Guide to Pharmacology

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A multifold increase in the number of drug targets in recent years and has led to the need for organizing them in a logical manner in terms of a standardized nomenclature, pharmacological properties and details of their ligands. Earlier initiatives aimed at categorization were met with the twin constraints of sheer volume and the rapidity with which new targets were being discovered. The introduction of searchable electronic databases revolutionized the process of classification and retrieval. Additionally, these databases which could be linked to other similar sources made the process of finding therapeutically useful targets more meaningful. One of the most authoritative initiatives was the Guide to Receptors and Channels (GRAC), distributed with the British Journal of Pharmacology, and produced in association with NC-IUPHAR, the Nomenclature Committees of the International Union of Basic and Clinical Pharmacology. The guide was first published in 2004 and is presently in its fifth edition.

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The Guide to Pharmacology (http://www.guidetopharmacology.org) is a website which was created in collaboration between The

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British Pharmacological Society (BPS) and the International Union of Basic and Clinical Pharmacology (IUPHAR). The website is envisioned as an authoritative source of information on drug targets, medicines and experimental drugs. It has been structured in order to eventually provide users with information gleaned from various sources and presented in a concise and uncomplicated format.

Two databases are represented, the GRAC database that provides a synopsis of the major properties of over 1600 established or potential pharmacological targets, chemical structure data and PubMed citations and theIUPHAR database that focusses on the G-protein-coupled receptors (GPCRs), ion channels and nuclear receptors. The databases are linked to each other and can be explored separately or as hyperlinked entities from the main page.

The best place to understand the intricacies of navigating this website is by going through the GRAC tutorial that succinctly depicts the structure and application of the databases. The content is subdivided into GPCRs, ion channels, nuclear receptors, catalytic receptors, transporters and enzymes. Each of these categories is linked to a receptor family page and each of these pages consists of an overview, list of receptors contained in the family, link to an NC-IUPHAR review article, link to the genome database provided by ensmbl.org and additional links for further reading and references. The page for individual receptors also contains similar detailed information and discrete links. Details of available ligands are listed with data on human proteins and any species variation is clearly mentioned. The ion channels are grouped according to the gating regulator and have similar detailed information.

Ligand lists from both the GRAC and IUPHAR databases are listed and searchable. These ligands have been divided into various categories: synthetic and small organics, natural products, peptides, inorganics and others. Individual ligands are listed on a separate page with a depiction of the structure and in the case of proteins links are provided to the HUGO Gene Nomenclature Committee database (www.genenames.org) or the Uniprot (www.uniprot.org) database for protein sequences and precursors. The biological activity of ligands is accessible with selectivity data from both the searchable databases. Selective agents and probes (radioligands and PET ligands) are tabulated within a family of targets and details on confounding factors especially species and ligand metabolism are included.

The search options are powerful and receptors can be searched by inputting free text, database identifier or a literature reference. The ligand name search is interesting and the search can also be initiated by drawing the chemical structure or by importing it via the Java-based SMARTS (Smiles Arbitrary Target Specification) application.

The main page of the website includes the latest news that further links to recent news on receptor-ligand pairing and newer topics in pharmacology. An RSS feed is available for cutting edge delivery of the latest information from a link on the home page.

The predominant theme of the website is simplicity in terms of easy retrieval and the provision of irrefutable information on pharmacological targets which hold the promise of being beneficial for new drug discovery. The website is an appropriate single access point for researchers and pharmacologists working toward new drug discovery and the basis of drug action.

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