

## Contents

## ANALGESICS

- Hemodynamic Effects of GI 87084B, an Ultra-Short Acting *Mu*-Opioid Analgesic, in Anesthetized Dogs Michael K. James, Alain Vuong, Mary K. Grizzle, Suzanne V. Schuster and Joel E. Shaffer 84
- Antinociceptive Actions of Spinal Nonsteroidal Anti-Inflammatory Agents on the Formalin Test in the Rat Annika B. Malmberg and Tony L. Yaksh 136
- Modulation of *Mu*-Mediated Antinociception in the Mouse Involves Opioid *Delta-2* Receptors F. Porreca, A. E. Takemori, M. Sultana, P. S. Portoghese, W. D. Bowen and H. I. Mosberg 147
- Involvement of Supraspinal  $\epsilon$  and  $\mu$  Opioid Receptors in Inhibition of the Tail-Flick Response Induced by Etorphine in the Mouse Jimmy Y. Xu, James M. Fujimoto and Leon F. Tseng 246
- Isobolographic and Dose-Response Analyses of the Interaction Between Intrathecal *Mu* and *Delta* Agonists: Effects of Naltrindole and Its Benzofuran Analog (NTB) Annika B. Malmberg and Tony L. Yaksh 264
- Chronic Cocaine Treatment Suppresses Basal Expression of *zif268* in Rat Forebrain: *In Situ* Hybridization Studies Ratan V. Bhat, Andrew J. Cole and Jay M. Baraban 343

## AUTONOMIC PHARMACOLOGY

- Nicotinic Receptor-Evoked Release of Acetylcholine and Somatostatin in the Myenteric Plexus is Coupled to Calcium Influx *via* N-Type Calcium Channels Toku Takahashi, Yasuhiro Tsunoda, Yuanxu Lu, John Wiley and Chung Owyang 1
- Serotonin-Induced Relaxation in Canine Coronary Artery Smooth Muscle Daniel J. Cushing and Marlene L. Cohen 123
- Characterization of [<sup>3</sup>H]YM617, *R*-(-)-5-[2-[[2]Ethoxyring(*n*)-<sup>3</sup>H] (*o*-ethoxyphenoxy)ethyl]amino]-propyl]-2-methoxybenzenesulfonamide HCl, a Potent and Selective *Alpha-1* Adrenoceptor Radioligand Hidenori Yazawa, Masahiro Takanashi, Katsumi Sudoh, Osamu Inagaki and Kazuo Honda 201
- Selective Inhibitory Effects of Calcium Channel Antagonists on the Two Components of the Neurogenic Response of Guinea Pig Vas Deferens Fumiaki Hata, Akikazu Fujita, Kazuko Saeki, Isao Kishi, Tadayoshi Takeuchi and Osamu Yagasaki 214
- Evidence that *S*-Nitrosothiols are Responsible for the Smooth Muscle Relaxing Activity of the Bovine Retractor Penis Inhibitory Factor Steven W. Kerr, Lewis V. Buchanan, Stuart Bunting and W. Rodney Mathews 285
- The Role of Adrenergic Receptors in the Initiation of Vomiting and Its Gastrointestinal Motor Correlates I. M. Lang and S. K. Sarna 395

## BEHAVIORAL PHARMACOLOGY

- The Discriminative Stimulus Effects of Clozapine in Pigeons: Involvement of 5-Hydroxytryptamine<sub>1C</sub> and 5-Hydroxytryptamine<sub>2</sub> Receptors Eric M. Hoenicke, Susan A. Vanecek and James H. Woods 276
- Tolerance and Cross-Tolerance to the Activating Effects of 3,4-Methylenedioxymethamphetamine and a 5-Hydroxytryptamine<sub>1B</sub> Agonist Clifton W. Callaway and Mark A. Geyer 318

## CARDIOVASCULAR PHARMACOLOGY

- Inhibition of Human Cardiac Cyclic AMP-Phosphodiesterases by R 80 122, a New Selective Cyclic AMP-Phosphodiesterase III Inhibitor: A Comparison with Other Cardiotonic Compounds Didier de Chaffoy de Courcelles, Katrien de Loore, Eddy Freyne and Paul A. J. Janssen 6

<b>Flavonoid Potentiation of Contractile Responses in Rat Blood Vessels</b>	Morris E. Berger, Michael S. Golub, Chwen-Tzuei Chang, Jawad A. Al-Kharouf, Michael D. Nyby, Mark Hori, Arnold S. Brickman and Michael L. Tuck	78
<b>Carvedilol, a New Vasodilator and <i>Beta</i> Adrenoceptor Antagonist, is an Antioxidant and Free Radical Scavenger</b>	Tian-Li Yue, Hung-Yuan Cheng, Paul G. Lysko, Patrick J. McKenna, Ron Feuerstein, Juan-Li Gu, Kathryn A. Lysko, Louisa L. Davis and Giora Feuerstein	92
<b>A Comparison of the Potency of Selective L-Calcium Channel Blockers in Human Coronary and Internal Mammary Arteries Exposed to Serotonin</b>	Théophile Godfraind, Chantal Dessy and Salvatore Salomone	112
<b>Aldose Reductase and Myo-Inositol in Endothelial Cell Dysfunction Caused by Elevated Glucose</b>	Belay Tesfamariam, Michael L. Brown and Richard A. Cohen	153
<b>Enhanced Blood Pressure and Renal Hemodynamic Effect of Chronic vs. Acute Lisinopril Administration in the Rabbit</b>	Ali F. Hajj-ali and Ben G. Zimmerman	158
<b>Cardiac Effects of 3,5-Diiodothyropropionic Acid, a Thyroid Hormone Analog with Inotropic Selectivity</b>	Gregory D. Pennock, Thomas E. Raya, Joseph J. Bahl, Steven Goldman and Eugene Morkin	163
<b>Methylene Blue Inhibits Nitrovasodilator- and Endothelium-Derived Relaxing Factor-Induced Cyclic GMP Accumulation in Cultured Pulmonary Arterial Smooth Muscle Cells <i>via</i> Generation of Superoxide Anion</b>	Nandor Marczin, Una S. Ryan and John D. Catravas	170
<b>CELLULAR AND MOLECULAR PHARMACOLOGY</b>		
<b>Effect of Ambasilide, a New Class III Agent, on Plateau Currents in Isolated Guinea Pig Ventricular Myocytes: Block of Delayed Outward Potassium Currents</b>	Zhi-Hao Zhang, Christopher H. Follmer, Jonnalagedda S. M. Sarma, Fuhua Chen and Bramah N. Singh	40
<b>Imipramine's Selective Suppression of an L-Type Calcium Channel in Neurons of Murine Dorsal Root Ganglia Involves G Proteins</b>	Jay J. Choi, Guo-Jie Huang, Elizabeth Shafik, Wen-Hsien Wu and Joseph J. McArdle	49
<b>Effects of <math>\beta</math>-Endorphin on <i>Mu</i> and <i>Delta</i> Opioid Receptor-Coupled G-Protein Activity: Low-<math>K_m</math> GTPase Studies</b>	Dana E. Selley and Jean M. Bidlack	99
<b>On the Mechanism of Papaverine Inhibition of the Voltage-Dependent <math>Ca^{++}</math> Current in Isolated Smooth Muscle Cells from the Guinea Pig Trachea</b>	Mari Iguchi, Toshiaki Nakajima, Tetsuya Hisada, Tsuneaki Sugimoto and Yoshihisa Kurachi	194
<b>Block of Voltage-Gated Potassium Currents by Anticonvulsant U-54494A in Mouse Neuroblastoma Cells</b>	Yu Zhu, Haesook K. Im and Wha Bin Im	207
<b>Specific Inhibition of Isoproterenol-Stimulated Cyclic AMP Accumulation by M2 Muscarinic Receptors in Rat Intestinal Smooth Muscle</b>	Michael T. Griffin and Frederick J. Ehler	221
<b>Characterization of [<math>^{125}</math>I]Acidic Fibroblast Growth Factor Binding to the Cloned Human Fibroblast Growth Factor Receptor, FGF-<i>flg</i>, on NIH 3T3 Cell Membranes: Inhibitory Effects of Heparin, Pertussis Toxin and Guanine Nucleotides</b>	Michael F. Jarvis, George W. Gessner, Gregory E. Martin, Michael Jaye, Mark W. Ravera and Craig A. Dionne	253
<b>Neuromedin B Binds with High Affinity, Elevates Cytosolic Calcium and Stimulates the Growth of Small-Cell Lung Cancer Cell Lines</b>	Terry W. Moody, Julie Staley, Farah Zia, David H. Coy and Robert T. Jensen	311
<b>CHEMOTHERAPY</b>		
<b>Tamoxifen-Resistant Human Breast Cancer Cell Growth: Inhibition by Thioridazine, Pimozide and the Calmodulin Antagonist, W-13</b>	Jeannine S. Strobl and Virginia A. Peterson	186
<b>DRUG METABOLISM AND DISPOSITION</b>		
<b>Effects of Intrauterine Position on the Hepatic Microsomal Polysubstrate Monooxygenase and Cytosolic Glutathione S-Transferase Activity, Plasma Sex Steroids and Relative Organ Weights in Adult Male and Female Long-Evans Rats</b>	Th. van der Hoeven, R. LeFevre and R. Mankes	32

<b>Dose-Dependent Toxicokinetics of L-689,502, a Potent Human Immunodeficiency Virus Protease Inhibitor, in Rats and Dogs</b>	Jiunn H. Lin, I-Wu Chen and Joyce King	105
<b>Suppression of Hepatic Drug Metabolism by the Interferon Inducer, Polyribinosinic Acid:Polyribocitidylic Acid</b>	Hironori Sakai, Toshihiro Okamoto and Yutaka Kikkawa	381
<b>ENDOCRINE PHARMACOLOGY</b>		
<b>A Mechanistic Study on Enhancement of Rectal Permeability to Insulin in the Albino Rabbit</b>	Akira Yamamoto, Eiji Hayakawa, Yasuki Kato, Akio Nishiura and Vincent H. L. Lee	25
<b>GASTROINTESTINAL PHARMACOLOGY</b>		
<b>Prejunctional Muscarinic Receptors in the Deep Muscular Plexus of Canine Ileum: Comparison with Smooth Muscle Receptors</b>	Peter Kostka, Sultan Ahmad, Chiu-Yin Kwan, Edwin E. Daniel, Richard K. Gordon and Peter K. Chiang	226
<b>Gastroprotective Effects of Thromboxane Receptor Antagonists</b>	Martin L. Ogletree, Eugene H. O'Keefe, Stephen K. Durham, Bernard Rubin and Gunnar Aberg	374
<b>NEUROPHARMACOLOGY</b>		
<b>Opioid Receptor Antagonists Discriminate between Presynaptic <i>Mu</i> and <i>Delta</i> Receptors and the Adenylate Cyclase-Coupled Opioid Receptor Complex in the Brain</b>	Anton N. M. Schoffelmeer, Taco J. De Vries, Francois Hogenboom, Victor J. Hruby, Philip S. Portoghese and Arie H. Mulder	20
<b>Release of Endogenous Norepinephrine from Rat Hypothalamus by Stimulation of N-Methyl-D-Aspartic Acid Receptors</b>	Patrizio Blandina, David Johnson, Janice Walcott and Joseph Goldfarb	61
<b>The Effect of the Atypical Antipsychotic Drug, Amperozide, on Carrier-Mediated Striatal Dopamine Release Measured <i>in Vivo</i></b>	Bryan K. Yamamoto and Herbert Y. Meltzer	180
<b>Lack of Tolerance and Physical Dependence upon Repeated Treatment with the Novel Hypnotic Zolpidem</b>	Ghislaine Perrault, Eliane Morel, David J. Sanger and Branimir Zivkovic	298
<b>S-[2-(4-Imidazolyl)ethyl]isothiourea, a Highly Specific and Potent Histamine H<sub>3</sub> Receptor Agonist</b>	M. Garbarg, J.-M. Arrang, A. Rouleau, X. Ligneau, M. Dam Trung Tuong, J. C. Schwartz and C. R. Ganellin	304
<b>N-Methyl-D-Aspartic Acid (NMDA) and Non-NMDA Receptors Regulating Hippocampal Norepinephrine Release. III. Changes in the NMDA Receptor Complex Induced by Their Functional Cooperation</b>	Anna Pittaluga and Maurizio Raiteri	327
<b>Comparison of 5-Hydroxytryptamine<sub>1A</sub>-Mediated Hyperpolarization in CA1 and CA3 Hippocampal Pyramidal Cells</b>	Sheryl G. Beck, Kue C. Choi and Troy J. List	350
<b>Regulation of Cholecystokinin mRNA Content in Rat Striatum: A Glutamatergic Hypothesis</b>	Xuan-Zhou Ding and Italo Mocchetti	368
<b>PHARMACOLOGY OF SUBSTANCE ABUSE</b>		
<b>Membrane Potential in Myenteric Neurons Associated with Tolerance and Dependence to Morphine</b>	Judith A. Leedham, Jian-Qiang Kong, David A. Taylor, Stephen M. Johnson and William W. Fleming	15
<b>Lipid Solubility of Sedative-Hypnotic Drugs Influences Hypothermic and Hypnotic Responses of Long-Sleep and Short-Sleep Mice</b>	Nancy Ellen C. de Fiebre, Rodney J. Marley, Jeanne M. Wehner and Allan C. Collins	232
<b>PULMONARY PHARMACOLOGY</b>		
<b>Pulmonary Accumulation of Propranolol <i>in Vivo</i>: Sites and Physicochemical Mechanism</b>	Ralph E. Howell and Paul N. Lanken	130
<b>RENAL PHARMACOLOGY</b>		
<b>Renal Organic Acid Transport: Uptake by Rat Kidney Slices of a Furan Dicarboxylic Acid Which Inhibits Plasma Protein Binding of Acidic Ligands in Uremia</b>	Simon J. Henderson and W. Edward Lindup	54

<b>Pharmacological Profile of HS-142-1, a Novel Nonpeptide Atrial Natriuretic Peptide (ANP) Antagonist of Microbial Origin. II. Restoration by HS-142-1 of ANP-Induced Inhibition of Aldosterone Production in Adrenal Glomerulosa Cells</b>	Shoji Oda, Tomoyuki Sano, Yoshikazu Morishita and Yuzuru Matsuda	241
<b>Gentamicin-Induced Hypercalciuria in the Rat: Assessment of Nephron Site Involved</b>	Hugh O. Garland, Donna J. Phipps and Ernest S. Harpur	293
<b>Effect of Thrombin on Proliferation, Contraction and Prostaglandin Production of Rat Glomerular Mesangial Cells in Culture</b>	Christine R. Albrightson, Ponnal Nambi, Bodgan Zabko-Potapovich, George Dytko and Todd Groom	404
<b>TOXICOLOGY</b>		
<b>Mechanism for the Hepatotoxicity of the Antiandrogen, Nilutamide. Evidence Suggesting that Redox Cycling of this Nitroaromatic Drug Leads to Oxidative Stress in Isolated Hepatocytes</b>	Daniel Fau, Alain Berson, Dominique Eugene, Bernard Fromenty, Cecile Fisch and Dominique Pessayre	69
<b><i>In Vitro</i> and <i>In Vivo</i> Biotransformation and Covalent Binding of Benzo(a)pyrene in Gunn and RHA Rats with a Genetic Deficiency in Bilirubin Uridine Diphosphate-Glucuronosyltransferase</b>	Zhuohan Hu and Peter G. Wells	334
<b>Human Anti-Cytochrome P450 Antibodies in Aromatic Anticonvulsant-Induced Hypersensitivity Reactions</b>	J. Steven Leeder, Robert J. Riley, Vicki A. Cook and Stephen P. Spielberg	360
<b>Ca<sup>++</sup>-Activated DNA Fragmentation and Dimethylnitrosamine-Induced Hepatic Necrosis: Effects of Ca<sup>++</sup>-Endonuclease and Poly(ADP-Ribose) Polymerase Inhibitors in Mice</b>	Sidhartha D. Ray, Christopher L. Sorge, Lisa M. Kamendulis and George B. Corcoran	387