

## Introduction to the *IUPHAR Compendium of Voltage-Gated Ion Channels 2005*

The voltage-gated ion channels and their structural relatives comprise a superfamily encoded by at least 143 genes in the human genome and are therefore one of the largest superfamilies of signal transduction proteins, following the G protein-coupled receptors and the protein kinases in number. In addition to their prominence in signal transduction, these ion channels are also among the most common drug targets. As for other large protein superfamilies, understanding the molecular relationships among family members, developing a unified, rational nomenclature for the ion channel families and subfamilies, and assigning physiological functions and pharmacological significance to each family member has been an important challenge. This task was undertaken by the Nomenclature Committee of the International Union of Pharmacology (IUPHAR) in 1999, and the *IUPHAR Compendium of Voltage-Gated Ion Channels 2002* was published 3 years later as a bound volume by IUPHAR Media. This work was completed by 57 contributors in 8 subcommittees that each focused on one ion channel family.

Since 2002, new members of the ion channel protein superfamily have been discovered, and much more has been learned about the previously known members. Therefore, we have expanded and updated the previous volume, which is published here as a series of 10 articles comprising the *IUPHAR Compendium of Voltage-Gated Ion Channels 2005*. The first article provides an overview of the molecular relationships, structure, and function, focusing on aspects that cut across most of the families in the ion channel superfamily. The nine articles that follow the overview begin with an introductory section that presents the currently accepted nomenclature for each family of ion channels, describes their molecular relationships, and summarizes the main aspects of their structure and function. The introductory section is followed by a series of tables that present molecular, genetic, anatomical, physiological, and pharmacological data for each family member. The editors and contributors to this revised and updated version of the ion channel compendium hope that the unified no-

menclatures for the ion channel families presented here will enhance and clarify communication among the many scientists in a broad range of disciplines who work on the ion channel proteins and will provide a valuable reference resource for the ion channel community.

Developing this compendium has required the coordinated efforts of many people. As Guest Editors for the compendium articles, we would like to acknowledge the essential contributions of the chairs of the subcommittees who organized their committee's efforts to develop the nomenclatures presented here and to gather and present the wealth of data on each channel. The subcommittee chairs appear as first authors on each article. We would like to thank all of the subcommittee members who contributed to nomenclature development, introductory text, and data tables in each article and who appear as coauthors. The nomenclatures for each channel family and the overall form and content of the compendium owe much to the wisdom and input of the Nomenclature Committee of IUPHAR (see [www.iuphar.org/pdf/dir\\_18-19\\_nciuphar.pdf](http://www.iuphar.org/pdf/dir_18-19_nciuphar.pdf) for complete committee membership) and to the committee chair, Dr. Michael Spedding (Institut de Recherches Internationales Servier, Neuilly-sur-Seine, France). Finally, we would like to acknowledge the crucial contributions at both administrative and scientific levels provided by Dr. Sue Duckles (Secretary-General of IUPHAR; Department of Pharmacology, University of California, Irvine, Irvine, CA), her assistant Lindsay Hart, and Dr. Darrell Abernethy (Editor of *Pharmacological Reviews*; Gerontology Research Center, National Institute on Aging, National Institutes of Health, Baltimore, MD).

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