

# Endogenous Sleep-Promoting Substances and Sleep Regulation

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## I. INTRODUCTION

The field of endogenous sleep-promoting substances has become increasingly popular in recent years, and various reviews (2, 29, 39, 73, 77, 82, 85, 128a, 145, 146, 151, 155, 157, 165, 166, 178, 186, 189, 201, 210, 234, 240, 277, 393, 394), two symposium volumes (148, 156), and a monograph (147a) have been published on this topic. However, because many of the reviews have focused on a specific class of substances, they did not offer an extensive overview of endogenous sleep-promoting substances. In the present review we attempt to provide this information. Moreover, by presenting the various approaches within the framework of physiological sleep regulation, we made an effort to transcend the purely descriptive level. Ultimately, endogenous sleep-promoting substances must be understood as chemical mediators of physiological processes. It is therefore important to analyze their effects from this vantage point. To provide the necessary background, the relevant recent developments in the physiology of sleep regulation are summarized in the next section. Even though a considerable body of data cannot yet be fitted into physiological categories, we are convinced that physiology must remain

# Endogenous Sleep Substances And Sleep Regulation

**RM Cervero**



## **Endogenous Sleep Substances And Sleep Regulation:**

*Biology of Sleep Substances* Shojiro Inoue, 2020-08-11 All aspects of sleep sciences are included in this excellent resource text with special reference to sleep substances and sleep modulators The historical development of the theories of sleep are reviewed in conjunction with the technical problems All candidate substances are overviewed as to their sites of presence chemical nature bioassay techniques physiological and pharmacological effects On the basis of a standardized methodology developed by the author sleep modulatory characteristics of some substances are compared and evaluated in quantitative terms The sleep regulatory mechanisms which are composed of complex neurohumoral subsystems are analyzed from the results of recent neurophysiological and neuroendocrinological experiments Furthermore an evolutionary aspect of sleep substances is taken into consideration Chapters Highlight Techniques for isolation and evaluation Prostaglandins Paradoxical sleep factors Sleep promoting substances and nucleosides [Endogenous Sleep Substances and Sleep Regulation](#) Shojiro Inoue, Alexander A. Borbély, 1985-12 This volume provides the first major overview by eminent authorities on the subject of recent developments in the field of endogenous substances and their regulation of sleep processes The first two sections discuss general aspects of sleep regulation including an historical overview the restorative and adaptive functions of sleep and evolutionary features The third section contains contributions focussing on circadian rhythms in relation to humoral factors hormones neurotransmitters and metabolism The sleep substances currently receiving most attention delta sleep inducing peptide DSIP muramyl peptides interleukin 1 sleep promoting substance SPS and prostaglandin D2 are extensively discussed Substances that may selectively modulate REM sleep are dealt with in the final section **Endogenous Sleep**

**Substances and Sleep Regulation** Shojiro Inoue, Alexander A. Borbély, 1985 *Molecular Regulation of Arousal States* Ralph Lydic, 2019-04-30 Arousal states are processes that include waking deep sleep and the dreaming phase of sleep REM Molecular Regulation of Arousal States explores the cellular and molecular mechanisms by which sleep and wakefulness are regulated and seeks explanations for the generation of arousal states It presents step by step research protocols that allow investigators to apply the techniques described to a wide range of physiological and behavioral research problems such as sleep neurobiology and state dependent disruption of cardiopulmonary control For the first time a single source integrates cellular and molecular research techniques with studies of arousal opening the door to exciting new research methodologies

**Neurochemistry of Sleep and Wakefulness** Jaime Monti, S. R. Pandi-Perumal, Christopher M. Sinton, 2008-01-17 Pharmacological approaches to our understanding of sleep have been at the forefront of sleep research for many years Traditional techniques have included the use of pharmacological agonists and antagonists as well as transmitter specific lesions These have been enhanced by the introduction of molecular genetics and the use of transgenes and targeted gene deletion Neurochemistry of Sleep and Wakefulness is an exceptional single source of information on the role of the major mammalian neurotransmitter systems involved in the regulation of sleep and waking With contributions from internationally

recognized experts this book clearly describes how researchers have made use of the myriad techniques in their armamentarium to characterize the role of a given neurotransmitter in the regulation of sleep and waking Suitable for experimental and clinical pharmacologists the book will have wider appeal to sleep researchers psychiatrists and any professional interested in the interdisciplinary areas of neurobiology and pharmacology The Pharmacology of Sleep Anthony Kales, 2012-12-06 The last four decades have witnessed considerable advances in our knowledge of the pharmacology of sleep Both basic and clinical pharmacology have made major contributions toward our current understanding of the complex mechanisms of sleep and wakefulness In addition these advances in our understanding of the pharmacology of sleep have benefited the treatment of sleep disorders and various neurologic and psychiatric conditions This volume is organized into three different parts The first is a review of the basic mechanisms of sleep and wakefulness and the chronobiology of sleep The second part reviews the basic pharmacology of the various neuro transmitter systems involved in sleep and wakefulness while the third is clinically oriented and focuses on the effects of a variety of drugs on sleep and wakefulness The initial part begins with a historical review of the hypotheses of the mechanisms of sleep evolving from passive to active regulation and concepts involving sleep related neurotransmitters and other sleep factors Then regulation of sleep and wakefulness is discussed in terms of homeostatic circadian and ultradian processes Also discussed is the fact that sleep homeostasis is not disrupted by the administration of hypnotic drugs This part also reviews time dependent properties of pharmacologic agents in relation to endogenous biologic rhythms and more specifically to chronopharmacologic changes Sleep Disorders S. R. Pandi-Perumal, Joris Verster, Jaime Monti, Salomon Langer, 2008-07-23 One of the first such volumes in this field Sleep Disorders Diagnosis and Therapeutics explores sleep pharmacology and therapeutics Leading researchers in the area of experimental and clinical and psychopharmacology critically assess the progress in their specialist fields The book is suitable as an introduction for clinicians and researchers w **Neurobiology of Cytokines, Part B** Errol B. DeSouza, 2013-10-22 Recent data suggest a critical role for cytokines in the regulation of brain and endocrine function under normal physiological conditions The aim of this volume and its companion Volume 16 is to provide an overview of the effects of cytokines in the brain and in the endocrine system Methods presented for easy adaptation to new systems Comprehensive protocols included for The synthesis and release of cytokines The study of their central nervous system actions Studying the role of cytokines in human neuropathological conditions Advances in Mercury Toxicology Tsuguyoshi Suzuki, Nobumasa Imura, Thomas W. Clarkson, 2013-11-11 This book is based on an international meeting organized by the University of Tokyo and the University of Rochester and is published as one belonging to the series of Rochester International Conferences in Environmental Toxicity The meeting on Advances in Mercury Toxicology was held at the University of Tokyo on August 1 to 3 1990 The invited papers are published in this book along with an Overview chapter that was written by the editors at a meeting held at the University of Rochester on August 1 to 2

1991 The purpose of the meeting was to assemble leading scientists to discuss their most recent findings on the toxicology of mercury The time was opportune Considerable progress has been made on the environmental fate and toxicology of mercury Recent findings have given new insight into the global model for mercury Transport in the atmosphere extends great distances resulting in pollution of lakes and rivers far distant from the source of mercury release The process of methylation leads to accumulation of methylmercury in fish and thus in the human diet New evidence indicates that acid rain and the impoundment of water for hydroelectric purposes affects the methylation and bioaccumulation processes resulting in higher levels of methylmercury in fish      **Cumulated Index Medicus** ,1986      **Mapping the Mind** Fred M. Levin,2018-05-08

This book makes detailed correlations between psychological psychoanalytic variables on one hand and neuroanatomical neurophysiological considerations on the other It aims to assist those who wish to pursue interdisciplinary work in the endlessly fascinating area of the mind and brain      Medications and their Effects on Sleep and Wake, An Issue of Sleep Medicine Clinics Johan Verbraecken,Jan Hedner,2018-05-23 This issue of Sleep Medicine Clinics focuses on Medications and their Effects on Sleep and Wake with topics including Sleep wake neurochemistry Effect of sleep and circadian rhythm on pharmacokinetics and pharmacodynamics Drugs used in insomnia and non restorative sleep Drug induced excessive sleepiness Drug induced insomnia Drug induced sleep disordered breathing and ventilatory impairment Drug induced parasomnias and movement disorders Abuse and dependency on sleep and waking Sleep related drug therapy in special conditions children Sleep related drug therapy in special conditions pregnancy Sleep related drug therapy in special conditions the elderly Medicolegal and social consequences of sleep disorders and Tapering sleep related drug therapy

**Proceedings of the Taniguchi Symposia on Brain Sciences, Volume 10: Strategy and Prospects in Neuroscience** Osamu Hayaishi,2024-11-01 This book deals with molecular neurobiology based on neurochemical approaches and focuses on neural plasticity studied by neurophysiological methods It offers discussions on prospects of neuroscience from the respective stances of the participants      *Sleep and Mental Illness* S. R. Pandi-Perumal,Milton Kramer,2010-04 This comprehensive volume provides clinicians with a better understanding of the correlation between sleep and mental illness      **International Review of Neurobiology** ,1993-04-20 International Review of Neurobiology      **Sleep Disorders Medicine** Sudhansu Chokroverty,2013-10-22 Sleep Disorders Medicine Basic Science Technical Considerations and Clinical Aspects presents the scientific basis for understanding sleep This book provides information on the diagnosis and treatment of a wide variety of sleep disorders Organized into 28 chapters this book begins with an overview of the cerebral activity of wakefulness and the cerebral activity of sleep This text then discusses the effects on mental and physical health of non rapid eye movement NREM sleep rapid eye movement REM sleep and all sleep Other chapters consider the neurophysiology and cellular pharmacology of sleep mechanisms This book discusses as well the physiologic changes that occur in both the autonomic and somatic nervous system during sleep The final chapter deals with the application of nasal

continuous positive airway pressure for the treatment of obstructive apnea in adults This book is a valuable resource for neurologists internists psychiatrists pediatricians otolaryngologists neurosurgeons psychologists neuroscientists and general practitioners An Introduction to Neuroendocrinology Richard E. Brown,1994-01-27 This book is designed as an

introductory text in neuroendocrinology the study of the interaction between the brain and endocrine system and the influence of this on behaviour The endocrine glands pituitary gland and hypothalamus and their interactions and hormones are discussed The action of steroid and thyroid hormone receptors and the regulation of target cell response to hormones is examined The function of neuropeptides is discussed with respect to the neuroendocrine system and behaviour The neuroimmune system and lymphokines are described and the interaction between the neuroendocrine and neuroimmune systems discussed Finally methods for studying hormonal influences on behaviour are outlined Each chapter has review and essay questions designed for advanced students and honours or graduate students with a background in neuroscience respectively

**Review of Sleep Medicine** Alon Y. Avidan,Teri J. Barkoukis,2011-08-26 Here s an ideal refresher on the core information in the field of sleep medicine It is a comprehensive review and test workbook for preparation of the Sleep Board exam that emphasizes the highlights of sleep medicine and recaps major points with figures tables and lists to guide readers The second half is a mock examination for practice which includes many polysomnogram segments and multiple epochs Also included are 500 exam questions a quick reference to drug effects relating to sleep medicine and an appendix on sleep scoring basics Enables the user to practice for the exam with the same type of questions used in the exam itself Provides the busy clinician a succinct summary of all aspects of working up the sleep disordered patient Offers very comprehensive and thorough answers and rationals so the user will know the why and how to think logically about the problem Additional coverage brings review book up to date with ASBM test material New chapters include Sleep Breathing Disorders Cardiovascular Pathophysiology Evaluating Epilepsy Pearls of Pediatric Sleep Cardiopulmonary Disorders Neurological Sleep Disorders Sleep Wake Disorders Clinical Case Studies II Knowing Practice Parameters Sleep Journals in Review

**Review of Sleep Medicine E-Book** Alon Y. Avidan,Teri J. Barkoukis,2011-08-06 Review of Sleep Medicine by Drs Alon Avidan and Teri Barkoukis prepares you for the ABSM exam with a comprehensive review and test format that includes figures tables and lists highlighting key points With content revised to match the new exam and updated coverage of pharmacology and sleep medicine insomnias parasomnias sleep related breathing disorders and more you ll stay current on recent developments in the field Effectively prepare for the ABMS sleep exam using case based multiple choice and fact testing questions that parallel those on the test Identify the reasoning behind each answer with comprehensive explanations so you know how to think logically about the problems Quickly review crucial material with succinct summaries of all aspects of working with the sleep disordered patient Master the content tested on the exam through explanatory high yield tables and charts sleep stage scoring and an artifacts and arrhythmias mini atlas Tap into the expertise of a multidisciplinary team

of recognized leaders ranging from world renowned sleep researchers to sleep clinicians and educators Updated coverage of the latest advances in sleep medicine for pharmacology tools in clinical sleep medicine sleep disorders and much more Brand new chapters in Sleep Breathing Disorders Cardiovascular Pathophysiology Evaluating Epilepsy Pearls of Pediatric Sleep Cardiopulmonary Disorders Neurological Sleep Disorders Sleep Wake Disorders Clinical Case Studies II Knowing Practice Parameters     **L-tryptophan** Walter Kochen,Hans Steinhart,1994

The Top Books of the Year Endogenous Sleep Substances And Sleep Regulation The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous captivating novels enthralling the hearts of readers worldwide. Lets delve into the realm of bestselling books, exploring the fascinating narratives that have charmed audiences this year. Endogenous Sleep Substances And Sleep Regulation : Colleen Hoover's "It Ends with Us" This heartfelt tale of love, loss, and resilience has gripped readers with its raw and emotional exploration of domestic abuse. Hoover masterfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can triumph. Uncover the Best : Taylor Jenkins Reid's "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reid's compelling storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Endogenous Sleep Substances And Sleep Regulation : Delia Owens' "Where the Crawdads Sing" This mesmerizing coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens crafts a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a brilliant and gripping novel that will keep you guessing until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

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