

MOLECULAR PHARMACOLOGY

April 2009

Volume 75

Number 4

<http://molpharm.aspetjournals.org>

ISSN 0026-895X


MINIREVIEW

- Fluorescent and Bioluminescent Protein-Fragment Complementation Assays in the Study of G Protein-Coupled Receptor Oligomerization and Signaling
Pierre-Alexandre Vidi and Val J. Watts 733


PERSPECTIVE

- PAQRs: A Counteracting Force to Ceramides? 
William L. Holland and Philipp E. Scherer 740

ACCELERATED COMMUNICATION

-  Long-Term Morphine Treatment Decreases the Association of μ -Opioid Receptor (MOR1) mRNA with Polysomes through miRNA23b
Qifang Wu, Lei Zhang, Ping-Yee Law, Li-Na Wei, and Horace H. Loh 744

ARTICLES

- Anterograde Trafficking of G Protein-Coupled Receptors: Function of the C-Terminal F(X)₆LL Motif in Export from the Endoplasmic Reticulum
Matthew T. Duvernay, Chunmin Dong, Xiaoping Zhang, Fuguo Zhou, Charles D. Nichols, and Guangyu Wu 751
-  Engineering a Stable and Selective Peptide Blocker of the Kv1.3 Channel in T Lymphocytes
M. W. Pennington, C. Beeton, C. A. Galea, B. J. Smith, V. Chi, K. P. Monaghan, A. Garcia, S. Rangaraju, A. Giuffrida, D. Plank, G. Crossley, D. Nugent, I. Khaytin, Y. LeFievre, I. Peshenko, C. Dixon, S. Chauhan, A. Orzel, T. Inoue, X. Hu, R. V. Moore, R. S. Norton, and K. G. Chandy 762
- Activation of (Na⁺ + K⁺)-ATPase Modulates Cardiac L-Type Ca²⁺ Channel Function
Dong I. Lee, Michael G. Klein, Weizhong Zhu, Rui-Ping Xiao, Volodymyr Gerzanich, and Kai Y. Xu 774
- Bezafibrate at Clinically Relevant Doses Decreases Serum/Liver Triglycerides via Down-Regulation of Sterol Regulatory Element-Binding Protein-1c in Mice: A Novel Peroxisome Proliferator-Activated Receptor α -Independent Mechanism
Takero Nakajima, Naoki Tanaka, Hiroki Kanbe, Atsushi Hara, Yuji Kamijo, Xiaowei Zhang, Frank J. Gonzalez, and Toshifumi Aoyama 782

The  symbols in the table of contents identify articles discussed in the *Perspective*.

Molecular Pharmacology (ISSN 0026-895X) is published monthly (two volumes per year beginning in January and July) by the American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, MD 20814-3995; e-mail: subscriptions@aspet.org; web site: aspet.org. Periodicals postage paid at Bethesda, MD, and at additional mailing offices. POSTMASTER: Send address changes to *Molecular Pharmacology*, 9650 Rockville Pike, Bethesda, MD 20814-3995. Subscription rates: U.S.: \$686.00; outside the U.S.: \$778.00. Single copy: \$60.00. GST Tax Number for Canadian sub-

scribers: BN:13489 2330 RT. Indexed or abstracted by *Biochemistry & Biophysics Citation Index*[®], *Biological Abstracts*, *Current Awareness in Biological Sciences*, *Current Contents*[®]/*Life Sciences*, *EMBASE/Excerpta Medica*, *Index Medicus*, *Medical Documentation Service*[®], *Reference Update*[®], *Research Alert*[®], *Science Citation Index*[®], and *SciSearch*[®]. Copyright © 2009 by the American Society for Pharmacology and Experimental Therapeutics. All rights reserved. Printed in the U.S.A.

Alanine Scanning Mutagenesis of the Second Extracellular Loop of Type 1 Corticotropin-Releasing Factor Receptor Revealed Residues Critical for Peptide Binding <i>Kostas Gkountelias, Theodoros Tselios, Maria Venihaki, George Deraos, Iakovos Lazaridis, Olga Rassouli, Achille Gravanis, and George Liapakis</i>	793
The Sequence after the Signal Peptide of the G Protein-Coupled Endothelin B Receptor Is Required for Efficient Translocon Gating at the Endoplasmic Reticulum Membrane <i>Martina Alken, Antje Schmidt, Claudia Rutz, Jens Furkert, Gunnar Kleinau, Walter Rosenthal, and Ralf Schülein</i>	801
▣ A Small-Molecule Triptolide Suppresses Angiogenesis and Invasion of Human Anaplastic Thyroid Carcinoma Cells via Down-Regulation of the Nuclear Factor- κ B Pathway <i>Wenbo Zhu, Yanqiu Ou, Yan Li, Ru Xiao, Minfeng Shu, Yuehan Zhou, Jun Xie, Songmin He, Pengxin Qiu, and Guangmei Yan</i>	812
Nitrooleic Acid, an Endogenous Product of Nitritative Stress, Activates Nociceptive Sensory Nerves via the Direct Activation of TRPA1 <i>Thomas E. Taylor-Clark, Srinivas Ghatta, Weston Bettner, and Bradley J. Udem</i>	820
Capacitative Ca ²⁺ Entry via Orai1 and Stromal Interacting Molecule 1 (STIM1) Regulates Adenylyl Cyclase Type 8 <i>Agnes C. L. Martin, Debbie Willoughby, Antonio Ciruela, Laura-Jo Ayling, Mario Pagano, Sebastian Wachten, Anders Tengholm, and Dermot M. F. Cooper</i>	830
Calcium Signaling by Dopamine D5 Receptor and D5-D2 Receptor Hetero-Oligomers Occurs by a Mechanism Distinct from That for Dopamine D1-D2 Receptor Hetero-Oligomers <i>Christopher H. So, Vaneeta Verma, Mohammad Alijaniam, Regina Cheng, Asim J. Rashid, Brian F. O'Dowd, and Susan R. George</i>	843
The 27-kDa Heat Shock Protein Confers Cytoprotective Effects through a β 2-Adrenergic Receptor Agonist-Initiated Complex with β -Arrestin <i>Lalida Rojanathammanee, Erin B. Harmon, Laurel A. Grisanti, Piyarat Govitrapong, Manuchair Ebadi, Bryon D. Grove, Masaru Miyagi, and James E. Porter</i>	855
▣ Sphingolipids Function as Downstream Effectors of a Fungal PAQR <i>Nancy Y. Villa, Brian R. Kupchak, Ibon Garitaonandia, Jessica L. Smith, Emilio Alonso, Charlene Alford, L. Ashley Cowart, Yusuf A. Hannun, and Thomas J. Lyons</i>	866
▣ Intestinal Breast Cancer Resistance Protein (BCRP)/Bcrp1 and Multidrug Resistance Protein 3 (MRP3)/Mrp3 Are Involved in the Pharmacokinetics of Resveratrol <i>Koen van de Wetering, Alexander Burkon, Wouter Feddema, Alice Bot, Hugo de Jonge, Veronika Somoza, and Piet Borst</i>	876
Inactivation of Soluble Guanylate Cyclase by Stoichiometric S-Nitrosation <i>Bernd Mayer, Andrei L. Kleschyov, Heike Stessel, Michael Russwurm, Thomas Münzel, Doris Koelsing, and Kurt Schmidt</i>	886
Modulation of Excitatory Synaptic Transmission by Δ^9 -Tetrahydrocannabinol Switches from Agonist to Antagonist Depending on Firing Rate <i>Alan M. Roloff and Stanley A. Thayer</i>	892
An Acyl-Ghrelin-Specific Neutralizing Antibody Inhibits the Acute Ghrelin-Mediated Orexigenic Effects in Mice <i>Shu-Chen Lu, Jing Xu, Narumol Chinookoswong, Shuying Liu, Shirley Steavenson, Colin Gegg, David Brankow, Richard Lindberg, Murielle Véniant, and Wei Gu</i>	901
Direct Subunit-Dependent Multimodal 5-Hydroxytryptamine ₃ Receptor Antagonism by Methadone <i>Tarek Z. Deeb, Douglas Sharp, and Tim G. Hales</i>	908

Acetylcholine-Stimulated [³ H]GABA Release from Mouse Brain Synaptosomes is Modulated by $\alpha 4\beta 2$ and $\alpha 4\alpha 5\beta 2$ Nicotinic Receptor Subtypes <i>Tristan D. McClure-Begley, Nathan M. King, Allan C. Collins, Jerry A. Stitzel, Jeanne M. Wehner, and Christopher M. Butt</i>	918
☐ Intracellular Potassium Stabilizes Human <i>Ether-à-go-go</i> -Related Gene Channels for Export from Endoplasmic Reticulum <i>Lu Wang, Adrienne T. Dennis, Phan Trieu, Francois Charron, Natalie Ethier, Terence E. Hebert, Xiaoping Wan, and Eckhard Ficker</i>	927
Prominent Role of $\alpha 3/\alpha 6\beta 2^*$ nAChRs in Regulating Evoked Dopamine Release in Primate Putamen: Effect of Long-Term Nicotine Treatment <i>Xiomara A. Perez, Kathryn T. O'Leary, Neeraja Parameswaran, J. Michael McIntosh, and Maryka Quik</i>	938
Cross-Talk between Integrins and Oncogenes Modulates Chemosensitivity <i>Jordi Carreras Puigvert, Stephan Huveneers, Lisa Fredriksson, Marieke op het Veld, Bob van de Water, and Erik H. J. Danen</i>	947
Interaction of Cytochrome P450 3A4 and UDP-Glucuronosyltransferase 2B7: Evidence for Protein-Protein Association and Possible Involvement of CYP3A4 J-Helix in the Interaction <i>Shuso Takeda, Yuji Ishii, Megumi Iwanaga, Arief Nurrochmad, Yuji Ito, Peter I. Mackenzie, Kiyoshi Nagata, Yasushi Yamazoe, Kazuta Oguri, and Hideyuki Yamada</i>	956
A Cytochrome P450-Derived Epoxygenated Metabolite of Anandamide Is a Potent Cannabinoid Receptor 2-Selective Agonist <i>Natasha T. Snider, James A. Nast, Laura A. Tesmer, and Paul F. Hollenberg</i>	965
☐ Steroid Interaction with a Single Potentiating Site Is Sufficient to Modulate GABA-A Receptor Function <i>John R. Bracamontes and Joe Henry Steinbach</i>	973
Conformational Toggle Switches Implicated in Basal Constitutive and Agonist-Induced Activated States of 5-Hydroxytryptamine-4 Receptors <i>Lucie P. Pellissier, Jessica Sallander, Mercedes Campillo, Florence Gaven, Emilie Queffeulou, Marion Pillot, Aline Dumuis, Sylvie Claeysen, Joël Bockaert, and Leonardo Pardo</i>	982
Regulation of Group II Metabotropic Glutamate Receptors by G Protein-Coupled Receptor Kinases: mGlu2 Receptors Are Resistant to Homologous Desensitization <i>L. Iacovelli, G. Molinaro, G. Battaglia, M. Motolese, L. Di Menna, M. Alfiero, J. Blahos, F. Matrisciano, M. Corsi, C. Corti, V. Bruno, A. De Blasi, and F. Nicoletti</i>	991

☐ Supplemental material is available online at <http://molpharm.aspetjournals.org>.

About the cover: Combination of PCA and RET techniques. See the article by Vidi and Watts on page 733 of this issue.