

Sex Cells Are Diploid

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 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.

The Biology of Reproduction - Giuseppe Fusco 2019-10-10

A look into the phenomena of sex and reproduction in all organisms, taking an innovative, unified and comprehensive approach.

Sex Chromosomes and Sex-Linked Genes - Susumu Ohno 2013-06-29

Natural selection operates among individual organisms which differ in their genetic constitution. The degree of hereditary variability within a species is greatly enhanced by cross-fertilization. Indeed, the mechanism of sexual reproduction occurred very early in evolution, for it is seen today even in bacteria. In *Escherichia coli*, fertilization occurs by passage of the single chromosome from the male into the female bacterium (LEDERBERG, 1959). In multicellular organisms, the separation of germ from soma, and the production of haploid gametes became mandatory. The gametes were of two types. One, extremely mobile, was designed to seek out and penetrate the other, which loaded with nutrients, received the mobile gamete and initiated the development of a new individual. The foundation for true bisexuality was thus laid. In the primitive state of bisexuality, whether an individual is to be a sperm-producing male or an egg-producing female appears to be decided rather haphazardly. In the worm, *Banella viridis*, the minute males are parasites in the female. Larvae that become attached to the proboscis of an adult female become males, while unattached larvae sink to the bottom and become females (BALTZER, 1935). The more sophisticated state of bisexuality was initiated by setting aside a particular pair of chromosomes for specialization and making either the male or the female a heterogametic sex. Sex chromosomes as we know them were thus born.

Plant Biology - Nishant Pal 2021-12-06

Plant development is a multiphasic process where two distinct forms of plants succeed in alternating generations. The sporophyte is a form created by the union between gametes (sex cells). It is diploid (contains two sets similar chromosomes). The sporophyte matures and produces haploid spores (containing one set of chromosomes). These spores then grow into the gametophyte genus. The gametophytes reach sexual maturity and produce haploid gametes, which unite to start a new cycle. Despite sharing the same chemical basis for inheritance and the translation of the genetic codes into structural units called protein, the development of plants differs from animals in many important ways. Higher plants can sustain their growth all through life, and are therefore perpetually embryonic. Animals, however, have a fixed period of growth after which they are considered mature. **EARLY STUDIES ON CELLS** Robert Hooke, an Englishman who first described cells in 1665, was the first to do so. Hooke, an Englishman, was studying cork's structure with a primitive microscope (figure 2). He noticed small units of cork that looked similar to the monks' sleeping quarters in monasteries. These rooms were called "cells" by Hooke, who gave the name to cork's little compartments. This was later used to refer to the basic unit for life.

Hooke discovered cells in cork, even though it was not living. In the latter part of the seventeenth century, Hooke continued to study microscopic organisms. Matthias Schleiden, Rudolf Virchow and Theodor Schwann established the Cell Theory in the middle of the nineteenth century. This theory recognizes the cell to be the fundamental unit of life. The Cell Theory states that all organisms are made up of cells, and that all cells originate from preexisting cells. This theory is one of the most important principles of biology.

Meiosis and Gametogenesis - 1997-11-24

In spite of the fact that the process of meiosis is fundamental to inheritance, surprisingly little is understood about how it actually occurs. There has recently been a flurry of research activity in this area and this volume summarizes the advances coming from this work. All authors are recognized and respected research scientists at the forefront of research in meiosis. Of particular interest is the emphasis in this volume on meiosis in the context of gametogenesis in higher eukaryotic organisms, backed up by chapters on meiotic mechanisms in other model organisms. The focus is on modern molecular and cytological techniques and how these have elucidated fundamental mechanisms of meiosis. Authors provide easy access to the literature for those who want to pursue topics in greater depth, but reviews are comprehensive so that this book may become a standard reference. Key Features * Comprehensive reviews that, taken together, provide up-to-date coverage of a rapidly moving field * Features new and unpublished information * Integrates research in diverse organisms to present an overview of common threads in mechanisms of meiosis * Includes thoughtful consideration of areas for future investigation

Heritable Human Genome Editing - The Royal Society 2021-01-16

Heritable human genome editing - making changes to the genetic material of eggs, sperm, or any cells that lead to their development, including the cells of early embryos, and establishing a pregnancy - raises not only scientific and medical considerations but also a host of ethical, moral, and societal issues. Human embryos whose genomes have been edited should not be used to create a pregnancy until it is established that precise genomic changes can be made reliably and without introducing undesired changes - criteria that have not yet been met, says Heritable Human Genome Editing. From an international commission of the U.S. National Academy of Medicine, U.S. National Academy of Sciences, and the U.K.'s Royal Society, the report considers potential benefits, harms, and uncertainties associated with genome editing technologies and defines a translational pathway from rigorous preclinical research to initial clinical uses, should a country decide to permit such uses. The report specifies stringent preclinical and clinical requirements for establishing safety and efficacy, and for undertaking long-term monitoring of outcomes. Extensive national and international dialogue is needed before any country decides whether to permit clinical use of this technology, according to the report, which identifies essential elements of national and international scientific governance and oversight.

Exploring the Biological Contributions to Human Health - Institute of Medicine 2001-07-02

It's obvious why only men develop prostate cancer and why only women get ovarian cancer. But it is not obvious why women are more likely to recover language ability after a stroke than men or why women are more apt to develop autoimmune diseases such as lupus. Sex differences in health throughout the lifespan have been documented. *Exploring the Biological Contributions to Human Health* begins to snap the pieces of the puzzle into place so that this knowledge can be used to improve health for both sexes. From behavior and cognition to metabolism and response to chemicals and infectious organisms, this book explores the health impact of sex (being male or female, according to reproductive organs and chromosomes) and gender (one's sense of self as male or female in society). *Exploring the Biological Contributions to Human Health* discusses basic biochemical differences in the cells of males and females and health variability between the sexes from conception throughout life. The book identifies key research needs and opportunities and addresses barriers to research. *Exploring the Biological Contributions to Human Health* will be important to health policy makers, basic, applied, and clinical researchers, educators, providers,

and journalists-while being very accessible to interested lay readers.

The Basics of Genetics - Anne Wanjie 2013-07-15

Beginning with a short chapter introducing the concept of heredity and continues with a broader explanation of the principles of inheritance. Fascinating basic information covering cell division, molecular genetics, and genomes are all presented but does not go into excessive detail. The final chapter is a biography of Gregory Mendel.

The Major Principles of the Biological Sciences of Importance for General Education - William Edgar Martin 1948

Using Labs and Activities to Teach High School Genetics - Matthew Richard Withers 2003

Reproductive Biology of Plants - B.M. Johri 2013-06-29

Reproductive Biology of Plants is a comparative account of reproduction in viruses, bacteria, cyanobacteria, algae, fungi, lichens, bryophytes, pteridophytes, gymnosperms and angiosperms, each chapter written by an expert in the field. Special emphasis is placed on the truly comparative approach illustrating the vast range from simplicity to complexity in structure and function with respect to the various organisms.

The Masterpiece of Nature - Graham Bell 2019-11-28

Originally published in 1982, The Masterpiece of Nature examines sex as representative of the most important challenge to the modern theory of evolution. The book suggests that sex evolved, not as the result of normal Darwinian processes of natural selection, but through competition between populations or species - a hypothesis elsewhere almost universally discredited. The book also discusses the nature of sex and its consequences for the individual and for the population, as well as various other theories of sex. Since the value of these theories is held to reside wholly in their ability to predict the patterns of sexuality observed in nature, the book seeks to provide an extensive review of the circumstances in which sexuality is attenuated or lost throughout the animal kingdom, and these facts are then used to weigh up the merits of the rival theories. This book will be of interest to researchers in the area of genetics, ecology and evolutionary biology.

Guide to Yeast Genetics: Functional Genomics, Proteomics, and Other Systems Analysis - 2010-02-27

This fully updated edition of the bestselling three-part Methods in Enzymology series, Guide to Yeast Genetics and Molecular Cell Biology is specifically designed to meet the needs of graduate students, postdoctoral students, and researchers by providing all the up-to-date methods necessary to study genes in yeast. Procedures are included that enable newcomers to set up a yeast laboratory and to master basic manipulations. This volume serves as an essential reference for any beginning or experienced researcher in the field. Provides up-to-date methods necessary to study genes in yeast. Includes procedures that enable newcomers to set up a yeast laboratory and to master basic manipulations. This volume serves as an essential reference for any beginning or experienced researcher in the field.

The Evolution of Sex and its Consequences - S.C. Stearns 2013-11-21

Concepts of Biology - Samantha Fowler 2018-01-07

Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an

important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand. We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

Cells - Alvin Silverstein 2009-01-01

The authors discuss cellular functions, including how advances in cell research have led to artificial cloning, and how they are bringing scientists closer to finding cures for serious diseases.

Molecular Biology of the Cell - Bruce Alberts 2004

The Zebrafish: Cellular and Developmental Biology - 2011-06-02

This volume of Methods in Cell Biology, the second of two parts on the subject of zebrafish, provides a comprehensive compendium of laboratory protocols and reviews covering all the new methods developed since 1999. * Details state-of-the art zebrafish protocols, delineating critical steps in the procedures as well as potential pitfalls * Illustrates many techniques in full-color * Summarizes the Zebrafish Genome Project

Principles of Biology - Lisa Bartee 2017

The Principles of Biology sequence (BI 211, 212 and 213) introduces biology as a scientific discipline for students planning to major in biology and other science disciplines. Laboratories and classroom activities introduce techniques used to study biological processes and provide opportunities for students to develop their ability to conduct research.

Sex Chromosomes - Ursula Mittwoch 2014-06-28

Sex Chromosomes focuses on the study of sex chromosomes, including human chromosomal abnormalities, behavior and characteristics of chromosomes, and cell division. The book first offers information on the chromosomal basis of sex determination, as well as development of the cell theory, mitosis, fertilization, meiosis, and discovery of sex chromosomes. The publication also ponders on the mitosis, meiosis, and formation of gametes. Discussions focus on the special characteristics of sex chromosomes, abnormalities of cell division, and sexual differentiation. The manuscript reviews sex chromosomes in plants, Drosophila, and Lepidoptera. The book also examines sex-chromosome mechanisms that differ the classic type; sex chromosomes in fishes, amphibia, reptiles, and birds; and sex chromosomes in man. Discussions focus on normal human sex chromosomes, Turner's syndrome, Klinefelter's syndrome, true hermaphrodites, testicular feminization, and pseudohermaphrodites. Sex chromosomes in mammals other than man, including monotremata, marsupialia, insectivora, rodentia, and carnivora, are discussed. The publication is a dependable reference for readers interested in the study of sex chromosomes.

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