

The Mammalian Auditory Pathway Neuroanatomy 1st Edition

The Mammalian Auditory Pathway: Neuroanatomy The Mammalian Auditory Pathway: Neurophysiology The Mammalian Auditory Pathways Integrative Functions in the Mammalian Auditory Pathway The Mammalian Auditory Pathway The Mammalian Auditory Pathway Studies with a Neuronal Modeling System for the Mammalian Auditory Pathway Development of the Auditory System Evolution of the Vertebrate Auditory System Hearing — the Brain and Auditory Communication in Marsupials Commonalities and Differences in Vestibular and Auditory Pathways Plasticity of the Auditory System Studies of the Organisation of the Mammalian Auditory Pathway Descending Control in the Auditory System Fundamental Neuroscience Information Processing in Mammalian Auditory and Tactile Systems THE AUDITORY PATHWAY OF THE EPILEPTIC WALTZING MOUSE Auditory System Plasticity and Regeneration The Auditory System Anatomy and Physiology of Hearing for Audiologists Douglas B Webster Richard R. Fay Douglas L. Oliver Donata Oertel Douglas B. Webster Arthur N. Popper Bruce Robert Parnas Edwin W. Rubel Geoffrey A. Manley Lindsay Aitkin Soroush G. Sadeghi Thomas N. Parks Lindsay Michael Aitkin David Pérez-González Larry Squire Mark Rowe MURIEL DOROTHY KARP ROSS Richard Salvi Frank E. Musiek William W. Clark

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the springer handbook of auditory research presents a series of comprehensive and synthetic reviews of the fundamental topics in modern auditory research it is aimed at all individuals with interests in hearing research including advanced graduate students postdoctoral researchers and clinical investigators the volumes will introduce new investigators to important aspects of hearing science and will help established investigators to better understand the fundamental theories and data in fields of hearing that they may not normally follow closely each volume is intended to present a particular topic comprehensively and each chapter will serve as a synthetic overview and guide to the literature as such the chapters present neither exhaustive data reviews nor original research that has not yet appeared in peer reviewed journals the series focusses on topics that have developed a solid data and conceptual foundation rather than on those for which a literature is only beginning to develop new research areas will be covered on a timely basis in the series as they begin to mature

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the auditory system is a complex neural system composed of many types of neurons connected into networks one feature that sets the auditory system apart from other sensory systems such as somatosensory or visual systems is the many stages of neural processing that occur between the ear in the periphery and the cerebral cortex each stage is composed of specialized types of neurons connected in specific microcircuits that perform computations on the information about sound to understand this processing all the tools of neuroscience must be employed the proposed text integrates cell biology synaptic physiology and electrophysiology to fully develop the topic presenting an overview of the functional anatomy of the central auditory system it is organized based on the neuronal connectivity of the central auditory system which emphasizes the neurons their synaptic organization and their formation of functional pathways and microcircuits the goal of the book is to stimulate research into the cell biology of the central auditory system and the characteristics of the specific neurons and connections that are necessary for normal hearing future research on the development of the central auditory including that employing stem cells will require such information in order to engineer appropriate therapeutic approaches

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extraordinary progress has been made in recent years in understanding the cellular and molecular basis of development this progress is having a strong influence on our knowledge of the auditory system from the molecular genetics of ear development to the ontogeny of auditory capability great inroads have been made the contributors to this volume on development of the auditory system have provided a detailed and integrated introduction to the behavioral anatomical and physiological changes that occur in the auditory system of developing animals about the editors edwin w rubel is virginia merrill bloedel professor of hearing sciences at the virginia merrill bloedel hearing research center at the university of washington arthur n popper is professor and chair of the department of zoology at the university of maryland richard r fay is associate director of the parmy hearing institute and professor of psychology at loyola university of chicago about the series the springer handbook of auditory research presents a series of synthetic reviews of fundamental topics dealing with auditory systems each volume is independent and authoritative taken as a set this series will be the definitive resource in the field

the function of vertebrate hearing is served by a surprising variety of sensory structures in the different groups of fish amphibians

reptiles birds and mammals this book discusses the origin specialization and functional properties of sensory hair cells beginning with environmental constraints on acoustic systems and addressing in detail the evolutionary history behind modern structure and function in the vertebrate ear taking a comparative approach chapters are devoted to each of the vertebrate groups outlining the transition to land existence and the further parallel and independent adaptations of amniotic groups living in air the volume explores in depth the specific properties of hair cells that allowed them to become sensitive to sound and capable of analyzing sounds into their respective frequency components evolution of the vertebrate auditory system is directed to a broad audience of biologists and clinicians from the level of advanced undergraduate students to professionals interested in learning more about the evolution structure and function of the ear

this monograph evolved from years of research into the auditory pathway and hearing of many species of marsupials its function is to give biologists in particular neurobiologists a broad description and review of what is known of the auditory sensory capacities and processing mechanisms in this large order of mammals my initial interest in marsupials developed from collaborative work with dr richard gates at monash and melbourne universities in the 1970s and by curiosity as to whether concepts about the auditory system was stimulated stemming from experiments mainly on domestic cats could be extended to mammals of other orders my subsequent interest in australian marsupials aroused by collaboration with dr john nelson at monash university in the 1980s and 1990s concerned their auditory systems and behavior per se and not as primitive cousins of eutherians more recently i have collaborated with dr bruce masterton at florida state university in studies of new world marsupials his sad death in 1996 has robbed neurobiologists of one of our most provocative thinkers and hypothesis testers i would like to thank the department of physiology at monash university for making many facilities available to me the national health and medical research of australia and the australian research council for providing

funds for council research and jill poynton and michelle mulholland who illustrated this volume

the auditory system has a remarkable ability to adjust to an ever changing environment the six review chapters that comprise plasticity of the central auditory system cover a spectrum of issues concerning this ability to adapt defined by the widely applicable term plasticity with chapters focusing on the development of the cochlear nucleus the mammalian superior olivary complex plasticity in binaural hearing plasticity in the auditory cortex neural plasticity in bird songs and plasticity in the insect auditory system this volume represents much of the most current research in this field the volume is thorough enough to stand alone but is closely related a previous shar volume development of the auditory system volume 9 by rubel popper and fay the book fully addresses the difficulties challenges and complexities of this topic as it applies to the auditory development of a wide variety of species

with over 300 training programs in neuroscience currently in existence demand is great for a comprehensive textbook that both introduces graduate students to the full range of neuroscience from molecular biology to clinical science but also assists instructors in offering an in depth course in neuroscience to advanced undergraduates the second edition of fundamental neuroscience accomplishes all this and more the thoroughly revised text features over 25 new material including completely new chapters illustrations and a cd rom containing all the figures from the text more concise and manageable than the previous edition this book has been retooled to better serve its audience in the neuroscience and medical communities key features logically organized into 7 sections with uniform editing of the content for a one voice feel throughout all 54 chapters includes numerous text boxes with concise detailed descriptions of specific experiments disorders methodological approaches and concepts well illustrated with over 850 full color figures also included on the accompanying cd rom

this text explores the shared and contrasting strategies for signalling and processing sensory information within auditory and tactile systems and describes their physiologic organization it brings together researchers in aspects of sensory physiology whose studies are linked by their reliance upon mechanoreceptor mechanisms the book has a strong functional emphasis and is based on electrophysiological analyses from the receptor level to the anatomic level probing the sensory and motor areas of the cerebral cortex it presents recent research data on mechanisms of auditory transduction efferent control of cochlear function the coding of information about sound intensity directional aspects of hearing frequency parameters of simple and complex vibrotactile stimuli development and reorganization within auditory tactile systems the application of fundamental sensory research to the problems of deafness

this volume contains contributions from international specialists who document the progress achieved in understanding plasticity and regeneration of the adult auditory system it should be of interest to audiologists otolaryngologists hearing scientists and neuroscientists

from well known author frank musiek comes a new text designed to aid audiology students through the clinical portion of their experience the auditory system anatomy physiology and clinical correlates takes an easy to understand approach to the anatomy and physiology of the auditory system bull increases appreciation of the entire auditory system by providing balanced coverage between peripheral and central auditory systems bull chapter 1 provides a quick reference and overview to the entire text bull integrated clinical correlates for anatomical and physiological information provide clinical relevance bull generous use of review articles and secondary sources enhances general understanding of the subject bull facilitates learning with a balanced mixture of anatomical sketches and photographs

the first anatomy and physiology text just for audiologists this new text brings together some of the best professional minds in the field

to consider the structures and mechanisms of the auditory system basic science is covered in the foundations section of the text giving a much needed examination of the biological processes in terms the audiologist needs most detailed examination of the anatomy and physiology of hearing follows with diagrams and in depth discussions the text concludes with chapters on the pathology of hearing covering the different causes of hearing loss from noise induced hearing loss to genetic aspects of hearing loss from start to finish this text is written specifically for the audiologist making it an essential foundational resource

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