharmaceutical
Chemistry of the Czech Chemical Society
Czech Microbiological Society
Prof. Jitka Moravcová

Tel: +420 224 354 283 Fax: +420 224 310 859 Jitka.Moravcova@yscht.cz http://yscht.cz/lam/new

April 2005

16th East of England Medicinal Chemistry Meeting Hatfield, UK BMCS

Stephen Fletcher Tel: +44 1279 440289 Stephen.fletcher@merck.com April 7-8, 2005

4th Johnson and Johnson PRD Symposium on Drug Discovery Antwerp (Belgium)

Johnson and Johnson, University of Antwerp with the aid of KVCV Prof. Koen Augustyns Tel: +32 3 820 27 03 Fax: +32 3 820 27 39

koen.augustvns@ua.ac.be www.kvcv.be

May 2005

9th Conference in Advanced Medicinal Chemistry

Thessaloniki, Greece
Department of Medicinal Chemisty,
Aristotelian University of Thessaloniki and Hellinic
Society of Chemistry

Panos N. Kourounakis Tel: +30 2310997621 Fax: +30 2310997622

panoskur@pharm.auth.gr http://www.pham.auth.gr

May 2005

XXX<sup>th</sup> Colouristic Symposium Eger (Hungary) Hungarian Chemical Society

> Dr. Agnes Kovacs-Stahl Tel: +36 1 201 6883 Fax: +36 1 201 8056 mail@mke.org.hu www.mke.org.hu

May 8-13, 2005

15th Noordwijkerhout-Camerino Symposium : Trends in Drug Research Noordwijkerhout, the Netherlands Secretariat 15th Noordwijkerhout-Camerino Symposium

Prof. Dr. Henk Timmerman Tel: +31 20 444 75 80 Fax: +31 20 444 76 10 timmermn@few.yu.nl May 9-10, 2005

**Protein Kinases: Signalling Success** English Heritage Lecture Theatre, London, UK BMCS/SCI

> Elaine Wellingham Tel: +44 1275 853311 Fax: +44 1275 853311 confsec@blueyonder.co.uk

#### June 16, 2005 The Therapeutic Potential

of Tissue Engineering and Regeneration National Heart and Lung Institute, Kensington, London, UK

**SMR** Secretariat Tel: +44 870 833 2431 Fax: +44 870 833 2434 secretariat@smr.org.uk www.smr.org.uk

#### June 20-23, 2005

Joint Meeting on Medicinal Chemistry Vienna

Medicinal Chemistry organisations from Austria, Germany, Hungeria, Italy, Poland and Spain

Peter Ettmayer Tel: +43 1 86634 378 Fax: +43 1 86634 383 peter.ettmayer@pharma.novartis.at http://www.goech.at

#### June 28-29-30, 2005

Vegyészkonferencia (Org. and Med. Chem. Symp.) Hajduszoboszló (Hungary)

Organic and Medicinal Chemistry Division (OMCD) of the Hungarian Chemical Society Prof. Péter Mátyus

Tel: +36 1 217 0851 Fax: +36 1 217 0851 matypet@szerves.sote.hu www.mke.org.hu

#### August 28 - September 1, 2005

11th Blue Danube Symposium on Heterocyclic Chemistry Brno, Czech Republic Department of Organic Chemistry, Masaryk University of Brno, Kotlarska 2, 611 37 Brno Prof. Dr. Milan Potacek

Fax: +420 549 492 688 Tel: +420 549 496 615 potacek@chemi.muni.cz http://www.bdshc.org/bdshc11

#### September 3-8, 2005

XVI<sup>th</sup> Fechem **Conference on Organometallic Chemistry** 

Budapest (Hungary)
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of the Hungarian Chemical Society Prof. István T. Horváth

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June 17, 2005

Pharma Sci Fair. Anticancer Agents Session Nice, France, Palais des Congrès

Michel Koch, Claude Monneret, Olivier Lafont

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#### June 25-26-27, 2005

The Role of Chemistry in Molecular Medicine
Szeged (Hungary)

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#### July 5-8, 2005

**Rencontres Internationales** 

**de Chimie Thérapeutique** Paris, Maison de la Chimie Madame le Professeur Garbay, M. Vidal

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#### September 4-7, 2005

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#### September 8, 2005

**Cardiovascular Medicine** 

Organon Research Laboratories, Scotland, UK

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#### September 11-16, 2005

**Summer School Drug Design** 

Austria Austrian Pharmaceutical Society & Austrian Chemical Society Prof. Gerhard Ecker Tel: +43 1 4277 55063 Fax: +43 1 4277 9551 gerhard.f.ecker@univie.ac.at http://www.oephg.at/

#### September 12-16, 2005

Second Joint Italian Swiss Meeting on Medicinal Chemistry Modena

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Tel: + 39 059 205 51 39 Fax: + 39 059 205 51 31 brasili.livio@unimore.it http://www.swiss-chem-soc.ch/smc/

#### September 14-15, 2005

Interfaces'05 SOPRON (Hungary) Hungarian Chemical Society

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#### October 13, 2005

**Fall Meeting of Swiss Chemical Society** Ecole Polytechnique fédérale de Lausanne

> Prof. Thomas Rizzo Tel: +41 21 693 3073 Fax: +41 21 693 5170 Thomas.rizzo@epfl.ch http://www.swiss-chem-soc.ch/

#### December 8, 2005

Case Histories in Drug Discovery and Design National Heart and Lung Institute, Kensington, London, UK

> **SMR** Secretariat Tel: +44 870 833 2431 Fax: +44 870 833 2434 secretariat@smr.org.uk www.smr.org.uk

September 12-14, 2005 34<sup>th</sup> Conference Synthesis and Analysis of Drug Brno, Czech Republic

Czech Pharmaceutical Society, Section of Synthetic Drugs Prof. Luděk Beneš Tel: +420 541 562 927 Fax: +420 541 240 607 benesl@vfu.cz

September 13-16, 2005 XIV Congreso Nacional de la SEQT Bilbao

Dr. Aurelio Orjales, Dr. Esther Domínguez, Dr. Maravillas Bordell, Dr. Roberto Olivera, Dr. Ma Dolores Badía. Dr. Esther Lete, Dr. Ma Luisa Lucero, Dr. Ramón Mosquera Tel : +34 94 4818300

Fax: +34 94 4818309 http://www.segt.org

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#### September 18-21, 2005

11th Conference on Total Reflection X-Ray Fluorescence Analysis and Related Methods

Budapest (Hungary) Spectrochemical Association of the Hungarian Chemical Society
Prof. Gyula Záray Tel: +36 1 209 0555 zaray@ludens.elte.hu www.mke.org.hu

#### November 2005

Annual One Day Symposium Namur, Belgium SRC & KVCV, Medicinal Chemistry Divisions

> LD Organisation Tel: +32 10 45 47 77 Fax: +32 10 45 97 19 secretariat@ldorganisation.com www.src.be

#### September 2-6, 2006

XIX<sup>th</sup> International Symposium on Medicinal Chemistry Instanbul, Turkey Turkish Association of Pharmaceutical and Medicinal Chemistry

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# Intellectual Property for Pharmaceuticals

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Why should a medicinal chemist care about intellectual property? There are specialists dealing with the matter of patents and trademarks, so let us concentrate on "true" science! But: Intellectual property protection is paramount for the pharmaceutical industry. With increased globalisation and global competition as a consequence thereof, only companies with a constant flow of innovative products and services will survive. The better you can protect this innovation the better off your company is.

Intellectual property protection has also grown in importance for universities. Nowadays it is more difficult than ever to secure funds for research. If the results of research could be commercialised, and at the same time a royalty stream generated from it, many financial problems of research groups at universities could be alleviated. The general public will also profit from such a development when the fruits of academic research are more often translated into practical products and made generally available.

Intellectual property rights get more and more attention in the general media. In the past few years a lot of awareness has been created on the emotional side, with slogans such as "no patents for life", or in the context of healthcare costs, prices for pharmaceuticals and parallel imports. It is therefore important that scientists working in research, development, production, marketing and administration know the basic aspects and principles of intellectual property, and have an idea of the burning questions that intellectual property specialists are dealing with [1].

The success of today's pharmaceutical industry very much depends on adequate protection of intellectual property. Under the term intellectual property one understands many different forms of protection titles such as patents, trademarks, designs, plant variety protection, protection of geographical indication and other related titles. but also protection of undisclosed information, know-how, and copyright. Protection of inventions by patents, protection of (generally undisclosed) information required for registration of pharmaceuticals, and trademarks supporting effective marketing are all very important, but one can properly state that patents form the lifeline for the research-based pharmaceutical industry. Investment of, at present, more than USD 500 million for research and development of one new medicine which reaches the market can only be justified because intellectual property protection grants a limited term of exclusivity for the commercial exploitation of such an invention. Yet, patents are and will probably continue to remain a contentious issue.

There is an inherent tension between the limited monopoly of a (pharmaceutical) patent, which gives the successful innovator a fair chance to recoup his investments, and the interest of governments in containing health care cost. Likewise the use of trademarks in marketing efforts of pharmaceutical industry is under attack, mainly because some governments and political circles believe that trademarks are misused to partition markets and to indirectly extend the period of exclusivity granted by a patent.

#### What is a Patent?

A patent is an exclusive right granted by the state for a limited time in respect of a new and useful invention [2]. This right is usually limited to the territory of the state granting the patent. If protection is desired in a number of countries, patents must be obtained in all of them, either through national patent offices or through a regional multinational body such as the European Patent Office.

For a patent to be granted for an invention, the invention must be novel and involve an inventive step, that is, must be nonobvious. Novelty and non-obviousness are determined with respect to the "state of the art", which (somewhat simplified) means everything in use or published before the patent application was first filed or before the invention was made.

It is important to realise that a patent does not give the right to practise the invention, but only the right to exclude others from doing so. For example, owning a patent for a new drug does not give the right to market the drug without permission from the regulatory authorities, nor does it give the right to infringe an earlier existing patent. The patent owner may enforce his exclusive right in the courts, stop the activities of an infringer and make him pay damages. The patent owner may also grant licenses allowing a licensee to use the invention (if he fulfils all the other non-patent requirements), usually in return for financial compensation such as royalties on the sale of products.

The exclusive right given by a patent is granted for a limited period only, usually 20 years from the filing date. Some countries allow extensions of the patent term for pharmaceuticals to make up for the fact that marketing is delayed by the need to obtain regulatory approval. Once the patent term has expired or the patent has lapsed by non-payment of the renewal fees, anyone is free to use the invention. The public is able to do so because the patent specification is published (usually 18 months after the first filing date) with a description which enables the invention to be carried out by a skilled person.

#### International Agreements

Basis for the "globalisation" of patent rights is the International Convention for the Protection of Industrial Property (Paris Convention) dating back more than 120 years [3]. The most important practical aspect of the Paris Convention is that, if an application for a patent is made in one country, corresponding applications may be filed in other countries within one year from the first filing date. These later filings will be treated as if they were filed on the same day as the first application.

As a consequence, publications and use relating to the invention after that first filing date will not influence the patentability of later filed identical patent applications in other countries. This allows an inventor to first test and develop an invention before spending all the money for world wide filing. It is still desirable to postpone planned publications until patent applications have been filed world wide, since additions to the subject matter included in those later world wide patent applications are not shielded from the impact of prior art surfacing in these first 12 months called "priority year".

The Paris Convention not only covers patents, but also other industrial property rights, notably trademarks. Another important aspect of the Paris Convention is the fact that foreigners and nationals of the state where an intellectual property right is applied for are treated equally except for formal requirements.

A simplified mechanism for world wide patent applications is offered by the Patent Cooperation Treaty (PCT) [4]. The PCT is now in force for over 120 countries, covering all important markets in North America, Europe and Asia, except e.g. for Taiwan. Argentina, Chile and some other countries in Latin America, Arabic countries in the Middle East and also some countries in Africa are not yet members of PCT. The PCT, like the Paris Convention, is administered by the World Intellectual Property Organization (WIPO), a UN organization with its headquarters in Geneva. It does not create a supranational patent office, nor does it grant a "world patent", but it does simplify the process of filing patent applications simultaneously in a

number of countries. Under the PCT, a single application may be filed securing rights for all PCT contracting states. A search is made for relevant prior art together with a first assessment of patentability, and the application is published, together with the search report, 18 months after the priority date. The applicant then has 12 more months (i.e. a total of 2<sup>1/2</sup> years from the first filing date) in which to prepare all necessary translations and documents for national filings in the designated countries. This again allows a patent applicant to further evaluate the commercial value of the invention before making investments in world wide filings. The search results and the preliminary assessment of patentability also reveal if prior art is known which prohibits the grant of a valid patent.

The agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs) is a further important agreement which had considerable impact on patent, trademark and other intellectual property rights available to pharmaceutical companies [5]. This agreement evolved form the GATT Uruguay Round and is part of the package of agreements which had to be accepted and implemented by all World Trade Organization (WTO) member states. The TRIPs agreement covers the whole range of intellectual property issues including patents. trademarks, geographical indications, industrial designs, integrated circuits, copyright and trade secret protection, as well as general provisions concerning basic principles, intellectual property enforcement, and dispute resolution between WTO member states.

TRIPs requires WTO member states to introduce strong patent protection, the most important elements of which are: A minimum term of 20 years from filing; patent protection to be available for all chemical compounds, including pharmaceuticals; patent rights to be without discrimination as to whether products are locally made or imported; and enforcement procedures to be effective, fair, equitable and not unnecessarily costly. Further to that the WTO offers a convenient and comparatively fast dispute settlement procedure for disputes between WTO member states about whether TRIPs (and other GATT/WTO agreements) are properly implemented and properly interpreted.

Prior to the TRIPs agreement a number of countries discriminated against pharmaceutical patents by allowing automatic compulsory licences in this field. This meant that the patent owner could not use the patent to exclude others, but only to collect royalties from imitators, the royalties often being fixed at arbitrarily low levels. Under TRIPs, compulsory licenses are allowed only under strict conditions, and on an individual basis. The question of compulsory licences are again on the table in the political discussions around TRIPs, as could be seen in the Doha and Cancún Ministerial Conferences. Many developing countries believe that the problems with their national health systems could be alleviated by importing pharmaceuticals from other countries under compulsory licences. A complicated system of rules has now been set up, which should make sure, e.g., that the compulsory licence system will not be misused and that the pharmaceuticals imported into developing countries under such a compulsory licence will not be reexported to first world countries [6].

#### Formal Aspects of a Patent

A patent application consists of a description of the invention, which may include figures (and in pharmaceutical applications usually chemical formula and examples), the claims, and an abstract. The abstract is technical information only, is used chiefly for search purposes, and has no legal effect.

A patent description is a legal as well as a scientific document, which serves a different purpose from that of a paper in a scientific journal, and should be read in a different way. The description must be sufficiently clear to enable a skilled person to reproduce the invention. In pharmaceutical cases it will normally contain a number of examples. Academic scientists are sometimes distrustful of patents as sources of scientific information because many patents contain what are called "paper examples" which were never actually carried out. The inclusion of a "paper example" as a cookbook recipe in a patent is not a false representation that the compound has been made; it is an honest representation that it is predictable that the compound can be made in that way.

The claims serve the important legal purpose of defining the scope of the exclusive rights given by the patent. Claims in patent applications as filed are often much broader than claims in a patent as granted after examination in a patent office, and only the latter have to be observed. It is an infringement of the patent to make or do something which is covered by the scope of the claims, as interpreted by the responsible court. The scope of the claims is not limited to the literal wording, but to some extent also includes equivalents of the literal wording. The claims must be supported by the description, but will often be broader in scope than the specific embodiments of the invention described in the examples. On the other hand, claims may only cover part of what is described in the patent, since examination of the claims by a patent office may reveal that original claims as filed in the application do not fulfil the legal requirements.

Patents usually contain a number of claims starting with a broad claim to a large group of compounds or a very general process, going on to more limited (dependent) claims to particular sub-groups, and ending with specific claims to individual preferred compounds or particular conditions of a process. These dependent claims are supposed to give a fall-back position in the event that the broadest (or a broader) claim is later found invalid by a court.

Patent claims may be classified into product claims and process claims. Product claims claim a physical entity, for example a chemical compound, a crystal form, a compound mixture or a pharmaceutical formulation. Process claims (sometimes called method claims) cover the act of doing something, for example manufacturing a (new or old) product, using a product in a particular way, or even treating a disease. A compound claim is infringed by someone making, using or selling the compound, irrespective of how it is made. A claim to a process for making the compound is infringed not only by carrying out the process, but also by using or selling the product of the process.

Once a compound is sold, the patent rights are exhausted, which means that the purchaser may use or re-sell it without limita-

tion. Since a patent is a territorial right, this exhaustion is - in principle - limited to the patent territory. The patent owner can therefore stop the import of a patented product even if the patent rights to this product are exhausted in the exporting country. There is a notable exception to the mentioned principle of national exhaustion within the European Economic Area, where the free flow of goods is the rule. Patents can only be enforced once when a product is first put on the European market, a situation called regional exhaustion. Parallel trade within the European Union is a continuous concern for the pharmaceutical industry since national health authorities regulate marketing and pricing, thereby creating considerable price differences for pharmaceuticals between different member states of the EU. These price differences are then used (or rather misused) by parallel traders shifting products from one country to another, and re-labelling or re-packaging the products. Patent (and also trademark) rights cannot be used to stop parallel trade, except under special circumstances.

# Patentability Requirements in Europe

Although formal aspects of patent applications and patents are pretty much harmonized throughout the world actually as a consequence of the PCT discussed above and the Patent Law Treaty [7] signed recently, there are still differences in the substantive patentability requirements, most notably between the United States and the rest of the world. In the following we will first present the situation in Europe.

The European Patent Convention (EPC) [8] now comprises 28 member states, in particular the 25 countries of the European Union (EU) with the exception of Latvia, Lithuania and Malta (which will have to join the EPC as well), and also Bulgaria, Romania, Turkey, Monaco. Switzerland Liechtenstein [9]. As an alternative to filing separate patent applications at each national patent office, the EPC provides for the grant of patents in some or all of the member states by means of a single patent application written in English, French or German. The patent application is examined for patentability by the European Patent Office in Munich and Den Haag. Once the European patent is granted, it has to be translated into the national official languages and falls apart into a bundle of national patents subject to national laws on validity and infringement. Although an EU ("Community") patent is in discussion since 1975 no unitary EU patent is available and probably will not be in the near future. Such unitary EU patent would be highly desirable for industry, but the projects for an EU patent failed so far because of the translation requirements, the projected costs for the patent applicant, and inadequate proposals for the judicial arrangements for validity and infringement of such patents.

According to the EPC, inventions can only be patented if they are new, are based on an inventive step, and are industrially applicable [10]. Novelty is determined in relation to the "state of the art", which comprises everything that is known to the public by written or oral publication, use or any other way, in any country in the world, before the priority date of the invention. Earlier filed patent applications, even if they are not yet published, are also taken into account for novelty purposes. The novelty requirement makes sure that nothing is patented which is already in the public domain and freely accessible.

A so-called "inventive step" is present if the invention is non-obvious to "the person skilled in the art", i.e. to a person familiar with the technical field which is a competent worker but lacks imagination or inventive capability. For chemical patents the person skilled in the art normally is an average qualified industrial chemist. For complex inventions such as in the field of biotechnology the person skilled in the art may be considered to be a team of qualified scientists from different branches of science. Whether or not a claim will be regarded by the examiner or the judge as involving an inventive step is sometimes difficult to predict, since to some extent judgment of what is obvious or non-obvious is a matter of subjective interpretation.

In considering obviousness, it is of no relevance how the invention was made, whether as a result of planned research, a flash of inspiration, or even pure chance. An invention may be simple without being obvious.

Producing a simple solution to what appears to be a complex problem is often highly inventive. With the benefit of hindsight an invention very often seems to be simple, derived from the prior art as a series of logical steps, but it does not necessarily follow that the invention was obvious at the time of filing the patent application. Further indication of nonobviousness of an invention may be commercial success, a solution to a long-time need, or success where many others failed. The inventive step requirement makes sure that simple and obvious modifications of prior art should remain free to use by everybody.

The third basic requirement of the EPC is that the invention should be susceptible of industrial application. Industrial application comprises making or using the invention in any kind of industry, including agriculture. According to the EPC, methods of medical treatment or diagnosis performed on the human or animal body are regarded as being incapable of industrial application and therefore not patentable. However, substances invented for use in such medical treatment and diagnosis may be patented. An old compound not previously known to have any medicinal property can be protected as a drug claiming "Substance X as a pharmaceutical". The invention that a known drug has a new and unrelated medicinal benefit can be protected by a claim of the type "Use of substance X in the manufacture of a medicament for the treatment of disease Y", commonly known as a "Swiss-type" claim because the Swiss patent office was the first to accept claims of this type. The reason for the exclusion of medical and surgical treatment from patenting is the understanding that doctors should be free to treat their patients without having to worry about whether they are infringing a patent.

The EPC makes further specific exceptions to patentability. For example, artistic works, aesthetic creations, scientific theories, mathematical methods, the presentation of information, business methods, and computer programs as such are all unpatentable. Discussions about the patentability of computer inventions are presently going on, and these inventions may be patentable if they do not relate to computer programs as such. Animal and plant varieties are also not patentable. Plant varieties

can be protected by plant breeders' rights. However, any invention relating to plants which is not restricted to a variety (and for that reason not protectable under plant breeders' rights) should be patentable, if new and non-obvious.

Further excluded from patentability are inventions the publication or exploitation of which would be contrary to "ordre public" or morality. This provision, designed to ensure that patents would not be granted for inventions such as improved letter bombs, has been seized upon by opponents to gene technology, in their attempts to prevent patenting of nucleic acids living organisms. The European Communities recently approved the Directive on the Patenting of Biotechnological Inventions which more closely defines what should be regarded as contrary to ordre public and morality. The subject matter of the EU Directive is incorporated into the **Implementing** Regulations of the EPC [11]. It is now clear that processes for cloning human beings, processes for modifying the germ line genetic identity of human beings, uses of human embryos for industrial and commercial purposes, and processes for modifying the genetic identity of animals which are likely to cause them suffering without any substantial medical benefit to man or animal, and also animals resulting from such processes, are not patentable. On the other hand it is now clearly stated that biological material which is isolated from its natural environment or produced by means of a technical process is patentable (if new and nonobvious), even if it previously occurred in nature. However, discussions about patentability of biotechnological inventions are far from being settled, which is illustrated by the controversy about patenting of stem cell inventions and the fact that leading EU countries such as Germany and France have so far failed to implement the EU Directive on the Patenting of Biotechnological Inventions.

Patent laws of many non-European countries contain similar patentability requirements and exclusions from patentability as the EPC. Some countries offer a "grace period" for publications of the inventors. This means that a publication of the inventor(s) or derived from the inventor(s) will not be regarded as prior art, if the first filing date or the filing date in that particular country is not later than a specified period of months, usually 6 or 12 months, after

the first publication date. An inventor publishing his invention in a scientific journal or presenting the subject matter at a public seminar still can file a patent application in these countries. It must, however, be taken into account that under the EPC no valid patent can be granted for European countries if the first filing date is after the publication date!

#### Patents in the US

Whereas the rest of the world uses the "first-to file" system, in which the date of the first patent filing (the priority date) is important, the USA adheres to the "first-to-invent" system [12]. Here the critical date is the date of invention, and if two inventors independently make the same invention, the patent goes to the one who can prove the earlier invention date in a complex process called "interference". Accordingly, for a US patent, prior art is what was known before the invention date, rather than before the filing date, but with the proviso that if there has been a publication of the invention, the US patent must be applied for within 12 months of the publication date, corresponding to the so-called "grace period" explained above. Furthermore the law in the US does not take into account if an invention is used outside the United States at any time before filing a patent application in the US. Printed publications from anywhere in the world, however, are invalidating a patent as in other constituencies. US law requires that the invention should be "useful", which to some extent corresponds to the industrial applicability requirement under the EPC, but represents a higher hurdle for patentability. In the US, unlike under the EPC, methods of medical and surgical treatment, business methods, and computer programs are patentable.

#### **Trademarks**

A trademark is used to identify a product or service and to indicate the source. It serves to differentiate a product or service of one company from same or similar products or services of other companies. Trademarks allow consumers to select products and services from companies they know and trust. Trademarks are exclusive rights granted by the state and limited to the territory of that

state. Again it is not possible to have one registration for a trademark for the whole world, but through registration in each country, or group of countries such as the European Union. The term of a trademark right is generally ten years and renewable indefinitely.

Trademarks are usually words (brands, names), combinations of letters and/or numerals, but they can also be signs, symbols, and even colours, shapes, smells and sounds. When registering, classes of application (groups of goods or services) have to be designated for which a registration is sought.

There is no "novelty requirement", but a trademark is registered in the name of an applicant only if there are no conflicting older trademark rights, i.e. trademarks that are identical or confusingly similar and registered by others before the registration date, or in use by others and widely accepted, or famous trademarks. Trademarks are examined with respect to whether they do not monopolize words of general usage and whether they do not conflict (being identical or confusingly similar) with earlier trademarks.

The Paris Convention and the TRIPs Agreement mentioned above also apply to trademarks. The Paris Convention provides that a priority of a trademark registration in one country is accepted in all other countries within 6 months. The Trademark Law Treaty [13] harmonizes formal aspects of trademark applications and trademark registration. The Madrid Agreement concerning the International Registration of Marks and its Protocol allow a simplified registration procedure in Madrid Union member states based on registration in the home country [14]. The Nice Agreement concerns the International Classification of Goods and Services for the purpose of registration of trademarks [15].

Domain names are to some extent related to trademarks. For domain names, however, a first come first served principle applies, and they cannot be used to exclude others from using the name. Conflicts between trademark owners and domain name owners can often be solved by an efficient arbitration system offered by WIPO, but sometimes regular courts have to decide.

#### **Know-how**

Know-how can also be regarded as a special form of intellectual property. To keep know-how secret may be important to retain or gain an advantage vis-à-vis a competitor not disposing over similar knowledge. However, if the secret know-how is (intentionally or accidentally) made public or independently developed by somebody else, all the advantage of secret know-how is lost. For this reason a know-how owner should always make a learned decision whether to keep the know-how secret or to patent it. If it is patented, it cannot be kept secret, but the patent gives a right to exclude others from the use of the patented knowledge.

The TRIPs agreement discussed above also foresees that "undisclosed information" should be protected by law [16]. A special form of undisclosed information are clinical test data required by registration bodies as a condition for approving the marketing of pharmaceutical products. Such data shall be protected against disclosure, and steps taken to ensure that the data are protected against unfair commercial use. In practical terms this means that a competitor (e.g. a generic producer) is not allowed to make use of this information when trying to get marketing approval for a copy product, at least for a period of years. In Europe, registration exclusivity is 6 or 10 years depending on the country and the type of product, and 5 years in the US.

# Impact of patents and trademarks on the pharmaceutical industry

The rapid pace of modern developments is accentuating the significance of the drug trademark. In technical terms, the trademark of a respected company stands for quality. The drug trademark conveys to the authorities, doctors, pharmacists and patients a guarantee of safety and therapeutic efficacy for the whole product, and not just for the active substance, as is the case with generics. In commercial terms, it is useful for all parties – above all, patients – to sell a drug under a trade name, rather than using complicated chemical or generic denominations. With an easily memorized trademark and the associated quarantee of quality, the pharmaceutical

manufacturer is invoking the reputation of the company as a whole. Of course, defects must be avoided at all costs, to prevent fatal damage to the company's reputation. In economic terms, the trademark carries a high value-adding potential in the pharmaceutical market [17].

Strong worldwide patent protection is essential to support innovation in the pharmaceutical industry. The great majority of medicines would not have been developed or commercially introduced if patent protection had not been available. The huge cost of research and development for a new chemical entity or for a new indication of an existing pharmaceutical, and the relative ease of copying a medicinal product provide an explanation for the importance of patent protection for major pharmaceutical companies. For drugs introduced in the nineties of the last century, it is estimated that R&D costs are approximately USD 500 million per drug put on the market. And these figures are even higher today. On the other hand costs for demonstrating bioequivalence of a generic copy of a medicinal product is approximately USD 1 million [18].

Yet, the relevance of strong intellectual property protection goes far beyond major multinational pharmaceutical corporations. Guaranteeing the protection of intellectual property in research using the modern tools of molecular biology is essential for many start-up biotech companies to survive. Many of these firms do not yet have products for sale, and for them it is essential to protect their intellectual

property as the only real capital they have.

In the context of the controversy surrounding the international trade debate. there are a lot of myths surrounding the issue of patents. A first such myth is that patents create monopolies. In reality, patents offer protection only for a limited time. Due to the time required for market introduction, the actual exclusivity is limited to eight to ten years, in spite of a patent term of 20 years. In countries with patent term extension the exclusivity may last up to five years more. Furthermore, most new medicines protected by patents compete with similar products, both protected and offpatent. Competition is fierce in almost all therapeutic areas, and even new chemical entities which introduce a novel therapeutic concept are followed by competitor products within a short time period. A second myth is that patents are a significant factor in escalating health care costs. This argument ignores the fact that there is a clear and established link between patent protection and the rate of innovation, but no such link between the strength of intellectual property protection and price levels. Innovation has an impact on health care cost: Many pharmaceuticals shorten treatment and hospitalisation time and costs. On the other hand they improve treatment, prolong life, and thereby cause costs which we all think are justified by the results obtained.

Patents are a main driver for future pharmaceutical innovation which will help alleviation, early detection and prevention, and cure of disease.

- [1] A more comprehensive discussion of Intellectual Property for non-specialists may be found in Chimia 2000, 54. No. 5 (pages 272 –324)
- [2] See P.W. Grubb, Chimia 2000, 54, 274-277; P.W. Grubb, "Patents for Chemicals, Pharmaceuticals and Biotechnology", 3rd edition, Oxford University Press 1999, 4th edition expected in 2004.
- [3] http://www.wipo.int/treaties/en/ip/paris/index.html
- [4] http://www.wipo.int/pct/en/index.html
- http://www.wto.org/english/docs\_e/legal\_e/27-trips.doc or .pdf, see also http://www.wto.org/english/docs\_e/legal\_e/legal\_e.htm
- [6] http://www.wto.org/english/tratop\_e/trips\_e/t\_news\_e.htm
- [7] http://www.wipo.int/treaties/en/ip/plt/index.html
- [8] http://www.european-patent-office.org/legal/epc/index.html
- [9] http://www.european-patent-office.org/epo/members.htm
- [10] Articles 52 to 57 EPC
- [11] Rules 23b to 23e EPC
- [12] http://www.uspto.gov/web/patents/legis.htm, see in particular 35 USC § 100 to 103
- 13] http://www.wipo.int/treaties/en/ip/tlt/index.html
- [14] http://www.wipo.int/madrid/en/legal\_texts/index.html
- [15] http://www.wipo.int/treaties/en/classification/nice/index.html
- [16] Article 39 TRIPs
- 17] W. Haring, Chimia 2000, 54, 290-292
- [18] T.B. Cueni, Chimia 2000, 54, 318-320





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Agenda:

MedChemEurope.com

Registration:

ScientificUpdate.co.uk

Exhibition:

BioFine.uk.com









Name Austrian Chemical Society, Medicinal Chemistry Section

Mission

To foster medicinal chemistry in Austria by jointly organizing and hosting national and international summerschools, minisymposia and workshops together with the Austrian Pharmaceutical Society.

Founded Members Members Profile 1999 100

Trade and Industry: 27%
Research Institute and University: 46%

Others:

**Activities** 

Neue Werkstoffe – Neue Wirkstoffe, mini-symposium during the 10th Chemietage, September 2002, Innsbruck.

Summer School for Drug Design, September 2003, Vienna.

Joint Meeting on Medicinal Chemistry, Krakow 15-18 October

2003.

**Address** 

Postal: Telephone:

Name:

Fax:

Nibelungengasse 11/6, AT-1010 Vienna +43 1 587 42 49 or +43 1 587 39 80

27%

+43 1 587 89 66

President Section head Secretary

O.Univ. Prof. Dr. Ulrich Schubert

Dr. Peter Ettmayer Gabriela Ebner

**EFMC-Delegate** 

Dr. Peter Ettmayer

Address: Novartis Forschungsinstitut GmbH,

Brunner Strasse 59, AT-1235 Vienna

Email: peter.ettmayer@pharma.novartis.com



#### Medicinal and Bioorganic Chemistry Division of Royal Flemish Chemical Society (KVCV)

Name

2002 120 Founded Members

**Activities** 

Organisation of symposia and activities. Promotion of contacts between industry and academia. Promotion of contacts with other national and international organisations. Every 2 years the "Dr. Paul Janssen Price of Medicinal Chemistry"

Address

Postal: **KVCV** Secretariaat

Celestijnenlaan 200F 3001 Herverlee

+32 16 29 32 14 +32 16 22 68 92 info@kvcv.be http://www.kvcv.be

is awarded to an outstanding Ph.D. thesis in the field.

Tel: Fax: Email: Internet:

Tel:

Fax: Email:

Prof. Koen Augustyns Prof. Serge Van Calenbergh Dr. Peter Ten Holte

Prof Koen Augustyns University of Antwerp Campus Drie Eiken Laboratory of Medicinal Chemistry Universiteitsplein 1

B-2610 Antwerpen +32 3 820 27 03 +32 3 820 27 39 koen.augustyns@ua.ac.be

President Treasurer Secretary

**EFMC-Delegate** 

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#### Société Royale de Chimie (SRC), Medicinal Chemistry Division

Name

The Division of Medicinal Chemistry of the SRC provides a forum for scientists interested in medicinal chemistry and related areas in pharmaceutical research. The Division's activities intend to bring together its members and to foster contacts in a European context.

Mission

1973 179 **Founded** Members

The DMC organises annually a Symposium aimed at updating interested participants on particularly rapidly evolving areas of pharmaceutical research, by specialists in their respective field. The DMC confers, every 2 years, the "Paul Janssen Price" to acknowledge an outstanding Ph.D. thesis work.

**Activities** 

Postal (SRC): ULB, CP 160/07, Av. F. D. Roosevelt 50 BE-1050 Bruxelles

Tel· +32 2 650 52 08 Fax: +32 2 650 51 84 Internet: http://www.src.be Email: src@ulb.ac.be

Dr. Edmond Differding

Name: Dr. Benoît Kenda Address:

UCB Pharma, R & D Chemin du Foriest

BE-1420 Braine-l'Alleud

Tel: +32 2 386 24 15 Fax: +32 2 386 36 69 Fmail:

benoit.kenda@ucb-group.com

President

Address



Name Division of Organic, Bioorganic and Pharmaceutical Chemistry of the Czech Chemical Society

Mission The Division represents chemists of a wide range of professional interest in organic chemistry and related fields and organizes mee-

tings and lectures in Czech Republic.

Founded 1993 by reorganization from Division of Organic and

> Pharmaceutical Chemistry and Prague Division of Czech Chemical Society and organizers of microsymposia "Bio-organic Days".

723 of which 10 are members of the medicinal chemistry section

Trade and Industry: 20%

Research Institutes and Universities: 70% 10% Other:

**Activities** 

**Members** 

**Members Profile** 

Organization of annual national symposium "Advances in Organic, Bioorganic and Pharmaceutical Chemistry". Organization of annual microsymposium "Cukrblik" on

Carbohydrate Chemistry.

Organization of annual series of lectures "Publikum".

Providing informations for Czech organic, bioorganic and pharmaceutical Chemists, webpage: http://uoch.vscht.cz/orbifachos/ Cooperation in organization of Alfred Bader Prize competition for

young Czech organic and bioorganic chemists

Address

Postal: Assoc Prof Jaroslav Kvicala

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Institute of Chemical Technology in Prague,

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President Secretary

Assoc. Prof.Jaroslav Kvicala

Dr. Irena Valterova

Address:

**EFMC-Delegate** 

Name: Assoc. Prof. Věra Klimešová

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Hevrovského 1203

CZ-500 05 Hradec Králové

klimeso@faf.cuni.cz Email:



#### The Danish Society for Pharmacology and Toxicology

To advance the development of pharmacology, toxicology and

Mission medicinal chemistry.

338 members of which 86 are members of the medicinal chemistry section.

**Members** 

Name

Trade and Industry: Research Institute and University:

Fmail:

50% **Members Profile** 50%

5-10 yearly seminars on current topics in pharmacology, toxicology and medicinal chemistry 19 January 2005: Danish Pharmacology 2005, University of Southern Denmark, Odense.

**Activities** 

Postal: Att. Assoc. Prof. Søren K. Kjærgaard Address

Institut for Miljø- og Arbejdsmedicin,

Aarhus Universitet Vennelyst Bld. 6 DK-6000 Århus C

+45 89 42 61 74 Telephone: Fax: +45 89 42 61 99 http://www.dsft.dk Internet:

skk@mil.au.dk

Prof. Dr. Michael J. Mulvany Assoc. Prof. Dr. Søren K. Kiærgaard

Prof. Dr. Hans Bräuner-Osborne Name: Address: Department of Medicinal Chemistry

The Danish University of Pharmaceutical Sciences

Universitetsparken 2

DK-2100 Copenhagen Ø

Email: hbo@molpharm.net +45 3530 65 18 Telephone:

**President** Secretary



#### Name Société de Chimie Thérapeutique

Mission

To gather medicinal chemists in order to promote progress in Medicinal Chemistry by organizing meetings, distributing awards and grants, encouraging junior scientists and publishing medicinal chemistry journals or series.

Founded Members **Members Profile**  1966 302

Trade and Industry: 17% Research Institute: 8% 70% University: 5% Other:

**Activities** 

Meetings and conferences:

Annual Meeting: Rencontres internationales de Chimie

Thérapeutique (Next meeting: Paris, July 5-8, 2005).

Nouvelles stratégies de recherches en chimie thérapeutique, Paris, Dec. 9, 2004.

Conferences organised with Société française de Chimie and Académie Nationale de Pharmacie, Paris, March 2005.

Junior scientists meeting, Paris, January 2005.

General Assembly, Paris, December 9, 2004.

Parma Sci Fair, Theme Anticancer agents, Nice, June 17, 2005. Awards:

Every two-year: \*Prix Charles Mentzer, rewarding a fruitful career in Medicinal Chemistry.

Every year: \*Prix d'encouragement à la recherche en Chimie Thérapeutique, for junior scientists.

Paul Ehrlich Lecture, attributed every year during the annual meeting. Prix de la vocation en Chimie Thérapeutique, attributed to students during the annual meeting.

Publishing activities:

Scientific editing of The European Journal of Medicinal Chemistry, Elsevier, 1 issue per month (2004 Volume 39).

Actualités de Chimie Thérapeutique, 1 volume per year (2004 n° 30).

Address

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> FR-92296 Chatenay-Malabry cedex +33 1 46 83 56 84 - Fax:+33 1 46 83 53 23

Internet: http://www.sct.asso.fr

Email: Joelle.Mayrarque@cep.psud.fr

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Email:

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Address: Faculté de Médecine et de Pharmacie, 22, boulevard Gambetta ,FR-76183, Rouen cedex 1

Olivier.Lafont@univ-rouen.fr



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#### Division of Medicinal Chemistry of the German Chemical Society

Name

(GDCh)

To foster the whole area of Medicinal Chemistry in University and Pharmaceutical Industry. The Division builds an interdisciplinary bridge between Chemistry, Biology, Medicine and Pharmacy.

Mission

1971 at Karlsruhe, Germany

Founded

Trade and Industry:
Research Institute and University:

Members
Members Profile

Research Institute and University:
Other:

35% 5%

700

60%

Annual meetings, interdisciplinary symposia, scientific publications, award.

Activities

Postal:

Varrentrappstr. 40-42 D-60486 Frankfurt am Main

Telephone:

+49 69 7917 363 +49 69 7917 450

Fax: Internet: Email:

www.medchem.de U.Bechler@gdch.de

Dr. Ulrich Stilz

Name:

Prof. Dr. Gerd Schnorrenberg

Address:

Boehringer Ingelheim Pharma GmbH & Co. KG Chemische Forschung

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Telephone:

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Email:

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Address

**President** 



Name **Hellenic Society of Medicinal Chemistry** 

Mission Advancement of research in Medicinal Chemistry and Drug

Design, promotion of cooperation between scientists of related

fields and consulting on relevant subjects.

Founded Members

1980 107

**Members Profile** Trade and Industry: 20%

Research Institute: 30% 40% University: Other: 10%

Activities Symposia, seminars, consulting.

Address

Postal.

Koryzi 6, Athens GR-117 43

Internet:

http://amorgos.pharm.auth.gr/HelSocMedChem/home.html

President Vice-President Secretary

Assoc. Prof. Dr. Anna Tsantili-Kakoulidou Assoc. Prof. Dr. Emmanuel Mikros Ass. Prof. Dr. Sotiris Nikolaropoulos

**EFMC-Delegate** 

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School of Pharmacy, Univ. of Thessaloniki,

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panoskur@pharm.auth.gr



# Organic and Medicinal Chemistry Division (OMCD) of the Hungarian Chemical Society (HCS)

Name

The dissemination of results and particularly of new trends in organic and medicinal chemistry among Hungarian scientists.

Mission

1907 (HCS)

10%

300 (Medicinal Chemistry oriented members of the OMCD)

Founded Members

Trade and Industry: 40%
Research Institute: 20%
University: 30%

**Members Profile** 

Regular organisation of conferences, seminars and lectures in various fields of medicinal chemistry.

Encouragement and initiating the development of new generations of scientists working in this field.

Bimonthly seminars by invited scientists in the field of medicinal chemistry.

**Activities** 

Postal (HCS Headquarters):

HU-1027 Budapest, Fou. 68.

Telephone: Fax: +36 1 201 6883 +36 1 201 8056

Internet: Email:

Others:

www.mke.mtesz.hu mail.mke@mtesz.hu

Prof. Dr. Péter Mátyus Dr. János Wölfling

Name: Address:

Prof. Dr. Péter Mátyus Department of Organic Chemistry

Semmelweis University,

Budapest

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Tel: +36 1 2170851
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Email: matypet@szerves.sote.hu
Internet: http://clauder.sote.hu

**Address** 

President OMCD Secretary



#### Name Israel Association for Medicinal Chemistry

#### Mission

To organize and to foster the interaction between medicinal chemists in academia, industry and drug dispensing institutions, in an independent Association devoted to education, research and development of Medicinal Chemistry through meetings and workshops, and to represent the Association at the national level, at the EFMC, and at related international levels. IAMC is open for membership to molecular biologists, pharmacologists and pharmacists.

#### **Founded** Members **Members Profile**

1991 52

Trade and Industry: 55%

Research Institute and University: 40% Other: 5%

#### Activities

The Association holds symposia and annual scientific meetings. Promotion of one-day symposia on new vistas in drug research and a workshop on progress in instrumental drug analysis, and representation of the Association at the EFMC and related international bodies. The past annual meeting was held at Kfar Hamaccabiah, Ramat Gan, in March 2003. It was highly successful and lectures were delivered in selected topics such as "Molecular diagnosis of Prion diseases", "Computational Drug Design", Synthetic drug candidates", Animal models for drug development", "Cell therapy" and "Anticancer drugs".

#### Planned activities

November 2004 - workshop on Medicinal chemistry of phosphorus March 2005 - Annual Association meeting

May 2005 - workshop on Patents in Med. Chem.

#### **Address**

Department of Medicinal Chemistry and Postal:

Natural Products

School of Pharmacy – Faculty of Medicine

Hebrew University of Jerusalem

Jerusalem IL-91120 +972 2675 75 73 +972 2675 89 59 adomb@md.huji.ac.il

PO Box 12065

Fmail: Prof. Abraham J. Domb

#### President Secretary

Dr. Jeffrey Sterling

Telephone:

Fax:

Email:

#### **EFMC-Delegate**

Name: Prof. Abraham J. Domb Address:

Hebrew University of Jerusalem

PO Box 12065. Jerusalem IL-91120 adomb@md.huji.ac.il



#### Section for Medicinal Chemistry, Israel Chemical Society

Name

As a Section of the Israel Chemical Society (ICS), its missions are to recruit medicinal chemists and pharmaceutical chemists living in Israel and interested foreign residents, to enhance the science of Medicinal Chemistry, to represent its members in organizations at the national and international levels, including EFMC, to cultivate the teaching of Medicinal Chemistry, to initiate, organize and sponsor scientific meetings.

Mission

1079

		570
		50
Trade and Industry:	ī	50%
Research Institute:		10%
University:	3	30%
Other:	•	10%

Founded Members Members Profile

The past annual meeting of the ICS-Section on Medicinal Chemistry was held at the Convention Center, Dan Panorma Hotel, Tel Aviv, in February 2003, attracting a great audience, and lectures were delivered in selected topics such as "Molecular Recognition – The basis for Drug Design", "Discovery of peptido- and proteino-mimetic drug leads using cyclic peptide spatial libraries", "Finding many needs in the haystack of chemistry" and "Peptide pharmaceuticals and the trends in the pharmaceutical market".

**Activities** 

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Telephone: +972 8 646 11 96

Fax: +972 8 667 29 43
Internet: http://www.technion.ac.il/technion/chemistry/ICS

http://www.weizmann.ac.il/ICS

Email: ashani@bgumail.bgu.ac.il

Prof. Shammai Speiser Prof. Dr. Haim Cohen President Secretary

Name: Prof. Dr. Israel Agranat, Address: Department of Organic Chemistry

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Fax: + 972 2 651 19 07
Email: isria@vms.huji.ac.il

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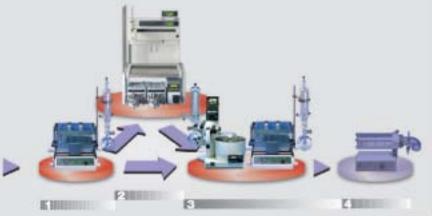
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Name Division of Medicinal Chemistry

of the Italian Chemical Society (Società Chimica Italiana)

Mission The Division of Medicinal Chemistry is a section of the Italian

Chemical Society (a non-profit association with about 6,000 adhering members), which has the aim to diffuse the knowledge

of chemistry and medicinal chemistry in particular.

Members 644

Members Profile Trade and Industry: 13%

Research Institute: 0,5% University: 86% Other: 0,5%

**Activities** Promotion and stimulation of the development of research and

training in medicinal chemistry. Organisation of national and international symposia and meetings. Organisation of advanced schools in medicinal chemistry, analytical chemistry and organic

synthesis in medicinal chemistry.

Address Postal: Divisione di Chimica Farmaceutica (S.C.I.)

c/o Dipartimento di Scienze Farmaceutiche

Università degli Studi di Catania Viale A. Doria, 6 – Città Universitaria

IT-95125 Catania

Email: giuseppe.ronsisvalle@unict.it

President Prof. Dr. Giuseppe Ronsisvalle Prof. Dr. Alba Chimirri

Secretary Prof. Dr. Antonello Mai

**EFMC-Delegate** Name: Prof. Dr. Giuseppe Ronsisvalle

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IT-95125 Catania

Email: giuseppe.ronsisvalle@unict.it



#### Latvian Association for Medicinal Chemistry Name

Promotion of medicinal chemistry

Mission

1992

83%

17%

Founded Members

Research Institute and University:
Other:

**Members Profile** 

Promotion of medicinal chemistry

**Activities** 

Postal: Latvian University,

Institute of Microbiology and Biotechnology

4-402 Kronvalda Boulevard

LV-1586 Riga

Telephone: +371 7034890
Fax: +371 7323065
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Dr. Ilmara Vina

Name: Prof. Dr. Gunars Duburs Address: Latvian Institut of Organic Synthesis

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 Telephone:
 +371 7551232

 Fax:
 +371 7550338

 Email:
 gduburs@osi.lv

Address

President



Name Medicinal Chemistry Section of the Polish Chemical Society

Mission

Basis for mutual contacts and integration for scientists who represent different profile of their activity in the following areas: organic and bioorganic synthesis, analytical chemistry, computational chemistry, biochemistry, molecular biology, biotechnology, pharmacy and medicine.

Founded Members 1975 100

Activities

Organization of bimonthly as well occasional gatherings where various theoretical and practical topics of drug research and development are discussed.

Organization of experts groups in the field of medicinal chemistry and drug development.

Participation in organization of national and international conferences on medicinal chemistry.

Organization of the Medicinal Chemistry Section during yearly meetings of the Polish Chemical Society.

Address

Postal: **Technical University** 

Institute of General and Ecological Chemistry

Zeromskiego 116 90-024 Łódź

Poland

Telephone: +48 42 631 31 22 Fax: +48 42 631 31 28 Email: jkarolak@mail.p.lodz.pl

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Ass. Prof. Dariusz Matosiuk

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**EFMC-Delegate** 

Name: Prof. Katarzyna Kieć-Kononowicz

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Medyczna 9 30 688 Kraków

Email: mfkonono@cyf-kr.edu.pl



#### The D.I. Mendeleev Russian Chemical Society, Medicinal Chemistry Section

Name

Education in medicinal chemistry. Organisation of regular scientific seminars.

Mission

2000 150 Founded Members

67% 26% 7% **Members Profile** 

Organising regular and specific seminars in medicinal chemistry. Assisting in the organisation of regular courses for undergraduate students of Moscow State University in medicinal chemistry. Providing interaction between Russian academician research in the field of medicinal chemistry and industrial institutions.

Activities

Postal:

Research Institute:

University:

Other:

Attention Prof. Dr. Zefirov N.

Chem. Department, Organic Chair Moscow State University

RU-119899, Moscow + 7 095 939 1620

+ 7 095 135 5228

Telephone: Fax:

> Prof. Dr. Nikolai S. Zefirov Prof. Dr. Sergey O. Bachurin

Prof. Dr. Alexey N. Zefirov

Name: Address: Prof. Dr. Nikolai S. Zefirov Chem. Department, Organic Chair

Moscow State University
RU-119899 Moscow

Email:

zefirov@org.chem.msu.ru

Address

President Vice-President

Secretary



Name

Section for Medicinal Chemistry of the Slovenian **Pharmaceutical Society** 

Mission

The mission of the Section for Medicinal Chemistry of the Slovenian society is the advancement and promotion of medicinal chemistry in Slovenia and Europe. It will pursue its mission by organizing scientific meetings, schools and working-group in order to encourage discussions and exchange of ideas in the field of medicinal chemistry. This section will cooperate with similar associations in the country and abroad.

**Founded** Members

23 February 2004 21

**Members Profile** 

Trade and Industry: 20 % 15 % Research Institute: University: 60 % Others: 5 %

Address

Postal: University of Ljubljana, Faculty of Pharmacy

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Slovenia

+386 1 4769561 Telephone: Fax: +386 1 4258031

E-mail: danijel.kikelj@ffa.uni-lj.si www.farmacevtsko-drustvo.si Internet:

President

Dr. Lucija Peterlin Măsič

**EFMC-Delegate** 

Name: Prof Danijel Kikeli

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Telephone: +386 1 4769561 Fax: +386 1 4258031 E-mail: danijel.kikelj@ffa.uni-lj.si



#### Sociedad Española de Química Terapéutica

To assist in the development and improvement of research and training in the different areas of Medicinal Chemistry throughout Spain. Name Mission

1977 300 Founded Members

Trade and Industry: 25% Research Institute: 30% University: 35% Other: 10% **Members Profile** 

Supporting the participation of young researchers at meetings and other educational events.

Organising symposia on topics related with research and education towards the discovery of new drugs. Sponsoring the Spanish Society of Medicinal Chemistry Award.

Administrating five Awards addressed to young scientists to acknowledge outstanding research in the field of Medicinal Chemistry.

**Activities** 

Address

Postal: SEOT

> Juan de la Cierva, 3 ES-28006-Madrid +34 91 56 22 900 +34 91 56 44 853 seqt@iqm.csic.es

Telephone:

Fax:

Name:

Address:

Email: Internet: http://www.segt.org Dr. Ma José Camarasa Ríus

President Vice-President

Dr. Jordi Quintana and Dr. Felipe Alcudia Dr. Rosario González-Muñiz

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Fmail:

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Secretary



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Timely Topic



#### Swedish Pharmaceutical Society, Section for Medicinal Chemistry

To strengthen the Medicinal Chemistry Discipline through the arrangement of conferences, seminars and other educational initiatives

25

Name

Mission

1972 F

70%

1%

19%

10%

Founded Members

**Activities** 

Trade and Industry:
Research Institute:
University:
Other:

**Members Profile** 

Anglo-Swedish Medicinal Chemistry Symposium Åre, March 2003, Medicinal Chemistry

Scheelesymposium

Stockholm, November 27<sup>th</sup> 2003, Combinatorial Chemistry Techniques in Medicinal Chemistry Success Stories in Medicinal Chemistry

Stockholm, September 27th 2004

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Dr. Anders Karlén Dr. Rolf Johansson Dr. Kostas Karabelas

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President Vice-President Secretary

**EFMC-Delegate** 

Name: Address:

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Dr. Anders Karlén Uppsala University,

Dept. Organic Pharmaceutical Chemistry, Box 574

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Email: anders.karlen@orgfarm.uu.se



Name Division for Medicinal Chemistry (DMC),

**Swiss Chemical Society (SCS)** 

Mission The DMC provides a forum for scientists interested in medicinal

chemistry and related fields by organising symposia, seminars,

presentations and courses.

Founded Members 1990 575

**Members Profile** Trade and Industry: 78%

Research Institute: 3% University: 11% Other: 8%

**Activities** 

July 1-4, 2003: 2nd French-Swiss Meeting MC, Beaune October 9, 2003: Fall Meeting of the SCS in Lausanne

May 13, 2004: Minisymposium on Research Concepts of Swiss

Startup Companies, Basel

October 7, 2004: Fall Meeting of the SCS at the Univ. of Zurich

October 10-15, 2004: 6th Swiss Course on MC, Leysin September 2005: Second Joint Italian – Swiss Meeting on

Medicinal Chemistry, Modena

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President

Secretary

Postal: Attention Dr. Wolfgang Froestl

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NOVARTIS Pharma AG is pleased to announce the 2003 recipient of the

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for his outstanding contribution to the fields of asymmetric photochemistry and catalysis

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2002 award winners:

Prof. Bernhard Breit, University of Freiburg
Prof. Thomas Carell, Philipps University, Marburg





Name

Section of Pharmacochemistry,

**Royal Netherlands Chemical Society (KNCV)** 

Mission

 to promote scientific research and education in the area of pharmacochemistry.

- to bring together scientists in the field and to offer them a platform for discussion and exchange of ideas.

- to identify talent in the field.

- to organize meetings in the field.

Founded Members

28th August 1970

450 (including student members)

**Members Profile** 

Trade and Industry: 20%
Research Institute: 10%
University: 40%
Other: 30%

Activities

Organisation of one annual scientific meeting (1 day).
Co-organisation of Dutch Medicine Days (FIGON) (2 days).
Co-organisation of annual NWO platform meeting (1 day).
Co-organisation of sessions at KNCV Winter/Summer Congress.
Participation in KNCV, NWO, FIGON and EFMC platforms.
Dutch Pharmacochemistry Award every 2 years for the best Dutch

Ph.D. thesis in the field.

Postal:

Address

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Organon International

Department of Medicinal Chemistry,

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Email: Marco.timmers@organon.com

President Vice-President Secretary

Prof. Dr. N.P.E. Vermeulen (Vrije Universiteit, Amsterdam)

Dr. D. Dijkstra (Rijksuniversiteit Groningen) Dr. C.M. Timmers (Organon International, Oss)

**EFMC-Delegate** 

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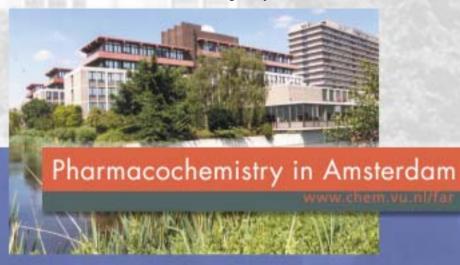
#### vrije Universiteit amsterdam

At the Vrije Universiteit the word "Pharmacochemistry" was invented and introduced in the 1960's. The department is now a partner of the Leiden Amsterdam Center for Drug Research (LACDR).

The LACDR took also the initiative for the European Consortium in Pharmaceutical Sciences (ULLA).

The department of pharmacochemistry offers masterprogrammes in different fields :

- drug design and synthesis
- computational medicinal chemistry and toxicology
  - drug discovery and target finding
    - drug disposition and safety
    - biomolecular and drug analysis



#### Current fields of research

- G-protein coupled receptors
- ligands for histamine and chemokine receptors
- cytochrome P450 structures
- activities and affinities
- bioactivation mechanisms and biomakers
- bio-analytical technologies

full professors:

Prof. dr. Hubertus Irth Prof. dr. Rob Leurs Prof. dr. Henk Timmerman Prof. dr. Nico Vermeulen



Name Turkish Association of Medicinal and Pharmaceutical Chemistry

Mission

Establish communication and cooperation between the members. Establish policies in medicinal chemistry teaching and research in the country.

Organize scientific meetings and conferences, get in touch with

international related bodies.

Founded Members

Activities

1994 100

**Members Profile** Academics:

Organizing meetings and conferences.

9-12 October 2004, International meeting (IMMPC-2)

100%

organised by the Association, Antalya.

Address

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**EFMC-Delegate** 

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#### The Biological and Medicinal Chemistry Sector (BMCS) of the Royal Society of Chemistry (RSC)

Name

The BMCS aims to further the interests of all members of the RSC, both industrial and academic, involved in the pursuit and understanding of biologically active molecules. It also acts to promote public awareness of the crucial role played by chemistry in the modern industrial environment Mission

1995 (Formerly Fine Chemicals & Medicinals Group) 1129 in total; 600 of which are medicinal chemists

Founded Members

Address

**President** 

Secretary

Predominantly industry

**Members Profile** 

Major Meetings scheduled for 2004-2005: 14 October 2004: Ion Channels in 21st Century, Harlow, UK 13-16th March 2005: 2nd Åre Anglo-Swedish Medicinal Chemistry Meeting, Åre, Sweden

**Activities** 

April 2005: 16th East of England Medicinal Chemistry Meeting, Hatfield, UK

9-10th May 2005: Protein Kinases; Signalling Success, London, UK 4-7th September 2005: 13th RSC-SCI Medicinal Chemistry Symposium, Cambridge, UK

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Email:

Royal Society of Chemistry

**Burlington House** 

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Piccadilly London UK-W1J 0BA

http://www.rsc.org/lap/rsccom/dab/ind009.htm Internet:

Dr. David Alker, (Pfizer Central Research, UK)

Dr. Karl Swift (Maybridge, UK)

Name: Dr. Derek R Buckle 18 Hillfield Road Address:

Redhill

Surrey, UK-RH1 4AP drbassociates@dsl.pipex.com



## Name Society for Medicines Research

Mission

A multidisciplinary society with the object of advancing science relating to all aspects of medicines research, providing a common meeting ground for all those interested or involved in such research, and to further the education of such persons.

Founded Members 1966 500-550

**Members Profile** 

Trade and Industry: 70%
Research Institute: 5%
University: 11%
Other: 4%

**Activities** 

The SMR organises four one-day scientific meetings per year in the UK. Examples of meeting topics: Improving medicines through drug delivery; The role of sodium channels in disease; Case histories in drug discovery; Trends in medicinal chemistry (More details are available on the SMR web site).

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Internet: www.smr.org.uk
Email: secretariat@smr.org.uk

Chairman Vice-Chairman

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**EFMC-Delegate** 

Name: Dr. Richard Armer

Address: Contact via the SMR Secretariat

Email: r.armer@oxagen.co.uk

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# **Directory of Companies**

An alphabetical list of pharmaceutical companies, as well as manufacturers and sppliers of products and services for medicinal chemistry in Europe



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# DRUG RESEARCH ACADEMY

An academic/industrial graduate School of Excellence established at THE DANISH UNIVERSITY OF PHARMACEUTICAL SCIENCES Copenhagen, Denmark

10 Danish established pharma companies including 3 biotech companies and the Danish Medicines Agency participate at this research training initiative during the period 2002–2009.

The graduate school, which is linked to a Marie Curie Training Site, is co-financed by

- . The Danish Ministry of Science and Technology.
- . The Danish Drug Company Association (UF)
- · The Danish Medicines Agency and
- . The Danish University of Pharmaceutical Sciences (DFU)

with a total budget of 95 mio. DKK (about 11 mio EURO).

In addition to a number of mini-symposia, lectures and study circles organised within the frame of Drug Research Academy, the budget covers a total of 41 Ph.D. grants and about 11 three-year post doc. grants. The Ph.D. projects and the post doc. positions are being announced internationally, reflecting the high international level of the activities at Drug Research Academy.

The research projects are focused around four strategic focus areas recently defined by DFU:

- Metabonomics
- Drug Delivery and Formulation Design
- Structure-Based Drug Research
- · Rational Pharmacotherapy.

The Ph.D. study programmes are characterized by

- · integrated drug research training
- · research at a drug company for at least 3 months
- participation at Ph.D. courses upon key elements of drug research
- main supervisor from the DFU and a co-supervisor from the external partners.

The Drug Research Academy Leadership:

- · Professor Sven Frøkjær, School Director
- · Professor Povl Krogsgaard-Larsen, Chairman of the Board
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- The 9-membered Board comprises 4 industrial research vice presidents.

For more information, please check www.dfuni.dk/dra





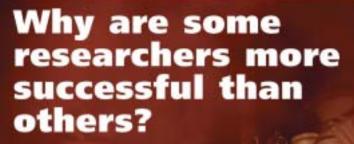




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