Hox Gene Expression Molecular Biology Intelligence

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Molecular Evolution Roderick D.M. Page 2009-07-14 The study of evolution at the molecular level has given the subject of evolutionary biology a new significance. Phylogenetic 'trees' of gene sequences are a powerful tool for recovering evolutionary relationships among species, and can be used to answer a broad range of evolutionary and ecological questions. They are also beginning to permeate the medical sciences. In this book, the authors approach the study of molecular evolution with the phylogenetic tree as a central metaphor. This will equip students and professionals with the ability to see both the evolutionary relevance of molecular data, and the significance evolutionary theory has for molecular studies. The book is accessible yet sufficiently detailed and explicit so that the student can learn the mechanics of the procedures discussed. The book is intended for senior undergraduate and graduate students taking courses in molecular evolution/phylogenetic reconstruction. It will also be a useful supplement for students taking wider courses in evolution, as well as a valuable resource for professionals. First student textbook of phylogenetic reconstruction which uses the tree as a central metaphor of evolution. Chapter summaries and annotated suggestions for further reading. Worked examples facilitate understanding of some of the more complex issues. Emphasis on clarity and accessibility.

The Art of Genes Enrico Coen 1999-03-04 'Coen's book is spiced with historic quotations and examples of plants' and animals' intriguing behaviour contains a wealth of interesting material Coen communicates his immense learning with a hundred appealing tales' Max Perutz How is a tiny fertilised egg able to turn itself into a human being? How can an acorn transform itself into an oak tree? Over the past twenty years there has been a revolution in biology. For the first time we have begun to understand how organisms make themselves. The Art of Genes gives an account of these new and exciting findings, and of their broader significance for how we view ourselves. Through a highly original synthesis of science and art, Enrico Coen vividly describes this revolution in our understanding of how plants and animals develop. Drawing on a wide range of examples–from flowers growing petals instead of sex organs, and flies that develop an extra pair of wings, to works of art by Leonardo and Magritte–he explains in lively, accessible prose the language and meaning of genes. 'I would have loved this book at 16, and so should anyone–aged 16 to 60–who really wants to understand development.' John Maynard

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Smith, Nature

Cumulated Index Medicus 1993

Master Control Genes in Development and Evolution Walter J. Gehring 1998-01-01 In this fascinating book, one of the world's most eminent developmental biologists discusses some of the exciting new insights into how genes control development. Walter Gehring describes in vivid detail his essential contributions to the landmark discovery of the homeobox, a characteristic DNA segment found in the genes of all higher organisms from the fruitfly to humans, and he explains how this has provided the key to our modern understanding of development and evolution. The book thus becomes not only a lucid discussion of genetics but also an engaging description of the art of scientific investigation. Gehring begins his story by looking at the work of the many researchers who laid the foundation for the fields of molecular, cellular, and developmental biology, providing insightful vignettes of past and present investigators. He then describes his laboratory's hunt for the gene that caused odd mutations in the fruitfly--in which, for example, antennae on the head were transformed into legs. He explains that researchers eventually found that the same master control genes that dictate the body plan in flies also pattern human bodies, limbs, hands, heart, and brain. And he illustrates the universality of the genetic control of development by describing the development of the eye; eyes as different as those of humans, squids, and flies, he shows, develop under the same master control gene.

Physics in Molecular Biology Kim Sneppen 2005-08-25 This book, first published in 2005, is a discussion for advanced physics students of how to use physics to model biological systems.

Gene Regulatory Networks 2020-05-22 Gene Regulatory Networks, Volume 139 in the Current Topics in Developmental Biology series, highlights new advances in the field, with this new volume presenting interesting chapters written by an international board of authors. Topics in this release include Mouse hindbrain GRN, Xenopus endoderm GRN – organogenesis, Vertebrate limb GRN, The notochord gene regulatory network in chordate evolution: conservation and divergence from Ciona to vertebrates, Ciona early embryo GRNs, Boolean logic models, Modeling GRN response to morphogen gradient, GRN architecture, Theory of GRN evolution, Evolution of fly segmentation GRNs, GRN evolution in echinoderms, Evolution of network specificity, and more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Current Topics in Developmental Biology series Includes the latest information on gene regulatory networks

Genetics of Adaptation Rodney Mauricio 2006-03-30 An enduring controversy in evolutionary biology is the genetic basis of adaptation. Darwin emphasized "many slight differences" as the ultimate source of variation to be acted upon by natural selection. In the early 1900’s, this view was opposed by "Mendelian geneticists", who emphasized the importance of "macromutations" in evolution. The Modern Synthesis resolved this controversy, concluding that mutations in genes of very small effect were responsible for adaptive evolution. A decade ago, Allen Orr and Jerry Coyne reexamined the evidence for this neo-Darwinian view and found that both the theoretical and empirical basis for it were weak. Orr and Coyne encouraged evolutionary biologists to reexamine this neglected question: what is the genetic basis of adaptive evolution? In this volume, a new generation of biologists have taken up this challenge. Using advances in both molecular genetic and statistical techniques, evolutionary geneticists have made considerable progress in this emerging field. In this volume, a diversity of examples from plant and animal studies provides valuable information for those interested in the genetics and evolution of complex traits.

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God, the Devil, and Darwin Niall Shanks 2004-01-08 In the last fifteen years a controversial new theory of the origins of biological complexity and the nature of the universe has been fomenting bitter debates in education and science policy across North America, Europe, and Australia. Backed by intellectuals at respectable universities, Intelligent Design Theory (ID) proposes an alternative to accepted accounts of evolutionary theory: that life is so complex, and that the universe is so fine-tuned for the appearance of life, that the only plausible explanation is the existence of an intelligent designer. For many ID theorists, the designer is taken to be the god of Christianity. Niall Shanks has written the first accessible introduction to, and critique of, this controversial new intellectual movement. Shanks locates the growth of ID in the last two decades of the twentieth century in the growing influence of the American religious right. But as he shows, its roots go back beyond Aquinas to Ancient Greece. After looking at the historical roots of ID, Shanks takes a hard look at its intellectual underpinnings, discussing modern understandings of thermodynamics, and how self-organizing processes lead to complex physical, chemical, and biological systems. He considers cosmological arguments for ID rooted in so-called "anthropic coincidences" and also tackles new biochemical arguments for ID based on "irreducible biological complexity." Throughout he shows how arguments for ID lack cohesion, rest on errors and unfounded suppositions, and generally are grossly inferior to evolutionary explanations. While ID has been proposed as a scientific alternative to evolutionary biology, Shanks argues that ID is in fact "old creationist wine in new designer label bottles" and moreover is a serious threat to the scientific and democratic values that are our cultural and intellectual inheritance from the Enlightenment.

Natural Selection J. Phil Gibson 2009 In his groundbreaking book Natural Selection, Charles Darwin explained his theory that evolution is driven by adaptation of species to their environmental surroundings. From the tiniest microbe to the largest whale, all organisms have changed over vast expanses of time due to the forces of natural selection. This new title in the Science Foundations series provides an overview of the processes and causes that drive natural selection and the principles that explain how it operates, using numerous diverse organisms as examples. Natural Selection promotes a solid understanding of how organisms change over the course of generations and how current biodiversity came to be.

HOX Genes 2009-07-19 A subgroup of homeobox genes, which play an important role in the developmental processes of a variety of multicellular organisms, Hox genes have been shown to play a critical role in vertebrate pattern formation. Hox genes can be thought of as general purpose control genes—that is, they are similar in many organisms and direct the same processes in a variety of organisms, from mouse, to fly, to human. * Provides researchers an overview and synthesis of the latest research findings and contemporary thought in the area * Inclusion of chapters that discuss the evolutionary development of a wide variety of organisms * Gives researchers and clinicians insight into how defective Hox genes trigger developmental abnormalities in embryos

The Evolution of Sex Determination Leo Beukeboom 2014-06-12 Sexual reproduction is a fundamental aspect of life. It is defined by the occurrence of meiosis and the fusion of two gametes of different sexes or mating types. Sex-determination mechanisms are responsible for the sexual fate and development of sexual characteristics in an organism, be it a unicellular alga, a plant, or an animal. In many cases, sex determination is genetic: males and females have different alleles or different genes that specify their sexual morphology. In animals, this is often accompanied by chromosomal differences. In other cases, sex may be determined by environmental (e.g. temperature) or social variables (e.g. the size of an organism relative to other members of its population). Surprisingly, sex-determination mechanisms are not evolutionarily conserved but are bewilderingly diverse and appear to have had rapid turnover rates during evolution. Evolutionary biologists continue to seek a solution to this

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conundrum. What drives the surprising dynamics of such a fundamental process that always leads to the same outcome: two sex types, male and female? The answer is complex but the ongoing genomic revolution has already greatly increased our knowledge of sex-determination systems and sex chromosomes in recent years. This novel book presents and synthesizes our current understanding, and clearly shows that sex-determination evolution will remain a dynamic field of future research. The Evolution of Sex Determination is an advanced, research level text suitable for graduate students and researchers in genetics, developmental biology, and evolution.

Molecular Basis of Epithelial Appendage Morphogenesis Cheng-Ming Chuong 1998 Reviews recent experimental findings and current thinking on epithelial appendage morphogenesis. Contains sections on overview, morphogenesis of epithelial appendages on the body surface and within the body, molecular mechanisms, models, and approaches. Specific subjects include early molecular events in feather morphogenesis, evolutionarily conserved gene interactions, and molecular biology of anhidrotic ectodermal dysplasia. Many chapters contain summary diagrams of the formative process of organs, with cellular and molecular explanations. Annotation copyrighted by Book News, Inc., Portland, OR

Bioinformatics Andreas D. Baxevanis 2004-03-24 "In this book, Andy Baxevanis and Francis Ouellette . . . haveundertaken the difficult task of organizing the knowledge in thisfield in a logical progression and presenting it in a digestibleform. And they have done an excellent job. This fine text will makea major impact on biological research and, in turn, on progress inbiomedicine. We are all in their debt." —Eric Lander from the Foreword Reviews from the First Edition "...provides a broad overview of the basic tools for sequenceanalysis ... For biologists approaching this subject for the firsttime, it will be a very useful handbook to keep on the shelf afterthe first reading, close to the computer." —Nature Structural Biology "...should be in the personal library of any biologist who usesthe Internet for the analysis of DNA and protein sequencedata." —Science "...a wonderful primer designed to navigate the novice throughthe intricacies of in scripto analysis ... The accomplished genesearcher will also find this book a useful addition to theirlibrary ... an excellent reference to the principles ofbioinformatics." —Trends in Biochemical Sciences This new edition of the highly successful Bioinformatics:A Practical Guide to the Analysis of Genes and Proteinsprovides a sound foundation of basic concepts, with practicaldiscussions and comparisons of both computational tools anddatabases relevant to biological research. Equipping biologists with the modern tools necessary to solvepractical problems in sequence data analysis, the Second Editioncovers the broad spectrum of topics in bioinformatics, ranging fromInternet concepts to predictive algorithms used on sequence,structure, and expression data. With chapters written by experts inthe field, this up-to-date reference thoroughly covers vitalconcepts and is appropriate for both the novice and the experiencedpractitioner. Written in clear, simple language, the book isaccessible to users without an advanced mathematical or computerscience background. This new edition includes: All new end-of-chapter Web resources, bibliographies, andproblem sets Accompanying Web site containing the answers to the problems,as well as links to relevant Web resources New coverage of comparative genomics, large-scale genomeanalysis, sequence assembly, and expressed sequence tags A glossary of commonly used terms in bioinformatics andgenomics Bioinformatics: A Practical Guide to the Analysis of Genesand Proteins, Second Edition is essential reading forresearchers, instructors, and students of all levels in molecularbiology and bioinformatics, as well as for investigators involvedin genomics, positional cloning, clinical research, andcomputational biology.

Materials for the Study of Variation William Bateson 1894

Principles of Evolutionary Medicine Alan Beedle 2016-03-17 Evolutionary science is critical to an understanding of integrated human biology and is increasingly recognised as a core discipline by

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medical and public health professionals. Advances in the field of genomics, epigenetics, developmental biology, and epidemiology have led to the growing realisation that incorporating evolutionary thinking is essential for medicine to achieve its full potential. This revised and updated second edition of the first comprehensive textbook of evolutionary medicine explains the principles of evolutionary biology from a medical perspective and focuses on how medicine and public health might utilise evolutionary thinking. It is written to be accessible to a broad range of readers, whether or not they have had formal exposure to evolutionary science. The general structure of the second edition remains unchanged, with the initial six chapters providing a summary of the evolutionary theory relevant to understanding human health and disease, using examples specifically relevant to medicine. The second part of the book describes the application of evolutionary principles to understanding particular aspects of human medicine: in addition to updated chapters on reproduction, metabolism, and behaviour, there is an expanded chapter on our coexistence with micro-organisms and an entirely new chapter on cancer. The two parts are bridged by a chapter that details pathways by which evolutionary processes affect disease risk and symptoms, and how hypotheses in evolutionary medicine can be tested. The final two chapters of the volume are considerably expanded; they illustrate the application of evolutionary biology to medicine and public health, and consider the ethical and societal issues of an evolutionary perspective. A number of new clinical examples and historical illustrations are included. This second edition of a novel and popular textbook provides an updated resource for doctors and other health professionals, medical students and biomedical scientists, as well as anthropologists interested in human health, to gain a better understanding of the evolutionary processes underlying human health and disease.

Limb Regeneration Panagiotis A. Tsonis 1996-07-13 This is the first book that analyses the mechanisms of limb regeneration by incorporating the information obtained from older experiments with the many new recent advances in molecular and cellular biology.

Bones and Cartilage Brian K. Hall 2014-12-23 Bones and Cartilage provides the most in-depth review and synthesis assembled on the topic, across all vertebrates. It examines the function, development and evolution of bone and cartilage as tissues, organs and skeletal systems. It describes how bone and cartilage develop in embryos and are maintained in adults, how bone is repaired when we break a leg, or regenerates when a newt grows a new limb, or a lizard a new tail. The second edition of Bones and Cartilage includes the most recent knowledge of molecular, cellular, developmental and evolutionary processes, which are integrated to outline a unified discipline of developmental and evolutionary skeletal biology. Additionally, coverage includes how the molecular and cellular aspects of bones and cartilage differ in different skeletal systems and across species, along with the latest studies and hypotheses of relationships between skeletal cells and the most recent information on coupling between osteocytes and osteoclasts All chapters have been revised and updated to include the latest research. Offers complete coverage of every aspect of bone and cartilage, with updated references and extensive illustrations Integrates development and evolution of the skeleton, as well a synthesis of differentiation, growth and patterning Treats all levels from molecular to clinical, embryos to evolution, and covers all vertebrates as well as invertebrate cartilages Includes new chapters on evolutionary skeletal biology that highlight normal variation and variability, and variation outside the norm (neomorphs, atavisms) Updates hypotheses on the origination of cartilage using new phylogenetic, cellular and genetic data Covers stem cells in embryos and adults, including mesenchymal stem cells and their use in genetic engineering of cartilage, and the concept of the stem cell niche

Linking Phenotypes and Genotypes Florian Markowetz 2015-07-02 The first book to comprehensively cover the field of systems genetics, gathering contributions from leading scientists.

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Mechanisms of Regeneration 2014-02-07 This new volume of Current Topics in Developmental Biology covers the area of mechanisms in regeneration. With an international board of authors, it provides a comprehensive set of reviews covering such topics as control of growth during regeneration, skeletal muscle degeneration and regeneration in mammals and flies, and suppression of regeneration in mammals. Covers the area of mechanisms in regeneration International board of authors Provides a comprehensive set of reviews

Biochemistry and Molecular Biology Compendium Roger L. Lundblad 2020-04-24 This book is an accessible resource offering practical information not found in more database-oriented resources. The first chapter lists acronyms with definitions, and a glossary of terms and subjects used in biochemistry, molecular biology, biotechnology, proteomics, genomics, and systems biology. There follows chapters on chemicals employed in biochemistry and molecular biology, complete with properties and structure drawings. Researchers will find this book to be a valuable tool that will save them time, as well as provide essential links to the roots of their science. Key selling features: Contains an extensive list of commonly used acronyms with definitions Offers a highly readable glossary for systems and techniques Provides comprehensive information for the validation of biotechnology assays and manufacturing processes Includes a list of Log P values, water solubility, and molecular weight for selected chemicals Gives a detailed listing of protease inhibitors and cocktails, as well as a list of buffers

Creationism's Trojan Horse Barbara Forrest 2007 This carefully documented expose of the Intelligent Design (ID) movement contributed to the stunning victory in Federal court of eleven Dover, PA, parents who recognized ID's threat to public education and religious freedom. Now in paperback, here is Forrest and Gross's influential work documenting the continuity of intelligent design with traditional creationism. The new text updates ID initiatives in Kansas and Ohio and the movement's shifting strategies in an attempt to remain viableafter its legal undoing in federal court. Anyone who values science and the benefits of life in an enlightened society should know about the Wedge's political, cultural, and religious ambitions. With a new foreword by Barry Lynn, this updated edition is an essential guide to ID's continuing threat to public education and the separation of church and state. It is the book to turn to for an inside look at the claims and operations of the ID movement, the most recent manifestation of American creationism.

Organism and Environment Sonia E. Sultan 2015-09-10 Over the past decade, advances in both molecular developmental biology and evolutionary ecology have made possible a new understanding of organisms as dynamic systems interacting with their environments. This innovative book synthesizes a wealth of recent research findings to examine how environments influence phenotypic expression in individual organisms (ecological development or 'eco-devo'), and how organisms in turn alter their environments (niche construction). A key argument explored throughout the book is that ecological interactions as well as natural selection are shaped by these dual organism-environment effects. This synthesis is particularly timely as biologists seek a unified contemporary framework in which to investigate the developmental outcomes, ecological success, and evolutionary prospects of organisms in rapidly changing environments. Organism and Environment is an advanced text suitable for graduate level students taking seminar courses in ecology, evolution, and developmental biology, as well as academics and researchers in these fields.

The Origin of Higher Taxa T. S. Kemp 2016 This text discusses whether the origin of radically new kinds of organisms - new higher taxa - are the result of normal Darwinian evolution proceeding, or whether unusual genetic processes and/or special environmental circumstances are necessary.

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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.

Mind and Life Pier Luigi Luisi 2010-12-20 Scientists, philosophers and Buddhist scholars discuss the nature of reality in a book that goes inside a Mind and Life Institute conference. For over a decade, members of the Mind and Life Institute have gathered to discuss questions that are both fundamental and profound: can physics, chemistry, and biology explain the mystery of life? How do our philosophical assumptions influence science and the ethics we bring to biotechnology? And how does an ancient spiritual tradition throw new light on these questions? In Mind and Life, Pier Luigi Luisi reproduces this stimulating cross-cultural dialogue in which world-class scientists, philosophers, and Buddhist scholars develop a holistic approach to the exploration of reality. He also adds scientific background to their presentations, as well as supplementary discussions with prominent participants and attendees. Interviews with His Holiness the Karmapa, the Buddhist monk Matthieu Ricard, and the actor and longtime human rights advocate Richard Gere further enrich the material with personal viewpoints. Conversation topics range from the origin of matter to the nature of evolution, the ethics of genetic manipulation, and the question of consciousness and ethics.

The Plausibility of Life Marc W. Kirschner 2005-10-19 Two biologists tackle the unresolved question in the field of evolution: how have living organisms on Earth developed with such variety and complexity? In the 150 years since Darwin, the field of evolutionary biology has left a glaring gap in understanding how animals developed their astounding variety and complexity. The standard answer has been that small genetic mutations accumulate over time to produce wondrous innovations such as eyes and wings. Drawing on cutting-edge research across the spectrum of modern biology, Marc Kirschner and John Gerhart demonstrate how this stock answer is woefully inadequate. Rather they offer an original solution to the longstanding puzzle of how small random genetic change can be converted into complex, useful innovations. In a new theory they call “facilitated variation,” Kirschner and Gerhart elevate the individual organism from a passive target of natural selection to a central player in the 3-billion-year history of evolution. In clear, accessible language, the authors invite every reader to contemplate daring new ideas about evolution. By closing the major gap in Darwin’s theory Kirschner and Gerhart also provide a timely scientific rebuttal to modern critics of evolution who champion “intelligent design.” “Makes for informative and enjoyable reading, and the issues the authors raise are worthy of

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attention."—American Scientist "Thought-provoking and lucidly written…The Plausibility of Life will help readers understand not just the plausibility of evolution, but its remarkable, inventive powers."—Sean Carroll, author of Endless Forms Most Beautiful: The New Science of Evo Devo

Introduction to the Cellular and Molecular Biology of Cancer Margaret Knowles 2005-07-28 Aimed at both students and new researchers, the fourth edition of this text provides a concise yet comprehensive overview of cancer biology, covering the current status of both research and treatment.

Mechanisms of Eukaryotic DNA Recombination Max E Gottesman 2014-06-28 Mechanisms of Eukaryotic DNA Recombination is a collection of papers that discusses advances in eukaryotic genetic recombination. Papers address issues in eukaryotic genetic recombination, particularly DNA integration in mammalian genomes, genetic recombination in Drosophila or Caenorhabditis; the manipulation of the mouse genome; genome organization; and genetic recombination in protozoa. One paper discusses chromatid interactions during intrachromosomal recombination in mammalian cells, namely, intrachromatid and sister chromatid. Another paper analyzes the implication for chromosomal recombination and gene targeting; results on extrachromosomal recombination show that circles are inefficient substrates for recombination even if only one of two substrates in an intermolecular reaction is circular. One author discusses the genetics and molecular biology of recombination, citing the work of Watson and Crick, stating that crossing-over occurs between genes (not within them). He also explains that the formation and resolution of recombination intermediaries depend on enzyme or other proteins. This book will prove invaluable to cellular biologists, microbiologists, and researchers engaged in genetics and general biology.

Inborn Errors of Development Charles J. Epstein 2004 In this book, the clinical chapters are organized into sections by defined developmental pathways or gene families, and each section is preceded by a general overview. For each disorder the authors cover the disease-causing genes, the role of these genes in development as elucidated in model organisms, the human mutations that have been identified, and the developmental pathogenesis of the condition. Clinical descriptions, along with discussions of therapy and counseling, are provided. This book will be an invaluable resource for physicians, dentists, and other health professionals and for basic scientists interested in developmental processes and genetic perturbations that affect them.

Evolutionary Developmental Biology of Crustacea Gerhard Scholtz 2003-06-01 Crustaceans, due to the great diversity of their body organization, segmentation patterns, tagmatization, limb types, larval forms, cleavage, and gastrulation modes, are highly desirable for the study of questions at the interface of evolution and development. Modern interest in evolutionary developmental biology (evo-devo) rests on the molecular genetic approach and a variety of molecular techniques have proven fruitful when performed on crustaceans. Evolutionary Developmental Biology of Crustacea presents a comprehensive treatment of all aspects of the field, beginning with a discussion of the implications of the typological Bauplan and phylum concepts versus historical concepts such as ground pattern and monophylum for the formulation of conceptual questions in evo-devo. Following this, the authors present the results of Hox gene expression in various crustacean taxa, aspects of segment formation at the cellular and genetic levels, the formation of segmental structures such as neurons, ganglia, and limbs, and the role of morphological ontogenetic characters in resolving phylogenetic relationships. By covering so many general aspects of crustacean development, morphology, and evolution, Evolutionary Developmental Biology of Crustacea serves as an indispensable reference for developmental and evolutionary biologists investigating the role of genetics in evolution and development.

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Molecular Biology of the Cell Bruce Alberts 2004

Organ Development 2019-02-21 Organ Development, Volume 132, the latest release in the Current Topics in Developmental Biology series, highlights new advances in the field, with this new volume presenting interesting chapter written by an international board of authors. This volume highlights cogent reviews of the development, maintenance and regeneration/repair of several organ systems, from eye to kidney, to the musculoskeletal system. Many reviews highlight new techniques or technologies that are currently pushing the field. The role of both embryonic and adult stem cells are highlighted and senior authors are all women scientists. Provides the authority and expertise of leading contributors from an international board of author Presents the latest release in this series Updated release includes the latest information on organ development

Free-Radical Retrograde-Precipitation Polymerization (FRRPP) Gerard Caneba 2010-01-08 Providing insight on the free-radical retrograde-precipitation polymerization process, this volume examines the phenomenological aspects in comparison to other materials, such as nanoscale confinement behavior and nucleated hot spots.

Introduction to Computational Genomics Nello Cristianini 2006-12-14 Where did SARS come from? Have we inherited genes from Neanderthals? How do plants use their internal clock? The genomic revolution in biology enables us to answer such questions. But the revolution would have been impossible without the support of powerful computational and statistical methods that enable us to exploit genomic data. Many universities are introducing courses to train the next generation of bioinformaticians: biologists fluent in mathematics and computer science, and data analysts familiar with biology. This readable and entertaining book, based on successful taught courses, provides a roadmap to navigate entry to this field. It guides the reader through key achievements of bioinformatics, using a hands-on approach. Statistical sequence analysis, sequence alignment, hidden Markov models, gene and motif finding and more, are introduced in a rigorous yet accessible way. A companion website provides the reader with Matlab-related software tools for reproducing the steps demonstrated in the book.

Endless Forms Most Beautiful Sean B. Carroll 2005 Presents an introduction to evolutionary developmental biology which studies genes and their role in biological diversity and evolution.

HOX Gene Expression Spyros Papageorgiou 2007-08-28 Hox Gene Expression starts with the amazing discovery of the homeobox twenty-three years ago and follows the exciting path thereafter of a series of breakthroughs in Genetics, Development and Evolution. It deals with homeotic genes, their evolution, structure, normal and abnormal function. Researchers and graduate students in biology and medicine will benefit from this integrated overview of Hox gene activities.

Mobile DNA III Michael Chandler 2020-07-24 An exploration of the raw power of genetic material to refashion itself to any purpose... Virtually all organisms contain multiple mobile DNAs that can move from place to place, and in some organisms, mobile DNA elements make up a significant portion of the genome. Mobile DNA III provides a comprehensive review of recent research, including findings suggesting the important role that mobile elements play in genome evolution and stability. Editor-in-Chief Nancy L. Craig assembled a team of multidisciplinary experts to develop this cutting-edge resource that covers the specific molecular mechanisms involved in recombination, including a detailed structural analysis of the enzymes responsible presents a detailed account of the many different recombination systems that can rearrange genomes examines the tremendous impact of mobile DNA in

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virtually all organisms Mobile DNA III is valuable as an in-depth supplemental reading for upper level life sciences students and as a reference for investigators exploring new biological systems. Biomedical researchers will find documentation of recent advances in understanding immune-antigen conflict between host and pathogen. It introduces biotechnicians to amazing tools for in vivo control of designer DNAs. It allows specialists to pick and choose advanced reviews of specific elements and to be drawn in by unexpected parallels and contrasts among the elements in diverse organisms. Mobile DNA III provides the most lucid reviews of these complex topics available anywhere.

Development of the Nervous System Dan H. Sanes 2005-11-02 Development of the Nervous System, Second Edition has been thoroughly revised and updated since the publication of the First Edition. It presents a broad outline of neural development principles as exemplified by key experiments and observations from past and recent times. The text is organized along a development pathway from the induction of the neural primordium to the emergence of behavior. It covers all the major topics including the patterning and growth of the nervous system, neuronal determination, axonal navigation and targeting, synapse formation and plasticity, and neuronal survival and death. This new text reflects the complete modernization of the field achieved through the use of model organisms and the intensive application of molecular and genetic approaches. The original, artist-rendered drawings from the First Edition have all been redone and colorized to so that the entire text is in full color. This new edition is an excellent textbook for undergraduate and graduate level students in courses such as Neuroscience, Medicine, Psychology, Biochemistry, Pharmacology, and Developmental Biology. Updates information including all the new developments made in the field since the first edition Now in full color throughout, with the original, artist-rendered drawings from the first edition completely redone, revised, colorized, and updated

The Regulatory Genome Eric H. Davidson 2010-07-19 Gene regulatory networks are the most complex, extensive control systems found in nature. The interaction between biology and evolution has been the subject of great interest in recent years. The author, Eric Davidson, has been instrumental in elucidating this relationship. He is a world renowned scientist and a major contributor to the field of developmental biology. The Regulatory Genome beautifully explains the control of animal development in terms of structure/function relations of inherited regulatory DNA sequence, and the emergent properties of the gene regulatory networks composed of these sequences. New insights into the mechanisms of body plan evolution are derived from considerations of the consequences of change in developmental gene regulatory networks. Examples of crucial evidence underscore each major concept. The clear writing style explains regulatory causality without requiring a sophisticated background in descriptive developmental biology. This unique text supersedes anything currently available in the market. The only book in the market that is solely devoted to the genomic regulatory code for animal development Written at a conceptual level, including many novel synthetic concepts that ultimately simplify understanding Presents a comprehensive treatment of molecular control elements that determine the function of genes Provides a comparative treatment of development, based on principles rather than description of developmental processes Considers the evolutionary processes in terms of the structural properties of gene regulatory networks Includes 42 full-color descriptive figures and diagrams

Animal Evolution Claus Nielsen 2012 Using modern phylogenetic reasoning based on an extensive review of morphology, including ultrastructure, and embryology, each phylum is analysed to ascertain its monophyly and hence its ancestral characters.

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