

# PHARMACOLOGICAL REVIEWS

A Publication of the American Society for Pharmacology and Experimental Therapeutics

January 2013

Volume 65, Number 1

## Review Articles

- A Modern Understanding of the Traditional and Nontraditional Biological Functions of Angiotensin-Converting Enzyme 1  
*Kenneth E. Bernstein, Frank S. Ong, Wendell-Lamar B. Blackwell, Kandarp H. Shah, Jorge F. Giani, Romer A. Gonzalez-Villalobos, Xiao Z. Shen, and Sebastien Fuchs*
- CC Chemokine Receptors and Chronic Inflammation—Therapeutic Opportunities and Pharmacological Challenges 47  
*Gemma E. White, Asif J. Iqbal, and David R. Greaves*
- Homeoprotein Signaling in Development, Health, and Disease: A Shaking of Dogmas Offers Challenges and Promises from Bench to Bed 90  
*Julien Spatazza, Elizabeth Di Lullo, Alain Joliot, Edmond Dupont, Kenneth L. Moya, and Alain Prochiantz*
- Therapeutic Potential of Mood Stabilizers Lithium and Valproic Acid: Beyond Bipolar Disorder 105  
*Chi-Tso Chiu, Zhifei Wang, Joshua G. Hunsberger, and De-Maw Chuang*
- The Flinders Sensitive Line Rat Model of Depression—25 Years and Still Producing 143  
*David H. Overstreet and Gregers Wegener*
- Integrating Optogenetic and Pharmacological Approaches to Study Neural Circuit Function: Current Applications and Future Directions 156  
*Garret D. Stuber and Alex O. Mason*
- The Pharmacology of L-DOPA-Induced Dyskinesia in Parkinson's Disease 171  
*Philippe Huot, Tom H. Johnston, James B. Koprach, Susan H. Fox, and Jonathan M. Brotchie*
- Regulation of  $\mu$ -Opioid Receptors: Desensitization, Phosphorylation, Internalization, and Tolerance 223  
*John T. Williams, Susan L. Ingram, Graeme Henderson, Charles Chavkin, Mark von Zastrow, Stefan Schulz, Thomas Koch, Christopher J. Evans, and MacDonald J. Christie*
- Individual Differences and Social Influences on the Neurobehavioral Pharmacology of Abused Drugs 255  
*M. T. Bardo, J. L. Neisewander, and T. H. Kelly*
- Targeted Drug Delivery to Treat Pain and Cerebral Hypoxia 291  
*Patrick T. Ronaldson and Thomas P. Davis*
- Strategies to Address Low Drug Solubility in Discovery and Development 315  
*Hywel D. Williams, Natalie L. Trevaskis, Susan A. Charman, Ravi M. Shanker, William N. Charman, Colin W. Pouton, and Christopher J. H. Porter*
- IUPHAR Nomenclature Report**
- International Union of Pharmacology. LXXXVII. Complement Peptide C5a, C4a, and C3a Receptors 500  
*Andreas Klos, Elisabeth Wende, Kathryn J. Wareham, and Peter N. Monk*
- Erratum** 544

*About the cover:* Pairings between individual chemokine receptors and their chemokine ligands. Please see article by White et al. on page 47 of this issue.