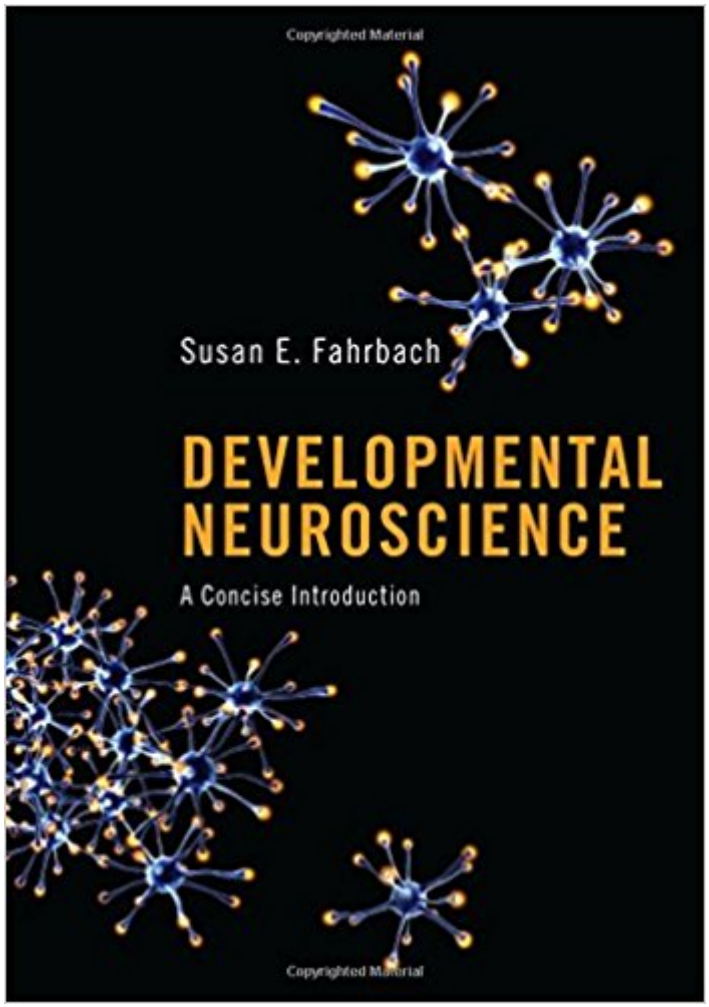
Developmental Neuroscience: A Concise Introduction



Synopsis

This textbook offers a concise introduction to the exciting field of developmental neuroscience, a discipline concerned with the mechanisms by which complex nervous systems emerge during embryonic growth. Bridging the divide between basic and clinical research, it captures the extraordinary progress that has been achieved in the field. It provides an opportunity for students to apply and extend what they have learned in their introductory biology courses while also directing them to the primary literature. This accessible textbook is unique in that it takes an in-depth look at a small number of key model systems and signaling pathways. The book's chapters logically follow the sequence of human brain development and explain how information obtained from models such as Drosophila and zebrafish addresses topics relevant to this area. Beginning with a brief presentation of methods for studying neural development, the book provides an overview of human development, followed by an introduction to animal models. Subsequent chapters consider the molecular mechanisms of selected earlier and later events, neurogenesis, and formation of synapses. Glial cells and postembryonic maturation of the nervous system round out later chapters. The book concludes by discussing the brain basis of human intellectual disabilities viewed from a developmental perspective. Focusing on the mechanistic and functional, this textbook will be invaluable to biology majors, neuroscience students, and premedical and pre-health-professions students. An accessible introduction to nervous system development Suitable for one-semester developmental neuroscience course Thorough review of key model systems Selective coverage of topics allows professors to personalize courses Investigative reading exercises at the end of each chapter An online illustration package is available to professors

Book Information

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Customer Reviews

"Written with a rare lucidity and grace, Susan Fahrbach's Developmental Neuroscience offers a systematic and logical account of the development of nerve cells and nervous systems, human and otherwise. The book is lecture friendly and the supplementary reading questions are ideal for college courses. It will be of surpassing interest to professors seeking a current treatment of developmental neuroscience."--Donald Pfaff, Rockefeller University and editor of Neuroscience in the 21st Century"The words 'delightful textbook' do not often occur together but they describe Developmental Neuroscience to a tee. Susan Fahrbach has an exceptional voice and, coupled with a deep scholarly bent, a keen ability for explaining the importance of developmental phenomena and how we come to understand them. There is much that is new here even for longtime instructors of the subject. This is a truly valuable addition to the field."--Darcy Kelley, Columbia University"Developmental Neuroscience is an elegantly written take on a subject rooted in classical embryology but now yielding to the contemporary tools of molecular genetics and neuroimaging. Fahrbach's approach is patient and steady, surveying the current state of understanding through humans and different model organisms, with a sensitive ear to the cultural issues and contexts that will inform and motivate students."--David Clayton, Queen Mary, University of London"This is the ideal textbook for students who want to think about particular big-picture topics and engage with the primary literature. With simple language, good points, interesting anecdotes, big ideas, and nice tie-in questions, the book provides broad brushstrokes on important issues, which then allows students, through guided discussion, to delve into specific developmental processes or signaling pathways."--Christopher Korey, College of Charleston

Susan E. Fahrbach is the Reynolds Professor of Developmental Neuroscience in the Department of Biology at Wake Forest University.

Audience: In the preface to this volume, the author considers her audience to be: (1) Readers interested in learning about the nervous system so that they can better understand brain evolution and animal behavior. (2) Physicians, educators, parents. (3) Those considering careers in neuroscience research. (4) Undergraduates encountering the subject of neurodevelopment for the first time.Pre-requisites: Introductory biology (covering the basics of physiology, cell biology, genetics, and molecular biology). The author provides the needed embryology background in the chapter 2.Author: Susan E. Fahrbach, PhD, is the Reynolds Professor of Neuroscience in the Department of Biology at Wake Forest University. Her primary area of research is development of

insect nervous systems. She is a credible expert in her field.Content: Covers the development of the human nervous system primarily as illustrated by studies of animal model organisms ÃƒÂ¢Ã â ¬Ã â œ fruit fly, worm (C. elegans), zebra-fish, and mouse.ÃƒÂ¢Ã â ¬Ã Â¢ Ch. 1 Introduction: covers methods of studying development in the nervous systemÃƒÂ¢Ã â ¬Ã Â¢ Ch. 2 Overview of nervous system development in humansÃƒÂ¢Ã â ¬Ã Â¢ Ch. 3 Animal models: provides background information on model organisms.ÃƒÂ¢Ã â ¬Ã Â¢ Ch. 4 Early events: axis determination and neural inductionÃƒÂ¢Ã â ¬Ã Â¢ Ch. 5 Neurogenesis (also has a section on adult neurogenesis)ÃƒÂ¢Ã â ¬Ã Â¢ Ch. 6 Later events: regionalization, cortical histogenesisÃƒÂ¢Ã â ¬Ã Â¢ Ch. 7: Becoming a neuron: how neuronal processes (dendrites and axon) form and synaptogenesis.ÃƒÂ¢Ã â ¬Ã Â¢ Ch. 8 GliaÃƒÂ¢Ã â ¬Ã Â¢ Ch. 9 Maturation: metamorphosis, adolescenceÃƒÂ¢Ã â ¬Ã Â¢ Ch. 10 Intellectual disabilityIllustrations: Black and white line drawings (81 illustrations)Writing style: The writing should be accessible to anyone with a strong biology background. New terms are defined as they are introduced.References: Ample references and bibliography for further reading.Comparison with other titles: If your interest is primarily biological, you may want to compare this work with Sanes and Reh. If you are also interested in cognitive aspects of brain development, you may also want to consider the works by Stiles and/or Johnson and deHaan.ÃƒÂ¢Ã â ¬Ã Â¢ Development of the nervous system, third edition, by Sanes and Reh (2011): I have not read this work, but it is a little cheaper and seems to have nice color illustrations.ÃƒÂ¢Ã â ¬Ã Â¢ The Fundamentals of Brain Development: Integrating Nature and Nurture by Joan Stiles (2008)ÃƒÂ¢Ã â ¬Ã Â¢ Developmental Cognitive Neuroscience by Johnson and deHaan (2015)Summary: This is an introductory level academic text for biology and neuroscience students and researchers and for those in related fields, such as medicine, neurology, and pediatrics/pediatric neurology. It covers the development of the human nervous system primarily as illustrated by studies of animal model organisms.

The layout of the book was structured much more intuitively than most publications in this field. The book can be read straight through like a novel while elucidating its information like a textbook. I also appreciate the fact that a lot of the "fluff" has been trimmed out leaving an information rich product.

Fascinating introduction into the field of Developmental Neuroscience.

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