

Preface

Biological rhythms have been known to man since the ancient Greeks, but they became a topic of systematic scientific interest only since the last century. As a matter of fact, it has been only until the dawn of the present century when its links to Physiology and Medicine have called the attention of a broader academic audience and the general population. The reason is mainly due to the recent advances on the molecular genetics of circadian rhythms and the discovery of its cross-links—mainly at the gene regulation level—with other systems involved in control of metabolic networks, cell cycle, as well as behavioral and mental processes.

This book provides a wide perspective on the organization of circadian systems along the animal kingdom from invertebrates to mammals. At the same time, it addresses some aspects of the physiological and clinical relevance of circadian regulation for human beings. It is organized in three parts preceded by a brief introduction that presents the basic concepts of circadian rhythms. In the first part *Circadian Systems* the authors outline a broad perspective of the timing system organization in a variety of animal groups including Crustacean, Insects, Fish, Birds and Primates. The next part *Mechanism of Circadian Oscillation* focuses on one of the most studied mammalian models, the Rodents. In this part the role of the suprachiasmatic nuclei as a circadian clock is reviewed from the cellular to the system level. The final part *Clinical Relevance of Circadian Rhythmicity* provides a perspective to integrate our knowledge on circadian rhythmicity with current human physiology and it reviews recent advances of molecular regulation of circadian rhythms in relation to metabolism, nutrition, cell cycle regulation, cancer, and neurological and mental disorders.

The book is aimed to graduate students in Neuroscience, Biology, Psychology, and Medicine interested in an integrative perspective of circadian rhythms. It also provides some contemporary advances on circadian system organization for experts in circadian biology. It is important to stress the integrative approach of each of the contributions, which distinguishes this book from other related texts. Finally, it is appropriate to mention that the contributors are active and distinguished scientists widely recognized in the field of Chronobiology from Argentina, Brazil, México, Netherlands, Japan, Sweden, and the USA.

We hope to call the attention of young science students to a fascinating area of Biology in order to contribute to the advance of this yet emerging field of science, and to correct or complete some of the hypothesis here presented. This is an invitation to join us in the adventure of understanding time in biology.

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