Neuroendocrine Regulation of Behavior

In this text Jay Schulkin discusses and emphasizes the important roles of steroids and neuropeptides in the regulation of behavior. The guiding principle behind much of the research and insights that are presented in the book is the concept of using certain model animal systems to study how hormones influence the brain. The results from these model systems can then be used to generalize the information obtained and apply it to other animals and humans.

The first chapter focuses on developmental periods and sexually dimorphic behaviors; the second discusses sodium and water appetite and ingestion; the third deals with appetite and food selection and ingestion. The fourth chapter examines how hormones influence parental behavior; the fifth is on fear and stress. The last chapter deals with biological clocks and endogenous rhythms. The conclusion summarizes the earlier chapters and emphasizes that steroids and peptides, or neuropeptides, affect behavior by acting directly on the brain and that common neural circuits underlie a variety of different central motive states.

Senior undergraduate and graduate students in neuroscience, endocrinology, psychology, and physiology will find this text a useful guide to the role of hormones in behavior. It should be of use to colleagues in the field and medical health-care professionals.

Jay Schulkin is a Research Professor at the Department of Physiology and Biophysics at the Georgetown University School of Medicine. He is also a research associate of the Clinical Neuroendocrinology Branch of the National Institute of Mental Health and Director of Research at the American College of Obstetricians and Gynecologists. He is the author of four books, including Sodium Hunger, published by Cambridge in 1991.
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JAY SCHULKIN
Dedicated to the memory of my maternal grandparents,
Nettie and David Linder,
and my senior colleague, Eliot Stellar
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As I was growing up I spent a good deal of time at the Bronx Zoo. Visiting the zoo and the American Museum of Natural History in New York City and playing the clarinet were my favorite preadolescent activities until, as a teenager, my life took a new direction. I well remember those happy hours spent at the zoo, and as an adult I have often visited zoos wherever I have traveled. It is my way of being close to different kinds of animals. What sorts of naturalists would go to zoos? City kids, as I once was.

The origin of this interest perhaps can be traced back to a book my grandparents gave me for Hanukkah when I was seven. It was entitled All about Animals and Their Young. My interest was further cultivated by three senior colleagues and mentors, now gone: Alan Epstein, Eliot Stellar, and George Wolf. I feel that I have had some of the best colleagues the world can offer. Bruce McEwen at Rockefeller University has been a great help to me. I thank my colleagues at the National Institute of Mental Health, particularly Phil Gold and Dave Jacobowitz, and at Georgetown University and the American College of Obstetricians and Gynecologists for their instruction and assistance.

My association with Olav Ofstedal of the Smithsonian Institution and the Washington Zoo has allowed me to return to my first love. I now go to the zoo here regularly for research, and sometimes I bring my daughter. Our colleagueship is very much appreciated.

As always, my colleagues, friends, and family have been of great help in my scientific pursuits. In particular, I thank Kent Berridge, G. DeVries, Lauren Hill, Micah Leshem, Peter Marler, Adrian Morrison, Ralph Norgren, Dick O’Keeffe, Ellen Parr Oliver, Mike Power, Jeff Rosen, Alan Rosenwasser, Louis Schmidt, and Dana Trevas.

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cells in the forebrain (bed nucleus of the stria terminalis, medial preoptic nucleus, and medial nucleus of the amygdala) that were involved in steroid-induced behavioral effects, thus implanting the thought that these nuclei might also underlie what I was studying: aldosterone-induced sodium appetite.

As I said in my book Sodium Hunger, I have been greatly influenced by those with whom I have interacted and in many instances been involved with personally. Science is set in a human context of social relationships. One of the joys of science is participation in the fragile community of inquirers. To those who may feel slighted if I have not properly attended to their work, I apologize. This book, in addition, is not intended to cover all aspects of the neuroendocrine regulation of behavior. It builds and draws on the sodium-hunger perspective for how steroids and peptides influence behavior, and the chapters reflect only a partial purview of the field.

This book is not intended, therefore, as a general textbook in behavioral endocrinology. It does not cover everything nor pretend to. For a comprehensive textbook that recently appeared, I urge readers to look at Randy Nelson’s book An Introduction to Behavioral Endocrinology or the volume Behavioral Endocrinology, edited by J. B. Becker, M. C. Breedlove, and D. Crews.

Many colleagues have been helpful in reviewing this manuscript and making it better. I thank them. Finally, I thank three influential women: my daughter, Danielle, my wife, April, and my mother, Rosalind, for their wonderful love.