Principles Of Development Lewis Wolpert 4th

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Essential Developmental Biology - Jonathan M. W. Slack 2009-03-12
TO ACCESS THE DEDICATED TEXTBOOK WEBSITE, PLEASE VISIT www.blackwellpublishing.com/slack Essential Developmental Biology, 2nd Edition, is a concise and well-illustrated treatment of this subject for undergraduates. With an emphasis throughout on the evidence underpinning the main conclusions, this book is suitable as the key text for both introductory and more advanced courses in developmental biology. Includes new chapters on Evolution & Development, Gut Development, & Growth and Aging. Contains expanded treatment of mammalian fertilization, the heart and stem cells. Now features a glossary, notated further reading, and key discovery boxes. Illustrated with over 250 detailed, full-color drawings. Accompanied by a dedicated website, featuring animated developmental processes, a photo gallery of selected model organisms, and all art in PowerPoint and jpeg formats (also available to instructors on CD-ROM). An Instructor manual CD-ROM for this title is available. Please contact our Higher Education team at HigherEducation@wiley.com for more information.

The Dynamics of Living Systems - Thomas Lecuit 2020-11-16
How can we explain the fundamental paradox of living matter, which combines stability and robustness of form with constant internal dynamics? It is not only the genetic information contained in every cell, but also numerous stochastic biomolecular processes that are at work in morphogenesis. In addition, the shaping of an organism is driven by mechanical forces that operate within and between cells, across tissues and organs. The dynamics of morphogenesis is a self-organized process that emerges from biological control and physical constraints at all scales. Its study is currently bringing together a fast-growing interdisciplinary community that observes, analyses and models living organisms.

A Passion for Science - Lewis Wolpert 1988
A collection of conversations in which scientists from all fields give non-technical accounts of their lives in the profession, showing how incidents and human characteristics have influenced discoveries.

Strickberger's Evolution - Brian K. Hall 2011-06-07
Thoroughly updated and reorganized, Strickberger's Evolution, Fourth Edition, presents biology students with a basic introduction to prevailing knowledge and ideas about evolution, discussing how, why, and where the world and its organisms changed throughout history. Keeping consistent with Strickberger's engaging writing style, the authors carefully unfold a broad range of philosophical and historical topics that frame the theories of today including cosmological and geological evolution and its impact on life, the origins

of life on earth, the development of molecular pathways from genetic systems to organismic morphology and function, the evolutionary history of organisms from microbes to animals, and the numerous molecular and populational concepts that explain the earth's dynamic evolution. Important Notice: The digital edition of this book is missing some of the images or content found in the physical edition.

Introduction to Epigenetics - Renato Paro 2021-03-23

This open access textbook leads the reader from basic concepts of chromatin structure and function and RNA mechanisms to the understanding of epigenetics, imprinting, regeneration and reprogramming. The textbook treats epigenetic phenomena in animals, as well as plants. Written by four internationally known experts and senior lecturers in this field, it provides a valuable tool for Master- and PhD- students who need to comprehend the principles of epigenetics, or wish to gain a deeper knowledge in this field. After reading this book, the student will: Have an understanding of the basic toolbox of epigenetic regulation Know how genetic and epigenetic information layers are interconnected Be able to explain complex epigenetic phenomena by understanding the structures and principles of the underlying molecular mechanisms Understand how misregulated epigenetic mechanisms can lead to disease

The Educated Mind - Kieran Egan 2007-12-01

The Educated Mind offers a bold and revitalizing new vision for today's uncertain educational system. Kieran Egan reconceives education, taking into account how we learn. He proposes the use of particular "intellectual tools"—such as language or literacy—that shape how we make sense of the world. These mediating tools generate successive kinds of understanding: somatic, mythic, romantic, philosophical, and ironic. Egan's account concludes with practical proposals for how teaching and curriculum can be changed to reflect the way children learn. "A carefully argued and readable book. . . . Egan proposes a radical change of approach for the whole process of education. . . . There is much in this book to interest and excite those who discuss, research or deliver education."—Ann Fullick, New Scientist "A compelling vision for today's uncertain educational system."—Library Journal "Almost anyone involved at any level or in any part of the education system will find this a fascinating book to read."—Dr. Richard Fox, British Journal of Educational Psychology "A fascinating and provocative study of cultural and linguistic history, and of how various kinds of understanding that can be distinguished in that history are recapitulated in the developing minds of children."—Jonty Driver, New York Times Book Review

Biological Processes in Living Systems - C. H. Waddington 2017-09-08

Biological Processes in Living Systems is the fourth and final volume of the Toward a Theoretical Biology series. It contains essays that deal in detail with particular biological processes: morphogenesis of pattern, the development of neuronal networks, evolutionary processes, and others. The main thrust of this volume brings relevance to the general underlying nature of living systems. Faced with trying to understand how the complexity of molecular microstates leads to the relative simplicity of phenome structures, Waddington-on behalf of his colleagues-stresses on the structure of language as a paradigm for a theory of general biology. This is language in an imperative mood: a set of symbols, organized by some form of generative grammar, making possible the conveyance of commands for action to produce effects on the surroundings of the emitting and the receiving entities. "Biology," he writes, "is concerned with algorithm and program." Among the contributions in this volume are: "The Riemann-Hugoniot Catastrophe and van der Waals Equation," David H. Fowler; "Differential Equations for the Heartbeat and Nerve Impulse," E. Christopher Zeeman; "Structuralism and Biology," Rene

Thom; "The Concept of Positional Information and Pattern Formation," Lewis Wolpert; "Pattern Formation in Fibroblast Cultures," Tom Elsdale; "Form and Information," C. H. Waddington; "Organizational Principles for Theoretical Neurophysiology," Michael A. Arbib; "Stochastic Models of Neuroelectric Activity," Jack D. Cowan. Biological Processes in Living Systems is a pioneering volume by recognized leaders in an ever-growing field.

The Unnatural Nature of Science - Lewis Wolpert 1994

Wolpert draws on the entire history of science, from Thales of Miletus to Watson and Crick, from the study of eugenics to the discovery of the double helix. The result is a scientist's view of the culture of science, authoritative, informed, and mercifully accessible to those who find cohabiting with this culture a puzzling experience.

Understanding Machine Learning - Shai Shalev-Shwartz 2014-05-19

Introduces machine learning and its algorithmic paradigms, explaining the principles behind automated learning approaches and the considerations underlying their usage.

The Multiple Realization Book - Thomas W. Polger 2016

Thomas W. Polger and Lawrence A. Shapiro provide a full investigation of multiple realisation - the idea that minds can be realised in ways other than the human brain. They cast doubt on the hypothesis and give an alternative framework for understanding explanations in the cognitive sciences, and in chemistry, biology, and related fields.

Bayesian Data Analysis, Third Edition - Andrew Gelman 2013-11-01

Now in its third edition, this classic book is widely considered the leading text on Bayesian methods, lauded for its accessible, practical approach to analyzing data and solving research problems. Bayesian Data Analysis, Third Edition continues to take an applied approach to analysis using up-to-date Bayesian methods. The authors—all leaders in the statistics community—introduce basic concepts from a data-analytic perspective before presenting advanced methods. Throughout the text, numerous worked examples drawn from real applications and research emphasize the use of Bayesian inference in practice. New to the Third Edition Four new chapters on nonparametric modeling Coverage of weakly informative priors and boundary-avoiding priors Updated discussion of cross-validation and predictive information criteria Improved convergence monitoring and effective sample size calculations for iterative simulation Presentations of Hamiltonian Monte Carlo, variational Bayes, and expectation propagation New and revised software code The book can be used in three different ways. For undergraduate students, it introduces Bayesian inference starting from first principles. For graduate students, the text presents effective current approaches to Bayesian modeling and computation in statistics and related fields. For researchers, it provides an assortment of Bayesian methods in applied statistics. Additional materials, including data sets used in the examples, solutions to selected exercises, and software instructions, are available on the book’s web page.

Principles of Development - Lewis Wolpert 2011

Principles of Development reveals the universal principles that govern the process of development, illustrating how a highly-complex living organism forms from just a single fertilized egg

Towards a Theoretical Biology - International Union of Biological Sciences 1972

Mechanisms in Plant Development - Ottoline Leyser 2009-04-01

Intended for undergraduate and graduate courses in plant development, this book explains how the cells of a plant acquire and maintain their specific fates. Plant development is a continuous process occurring throughout the life cycle, with similar regulatory mechanisms acting at different stages and in different parts of the

plant. Rather than focussing on the life cycle, the book is structured around these underlying mechanisms, using case studies to provide students with a framework to understand the many factors, both environmental and endogenous, that combine to regulate development and generate the enormous diversity of plant forms. New approach to the study of plant development and a refreshing look at this fast-moving area. Authors focus their discussion on the basic mechanisms which underpin plant development, tackling the fundamental question of how a single cell becomes a complex flowering plant from a cellular perspective. An up-to-date, modern text in plant development for advanced level undergraduates and postgraduates in plant science. Thought-provoking treatment of a difficult subject, the text will satisfy the needs of advanced level undergraduates and postgraduates in plant science. Experimental case studies throughout. The artwork from the book is available at www.blackwellpublishing.com/leyser

Principles of Development - Lewis Wolpert 2011-01-27

Principles of Development reveals the universal principles that govern the process of development, illustrating how a highly-complex living organism forms from just a single fertilized egg.

Principles of Developmental Biology - Fred H. Wilt 2004

Fred Wilt and Sarah Hake's Principles of Developmental Biology is a modern new text for the undergraduate course in developmental biology, informed by the molecular and cell biology revolutions that have changed the field over the last fifteen years. Designed for the one-semester undergraduate course, Principles of Developmental Biology stresses fundamental concepts, a select number of instructive experiments and cases, and contemporary research in its historical context.

Developmental Biology - Norman John Berrill 1971

Avian Growth and Development - J. Matthias Starck 1998

This is the first re-appraisal in 50 years of concepts of development made in birds. This book is a case study in evolutionary diversification of life histories. Although birds have a rather uniform body plan and physiology, they exhibit marked variation in development type, parental care, and rate of growth. Altricial birds are fully dependent on their parents for warmth and nutrition and begin posthatching life in a more or less embryonic condition. At the other extreme, such superprecocial species as the megapodes are independent of all parental care from hatching, and the neonate, able to fly, resembles an adult bird. This book thus attempts to present an integrative perspective of organism biology, ecology, and evolution.

Developmental Biology: A Very Short Introduction - Lewis Wolpert 2011-08-25

"A concise account of what we know about development discusses the first vital steps of growth and explores one of the liveliest areas of scientific research."--P. [2] of cover.

Towards a Theory of Development - Alessandro Minelli 2014-05-01

Is it possible to explain and predict the development of living things? What is development? Articulate answers to these seemingly innocuous questions are far from straightforward. To date, no systematic, targeted effort has been made to construct a unifying theory of development. This novel work offers a unique exploration of the foundations of ontogeny by asking how the development of living things should be understood. It explores the key concepts of developmental biology, asks whether general principles of development can be discovered, and examines the role of models and theories. The two editors (one a biologist with long interest in the theoretical aspects of his discipline, the other a philosopher of science who has mainly worked on biological systems) have assembled a team of leading contributors who are representative of the scientific and philosophical community within which a diversity of thoughts are growing, and out

of which a theory of development may eventually emerge. They analyse a wealth of approaches to concepts, models and theories of development, such as gene regulatory networks, accounts based on systems biology and on physics of soft matter, the different articulations of evolution and development, symbiont-induced development, as well as the widely discussed concepts of positional information and morphogenetic field, the idea of a 'programme' of development and its critiques, and the long-standing opposition between preformationist and epigenetic conceptions of development. Towards a Theory of Development is primarily aimed at students and researchers in the fields of 'evo-devo', developmental biology, theoretical biology, systems biology, biophysics, and the philosophy of science.

On Life - Franklin M. Harold 2021-12-17
Franklin M. Harold's On Life reveals what science can tell us about the living world. All creatures, from bacteria and redwoods to garden snails and humans, belong to a single biochemical family. We all operate by the same principles and are all made up of cells, either one or many. We flaunt capacities that far exceed those of inanimate matter, yet we stand squarely within the material world. So what is life, anyway? How do living things function, and how did they come into existence? Questions like these have baffled philosophers and scientists since antiquity, but over the past half-century answers have begun to emerge. Offering an inside look, Franklin M. Harold makes life accessible to readers interested in the biological big picture. The book traces how living things operate, focusing on the interplay of biology with physics and chemistry. He asserts that biology stands apart from the physical sciences because life revolves around organization-- that is, purposeful order. On Life aims to make life intelligible by giving readers an understanding of the biological landscape; it sketches the principles as biologists presently understand them and highlights major unresolved issues. What emerges is a biology bracketed by two stubborn mysteries: the nature of the mind and the origin of life. This portrait of biology is comprehensible but inescapably complex, internally consistent, and buttressed by a wealth of factual knowledge.

Principles of Development - Lewis Wolpert 2019
Revision of: Principles of development / Lewis Wolpert [and seven others]. 2015. Fifth edition.

Xenopus Development - Malgorzata Kloc 2014-06-03
Frogs from the genus Xenopus have long been used as model organisms in basic and biomedical research. These frogs have helped unlock key fundamental developmental and cellular processes that have led to important scientific breakthroughs and have had practical application in embryology, cancer research and regenerative medicine. Xenopus Development is a vital resource on the biology and development of these key model organisms, and will be a great tool to researchers using these frogs in various disciplines of biological science. Xenopus Development is divided into four sections, the first three highlight key processes in Xenopus development from embryo to metamophosis. These sections focus on the cellular processes, organogenesis and embryo development. The final section highlights novel techniques and approaches being used in Xenopus research. Providing thorough and detailed coverage, Xenopus Development, will be a timely and welcome volume for those working in cell and molecular biology, genetics, developmental biology and biomedical research. Provides broad overview of the developmental biology of both Xenopus laevis and Xenopus tropicalis Explores cellular to systems development in key biomedical model organisms Timely synthesis of the field of Xenopus biology Highlights key biomedical and basic biological findings unlocked by Xenopus

The History of Oxford University Press: Volume IV - Keith Robbins 2017-05-26

The story of Oxford University Press spans five centuries of printing and publishing. Beginning with the first presses set up in Oxford in the fifteenth century and the later establishment of a university printing house, it leads through the publication of bibles, scholarly works, and the Oxford English Dictionary, to a twentieth-century expansion that created the largest university press in the world, playing a part in research, education, and language learning in more than 50 countries. With access to extensive archives, the four-volume History of OUP traces the impact of long-term changes in printing technology and the business of publishing. It also considers the effects of wider trends in education, reading, and scholarship, in international trade and the spreading influence of the English language, and in cultural and social history - both in Oxford and through its presence around the world. In the decades after 1970 Oxford University Press met new challenges but also a period of unprecedented growth. In this concluding volume, Keith Robbins and 21 expert contributors assess OUP's changing structure, its academic mission, and its business operations through years of economic turbulence and continuous technological change. The Press repositioned itself after 1970: it brought its London Business to Oxford, closed its Printing House, and rapidly developed new publishing for English language teaching in regions far beyond its traditional markets. Yet in an increasingly competitive worldwide industry, OUP remained the department of a major British university, sharing its commitment to excellence in scholarship and education. The resulting opportunities and sometimes tensions are traced here through detailed consideration of OUP's business decisions, the vast range of its publications, and the dynamic role of its overseas offices. Concluding in 2004 with new forms of digital publishing, The History of OUP sheds new light on the cultural, educational, and business life of the English-speaking world in the late twentieth century.

Principles of Development - Lewis Wolpert 1998

Developmental biology is at the core of all biology. This text emphasizes the principles and key developments in order to provide an approach and style that will appeal to students at all levels.

How We Live and Why We Die: The Secret Lives of Cells - Lewis Wolpert 2011-01-24

Acclaimed biologist Lewis Wolpert eloquently narrates the basics of human life through the lens of its smallest component: the cell. Everything about our existence-movement and memory, imagination and reproduction, birth, and ultimately death-is governed by our cells. They are the basis of all life in the universe, from bacteria to the most complex animals. In the tradition of the classic Lives of a Cell, but with the benefit of the latest research, Lewis Wolpert demonstrates how human life grows from a single cell into a body, an incredibly complex society of billions of cells. Wolpert goes on to examine the science behind topics that are much discussed but rarely understood—stem-cell research, cloning, DNA, cancer—and explains how all life on earth evolved from just one cell. Lively and passionate, this is an accessible guide to understanding the human body and life itself.

Endless Forms Most Beautiful - Sean B. Carroll 2005

As described in this fascinating book, Evo Devo is evolutionary development biology, the third revolution in the science, which shows how the endless forms of animals--butterflies and zebras, trilobites and dinosaurs, apes and humans--were made and evolved.

Brain-Computer Interfaces - Jonathan Wolpaw 2012-01-24

A recognizable surge in the field of Brain Computer Interface (BCI) research and development has emerged in the past two decades. This book is intended to provide an introduction to and summary of essentially all major aspects of BCI research and development. Its goal is to be a comprehensive, balanced, and

coordinated presentation of the field's key principles, current practice, and future prospects.

What Makes Us Human? - Charles Pasternak 2007-10

How and why did we become who we are? In "What Makes Us Human?" some of theorld's most brilliant thinkers offer their answers to this perennial puzzle,ncluding Susan Blackmore, Robin Dunbar, Susan Greenfield, Richard Harries,enan Malik, Richard Wrangham, Ian Tattersall, and Lewis Wolpert. Together,hey draw on a broad spectrum of disciplines, from anthropology, biochemistry,edicine, and neuroscience, to philosophy, psychology, and religion, to askhat makes us distinctively human. Is it our cognitive abilities, or our usef tools, our story-telling, our beliefs, our curiosity, our ability to cook,r our culture? Are we half-ape or half-angel? "What Makes Us Human?"xplains how and why our ancestors adapted to their surroundings to produceuch clever, talented, and unlikely progeny. It is for all to enjoy.

Six Impossible Things Before Breakfast: The Evolutionary Origins of Belief - Lewis Wolpert 2008-07-17

"Marvelously funny and provocative."—Publishers Weekly Why do 70 percent of Americans believe in angels, while others are convinced that they were abducted by aliens? What makes people believe in improbable things when all the evidence points to the contrary? And don't almost all of us, at some time or another, engage in magical thinking?In Six Impossible Things Before Breakfast, evolutionary biologist Lewis Wolpert delves into the important and timely debate over the nature of belief, looking at its psychological foundations to discover just what evolutionary purpose it could serve. Wolpert takes us through all that science can tell us about the beliefs we feel are instinctive. He deftly explores different types of belief—those of children, of the religious, and of those suffering from psychiatric disorders—and he asks whether it is possible to live without belief, or whether it is a necessary component of a functioning society.

Malignant Sadness - Lewis Wolpert 2011-05-05

'An excellent book, the most objective short account I know of all the various approaches to depression.' Anthony Storr Several years ago, Lewis Wolpert had a severe episode of depression. Despite a happy marriage and successful scientific career, he could think only of suicide. When he did recover, he became aware of the stigma attached to depression - and just how difficult it was to get reliable information. With characteristic candour and determination he set about writing this book, an acclaimed investigation into the causes and treatments of depression, which formed the basis for a BBC TV series.This paperback edition features a new introduction, in which Wolpert discusses the reaction to his book and BBC series, and recounts his own recurring struggle with depression.

The Evolution of Developmental Mechanisms - Michael Akam 1994

Biophysics - William Bialek 2012-12-17

Interactions between the fields of physics and biology reach back over a century, and some of the most significant developments in biology--from the discovery of DNA's structure to imaging of the human brain--have involved collaboration across this disciplinary boundary. For a new generation of physicists, the phenomena of life pose exciting challenges to physics itself, and biophysics has emerged as an important subfield of this discipline. Here, William Bialek provides the first graduate-level introduction to biophysics aimed at physics students. Bialek begins by exploring how photon counting in vision offers important lessons about the opportunities for quantitative, physics-style experiments on diverse biological phenomena. He draws from these lessons three general physical principles--the importance of noise, the need to understand the extraordinary performance of living systems without appealing to finely tuned parameters, and

the critical role of the representation and flow of information in the business of life. Bialek then applies these principles to a broad range of phenomena, including the control of gene expression, perception and memory, protein folding, the mechanics of the inner ear, the dynamics of biochemical reactions, and pattern formation in developing embryos. Featuring numerous problems and exercises throughout, Biophysics emphasizes the unifying power of abstract physical principles to motivate new and novel experiments on biological systems. Covers a range of biological phenomena from the physicist's perspective Features 200 problems Draws on statistical mechanics, quantum mechanics, and related mathematical concepts Includes an annotated bibliography and detailed appendixes Instructor's manual (available only to teachers)

Fundamentals and Techniques of Biophysics and Molecular Biology - Pranav Kumar

Fundamentals and Techniques of Biophysics and Molecular Biology textbook has the primary goal to teach students about theoretical principles and applications of the key biophysical and molecular methods used in biochemistry and molecular biology. A substantial theoretical basis has been covered to understand key experimental techniques such as Chromatography, Electrophoresis, Spectroscopy, Mass spectrometry, Centrifugation, Microscopy, Flow cytometry, Chromatin immunoprecipitation, Immunotechniques, FRET and FRAP, Polymerase chain reaction, Phage display, Yeast two-hybrid assay, DNA sequencing, Biosensors, CRISPR/Cas systems so that students can make appropriate choices and efficient use of techniques. The most significant feature of this book is its clear, up-to-date and accurate explanations of mechanisms, rather than the mere description of facts and events. This book is published by Pathfinder Publication, New Delhi, India.

The Triumph of the Embryo - Lewis Wolpert 2008-01-01

"This is a clear and engagingly written book," declared Nature, "recommended certainly to nonspecialists, but also to developmental biologists." Its exploration of how single cells multiply and develop offers an accessible look at a difficult subject. Easy-to-understand descriptions of experimental studies offer fascinating insights into aging, cancer, regeneration, and evolution. 1993 edition.

Life Unfolding - Jamie A. Davies 2014-02

Tells the story of human development from egg to adult, showing how the understanding of how human beings come to be has been transformed in recent years.

Genes in Development - Eva M. Neumann-Held 2006-01-06

In light of scientific advances such as genomics, predictive diagnostics, genetically engineered agriculture, nuclear transfer cloning, and the manipulation of stem cells, the idea that genes carry predetermined molecular programs or blueprints is pervasive. Yet new scientific discoveries—such as rna transcripts of single genes that can lead to the production of different compounds from the same pieces of dna—challenge the concept of the gene alone as the dominant factor in biological development. Increasingly aware of the tension between certain empirical results and interpretations of those results based on the orthodox view of genetic determinism, a growing number of scientists urge a rethinking of what a gene is and how it works. In this collection, a group of internationally renowned scientists present some prominent alternative approaches to understanding the role of dna in the construction and function of biological organisms. Contributors discuss alternatives to the programmatic view of dna, including the developmental systems approach, methodical culturalism, the molecular process concept of the gene, the hermeneutic theory of description, and process structuralist biology. None of the approaches cast doubt on the notion that dna is tremendously important to biological life on earth; rather, contributors examine different ideas of how dna should be

represented, evaluated, and explained. Just as ideas about genetic codes have reached far beyond the realm of science, the reconceptualizations of genetic theory in this volume have broad implications for ethics, philosophy, and the social sciences. Contributors. Thomas Bürglin, Brian C. Goodwin, James Griesemer, Paul Griffiths, Jesper Hoffmeyer, Evelyn Fox Keller, Gerd B. Müller, Eva M. Neumann-Held, Stuart A. Newman, Susan Oyama, Christoph Rehmann-Sutter, Sahotra Sarkar, Jackie Leach Scully, Gerry Webster, Ulrich Wolf

A Laboratory Guide to the Mammalian Embryo - David K. Gardner 2004-01-08

Never before has there been such a comprehensive book of protocols. This compendium offers a full range of research techniques-from cell culture, to biochemical, to microscopic and genetic. More focused books, like Cold Spring Harbor's Manipulating the Mouse Embryo, are similar though more narrow in scope. This book will appeal to a broad range of researchers, from basic experimental scientists to clinical and animal scientists.

Coming To Life - Volhard Christiane Nusslein 2006-04-11

Christiane Nusslein-Volhard, winner of The Nobel Prize in Medicine, gives a concise and illustrative overview of genetics, evolution, and cellular processes as well as a discussing of current ethical issues in human biology. Coming to Life is a remarkable journey through developmental biology that reveals miraculous processes in the microscopic world of cells. Through an accounting of groundbreaking discoveries, Christiane Nusslein-Volhard tells us many answers to historical and contemporary questions in science. For example, she brings us the newest knowledge about embryonic forms, explains the genetic mechanisms that influence adult development of all animals, and shares insights into the ethical standards society moist uphold in the face of new scientific discoveries. As the author leads us from laboratory research to its applications in human beings, we also come to understand why children look like their parents, how an embryonic cell knows to become an eye rather than an eyelash, and other incredible influences hat result in variety in life. Complete with her own hand-drawn illustrations, Coming to Life gives a rare opportunity to understand a Nobel Prize-winner's passion for science in concise, understandable language. 55 b/w illustrations.

Philosophy of Developmental Biology - Marcel Weber 2022-02-28

The history of developmental biology is interwoven with debates as to whether mechanistic explanations of development are possible or whether alternative explanatory principles or even vital forces need to be assumed. In particular, the demonstrated ability of embryonic cells to tune their developmental fate precisely to their relative position and the overall size of the embryo was once thought to be inexplicable in mechanistic terms. Taking a causal perspective, this Element examines to what extent and how developmental biology, having turned molecular about four decades ago, has been able to meet the vitalist challenge. It focuses not only on the nature of explanations but also on the usefulness of causal knowledge - including the knowledge of classical experimental embryology - for further scientific discovery. It also shows how this causal perspective allows us to understand the nature and significance of some key concepts, including organizer, signal and morphogen. This title is also available as Open Access on Cambridge Core.