

PURINERGIC
APPROACHES *in*
EXPERIMENTAL
THERAPEUTICS

edited by

KENNETH A. JACOBSON
MICHAEL E. JARVIS

Purinergic Approaches In Experimental Therapeutics

N. Tony Eissa, David P. Huston



Purinergic Approaches In Experimental Therapeutics:

Purinergic Approaches in Experimental Therapeutics Kenneth A. Jacobson, Michael F. Jarvis, 1997-07-15 Edited by Kenneth A Jacobson and Michael F Jarvis The roles of extracellular purines and pyrimidines in cellular homeostasis and disease etiology have come to be understood gradually over the past 40 years However due to the recent cloning and expression of receptors for ATP and adenosine novel compounds have been developed with unique therapeutic potential for the treatment of thrombosis stroke epilepsy chronic pain immunological disorders and cancer As a result the study of adenosine and ATP mediated responses in cellular regulation is entering a phase of opportunity and development unmatched since the days of serotonin receptor research in the 1970s The only definitive book on the topic *Purinergic Approaches in Experimental Therapeutics* covers all of the major therapeutic applications of purinergic receptors and reflects the very latest developments in this new area of therapeutic research Twenty eight chapters authored by an international group of contributors who are the leading authorities in the field provide details on molecular pharmacology medicinal chemistry and therapeutic implications including cardiology metabolism immunology neurology and cancer Among the topics covered Purinergic Neurotransmission and Neuromodulation A Historical Perspective Adenosine Receptor Subtypes New Insights from Cloning and Functional Studies Modulators of Adenosine Uptake Release and Inactivation Cardiac Electrophysiology of Adenosine Antiarrhythmic and Proarrhythmic Actions Purinergic Modulation of Gastrointestinal Function The Role of Adenosine in Asthma ATP in Brain Function ATP in the Treatment of Cancer For researchers in pharmacology physiology molecular biology and medicinal chemistry *Purinergic Approaches in Experimental Therapeutics* heralds an exciting new era in the understanding of purinergic neurotransmission and the development of novel therapeutic modalities

Drug Discovery Strategies and Methods Alexandros Makriyannis, Diane Biegel, 2003-11-04 Navigate the complex and multidisciplinary path of drug discovery procedures with *Drug Discovery Strategies and Methods* a well organized and timely reference that analyzes methods in target identification and validation lead detection compound optimization and biological testing This volume addresses challenges encountered during the discovery of new pharmaceutical candidates including the use of cutting edge techniques utilized in drug design and development It considers key elements in the drug design cycle ranging from appropriateness of targets and disease models to compound characterization safety and efficacy and the role of protein crystallography in structure based drug design *Purinergic and Pyrimidinergic Signalling* Maria P.

Abracchio, Michael Williams, 2001-02-12 Physiological pharmacological and molecular biological data generated over the past three decades have demonstrated the existence of two major families of extracellular receptors the P1 a family of four G protein coupled receptors and the P2 a family of at least 12 receptors responsive to purine ATP ADP and pyrimidine UTP nucleotides through which adenosine and ATP can function as extracellular messengers The present two part volume represents an integrated compendium of invited chapters by leading researchers in the area focusing on advances in the

understanding of purinergic and pyrimidinergic signaling systems their role s in tissue function and pathophysiology and advances in developing potential new medications based on the modulation of P1 and P2 receptor signaling processes The volumes will thus provide the reader with a topical comprehensive and integrated overview of this important area

Neuropsychopharmacology Kenneth L. Davis,American College of Neuropsychopharmacology,2002 Thoroughly updated and completely reorganized for a sharper clinical focus the Fifth Edition of this world renowned classic synthesizes the latest advances in basic neurobiology biological psychiatry and clinical neuropsychopharmacology The book establishes a critical bridge connecting new discoveries in molecular and cellular biology genetics and neuroimaging with the etiology diagnosis and treatment of all neuropsychiatric disorders Nine sections focus on specific groups of disorders covering clinical course genetics neurobiology neuroimaging and current and emerging therapeutics Four sections cover neurotransmitter and signal transduction emerging methods in molecular biology and genetics emerging imaging technologies and their psychiatric applications and drug discovery and evaluation Compatibility BlackBerry R OS 4 1 or Higher iPhone iPod Touch 2 0 or Higher Palm OS 3 5 or higher Palm Pre Classic Symbian S60 3rd edition Nokia Windows Mobile TM Pocket PC all versions Windows Mobile Smartphone Windows 98SE 2000 ME XP Vista Tablet PC Purinergic and Pyrimidinergic Signalling II Maria P. Abracchio,Michael Williams,2012-12-06 Physiological pharmacological and molecular biological data generated over the past three decades have demonstrated the existence of two major families of extracellular receptors the P1 a family of four G protein coupled receptors and the P2 a family of at least 12 receptors responsive to purine ATP ADP and pyrimidine UTP nucleotides through which adenosine and ATP can function as extracellular messengers The present two part volume represents an integrated compendium of invited chapters by leading researchers in the area focusing on advances in the understanding of purinergic and pyrimidinergic signaling systems their role s in tissue function and pathophysiology and advances in developing potential new medications based on the modulation of P1 and P2 receptor signaling processes The volumes will thus provide the reader with a topical comprehensive and integrated overview of this important area

Therapeutic Targets in Airway Inflammation N. Tony Eissa,David P. Huston,2003-05-13 This reference examines the cellular molecular and genetic mechanisms involved in airway inflammation as well as the pathophysiology epidemiology and aetiology of asthma It explores strategies to prevent cellular injury and oxidative tissue damage inhibit key inflammatory pathways and identify disease specific targets to reduce the induction **Purinergic Signalling and the Nervous System** Geoffrey Burnstock,Verkhatsky Alexei,2012-06-05 In the first 20 years that followed the purinergic signalling hypothesis in 1972 most scientists were sceptical about its validity largely because ATP was so well established as an intracellular molecule involved in cell biochemistry and it seemed unlikely that such a ubiquitous molecule would act as an extracellular signalling molecule However after the receptors for ATP and adenosine were cloned and characterized in the early 1990s and ATP was established as a synaptic transmitter in the brain and sympathetic ganglia the tide turned More recently it has

become clear that ATP is involved in long term trophic signalling in cell proliferation differentiation and death in development and regeneration as well as in short term signalling in neurotransmission and secretion Also important papers have been published showing the molecular structure of P2X receptors in primitive animals like Amoeba and Schistosoma as well as green algae This has led to the recognition of the widespread nature of the purinergic signalling system in most cell types and to a rapid expansion of the field including studies of the pathophysiology as well as physiology and exploration of the therapeutic potential of purinergic agents In two books Geoffrey Burnstock and Alexej Verkhratsky have aimed at drawing together the massive and diverse body of literature on purinergic signalling The topic of this first book is purinergic signalling in the peripheral and central nervous systems and in the individual senses In a second book the authors focus on purinergic signalling in non excitable cells including those of the airways kidney pancreas endocrine glands and blood vessels Diseases related to these systems are also considered *ATP-gated P2X receptors in health and disease* Andrea Nistri, Geoffrey Burnstock, Baljit S Khakh, Rashid Giniatullin, 2015-01-05 Extracellular ATP is currently recognized as one of the most widely distributed neurotransmitters and neuromodulators in the peripheral and central nervous system ATP gated P2X receptors are expressed by neurons glial and many other non neuronal cells and represent an attractive target for therapeutic interventions Diverse molecular and cellular mechanisms have been identified for P2X receptor functioning including the ability to enlarge the size of the ion pore associated with the release of several key immune molecules A major recent breakthrough was the determination of the X ray crystal structures of zebrafish P2X4 receptor in ATP bound and ATP free states The P2X receptor research field is rapidly growing as evidenced by the almost 2000 papers published in the last 5 years However despite the fundamental signalling function of extracellular ATP in the nervous system the widespread roles of P2X receptors have not been widely elucidated and presented in textbooks In this volume of papers we aim to gather a collection of high quality papers detailing the latest insights from the most accomplished international P2X receptor researchers Importantly basic research into P2X receptors has a strong translational impact and our collection of articles could be a valuable guide for the development of new pharmacological and biotechnological tools addressing the function of P2X receptors Within this collection we plan to cover receptor structure function relationships receptors trafficking to highlight the special properties of P2X receptors and their pharmacological profiles and to describe the translational aspects of cellular ATP signaling in pain and in other neurological and vascular diseases *Nucleotides and their Receptors in the Nervous System* P. Illes, H. Zimmermann, 1999-08-31 The study of purinergic mechanisms has for long been focused on the actions of the nucleoside adenosine whereby the contribution of nucleotides to the signaling systems has been underestimated Based on the proceedings of a IUPHAR Satellite Conference held in Leipzig Germany this book offers a comprehensive update and overview of nucleotide release the structure and function of nucleotide receptors nucleotide metabolizing ecto enzymes as well as the physiological functions of nucleotides in the nervous system The physiology and

molecular biology of receptors for ATP and other nucleotides are examined as are the physiology and molecular biology of enzymes that hydrolyze extracellular nucleotides At present a pharmacology of the nucleotide signaling system is being developed Of particular interest is the production of receptor subtype specific antagonists and of drugs that selectively affect the extracellular lifetime of the nucleotide An excellent source of reference for institutes of pharmacology biochemistry neurology zoology and physiology and for the pharmaceutical industry *Handbook of Neurochemistry and Molecular Neurobiology* Naren L. Banik, Swapan K. Ray, Abel Lajtha, 2009 Therapeutic approaches in spinal cord injury Cell death and tissue degeneration in traumatic brain injury neurotransmitters and electrophysiology in brain injury neurotransmitters and electrophysiology in brain injury Parkinsonism in the MPTP model EAE Demyelination EAE Neurodegeneration Cataract Uveitis Optic neuritis GBS peripheral neuropathy paraproteinemia Brain Tumor Tumor Mechanisma Brain Tumor and angiogenesis SCIDS Phenylketone urea and mental retardation Neurofibromatosis BBB Muscular dystrophy Stracher Diabetic neuropathy retinopathy cataract Peroxisomes and adrenoleukodystrophy ALD Neuroprotection NFkB Inflammation and spinal cord injury spinal cord injury and traumatic brain injury free radicals and neuroprotection Traumatic brain injury white matter degeneration Mitochondrial membrane defects Encephalomyopathies metal induced neurodegeneration neurometals in protein misfolding neurodegenerative diseases hyperammonemia kyneurenines in the brain preclinical and clinical studies therapeutic condiserations Epilepsy: A Comprehensive Textbook Jerome Engel Jr, Solomon L. Moshé, 2023-10-23 Authoritative and updated Epilepsy A Comprehensive Textbook 3rd Edition contains 365 chapters that cover the full spectrum of relevant topics in biology physiology and clinical information from molecular biology to public health concerns in developing countries Written by world renowned authorities and expertly edited by epileptologists Drs Jerome Engel Jr Solomon L Mosh Aristeia S Galanopoulou John M Stern Alexis Arzimanoglou Jacqueline A French Renzo Guerrini Andres M Kanner and Istvan Mody this three volume work includes detailed discussions of seizure types and epilepsy syndromes relationships between physiology and clinical events psychiatric and medical comorbidities conditions that could be mistaken for epilepsy and an increasing range of pharmacologic surgical and alternative therapies

Extracellular Nucleotides and Nucleosides: Release, Receptors, and Physiological & Pathophysiological Effects, 2003-09-10 Purinergic receptors are proteins that bind ATP as their extracellular ligand Once thought only as an intracellular molecule that provides energy ATP is also now considered an essential autocrine paracrine agonist that acts extracellularly within tissues and tissue microenvironments Receptors for ATP and its metabolites so called purinergic receptors are essential membrane receptors that transduce the extracellular signal carried by ATP Many cell types or tissues express multiple types of these receptors often on the same cell This volume will cover the history and overall impact of extracellular ATP signaling methods to detect ATP release and signaling the molecular and cell biology of purinergic receptors the pharmacology of purinergic receptors the ion channel biophysics and biochemistry of P2X purinergic receptor

channels and the physiology and pathophysiology of purinergic receptors Key Features Organized and written by world renowned experts Covers state of the art experimental methods Has broad appeal to basic and clinical scientists the biotech industry and pharmaceutical research companies

Glioma Signaling Jolanta Barańska, 2012-08-10 Glioma Signaling is a text reference on cellular signaling processes focused on the mechanism of nucleotide receptors activation by exogenic nucleotides and the formation of complex signaling cascades including cytoplasmic transcription factors induced by growth factors cytokines and cannabinoids The book provides a framework explaining how signal transduction elements may modulate glioma cytoskeleton structure cytoplasmic calcium concentration changes cellular growth progression and invasion as well as presents perspective concerning potential targets for glioma therapy

CNS Neuroprotection Frank W. Marcoux, Dennis W. Choi, 2013-11-11 CNS neuroprotection was a common subject of papers symposia and reviews during the previous decade of the brain Indeed in recent years experimental study of putative neuroprotective agents prompted clinical trials of numerous drug candidates in acute and chronic human neurodegenerative conditions While the outcomes of these trials have not been as successful as initially hoped these were early explorations and the pipeline of relevant ideas continues to grow in strength and depth We predict that early in this new millennium crippling disorders such as stroke and Alzheimer's disease will be treated effectively by therapeutic neuroprotective strategies This volume of the Handbook of Experimental Pharmacology titled eNS Neuroprotection provides a pharmacological perspective on currently promising neuroprotective approaches and a clinical perspective on the challenges involved in establishing the efficacy of these approaches through appropriate clinical trials Section I Mechanistic Approaches to CNS Neuroprotection reviews major injury mechanisms that have formed the basis for many past and present clinical trials conducted around the world Dr KIM and colleagues Washington University School of Medicine review the status of blocking excitotoxicity as an approach to CNS neuroprotection Dr WANG Pfizer Global Research and Development Ann Arbor Laboratories outlines evidence supporting a contribution of apoptosis to pathological neuronal or glial cell loss Drs BECKER and HALLENBECK University of Washington and the National Institute on Neurological Diseases and Stroke respectively argue that inhibiting inflammatory pathways in the brain can be neuroprotective Dr

Boron-Based Compounds Evamarie Hey-Hawkins, Clara Viñas Teixidor, 2018-07-23 Noted experts review the current status of boron containing drugs and materials for molecular medical diagnostics Boron Based Compounds offers a summary of the present status and promotes the further development of new boron containing drugs and advanced materials mostly boron clusters for molecular medical diagnostics The knowledge accumulated during the past decades on the chemistry and biology of bioorganic and organometallic boron compounds laid the foundation for the emergence of a new area of study and application of boron compounds as lipophilic pharmacophores and modulators of biologically active molecules This important text brings together in one comprehensive volume contributions from renowned experts in the field of medicinal chemistry of boron compounds The authors cover a range of the most relevant topics

including boron compounds as modulators of the bioactivity of biomolecules boron clusters as pharmacophores or for drug delivery boron compounds for boron neutron capture therapy BNCT and for diagnostics as well as in silico molecular modeling of boron and carborane containing compounds in drug design

Authoritative and accessible Boron Based Compounds Contains contributions from a panel of internationally renowned experts in the field Offers a concise summary of the current status of boron containing drugs and materials used for molecular diagnostics Highlights the range and capacity of boron based compounds in medical applications Includes information on boron neutron capture therapy and diagnostics Designed for academic and industrial scientists this important resource offers the cutting edge information needed to understand the current state of boron containing drugs and materials for molecular medical diagnostics *Annual Reports in Medicinal Chemistry* David Robertson, Jacob J. Plattner, William K. Hagmann, Winnie W. Wong, George L. Trainor, 1998-10-21

Annual Reports in Medicinal Chemistry provides timely and critical reviews of important topics in medicinal chemistry together with an emphasis on emerging topics in the biological sciences which are expected to provide the basis for entirely new future therapies **Current Pharmaceutical Design**, 1998-10 **Neuroprotective Agents and Cerebral Ischaemia**, 1996-11-26

Since 1959 *International Review of Neurobiology* has been a well known series appealing to neuroscientists clinicians psychologists physiologists and pharmacologists This important serial is now being combined with *Neuroscience Perspectives and Methods in Neurosciences* This combination results in a series that reaches a wider audience and publishes a greater number of thematic volumes Stroke is the third major cause of death in the western world and recent data provide hope that treatments may soon be available Written by world experts on the mechanisms involved in neurodegeneration **Neuroprotective Agents and Cerebral Ischaemia** presents an up to date review of current research and developing therapies This book is essential reading for all clinicians and researchers searching for neuroprotective drugs Describes the mechanisms involved in cell death and the biochemical changes occurring during an ischaemic episode Presents the different factors affecting the neurodegenerative process and how compounds acting on these systems may lead to novel neuroprotective agents Reviews in vitro and in vivo models of stroke and the activity of putative neuroprotective drugs Discusses the application of preclinical data to formulate approaches to a clinical problem Provides detailed reviews of both completed clinical trials and those currently underway *Adenosine Receptors in Health and Disease* Constance N. Wilson, S. Jamal Mustafa, 2009-07-28

Since their discovery approximately 25 years ago adenosine receptors have now emerged as important novel molecular targets in disease and drug discovery These proteins play important roles in the entire spectrum of disease from inflammation to immune suppression Because of their expression on a number of different cell types and in a number of different organ systems they play important roles in specific diseases including asthma rheumatoid arthritis Parkinson's disease multiple sclerosis Alzheimer's disease heart disease stroke cancer sepsis and obesity As a result of intense investigations into understanding the molecular structures and pharmacology of

these proteins new molecules have been synthesized that have high specificity for these proteins and are now entering clinical trials These molecules will define the next new classes of drugs for a number of diseases with unmet medical needs

Dopamine in the CNS II Gaetano Di Chiara, 2013-06-29 With contributions by numerous experts

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