Book Review

Tinnitus, Springer Handbook of Auditory Research, Vol. 44

This book has very recently been published and constitutes a part of the Springer Handbook of Auditory Research (SHAR) Series. This series has been originally initiated in 1992 for the purpose to provide comprehensive reviews of fundamental topics in auditory research. The SHAR sequence aims at all individuals with interest in hearing research including advanced students, post-doctoral researchers, and clinical investigators. The volumes are intended both to introduce new investigators to important aspects of hearing science and to help established investigators to better understand the fundamental theories and data in fields of hearing that they may not normally follow closely. Each volume of this series presents a particular topic comprehensively and is intended to serve as a guide to the literature and as an “appetizer” for going deeper into detail.

The presented book contains almost 300 pages and focuses both on neural mechanisms of tinnitus and its behavioral consequences. Roughly, it is divided in two different parts, the first of them (Chapters 2-7) mainly concentrating on the underlying pathophysiology of tinnitus derived from basic research, the second one (Chapters 8-11) targeting research and potential therapies in humans.

After an opening chapter by Eggermont and Zeng, which provides historical reflections on current issues in tinnitus and its research, the first part of the book covers animal research that has led to increased understanding of the underlying mechanisms of the generation of tinnitus. In Chapter 2, Heffner and Heffner evaluate the behavioral tests for animals currently employed in tinnitus research. In Chapter 3, Knipper, Müller and Zimmermann discuss etiologies of tinnitus in the context of molecular changes in the peripheral auditory system, in subcortical areas, and in the auditory cortex. This is followed by Chapter 4 by Nouvian, Eybalin, and Puel, who argue that the auditory nerve is a potential tinnitus generator through recruitment of N-methyl-D-aspartate receptors at the first auditory synapse. In Chapter 5, Dehmel, Koehler, and Shore discuss the role of the dorsal cochlear nucleus as an interaction node between auditory and somatosensory neural activity in inducing tinnitus. In Chapter 6, Robertson and Mulders address the role of the inferior colliculus in tinnitus. Chapter 7 contains a discussion by Eggermont of the role of auditory cortex in sound perception in general and tinnitus in particular.

The first chapter of the second part of the book (Chapter 8) by Melcher describes the study of tinnitus in humans by means of brain imaging to measure human brain function and structure. In Chapter 9, Moore dissects the psychophysics of tinnitus, particularly that of pitch, loudness, and masking. In Chapter 10, Noreña emphasizes the view that tinnitus results from central changes due to sensory deprivation, which results in increases spontaneous activity and/or synchrony in auditory centers. Finally, in Chapter 11, Langguth, de Ridder, Kleinjung, and Elgoyhen review the effects of transcranial magnetic stimulation, direct electrical brain stimulation, and pharmacological interventions in tinnitus patients.

Overall evaluation: This book is suitable and highly recommendable both for the reader who wants to gather targeted pieces of information about certain tinnitus-related topics and is in need for a guide to current literature, as well as for the reader who wants to become familiar with the topic of tinnitus itself and is in need for a comprehensible and curt introduction. Due to its clear formal structure it may be used chapter-wise, but may be read at one go as well. The editors have perfectly managed to link animal and basic research to clinical approaches and we are sure that this book will be very helpful to broaden the view both for investigators and clinicians already working in the field of tinnitus and to draw the attention of individuals originally interested in other aspects of hearing. For sure, it will enable the reader to gain a deeper understanding of tinnitus without the need of gathering single pieces of information on his/her own and extracting pubmed-listed original research as a first step.

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Some passages are copied from the textbook