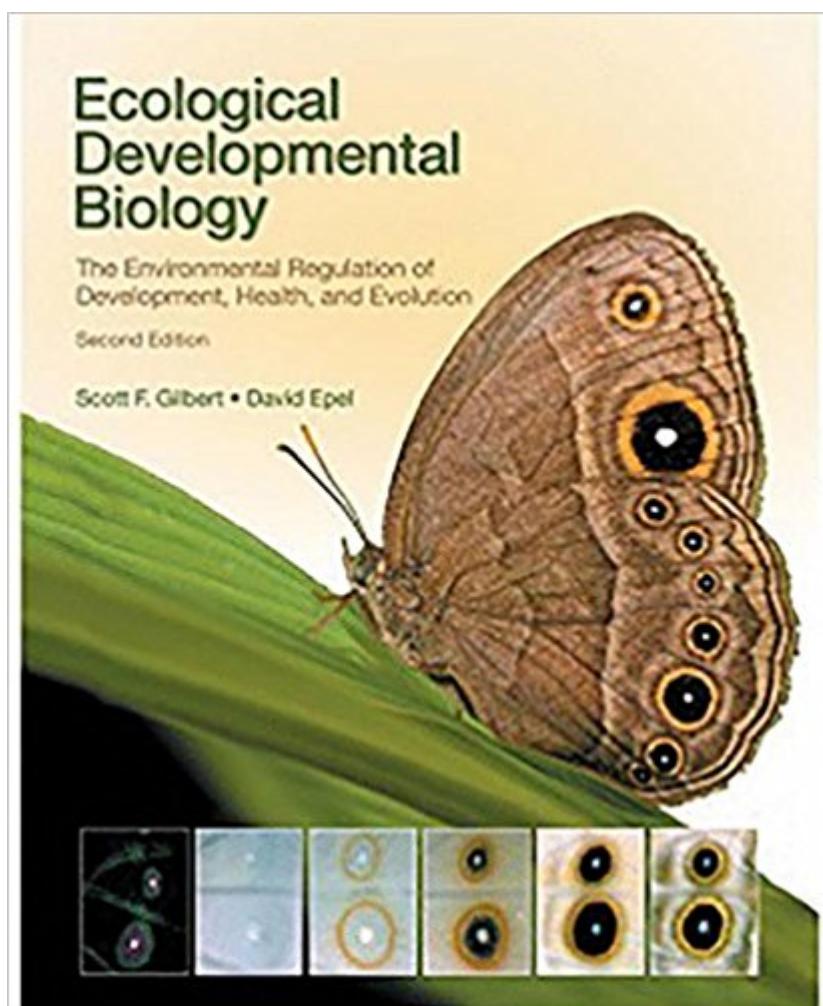


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Ecological Developmental Biology: The Environmental Regulation Of Development, Health, And Evolution



Synopsis

The only book that, in one place:- details the three main epigenetic sources of phenotype: symbionts, altered chromatin structure, and plasticity.- discusses the various ways that development can be disrupted: teratogens, endocrine disruptors, global climate change, and mismatches between diet and environment.- documents the evidence for an extended evolutionary synthesis involving the modern synthesis, evo-devo, and eco-evo-devo. The revolution in molecular technologies has created a revolution in our perception of the living world. It is life, but not as we knew it.* Symbiosis, once thought the exception to the rules of life, is now recognized as a signature of life, including its development and evolution. We function, develop, and possibly evolve as consortia.* Developmental plasticity has transformed our ways of relating the genome to both the organism and its environment, showing that the environment can instruct, as well as select, phenotypes.* Environmentally induced modifications of the genome (epialleles) can be created by ecological agents and inherited for many generations, showing the ability of environmental agents to generate selectable variation.* Disease susceptibilities--especially to diseases such as cancer, diabetes, asthma, autism, and obesity--may be inherited through epialleles caused by environmental agents, by mismatches in developmental plasticity, or by particular combinations of symbionts.* Global climate change and endocrine disruptors are affecting how organisms develop and how they behave. The science studying this new world, uncovering the relationships between genes, developing organisms, and their environments, is called ecological developmental biology. This book presents the data for ecological developmental biology, integrating it into new accounts of medicine, evolution, and embryology. The new evolutionary science created by this approach to nature is called ecological evolutionary developmental biology (eco-evo-devo). The book documents the evidence for a new, extended, evolutionary synthesis, a synthesis that: confounds the creationist belief that evolution can't be described above the species-level; integrates aging and "Western" diseases such as diabetes, atherosclerosis, cancer, and obesity into an evolutionary context; and sees interspecies interactions both within the organism and between organisms as being critical for evolution, development, and fitness. For Instructors/Instructor's Resource Library This resource includes all figures (line-art illustrations and photographs) and tables from the textbook, provided as both high- and low-resolution JPEGs. All have been formatted and optimized for excellent projection quality. Also included are ready-to-use PowerPoint presentations of all figures and tables.

Book Information

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Customer Reviews

"This second edition, written by two of its pioneers, serves as a primer to the field and is intended for advanced undergraduate students, although it is equally appropriate for graduate students, faculty, and the broader public. The book is written in an engaging, clear, accessible prose, and richly illustrated with hundreds of high-quality images and graphs. This is a well-written and valuable volume, which deserves to be not just on bookshelves, but to be read by anyone interested in why and how development and evolution unfold the way they do."--Sofía Casasa and Armin P.

Moczek, *The Quarterly Review of Biology*"The degree to which genetics and the environment affect organismal development is an important question. Ecological Developmental Biology articulates this topic for today's researcher by integrating modern environmental issues such as climate change and pollution with disparate fields of modern biology. Ecological Developmental Biology is a good companion for the undergraduate or graduate interested in dwelling not only at the crossroads of molecular and ecological-based biology, but also in fields of public policy and philosophy."--Brenden

Barco, *Yale Journal of Biology and Medicine*"This is an ambitious, largely successful incorporation of new discoveries and rediscoveries into biology. The book is aimed at students and professionals who wish to understand their subdisciplines in a broader ecological, evolutionary, and social context."--J. Burger, *CHOICE*"This is a book that deserves to be read. It presents complex

information clearly and engagingly, in context and with the citations of the primary literature that an instructor needs to add depth to a topic."--F. Harvey Pough, *Rochester Institute of Technology*

Scott F. Gilbert, a Senior Research Associate at Swarthmore College and the Finland Distinguished Professor at the University of Helsinki Institute of Biotechnology, teaches developmental biology, developmental genetics, and the history of biology. After receiving his B.A. from Wesleyan University, he pursued his graduate and postdoctoral research at The Johns Hopkins University and the University of Wisconsin. Dr. Gilbert is the recipient of several awards, including the first Viktor Hamburger Award for excellence in developmental biology education, the 2004 Alexander Kowalevsky Prize for evolutionary developmental biology, honorary degrees from the Universities of Helsinki and Tartu, and the Medal of François I from the Collège de France. He is a Fellow of the American Association for the Advancement of Science, a corresponding member of the St. Petersburg Society of Naturalists, and has been chair of the Professional Development and Education Committee of the Society for Developmental Biology. His research pursues the developmental genetic mechanisms by which the turtle forms its shell. David Epel is the Jane and Marshall Steel Jr. Professor Emeritus of Biological Sciences at Stanford University's Hopkins Marine Station in Pacific Grove CA. He did his undergraduate studies at Wayne State University and then graduate and postdoctoral studies at the University of California, Berkeley and the University of Pennsylvania. Dr. Epel has been a Guggenheim Fellow, is a Fellow of the American Association for the Advancement of Science, the California Academy of Sciences, and an Overseas Fellow of Churchill College and Life Fellow of Clare Hall at the University of Cambridge. His honors include the Cox Medal for Fostering Undergraduate Research at Stanford and the Ed Ricketts Memorial Award for Lifetime Achievement in the Marine Sciences. Epel's research focused on cell biology of development, especially the activation of the egg at fertilization, the unique physiology of the embryo and the cellular mechanisms of embryo protection. His current interest is high school science education. One area is highlighting early development of the sea urchin embryo to capture the imagination and interest of high school students. New curricula focus on the science of climate change and how students can help to solve this problem.

very good indeed. much new information for newbys and for those who aren't current in biology. moderately advanced---best for college juniors and above.

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