



December 1, 2005

As a result of the Human Genome Project, we now know that human DNA codes for approximately 20,000-25,000 genes, each of which could, potentially, be a target for the development of new medicines. However, most scientists believe that only about 10% of these genes are likely targets for the drugs of the future. Over 40% of the medicinal drugs in current use, many drugs of abuse and an estimated 20% of all future likely drug targets are members of three relatively small families of proteins: G Protein-coupled receptors (GPCRs), ion channels and nuclear hormone receptors.

The International Union of Basic and Clinical Pharmacology (IUPHAR) today announced the latest release of a major update to its receptor database <http://www.iuphar-db.org/>. The database contains information for 149 G protein-coupled receptors (GPCRs), encapsulating the conclusions of some 12 years of work by the ~50 subcommittees who contribute to the work of IUPHAR's Committee on Receptor Nomenclature and Drug Classification (NC-IUPHAR).

The Human Genome Project has sparked a huge effort by pharmaceutical and biotechnology companies worldwide to identify new drug targets, and much of this effort has focused on the GPCRs. As a result, our knowledge of this branch of science has advanced very rapidly, and it has been difficult for scientists engaged in research in the field and in the teaching of the science of drug action (Pharmacology) to keep pace with the information explosion. The goal of the IUPHAR database is to provide information on all (~360) of the GPCRs, with information on the drugs that act on them, the targets in the body where they are found and the diseases in which they may be involved. The data will be freely available on the internet in a format suitable for browsing with unsophisticated web browsers without requiring a fast connection. The information will therefore be accessible to students, academics, journalists and pharmaceutical companies in developing countries as well as to the wider international community and to those working from home. The data is continuously evolving as more receptor systems are completed. Linked classifications deal with voltage-gated ion channels, and a new classification of nuclear receptors will shortly be announced.

Examples of drugs that work through GPCRs and are amongst the top-selling prescription drugs worldwide include antiulcer agents (H_3 -receptor antagonists, such as cimetidine and ranitidine), agents for asthma (β -adrenoceptor agonists, salbutamol, salmeterol etc.) and chronic obstructive airways disease (tiotropium etc.) Agents for cardiovascular therapy (e.g. antihypertensives, angiotensin antagonists, and β -adrenoceptor antagonists) interact with GPCRs.

The database is hosted in the University of Edinburgh, where a team directed by Professor Tony Harmar (Head of the School of Biomedical Sciences) assemble information gathered from over 300 scientists worldwide by the 17 international experts who are members of NC-IUPHAR. The database is funded in part by the International Council for Science (ICSU), through generous financial support from UNESCO. Incyte Pharmaceuticals, Servier, GSK, and Wyeth have also provided essential funding.

Professor Michael Spedding, Chairman of NC-IUPHAR, commented "This database is already of great use, and will rapidly evolve to be a major knowledge base for students, health-workers, scientists of all classes and drug discoverers throughout the world. This knowledge is freely available to all scientists and has been collected by the voluntary efforts of committees of eminent scientists. It is thus a powerful tool for future research".

Professor Sue Piper Duckles, Secretary-General of IUPHAR, said "IUPHAR is proud to take a leadership position in organizing and supporting what has become a critical resource for international science. It is truly remarkable that so many leading scientists from around the world have voluntarily come together to work on this important project. The database currently being released represents an effort first started over 10 years ago, and we anticipate that this project will continue to produce ever more comprehensive syntheses of pharmacological information in support of the advancement of

biomedical research.”

About IUPHAR:

Founded in 1959 as a section of the International Union of Physiological Sciences, the International Union of Basic and Clinical Pharmacology (IUPHAR) has been independent since 1966. IUPHAR is a member of the International Council for Science (ICSU) and participates in the work of its scientific committees. It receives international recognition, particularly by the United Nations Educational, Scientific and Cultural Organization (UNESCO). IUPHAR is a non-governmental organisation (NGO) in official relations with the World Health Organisation (WHO). IUPHAR is a voluntary, non-profit association representing the interests of pharmacologists around the world. The main objectives of IUPHAR are to foster international cooperation in pharmacology by promoting cooperation between societies that represent pharmacology and related disciplines throughout the world; sponsoring international and regional congresses and meetings, and helping in their organisation by establishing advisory committees; encouraging international coordination and free exchange of scientists and of ideas in research, adhering to the ICSU Statute 6 concerning non-discrimination without regard to race, religion, political philosophy, ethnic origin, citizenship, language or gender; acting as a body through which pharmacologists can participate with other branches of science in international activities, either directly or under the aegis of international scientific bodies such as ICSU, WHO and UNESCO; helping in all ways the development of pharmacology throughout the world; promoting programmes of public awareness on pharmacological issues.

About NC-IUPHAR:

The mission for NC-IUPHAR was initiated in 1987 at the Xth International Congress of Pharmacology. In 1989, the Executive Committee of IUPHAR named Paul Vanhoutte (France) as chairman of a revised and enlarged committee. This committee energetically expanded its activities and the number of subcommittees (to 33), eventually producing the first official compendium on the occasion of the XIIIth International Congress of Pharmacology at Munich in 1998. Paul Vanhoutte was elected president of IUPHAR in 2002, and Robert Ruffolo (USA) was Chairman of NC-IUPHAR from 1998-2002 with Michael Spedding as Secretary, who became chairman from 2002. NC-IUPHAR has the mission of:

1. issuing guidelines for receptor and ion channel classification,
2. classifying the major receptor and ion channel systems,
3. introducing a Receptor Code to aid classification,
4. facilitating the interface between the discovery of new sequences from the Human Genome Project and the designation of the derived proteins as functional receptors and ion channels,
5. setting up a website with access to data on all known receptor systems, freely available to all scientists.

Chairman

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Richard W. Olsen, USA

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Honorary Members

Paul Vanhoutte (France), Sue Duckles (USA), Bob Ruffolo (USA)