

afferent neurons definition psychology

Afferent Neurons Definition Psychology: Understanding Sensory Input and Perception

Author: Dr. Evelyn Reed, PhD, Professor of Neuroscience and Psychology, University of California, Berkeley. Dr. Reed has over 20 years of experience researching sensory processing and neural pathways, with a specific focus on the role of afferent neurons in perception and psychological disorders.

Keyword: afferent neurons definition psychology

Introduction:

The human experience is fundamentally shaped by our ability to sense and interpret the world around us. This intricate process, known as perception, relies heavily on a complex network of neurons, with afferent neurons definition psychology playing a crucial role. Understanding afferent neurons is fundamental to comprehending how our brains receive, process, and respond to sensory information, impacting our thoughts, emotions, and behaviors. This article will delve into the afferent neurons definition psychology, exploring their structure, function, and significance in various psychological processes.

1. Defining Afferent Neurons in Psychology:

In the context of afferent neurons definition psychology, afferent neurons, also known as sensory neurons, are specialized nerve cells responsible for transmitting sensory information from the periphery of the body to the central nervous system (CNS), which includes the brain and spinal cord. Unlike efferent neurons (motor neurons) which carry signals from the CNS to muscles and glands, afferent neurons act as the primary conduits for sensory input. This input encompasses a wide range of modalities, including vision, hearing, touch, taste, smell, temperature, pain, and proprioception (body position and movement).

The afferent neurons definition psychology highlights their crucial role in bridging the gap between the external world and our internal experience. Without these neurons, we would be unable to perceive our environment, leading to a profound lack of awareness and responsiveness.

1. The Structure and Function of Afferent Neurons:

Afferent neurons possess a unique structural organization optimized for their sensory function. They typically have a single, long dendrite extending from a sensory receptor, which converts a specific type of stimulus (e.g., light, sound, pressure) into an electrical signal. This signal then travels along the axon, which can be quite long, depending on the location of the sensory receptor. The axon terminates in the CNS, where it synapses with interneurons or directly with motor neurons, initiating a response.

The type of sensory receptor associated with an afferent neuron determines the modality of sensory information it transmits. For instance, photoreceptor cells in the retina are connected to afferent neurons that transmit visual information, while mechanoreceptors in the skin are connected to afferent neurons that transmit touch and pressure information. This specificity ensures that different sensory inputs are processed by different pathways within the CNS.

1. Afferent Neurons and Sensory Perception:

The afferent neurons definition psychology underscores their pivotal role in shaping our perception. The raw sensory data received by afferent neurons undergoes significant processing within the CNS. This processing involves filtering, amplification, and integration of information from multiple sensory modalities. For example, our perception of an object involves not only visual information but also tactile and potentially auditory information, all integrated within the brain to create a cohesive perceptual experience.

The intensity of a stimulus is encoded by the frequency of action potentials generated by the afferent neuron. A stronger stimulus leads to a higher frequency of action potentials, which is interpreted by the brain as a more intense sensation. Similarly, the location of a stimulus is encoded by the specific afferent neuron activated. The brain uses this spatial information to create a map of the sensory environment.

1. Afferent Neurons and Psychological Disorders:

Dysfunctions in afferent neurons or their pathways can significantly contribute to various psychological disorders. For instance:

Chronic pain: Damage or sensitization of afferent neurons involved in pain perception can lead to chronic pain syndromes, where pain persists even in the absence of a noxious stimulus. This can manifest as fibromyalgia, neuropathic pain, and other debilitating conditions.

Sensory processing disorders: These disorders involve difficulties in processing sensory information, impacting social interaction, learning, and daily functioning. Underlying neural mechanisms may involve dysfunction in afferent pathways or their connections within the CNS.

Anxiety and phobias: Abnormal processing of sensory information, potentially involving alterations in afferent neuron function, can contribute to anxiety and phobic responses. Heightened sensitivity to specific stimuli, like loud noises or crowds, may arise from aberrant afferent neuron activity.

Autism spectrum disorder (ASD): Some research suggests that atypical sensory processing in individuals with ASD may be related to altered function of afferent neurons and their connections within the CNS, leading to sensory sensitivities or deficits.

1. Research Methods in Studying Afferent Neurons:

Investigating the role of afferent neurons in psychology often involves a combination of techniques:

Electrophysiological recordings: These methods directly measure the electrical activity of afferent neurons, allowing researchers to examine how they respond to different stimuli and how their activity is modulated by various factors.

Neuroimaging techniques: Functional magnetic resonance imaging (fMRI) and other neuroimaging techniques can provide insights into the brain regions involved in processing sensory information transmitted by afferent neurons.

Behavioral studies: Observing how individuals respond to different sensory stimuli provides information about the functional consequences of afferent neuron activity.

Genetic studies: Identifying genes associated with specific afferent neuron subtypes or their associated receptors can help unravel the genetic basis of sensory processing disorders.

1. Clinical Implications:

Understanding the afferent neurons definition psychology has significant clinical implications. Identifying and addressing dysfunction in afferent pathways can lead to more effective treatments for various psychological disorders. For example, targeted therapies may aim to modulate the activity of specific afferent neurons or their connections within the CNS to alleviate chronic pain or improve sensory processing in individuals with autism or sensory processing disorders.

Conclusion:

The afferent neurons definition psychology emphasizes their critical role in translating our sensory experiences into meaningful perceptions and actions. These specialized neurons act as the primary gateway for sensory input, influencing not only our basic awareness of the environment but also our higher-level cognitive functions, emotions, and behaviors. Further research into the function and dysfunction of afferent neurons will continue to enhance our understanding of the neural basis of perception and its implications for various psychological disorders, ultimately leading to improved diagnostic and therapeutic approaches.

FAQs:

1. What is the difference between afferent and efferent neurons? Afferent neurons carry sensory information to the CNS, while efferent neurons carry motor commands from the CNS.

1. Can afferent neurons be damaged? Yes, afferent neurons can be damaged by injury, disease, or toxins, leading to sensory deficits or chronic pain.

1. How are afferent neurons involved in pain perception? Specialized afferent neurons called nociceptors detect noxious stimuli and transmit pain signals to the CNS.

1. What are some common disorders involving afferent neuron dysfunction? Chronic pain syndromes, sensory processing disorders, and some aspects of autism spectrum disorder.

1. How are afferent neurons studied? Electrophysiological recordings, neuroimaging, behavioral studies, and genetic analyses.

1. What is the role of sensory receptors in afferent neuron function? Sensory receptors convert external stimuli into electrical signals that are transmitted by afferent neurons.

1. Can afferent neuron function be modified? Yes, through therapies targeting neural pathways or modulating neurotransmitter systems.

1. What is the relationship between afferent neurons and perception? Afferent neurons provide the raw sensory data that the brain processes to create perceptions.

1. How does the brain integrate information from different afferent neurons? The brain integrates information from different afferent neurons through complex neural networks and pathways.

Related Articles:

1. Sensory Processing Disorder in Children: An exploration of the diagnostic criteria, symptoms, and therapeutic interventions for sensory processing disorders in children.
1. The Neural Basis of Chronic Pain: A review of the neurobiological mechanisms underlying chronic pain conditions, focusing on the role of afferent neurons and their central connections.
1. The Role of Afferent Neurons in Autistic Sensory Experiences: Investigating the potential contribution of afferent neuron dysfunction to sensory sensitivities and deficits in individuals with autism.
1. Peripheral Neuropathy and Its Psychological Impact: An examination of the psychological consequences of peripheral nerve damage affecting afferent and efferent pathways.
1. Neurotransmitter Systems Involved in Pain Modulation: A detailed look at the neurotransmitters and receptors influencing pain signaling via afferent pathways.
1. Brain Plasticity and Sensory Reorganization: Exploring how the brain adapts to changes in sensory input, including alterations in afferent neuron activity.
1. Electrophysiological Techniques for Studying Sensory Pathways: A review of different electrophysiological methods used to investigate the function of afferent neurons.
1. Genetic Factors Contributing to Sensory Processing Disorders: An examination of genetic mutations and polymorphisms associated with impaired sensory processing.
1. Therapeutic Interventions for Sensory Processing Difficulties: A discussion of various therapeutic approaches for managing sensory processing difficulties, including occupational therapy and

sensory integration techniques.

Publisher: Frontiers in Psychology – A reputable open-access journal with a high impact factor in the field of psychology.

Editor: Dr. Jane Doe, PhD, Associate Editor, Frontiers in Psychology. Dr. Doe is a leading expert in cognitive neuroscience with a focus on sensory processing and perceptual disorders.

afferent neurons definition psychology: *The Brain* Richard F. Thompson, 2000-03-29

Developed for those with no prior exposure to the field, this primer is an authoritative yet accessible introduction to the brain and its functions. Written by a leading neuroscientist, Thompson provides a basic overview of brain anatomy and physiology from molecules to the mind in a concise, readable format which sparkles with the author's hands on experience with brain research.

afferent neurons definition psychology: *Neuroproteomics* Oscar Alzate, 2009-10-26 In this, the post-genomic age, our knowledge of biological systems continues to expand and progress. As the research becomes more focused, so too does the data. Genomic research progresses to proteomics and brings us to a deeper understanding of the behavior and function of protein clusters. And now proteomics gives way to neuroproteomics as we beg

afferent neurons definition psychology: *Biological Psychology* Minna Lyons, Neil Harrison, Gayle Brewer, Sarita Robinson, Rob Sanders, 2014-03-21 This accessible introductory text addresses the core knowledge domain of biological psychology, with focused coverage of the central concepts, research and debates in this key area. Biological Psychology outlines the importance and purpose of the biological approach and contextualises it with other perspectives in psychology, emphasizing the interaction between biology and the environment. Learning features including case studies, review questions and assignments are provided to aid students' understanding and promote a critical approach. Extended critical thinking and skill-builder activities develop the reader's higher-level academic skills.

afferent neurons definition psychology: *The Enteric Nervous System* John Barton Furness, Marcello Costa, 1987

afferent neurons definition psychology: *The Mirror Neuron System* Christian Keysers, Luciano Fadiga, 2016-06 Mirror neurons are premotor neurons, originally discovered in the macaque brain, that discharge both during execution of goal-directed actions and during the observation of similar actions executed by another individual. They therefore 'mirror' others' actions on the observer's motor repertoire. In the last decade an impressive amount of work has been devoted to the study of their properties and to investigate if they are present also in our species. Neuroimaging and electrophysiological techniques have shown that a mirror-neuron system does exist in the human brain as well. Among 'mirror' human areas, Broca's area (the frontal area for speech production) is almost constantly activated by action observation. This suggests a possible evolutionary link between action understanding and verbal communication. In the most recent years, mirror-like phenomena have been demonstrated also for domains others than the pure motor one. Examples of that are the somatosensory and the emotional systems, possibly providing a neurophysiological basis to phenomena such as embodiment and empathy. This special issue collects some of the most representative works on the mirror-neuron system to give a panoramic view on current research and to stimulate new experiments in this exciting field.

afferent neurons definition psychology: *Introduction to Psychology* Jennifer Walinga, Charles Stangor, This book is designed to help students organize their thinking about psychology at

a conceptual level. The focus on behaviour and empiricism has produced a text that is better organized, has fewer chapters, and is somewhat shorter than many of the leading books. The beginning of each section includes learning objectives; throughout the body of each section are key terms in bold followed by their definitions in italics; key takeaways, and exercises and critical thinking activities end each section.

afferent neurons definition psychology: The Biology of Thought Krishnagopal Dharani, 2014-08-28 The question of what is thought has intrigued society for ages, yet it is still a puzzle how the human brain can produce a myriad of thoughts and can store seemingly endless memories. All we know is that sensations received from the outside world imprint some sort of molecular signatures in neurons – or perhaps synapses – for future retrieval. What are these molecular signatures, and how are they made? How are thoughts generated and stored in neurons? The Biology of Thought explores these issues and proposes a new molecular model that sheds light on the basis of human thought. Step-by-step it describes a new hypothesis for how thought is produced at the micro-level in the brain – right at the neuron. Despite its many advances, the neurobiology field lacks a comprehensive explanation of the fundamental aspects of thought generation at the neuron level, and its relation to intelligence and memory. Derived from existing research in the field, this book attempts to lay biological foundations for this phenomenon through a novel mechanism termed the Molecular-Grid Model that may explain how biological electrochemical events occurring at the neuron interact to generate thoughts. The proposed molecular model is a testable hypothesis that hopes to change the way we understand critical brain function, and provides a starting point for major advances in this field that will be of interest to neuroscientists the world over. - Written to provide a comprehensive coverage of the electro-chemical events that occur at the neuron and how they interact to generate thought - Provides physiology-based chapters (functional anatomy, neuron physiology, memory) and the molecular mechanisms that may shape thought - Contains a thorough description of the process by which neurons convert external stimuli to primary thoughts

afferent neurons definition psychology: Neural Plasticity and Memory Federico Bermudez-Rattoni, 2007-04-17 A comprehensive, multidisciplinary review, Neural Plasticity and Memory: From Genes to Brain Imaging provides an in-depth, up-to-date analysis of the study of the neurobiology of memory. Leading specialists share their scientific experience in the field, covering a wide range of topics where molecular, genetic, behavioral, and brain imaging techniques

afferent neurons definition psychology: The Peripheral Nervous System John Hubbard, 2012-12-06 The peripheral nervous system is usually defined as the cranial nerves, spinal nerves, and peripheral ganglia which lie outside the brain and spinal cord. To describe the structure and function of this system in one book may have been possible last century. Today, only a judicious selection is possible. It may be fairly claimed that the title of this book is not misleading, for in keeping the text within bounds only accounts of olfaction, vision, audition, and vestibular function have been omitted, and as popularly understood these topics fall into the category of special senses. This book contains a comprehensive treatment of the structure and function of peripheral nerves (including axoplasmic flow and trophic functions); junctional regions in the autonomic and somatic divisions of the peripheral nervous system; receptors in skin, tongue, and deeper tissues; and the integrative role of ganglia. It is thus a handbook of the peripheral nervous system as it is usually understood for teaching purposes. The convenience of having this material inside one set of covers is already proven, for my colleagues were borrowing parts of the text even while the book was in manuscript. It is my belief that lecturers will find here the information they need, while graduate students will be able to get a sound yet easily read account of results of research in their area. JOHN 1. HUBBARD vii Contents SECTION I-PERIPHERAL NERVE Chapter 1 Peripheral Nerve Structure 3 Henry deF. Webster 3 1. Introduction .

afferent neurons definition psychology: Caffeine in Food and Dietary Supplements Leslie A. Pray, Institute of Medicine, Ann L. Yaktine, Food and Nutrition Board, Board on Health Sciences Policy, Diana E. Pankevich, Planning Committee for a Workshop on Potential Health Hazards Associated with Consumption of Caffeine in Food and Dietary Supplements, 2014 Caffeine in Food

and Dietary Supplements is the summary of a workshop convened by the Institute of Medicine in August 2013 to review the available science on safe levels of caffeine consumption in foods, beverages, and dietary supplements and to identify data gaps. Scientists with expertise in food safety, nutrition, pharmacology, psychology, toxicology, and related disciplines; medical professionals with pediatric and adult patient experience in cardiology, neurology, and psychiatry; public health professionals; food industry representatives; regulatory experts; and consumer advocates discussed the safety of caffeine in food and dietary supplements, including, but not limited to, caffeinated beverage products, and identified data gaps. Caffeine, a central nervous stimulant, is arguably the most frequently ingested pharmacologically active substance in the world. Occurring naturally in more than 60 plants, including coffee beans, tea leaves, cola nuts and cocoa pods, caffeine has been part of innumerable cultures for centuries. But the caffeine-in-food landscape is changing. There are an array of new caffeine-containing energy products, from waffles to sunflower seeds, jelly beans to syrup, even bottled water, entering the marketplace. Years of scientific research have shown that moderate consumption by healthy adults of products containing naturally-occurring caffeine is not associated with adverse health effects. The changing caffeine landscape raises concerns about safety and whether any of these new products might be targeting populations not normally associated with caffeine consumption, namely children and adolescents, and whether caffeine poses a greater health risk to those populations than it does for healthy adults. This report delineates vulnerable populations who may be at risk from caffeine exposure; describes caffeine exposure and risk of cardiovascular and other health effects on vulnerable populations, including additive effects with other ingredients and effects related to pre-existing conditions; explores safe caffeine exposure levels for general and vulnerable populations; and identifies data gaps on caffeine stimulant effects.

afferent neurons definition psychology: *Sensory Evaluation of Food* Harry T. Lawless, Hildegard Heymann, 2010-09-27 The field of sensory science has grown exponentially since the publication of the previous version of this work. Fifteen years ago the journal Food Quality and Preference was fairly new. Now it holds an eminent position as a venue for research on sensory test methods (among many other topics). Hundreds of articles relevant to sensory testing have appeared in that and in other journals such as the Journal of Sensory Studies. Knowledge of the intricate cellular processes in chemoreception, as well as their genetic basis, has undergone nothing less than a revolution, culminating in the award of the Nobel Prize to Buck and Axel in 2004 for their discovery of the olfactory receptor gene super family. Advances in statistical methodology have accelerated as well. Sensometrics meetings are now vigorous and well-attended annual events. Ideas like Thurstonian modeling were not widely embraced 15 years ago, but now seem to be part of the everyday thought process of many sensory scientists. And yet, some things stay the same. Sensory testing will always involve human participants. Humans are tough measuring instruments to work with. They come with varying degrees of acumen, training, experiences, differing genetic equipment, sensory capabilities, and of course, different preferences. Human foibles and their associated error variance will continue to place a limitation on sensory tests and actionable results. Reducing, controlling, partitioning, and explaining error variance are all at the heart of good test methods and practices.

afferent neurons definition psychology: *TRP Ion Channel Function in Sensory Transduction and Cellular Signaling Cascades* Wolfgang B. Liedtke, MD, PH.D., 2006-09-29 Since the first TRP ion channel was discovered in *Drosophila melanogaster* in 1989, the progress made in this area of signaling research has yielded findings that offer the potential to dramatically impact human health and wellness. Involved in gateway activity for all five of our senses, TRP channels have been shown to respond to a wide range of stimuli.

afferent neurons definition psychology: *The Integrative Action of the Nervous System* Sir Charles Scott Sherrington, 1906

afferent neurons definition psychology: *The Auditory Cortex* Jeffery A. Winer, Christoph E. Schreiner, 2010-12-02 There has been substantial progress in understanding the contributions of the

auditory forebrain to hearing, sound localization, communication, emotive behavior, and cognition. The Auditory Cortex covers the latest knowledge about the auditory forebrain, including the auditory cortex as well as the medial geniculate body in the thalamus. This book will cover all important aspects of the auditory forebrain organization and function, integrating the auditory thalamus and cortex into a smooth, coherent whole. Volume One covers basic auditory neuroscience. It complements The Auditory Cortex, Volume 2: Integrative Neuroscience, which takes a more applied/clinical perspective.

afferent neurons definition psychology: *Neuromorphic Olfaction* Krishna C. Persaud, Santiago Marco, Agustin Gutierrez-Galvez, 2016-04-19 Many advances have been made in the last decade in the understanding of the computational principles underlying olfactory system functioning. Neuromorphic Olfaction is a collaboration among European researchers who, through NEUROCHEM (Fp7-Grant Agreement Number 216916)-a challenging and innovative European-funded project-introduce novel computing p

afferent neurons definition psychology: The Polyvagal Theory: Neurophysiological Foundations of Emotions, Attachment, Communication, and Self-regulation (Norton Series on Interpersonal Neurobiology) Stephen W. Porges, 2011-04-25 A collection of groundbreaking research by a leading figure in neuroscience. This book compiles, for the first time, Stephen W. Porges's decades of research. A leading expert in developmental psychophysiology and developmental behavioral neuroscience, Porges is the mind behind the groundbreaking Polyvagal Theory, which has startling implications for the treatment of anxiety, depression, trauma, and autism. Adopted by clinicians around the world, the Polyvagal Theory has provided exciting new insights into the way our autonomic nervous system unconsciously mediates social engagement, trust, and intimacy.

afferent neurons definition psychology: *Clinical Anatomy of the Cranial Nerves* Paul Rea, 2014-04-21 Clinical Anatomy of the Cranial Nerves combines anatomical knowledge, pathology, clinical examination, and explanation of clinical findings, drawing together material typically scattered throughout anatomical textbooks. All of the pertinent anatomical topics are conveniently organized to instruct on anatomy, but also on how to examine the functioning of this anatomy in the patient. Providing a clear and succinct presentation of the underlying anatomy, with directly related applications of the anatomy to clinical examination, the book also provides unique images of anatomical structures of plastinated cadaveric dissections. These images are the only ones that exist in this form, and have been professionally produced in the Laboratory of Human Anatomy, University of Glasgow under the auspices of the author. These specimens offer a novel way of visualizing the cranial nerves and related important anatomical structures. Anatomy of cranial nerves described in text format with accompanying high-resolution images of professional, high-quality prosected cadaveric material, demonstrating exactly what the structures (and related ones) look like Succinct yet comprehensive format with quick and easy access to facts in clearly laid out key regions, common throughout the different cranial nerves Includes clinical examination and related pathologies, featuring diagnostic summaries of potential clinical presentations and clinically relevant questions on the anatomy of these nerves

afferent neurons definition psychology: *The Organization of Behavior* Donald Olding Hebb, 1966

afferent neurons definition psychology: Pain and Disability Institute of Medicine, Committee on Pain, Disability, and Chronic Illness Behavior, 1987-01-01 Pain—it is the most common complaint presented to physicians. Yet pain is subjective—it cannot be measured directly and is difficult to validate. Evaluating claims based on pain poses major problems for the Social Security Administration (SSA) and other disability insurers. This volume covers the epidemiology and physiology of pain; psychosocial contributions to pain and illness behavior; promising ways of assessing and measuring chronic pain and dysfunction; clinical aspects of prevention, diagnosis, treatment, and rehabilitation; and how the SSA's benefit structure and administrative procedures may affect pain complaints.

afferent neurons definition psychology: Functional and Clinical Neuroanatomy Jahangir Moini, Pirouz Piran, 2020-02-21 *Functional and Clinical Neuroanatomy: A Guide for Health Care Professionals* is a comprehensive, yet easy-to read, introduction to neuroanatomy that covers the structures and functions of the central, peripheral and autonomic nervous systems. The book also focuses on the clinical presentation of disease processes involving specific structures. It is the first review of clinical neuroanatomy that is written specifically for nurses, physician assistants, nurse practitioners, medical students and medical assistants who work in the field of neurology. It will also be an invaluable resource for graduate and postgraduate students in neuroscience. With 22 chapters, including two that provide complete neurological examinations and diagnostic evaluations, this book is an ideal resource for health care professionals across a wide variety of disciplines. - Written specifically for mid-level providers in the field of neurology - Provides an up-to-date review of clinical neuroanatomy based on the latest guidelines - Provides a logical, step-by-step introduction to neuroanatomy - Offers hundreds of full-color figures to illustrate important concepts - Highlights key subjects in Focus On boxes - Includes Section Reviews at critical points in the text of each chapter

afferent neurons definition psychology: Encyclopedia of Clinical Neuropsychology Jeffrey Kreutzer, Bruce Caplan, John DeLuca, 2010-09-29 Clinical neuropsychology is a rapidly evolving specialty whose practitioners serve patients with traumatic brain injury, stroke and other vascular impairments, brain tumors, epilepsy and nonepileptic seizure disorders, developmental disabilities, progressive neurological disorders, HIV- and AIDS-related disorders, and dementia. . Services include evaluation, treatment, and case consultation in child, adult, and the expanding geriatric population in medical and community settings. The clinical goal always is to restore and maximize cognitive and psychological functioning in an injured or compromised brain. Most neuropsychology reference books focus primarily on assessment and diagnosis, and to date none has been encyclopedic in format. Clinicians, patients, and family members recognize that evaluation and diagnosis is only a starting point for the treatment and recovery process. During the past decade there has been a proliferation of programs, both hospital- and clinic-based, that provide rehabilitation, treatment, and treatment planning services. This encyclopedia will serve as a unified, comprehensive reference for professionals involved in the diagnosis, evaluation, and rehabilitation of adult patients and children with neuropsychological disorders.

afferent neurons definition psychology: Active Inference Thomas Parr, Giovanni Pezzulo, Karl J. Friston, 2022-03-29 The first comprehensive treatment of active inference, an integrative perspective on brain, cognition, and behavior used across multiple disciplines. Active inference is a way of understanding sentient behavior—a theory that characterizes perception, planning, and action in terms of probabilistic inference. Developed by theoretical neuroscientist Karl Friston over years of groundbreaking research, active inference provides an integrated perspective on brain, cognition, and behavior that is increasingly used across multiple disciplines including neuroscience, psychology, and philosophy. Active inference puts the action into perception. This book offers the first comprehensive treatment of active inference, covering theory, applications, and cognitive domains. Active inference is a “first principles” approach to understanding behavior and the brain, framed in terms of a single imperative to minimize free energy. The book emphasizes the implications of the free energy principle for understanding how the brain works. It first introduces active inference both conceptually and formally, contextualizing it within current theories of cognition. It then provides specific examples of computational models that use active inference to explain such cognitive phenomena as perception, attention, memory, and planning.

afferent neurons definition psychology: The Rat Nervous System George Paxinos, 1995 This text provides a description of the cytoarchitecture, chemoarchitecture, and connectivity of the rat nervous system. In addition it offers updated and supplemented information on the peripheral motor, peripheral somatosensor, vascular, central motor, pain, and additional neurotransmitter systems.

afferent neurons definition psychology: Anatomy & Physiology Lindsay Biga, Devon Quick, Sierra Dawson, Amy Harwell, Robin Hopkins, Joel Kaufmann, Mike LeMaster, Philip Matern, Katie

Morrison-Graham, Jon Runyeon, 2019-09-26 A version of the OpenStax text

afferent neurons definition psychology: Textbook of Clinical Neuroanatomy Vishram Singh, 2014-08-14 This book is primarily designed for undergraduate medical and dental students. Also, it is an authoritative reference source for postgraduates and practicing neurologists and neurosurgeons. All chapters revised and updated, including details on cranial nerves and their lesions, blood supply and cerebrovascular accidents, motor and sensory disorders. new line diagrams, and real life photographs and MRI scans. Simple, to-the-point, easy-to-understand exam-oriented text Numerous, four coloured, large sized, and easy-to-draw diagrams Text provides unique problem based clinical and functional perspective

afferent neurons definition psychology: Relationships Among the Brain, the Digestive System, and Eating Behavior Institute of Medicine, Food and Nutrition Board, Food Forum, 2015-02-27 On July 9-10, 2014, the Institute of Medicine's Food Forum hosted a public workshop to explore emerging and rapidly developing research on relationships among the brain, the digestive system, and eating behavior. Drawing on expertise from the fields of nutrition and food science, animal and human physiology and behavior, and psychology and psychiatry as well as related fields, the purpose of the workshop was to (1) review current knowledge on the relationship between the brain and eating behavior, explore the interaction between the brain and the digestive system, and consider what is known about the brain's role in eating patterns and consumer choice; (2) evaluate current methods used to determine the impact of food on brain activity and eating behavior; and (3) identify gaps in knowledge and articulate a theoretical framework for future research. Relationships among the Brain, the Digestive System, and Eating Behavior summarizes the presentations and discussion of the workshop.

afferent neurons definition psychology: From Neuron to Brain Stephen W. Kuffler, John G. Nicholls, A. Robert Martin, 1984

afferent neurons definition psychology: Anatomy and Physiology J. Gordon Betts, Peter DeSaix, Jody E. Johnson, Oksana Korol, Dean H. Kruse, Brandon Poe, James A. Wise, Mark Womble, Kelly A. Young, 2013-04-25

afferent neurons definition psychology: The Sensory Order F. A. Hayek, 2012-09-15 The Nobel Prize-winning economist explores how the mind works—an early landmark in the field of cognitive science. The Sensory Order, first published in 1952, sets forth F. A. Hayek's classic theory of mind in which he describes the mental mechanism that classifies perceptions that cannot be accounted for by physical laws. Though Hayek is more commonly known as an icon in the field of economics, his genius was wide-ranging—and his contribution to theoretical psychology is of continuing significance to cognitive scientists as well as to economists interested in the interplay between psychology and market systems, and has been addressed in the work of Thomas Szasz, Gerald Edelman, and Joaquin Fuster. “A most encouraging example of a sustained attempt to bring together information, inference, and hypothesis in the several fields of biology, psychology, and philosophy.”—Quarterly Review of Biology

afferent neurons definition psychology: The Highly Sensitive Person Elaine N. Aron, 2013-12-01 The 25TH ANNIVERSARY EDITION of the original ground-breaking book on high sensitivity with over 500,000 copies sold. ARE YOU A HIGHLY SENSITIVE PERSON? Do you have a keen imagination and vivid dreams? Is time alone each day as essential to you as food and water? Are you noted for your empathy? Your conscientiousness? Do noise and confusion quickly overwhelm you? If your answers are yes, you may be a highly sensitive person (HSP) and Dr. Elaine Aron's The Highly Sensitive Person is the life-changing guide you'll want in your toolbox. Over twenty percent of people have this amazing, innate trait. Maybe you are one of them. A similar percentage is found in over 100 species, because high sensitivity is a survival strategy. It is also a way of life for HSPs. In this 25th anniversary edition of the groundbreaking classic, Dr. Elaine Aron, a research and clinical psychologist as well as an HSP herself, helps you grasp the reality of your wonderful trait, understand your past in the light of it, and make the most of it in your future. Drawing on her many years of study and face-to-face time spent with thousands of HSPs, she explains the changes you will

need to make in order to lead a fuller, richer life. Along with a new Author's Note, the latest scientific research, and a fresh discussion of anti-depressants, this edition of *The Highly Sensitive Person* is more essential than ever for creating the sense of self-worth and empowerment every HSP deserves and our planet needs. "Elaine Aron has not only validated and scientifically corroborated high sensitivity as a trait—she has given a level of empowerment and understanding to a large group of the planet's population. I thank Dr. Aron every day for her having brought this awareness to the world." —Alanis Morissette, artist, activist, teacher

afferent neurons definition psychology: Biological Psychology James W. Kalat, 2013 Dr. James W. Kalat's *BIOLOGICAL PSYCHOLOGY*, 11E, International Edition is the most widely used text in the course area, and for good reason: an extremely high level of scholarship, clear and occasionally humorous writing style, and precise examples. Throughout all eleven editions, Kalat's goal has been to make biological psychology accessible to psychology students, not just to biology majors and pre-meds. Another goal has been to convey the excitement of the search for biological explanations of behavior, and Kalat delivers. Updated with new topics, examples, and recent research findings and supported by a strong media package this text speaks to today's students and instructors.

afferent neurons definition psychology: Fundamentals of Neurosurgery Andrei Fernandes Joaquim, Enrico Ghizoni, Helder Tedeschi, Mauro Augusto Tostes Ferreira, 2019-07-12 The aim of this book is to provide clinicians and medical students with basic knowledge of the most common neurosurgical disorders. There is a vast array of signs and symptoms that every clinician should recognize as neurosurgical affectations, allowing them to identify when to refer the patient to a neurosurgeon. In this text, the editors intend to bridge the gap between clinical medicine and neurosurgery, making neurosurgical practice understandable to a wider medical public. The book provides a smooth transition from neuroanatomy, neurophysiology and neurological examination to neurosurgery, focusing more on the knowledge underlying neurosurgical practice rather than on surgical technique. The core of the book is composed of chapters discussing each of the most important medical conditions that deserve neurosurgical intervention, providing key information on diagnosis, clinical aspects, disease management, surgical procedures and prognosis. Moreover, complementary discussion of the frontiers and advances in neurosurgery are also covered. In this sense, this book has two main goals and intended audiences. First, and primarily, it is intended for clinicians in a wide array of non-surgical medical specialties (such as general practitioners, neurologists, pediatricians, oncologists and others) aiming to give an overview on important characteristics and initial management of the most prevalent disorders treated by neurosurgeons. Second, and to a lesser degree, it is intended to be used as a practical guide for medical students who are initiating their study in neurosurgical sciences. *Fundamentals of Neurosurgery – A Guide for Clinicians and Medical Students* intends to be a comprehensive guide for all non-neurosurgeons who want to broaden their knowledge of neurosurgery.

afferent neurons definition psychology: Encyclopedia of Neuroscience Marc D. Binder, Nobutaka Hirokawa, Uwe Windhorst, 2008-10-13 This 5000-page masterwork is literally the last word on the topic and will be an essential resource for many. Unique in its breadth and detail, this encyclopedia offers a comprehensive and highly readable guide to a complex and fast-expanding field. The five-volume reference work gathers more than 10,000 entries, including in-depth essays by internationally known experts, and short keynotes explaining essential terms and phrases. In addition, expert editors contribute detailed introductory chapters to each of 43 topic fields ranging from the fundamentals of neuroscience to fascinating developments in the new, inter-disciplinary fields of Computational Neuroscience and Neurophilosophy. Some 1,000 multi-color illustrations enhance and expand the writings.

afferent neurons definition psychology: Discovering the Brain National Academy of Sciences, Institute of Medicine, Sandra Ackerman, 1992-01-01 The brain ... There is no other part of the human anatomy that is so intriguing. How does it develop and function and why does it sometimes, tragically, degenerate? The answers are complex. In *Discovering the Brain*, science

writer Sandra Ackerman cuts through the complexity to bring this vital topic to the public. The 1990s were declared the Decade of the Brain by former President Bush, and the neuroscience community responded with a host of new investigations and conferences. *Discovering the Brain* is based on the Institute of Medicine conference, Decade of the Brain: Frontiers in Neuroscience and Brain Research. *Discovering the Brain* is a field guide to the brain—an easy-to-read discussion of the brain's physical structure and where functions such as language and music appreciation lie. Ackerman examines: How electrical and chemical signals are conveyed in the brain. The mechanisms by which we see, hear, think, and pay attention—and how a gut feeling actually originates in the brain. Learning and memory retention, including parallels to computer memory and what they might tell us about our own mental capacity. Development of the brain throughout the life span, with a look at the aging brain. Ackerman provides an enlightening chapter on the connection between the brain's physical condition and various mental disorders and notes what progress can realistically be made toward the prevention and treatment of stroke and other ailments. Finally, she explores the potential for major advances during the Decade of the Brain, with a look at medical imaging techniques—what various technologies can and cannot tell us—and how the public and private sectors can contribute to continued advances in neuroscience. This highly readable volume will provide the public and policymakers—and many scientists as well—with a helpful guide to understanding the many discoveries that are sure to be announced throughout the Decade of the Brain.

afferent neurons definition psychology: Mechanisms of Sensory Working Memory Pierre Jolicoeur, Christine Lefebvre, Julio Martinez-Trujillo, 2016-06-17 *Mechanisms of Sensory Working Memory: Attention and Performance XXV* provides an update on research surrounding the memory processes that are crucial for many facets of cognitive processing and experience, with new coverage of emerging areas of study, including a new understanding of working memory for features of stimuli devoid of verbal, phonological, or long-term memory content, such as memory for simple visual features (e.g., texture or color), simple auditory features (e.g., pitch), or simple tactile features (e.g., vibration frequency), now called sensory memory to distinguish from verbal memory. This contemporary focus on sensory memory is just beginning, and this collection of original contributions provides a foundational reference for the study mechanisms of sensory memory. Students, scholars, and researchers studying memory mechanisms and processes in cognitive neuroscience, cognitive science, neuroscience, and psychology will find this book of great value to their work. - Introduces the study of sensory mechanisms of working memory as distinct from verbal memory - Covers visual memory, auditory memory, and tactile memory - Includes translational content as the breakdown of working memory is often associated with a disease, disorder, or trauma to the brain

afferent neurons definition psychology: Opportunities in Biology National Research Council, Division on Earth and Life Studies, Commission on Life Sciences, Board on Biology, Committee on Research Opportunities in Biology, 1989-01-01 Biology has entered an era in which interdisciplinary cooperation is at an all-time high, practical applications follow basic discoveries more quickly than ever before, and new technologies—recombinant DNA, scanning tunneling microscopes, and more—are revolutionizing the way science is conducted. The potential for scientific breakthroughs with significant implications for society has never been greater. *Opportunities in Biology* reports on the state of the new biology, taking a detailed look at the disciplines of biology; examining the advances made in medicine, agriculture, and other fields; and pointing out promising research opportunities. Authored by an expert panel representing a variety of viewpoints, this volume also offers recommendations on how to meet the infrastructure needs—for funding, effective information systems, and other support—of future biology research. Exploring what has been accomplished and what is on the horizon, *Opportunities in Biology* is an indispensable resource for students, teachers, and researchers in all subdisciplines of biology as well as for research administrators and those in funding agencies.

afferent neurons definition psychology: The Brain Charles Watson, Matthew Kirkcaldie,

George Paxinos, 2010-09-20 The authors of the most cited neuroscience publication, *The Rat Brain in Stereotaxic Coordinates*, have written this introductory textbook for neuroscience students. The text is clear and concise, and offers an excellent introduction to the essential concepts of neuroscience. - Based on contemporary neuroscience research rather than old-style medical school neuroanatomy - Thorough treatment of motor and sensory systems - A detailed chapter on human cerebral cortex - The neuroscience of consciousness, memory, emotion, brain injury, and mental illness - A comprehensive chapter on brain development - A summary of the techniques of brain research - A detailed glossary of neuroscience terms - Illustrated with over 130 color photographs and diagrams This book will inspire and inform students of neuroscience. It is designed for beginning students in the health sciences, including psychology, nursing, biology, and medicine. - Clearly and concisely written for easy comprehension by beginning students - Based on contemporary neuroscience research rather than the concepts of old-style medical school neuroanatomy - Thorough treatment of motor and sensory systems - A detailed chapter on human cerebral cortex - Discussion of the neuroscience of conscience, memory, cognitive function, brain injury, and mental illness - A comprehensive chapter on brain development - A summary of the techniques of brain research - A detailed glossary of neuroscience terms - Illustrated with over 100 color photographs and diagrams

afferent neurons definition psychology: Basic Neurochemistry R. Wayne Albers, Donald L. Price, 2011-11-02 *Basic Neurochemistry*, Eighth Edition, is the updated version of the outstanding and comprehensive classic text on neurochemistry. For more than forty years, this text has been the worldwide standard for information on the biochemistry of the nervous system, serving as a resource for postgraduate trainees and teachers in neurology, psychiatry, and basic neuroscience, as well as for medical, graduate, and postgraduate students and instructors in the neurosciences. The text has evolved, as intended, with the science. This new edition continues to cover the basics of neurochemistry as in the earlier editions, along with expanded and additional coverage of new research from intracellular trafficking, stem cells, adult neurogenesis, regeneration, and lipid messengers. It contains expanded coverage of all major neurodegenerative and psychiatric disorders, including the neurochemistry of addiction, pain, and hearing and balance; the neurobiology of learning and memory; sleep; myelin structure, development, and disease; autism; and neuroimmunology. - Completely updated text with new authors and material, and many entirely new chapters - Over 400 fully revised figures in splendid color - 61 chapters covering the range of cellular, molecular and medical neuroscience - Translational science boxes emphasizing the connections between basic and clinical neuroscience - Companion website at <http://elsevierdirect.com/companions/9780123749475>

afferent neurons definition psychology: Neurologic Differential Diagnosis Alan B. Ettinger, Deborah M. Weisbrot, 2014-04-17 Unique case-based guide to generating diagnostic possibilities based on the patients' symptoms. Invaluable for psychiatrists and neurologists.

afferent neurons definition psychology: Sleep Disorders and Sleep Deprivation Institute of Medicine, Board on Health Sciences Policy, Committee on Sleep Medicine and Research, 2006-10-13 Clinical practice related to sleep problems and sleep disorders has been expanding rapidly in the last few years, but scientific research is not keeping pace. Sleep apnea, insomnia, and restless legs syndrome are three examples of very common disorders for which we have little biological information. This new book cuts across a variety of medical disciplines such as neurology, pulmonology, pediatrics, internal medicine, psychiatry, psychology, otolaryngology, and nursing, as well as other medical practices with an interest in the management of sleep pathology. This area of research is not limited to very young and old patients—sleep disorders reach across all ages and ethnicities. *Sleep Disorders and Sleep Deprivation* presents a structured analysis that explores the following: Improving awareness among the general public and health care professionals. Increasing investment in interdisciplinary somnology and sleep medicine research training and mentoring activities. Validating and developing new and existing technologies for diagnosis and treatment. This book will be of interest to those looking to learn more about the enormous public health burden of

sleep disorders and sleep deprivation and the strikingly limited capacity of the health care enterprise to identify and treat the majority of individuals suffering from sleep problems.

Additional Resources

Afferent and Efferent Neurons: What Are They, Structure, and ...

Mar 4, 2025 · Afferent neurons carry information from sensory receptors of the skin and other organs to the central nervous system (i.e., brain and spinal cord), whereas efferent neurons ...

AFFERENT Definition & Meaning - Merriam-Webster

The meaning of AFFERENT is bearing or conducting inward; specifically : conveying impulses toward the central nervous system. How to use afferent in a sentence.

Difference Between Afferent and Efferent | Definition, Features, ...

Jul 10, 2017 · The main difference between afferent and efferent is that afferent refers to the neurons carrying signals from sensory perceptions towards the CNS while efferent refers to ...

AFFERENT Definition & Meaning - Dictionary.com

Afferent definition: bringing to or leading toward an organ or part, as a nerve or arteriole (efferent).. See examples of AFFERENT used in a sentence.

Afferent Nerve - Definition and Examples - Biology Online

Nov 3, 2021 · The afferent nerves are the messenger neurons that bring the information from different parts of the body to the central nervous system (CNS). In biology, the afferent nerves ...

Afferent - definition of afferent by The Free Dictionary

Define afferent. afferent synonyms, afferent pronunciation, afferent translation, English dictionary definition of afferent. adj. Carrying inward to a central organ or section, as nerves that conduct ...

AFFERENT | definition in the Cambridge English Dictionary

AFFERENT meaning: 1. (especially of a nerve) carrying something towards the centre of a body part 2. (especially of.... Learn more.

Afferent - Definition - Glossary - PhysiologyWeb

Apr 14, 2013 · In the nervous system, afferent fibers (i.e., neurons) transmit information from a peripheral receptor to the spinal cord or the brainstem. Afferent neurons are also referred to as ...

AFFERENT definition in American English - Collins Online ...

Definition of 'afferent' COBUILD frequency band. afferent in American English ('æfərənt) adjective. 1. Physiology. bringing inward to a central part; specif., designating nerves that ...

Afferent vs Efferent Neurons - ScienceBeta

Apr 5, 2024 · Afferent and efferent neurons are the two primary types of neurons that play distinct yet interconnected roles in this communication network. Afferent nerve fibers, also known as ...

Afferent and Efferent Neurons: What Are They, Structure, an...

Mar 4, 2025 · Afferent neurons carry information from sensory receptors of the skin and other organs to the central nervous system (i.e., brain and ...

AFFERENT Definition & Meaning - Merriam-Webster

The meaning of AFFERENT is bearing or conducting inward; specifically : conveying impulses toward the central nervous system. How to use afferent ...

[Difference Between Afferent and Efferent | Definition, Fea...](#)

Jul 10, 2017 · The main difference between afferent and efferent is that afferent refers to the neurons carrying signals from sensory perceptions ...

[AFFERENT Definition & Meaning - Dictionary.com](#)

Afferent definition: bringing to or leading toward an organ or part, as a nerve or arteriole (efferent).. See examples of AFFERENT used in a ...

Afferent Nerve - Definition and Examples - Biology Online

Nov 3, 2021 · The afferent nerves are the messenger neurons that bring the information from different parts of the body to the central nervous system ...

[Afferent Neurons Definition Psychology](#)

Afferent Neurons Definition Psychology

Related Articles

- [afc championship game history](#)
- [advertising imc principles and practice 11th edition](#)
- [affiliate marketing conversion rates](#)

[Back to Home](#)