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Sommario/riassunto

The rapid progress of neuroscience in the last decade can be largely attributed to significant advances in neuroethology, a branch of science that seeks to understand the neural basis of natural animal behavior. Novel approaches including molecular biological techniques, optical recording methods, functional anatomy, and informatics have brought drastic changes in how the neural systems underlying high-level behaviors such as learning and memory are described. This book introduces recent research techniques in neuroethology, with diverse topics involving nematodes, insects, and vertebrates (birds, mice and primates), divided into sections by research method. Each section consists of two chapters written by different authors who have developed their own unique approaches. Reports of research in “model animals” including C. elegans, Drosophila, and mice, which were not typical specimens in conventional neuroethology, have been deliberately selected for this book because a molecular genetic approach to these animals is necessary for advances in neuroethology. Novel methodology including optical recording and functional labeling with reporter genes such as GFP has been actively used in recent neurobiological studies, and genetic manipulation techniques such as optogenetics also are powerful tools for understanding the molecular basis of neural systems for animal behavior. This book provides not only these new strategies but also thought-provoking statements of philosophy in neuroethology for students and young researchers in the biological sciences. .