

Sex Cells Explanation

Sex and the Origins of Death - William R. Clark 1998-06-11

Death, for bacteria, is not inevitable. Protect a bacterium from predators, and provide it with adequate food and space to grow, and it would continue living--and reproducing asexually--forever. But a paramecium (a slightly more advanced single-cell organism), under the same ideal conditions, would stop dividing after about 200 generations--and die. Death, for paramecia and their offspring, is inevitable. Unless they have sex. If at any point during that 200 or so generations, two of the progeny of our paramecium have sex, their clock will be reset to zero. They and their progeny are granted another 200 generations. Those who fail to have sex eventually die. Immortality for bacteria is automatic; for all other living beings--including humans--immortality depends on having sex. But why is this so? Why must death be inevitable? And what is the connection between death and sexual reproduction? In *Sex and the Origins of Death*, William R. Clark looks at life and death at the level of the cell, as he addresses such profound questions as why we age, why death exists, and why death and sex go hand in hand. Clark reveals that there are in fact two kinds of cell death--accidental death, caused by extreme cold or heat, starvation, or physical destruction, and "programmed cell death," initiated by codes embedded in our DNA. (Bacteria have no such codes.) We learn that every cell in our body has a self-destruct program embedded into it and that cell suicide is in fact a fairly commonplace event. We also discover that virtually every aspect of a cell's life is regulated by its DNA, including its own death, that the span of life is genetically determined (identical twins on average die 36 months apart, randomly selected siblings 106 months apart), that human tissue in culture will divide some 50 times and then die (an important exception being tumor cells, which divide indefinitely). But why do our cells have such programs? Why must we die? To shed light on this question, Clark reaches far back in evolutionary history, to the moment when "inevitable death" (death from aging) first appeared. For cells during the first billion years, death, when it occurred, was accidental; there was nothing programmed into them that said they must die. But fierce competition gradually led to multicellular animals--size being an advantage against predators--and with this change came cell specialization and, most important, germ cells in which reproductive DNA was segregated. When sexual reproduction evolved, it became the dominant form of reproduction on the planet, in part because mixing DNA from two individuals corrects errors that have crept into the code. But this improved DNA made DNA in the other (somatic) cells not only superfluous, but dangerous, because somatic DNA might harbor mutations. Nature's solution to this danger, Clark concludes, was programmed death--the somatic cells must die. Unfortunately, we are the somatic cells. Death is necessary to exploit to the fullest the advantages of sexual reproduction. In *Sex and the Origins of Death*, William Clark ranges far and wide over fascinating terrain. Whether describing a 62-year-old man having a major heart attack (and how his myocardial cells rupture and die), or discussing curious life-forms that defy any definition of life (including bacterial spores, which can regenerate after decades of inactivity, and viruses, which are nothing more than DNA or RNA wrapped in protein), this brilliant, profound volume illuminates the miraculous workings of life at its most elemental level and finds in these tiny spaces the answers to some of our largest questions.

Anatomy and Physiology : The Reproductive System - Rumi Michael Leigh

This book will explain the definition, functions, organs and parts of the reproductive system, including the male and female reproductive system. It will make you discover the reproductive system in its entirety. All in the form of questions and answers to facilitate understanding of the subject.

Scientific and Medical Aspects of Human Reproductive Cloning - National Research Council 2002-06-17

Human reproductive cloning is an assisted reproductive technology that would be carried out with the goal of creating a newborn genetically identical to another human being. It is currently the subject of much debate around the world, involving a variety of ethical, religious, societal, scientific, and medical issues. *Scientific and Medical Aspects of Human Reproductive Cloning* considers the scientific and medical sides of this issue, plus ethical issues that pertain to human-subjects research. Based

on experience with reproductive cloning in animals, the report concludes that human reproductive cloning would be dangerous for the woman, fetus, and newborn, and is likely to fail. The study panel did not address the issue of whether human reproductive cloning, even if it were found to be medically safe, would be "or would not be" acceptable to individuals or society.

Aging, Sex, and DNA Repair - Gerard Meurant 2012-12-02

Why organisms age and why sexual reproduction exists are major unsolved problems in biology. This book provides an integrated explanation of aging and sex based on current knowledge of DNA damage and repair. Discusses the universality of the problem of DNA damage Describes aging as a consequence of accumulated DNA damage Considers meiosis as an adaptation for DNA repair Discusses mating in eukaryotes as an adaptation for masking mutation

Cells: Cell Reproduction - Angela Wagner 2013-04-01

This is the chapter slice "Cell Reproduction" from the full lesson plan "Cells". Cells are the building blocks of life. We take you from the parts of plant and animal cells and what they do to single-celled and multi-cellular organisms. Using simplified language and vocabulary concepts we discover human cell reproduction as well as diffusion and osmosis. Our resource provides ready-to-use information and activities for remedial students using simplified language and vocabulary. Ready to use reading passages, student activities and color mini posters, our resource is effective for a whole-class, small group and independent work. All of our content meets the Common Core State Standards and are written to Bloom's Taxonomy and STEM initiatives.

Sex, Cells, and Same-Sex Desire - David A Parker 2014-02-25

This fascinating new book explores the myriad aspects of biological theories of sexual preference. *Sex, Cells, and Same-Sex Desire* describes, reviews, and questions recent biological research on sexual preference from the point of view of knowledgeable scientists and of scholars in the social sciences and humanities representing the emerging field of gay studies. The issues involved have a vibrant history, are wide-ranging, and remain the objects of much controversy. This book demystifies biological research on sexual preference and makes it accessible to readers unfamiliar with biological and medical research. *Sex, Cells, and Same-Sex Desire* is divided into several sections, each of which is introduced by an explanation of key concepts and terms found in that section. The book begins with a discussion of the history of biological theories and sociocultural concepts of gender and sexuality. The next 3 sections explore specialized areas of biological science and related issues: genetics and evolution, hormones and the endocrine system, and brain physiology and structure. A final section discusses social stigma, science, and medicine. A glossary of terms used by the authors is included, so readers may look up those that may be unfamiliar.

The End of Sex and the Future of Human Reproduction - Henry T. Greely 2016-05-30

Within twenty, maybe forty, years most people in developed countries will stop having sex for the purpose of reproduction. Instead, prospective parents will be told as much as they wish to know about the genetic makeup of dozens of embryos, and they will pick one or two for implantation, gestation, and birth. And it will be safe, lawful, and free. In this work of prophetic scholarship, Henry T. Greely explains the revolutionary biological technologies that make this future a seeming inevitability and sets out the deep ethical and legal challenges humanity faces as a result. "Readers looking for a more in-depth analysis of human genome modifications and reproductive technologies and their legal and ethical implications should strongly consider picking up Greely's *The End of Sex and the Future of Human Reproduction*...[It has] the potential to empower readers to make informed decisions about the implementation of advancements in genetics technologies." —Dov Greenbaum, *Science* "[Greely] provides an extraordinarily sophisticated analysis of the practical, political, legal, and ethical implications of the new world of human reproduction. His book is a model of highly informed, rigorous, thought-provoking speculation about an immensely important topic." —Glenn C. Altschuler, *Psychology Today*

Sexual Plant Reproduction - Mauro Cresti 2012-12-06

In recent years there has been a growing awareness of the importance of reproductive biology to crop production and there has been a

tremendous increase in research on reproductive structures of higher plants. Presented here is a wide information of different aspects of micro- and macrosporogenesis, pollen-stigma interaction and recognition, pollen tube growth, cytoskeleton, in vitro and in vivo gamete fusion, and incompatibility. The most advanced techniques employed in studies on reproductive biology of higher plants are described in detail.

All About Mitosis and Meiosis - Elizabeth Cregan 2007-12-14

What is the difference between mitosis and meiosis? Children will learn the answer through this stimulating book that features stunning images and photos, captivating facts, engaging sidebars, and easy-to-read text. The steps of mitosis and meiosis--including interphase, prophase, metaphase, anaphase, telophase, cytokinesis, and meiosis I and meiosis II--are explained in easy-to-read text. The accessible glossary and index ensure that readers have the tools they need to better understand the content. Featuring an engaging lab activity, this book will have readers captivated and delighted from beginning to end!

Sex Cells - Jennifer Elizabeth Crawford 2007

Power, Sex, Suicide - Nick Lane 2006-10-26

Mitochondria are tiny structures located inside our cells that carry out the essential task of producing energy for the cell. They are found in all complex living things, and in that sense, they are fundamental for driving complex life on the planet. But there is much more to them than that. Mitochondria have their own DNA, with their own small collection of genes, separate from those in the cell nucleus. It is thought that they were once bacteria living independent lives. Their enslavement within the larger cell was a turning point in the evolution of life, enabling the development of complex organisms and, closely related, the origin of two sexes. Unlike the DNA in the nucleus, mitochondrial DNA is passed down exclusively (or almost exclusively) via the female line. That's why it has been used by some researchers to trace human ancestry daughter-to-mother, to 'Mitochondrial Eve'. Mitochondria give us important information about our evolutionary history. And that's not all.

Mitochondrial genes mutate much faster than those in the nucleus because of the free radicals produced in their energy-generating role. This high mutation rate lies behind our ageing and certain congenital diseases. The latest research suggests that mitochondria play a key role in degenerative diseases such as cancer, through their involvement in precipitating cell suicide. Mitochondria, then, are pivotal in power, sex, and suicide. In this fascinating and thought-provoking book, Nick Lane brings together the latest research findings in this exciting field to show how our growing understanding of mitochondria is shedding light on how complex life evolved, why sex arose (why don't we just bud?), and why we age and die. This understanding is of fundamental importance, both in understanding how we and all other complex life came to be, but also in order to be able to control our own illnesses, and delay our degeneration and death. 'An extraordinary account of groundbreaking modern science... The book abounds with interesting and important ideas.' Mark Ridley, Department of Zoology, University of Oxford

Lost Sex - Isa Schön 2009-09-22

Sex is the queen of problems in evolutionary biology. Generations of researchers have investigated one of the last remaining evolutionary paradoxes: why sex exists at all. Given that sexual reproduction is costly from an evolutionary point of view, one could wonder why not all animals and plants reproduce asexually. Dozens of contemporary hypotheses attempt to explain the prevalence of sex and its advantages and predict the early extinction of fully asexual lineages. The major theme of this book is: what is the fate of animal and plant groups in which sex is lost? Initial chapters discuss theory behind asexual life: what major disadvantages do asexual groups have to face, what are the genetic and ecological consequences and what does this theory predict for more applied aspects of asexual life, for example in agricultural pests, diseases as well as in cultural crops such as grapes. Cases studies in many animals (focusing on both invertebrates and vertebrates) and plants reveal parallel, but also singularly novel adaptations to the absence of meiosis and syngamy. And last but not least, are asexuals really doomed to early extinction or do genuine ancient asexuals exist? This book assembles contributions from the most important research groups dealing with asexual evolution in eukaryotes. It is a milestone in research on parthenogenesis and will be useful to undergraduate as well as graduate students and to senior researchers in all fields of evolutionary biology, as the paradox of sex remains its queen of problems.

All About Mitosis and Meiosis - Elizabeth Cregan 2007-12-14

Many organisms are multicellular, which means they have many cells--even trillions! The cells work together to help the organism do things

such as create energy, reproduce, and get rid of waste.

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.

Sex-Specific Analysis of Cardiovascular Function - Peter L. M. Kerkhof 2018-07-26

This book gathers together contributions from internationally renowned authors in the field of cardiovascular systems and provides crucial insight into the importance of sex- and gender-concepts during the analysis of patient data. This innovative title is the first to offer the elements necessary to consider sex-related properties in both clinical and basic studies regarding the heart and circulation on multiscale levels (i.e. molecular, cellular, electrophysiologically, neuroendocrine, immunoregulatory, organ, allometric, and modeling). Observed differences at (ultra)cellular and organ level are quantified, with focus on clinical relevance and implications for diagnosis and patient management. Since the cardiovascular system is of vital importance for all tissues, Sex-Specific Analysis of Cardiovascular Function is an essential source of information for clinicians, biologists, and biomedical investigators. The wide spectrum of differences described in this book will also act as an eye-opener and serve as a handbook for students, teachers, scientists and practitioners.

The Evolution of Sex - Sir Patrick Geddes 1897

Molecular Biology of the Cell - Bruce Alberts 2004

The Genetics and Biology of Sex Determination - Derek J. Chadwick 2002-04-26

Nature employs a wide variety of sex determining mechanisms and it is only comparatively recently that the tools have become available for these to be explored at the cellular and molecular levels. A major landmark was the discovery in 1990 of the SRY gene and the subsequent demonstration of its key role in triggering male sex determination in transgenic mice. This book reviews and discusses our current understanding of the molecular genetic pathways of sex determination, with special emphasis on vertebrates. It features comparisons with other modes of sex determination, consideration of the biology of sexual development and discussion of the evolution of sex-determining mechanisms. By bringing together an international and interdisciplinary group of experts who study many different aspects of the problem, the book highlights much new and exciting work in this area and serves to identify and stimulate promising new research directions.

Sex Cells - Rene Almeling 2011-09-20

"What happens when sex cells sell? Do human bodies become degraded objects of commerce? Challenging simplistic accounts of commodification, Almeling offers a compelling analysis of contemporary markets for eggs and sperm. A superb contribution to 21st century economic sociology." -Viviana A. Zelizer, author of *Economic Lives: How Culture Shapes the Economy* "This is a highly informative book. Almeling provides a balanced approach to this highly controversial subject. Although you might be conflicted by the ethical issues, you will definitely be extremely well-informed when you finish this book." -Alan H. DeCherney, MD, National Institute of Child Health and Human Development "Almeling offers a wonderfully thoughtful analysis and an innovative cultural lens for viewing the gendered lives of sex cells and their commodification in the contemporary USA." -Rayna Rapp, author of *Testing Women, Testing the Fetus: The Impact of Amniocentesis in*

America

The X in Sex - David. BAINBRIDGE 2009-06-30

A tiny scrap of genetic information determines our sex; it also consigns many of us to a life of disease, directs or disrupts the everyday working of our bodies, and forces women to live as genetic chimeras. The culprit--so necessary and yet the source of such upheaval--is the X chromosome, and this is its story. An enlightening and entertaining tour of the cultural and natural history of this intriguing member of the genome, *The X in Sex* traces the journey toward our current understanding of the nature of X. From its chance discovery in the nineteenth century to the promise and implications of ongoing research, David Bainbridge shows how the X evolved and where it and its counterpart Y are going, how it helps assign developing human babies their sex--and maybe even their sexuality--and how it affects our lives in infinitely complex and subtle ways. X offers cures for disease, challenges our cultural, ethical, and scientific assumptions about maleness and femaleness, and has even reshaped our views of human evolution and human nature. Table of Contents: Prologue 1. Making a Difference Interlude: What Is It, Exactly? 2. The Duke of Kent's Testicles Interlude: How Sexy Is X? 3. The Double Life of Women Epilogue: The Chosen One Further Reading Glossary Index

Reviews of this book: The author of *Making Babies* takes a lively, witty tour of the X chromosome, creator of "a delicious symmetry between men and women"...Entertaining and informative...A fine demonstration of science made accessible. --Kirkus Reviews

Reviews of this book: A well-written, well-researched, easy-to-read study that explains what has been learned about the X and Y chromosomes using DNA sequencing and other molecular biology techniques. British biologist Bainbridge...has pulled together historical and current scientific research about how the X and Y chromosomes affect us and what the genes on these chromosomes actually do, like causing sex-linked diseases and color blindness...An excellent example of good science writing...Recommended. --Margaret Henderson, *Library Journal*

Reviews of this book: Bainbridge is an essentialist, interested in understanding what aspects of gender are biologically driven, and why...He has a central question he wants to answer. The question is not so much why men and women are different (a worn topic that's the subject of too many Mars-and-Venus bestsellers) but, far more specific and far more interesting: Why are men and women more different than they need to be? --Liza Mundy, *Washington Post*

Reviews of this book: Bainbridge summarizes our knowledge of the genetic information that determines one's sex by recounting the ancients' speculations about the genesis of gender, following with modern biologists' discovery of the X and Y chromosomes about a century ago, and of the sex-determining gene Sry in the 1990s. In a discussion rich with history, evolution, and philosophy, Bainbridge points out the dramatic effect that gender selection has on people's lives...A fascinating, often humorous analysis of the science of sexuality. --Gilbert Taylor, *Booklist*

Reviews of this book: In *The X in Sex*, David Bainbridge explains the far-reaching effects of X. Bainbridge...moves with ease

between straightforward accounts of biology and historical stories about its effect, like the chapter describing the progression of hemophilia through the royal houses of Europe. Bainbridge discusses cultural history as well as natural history, and his wit enlivens every page. --Christine Kenneally, *New York Times Book Review*

Reviews of this book: There are many literary stars (such as Stephen Jay Gould, Richard Dawkins and Matt Ridley) in the firmament of writers on evolution, and to a man they write with dash and persuasive logic. David Bainbridge is one such and in his latest book he takes the reader through the glories of the X chromosome at a cracking pace. --Miriam Stoppard, *Times Higher Education Supplement (UK)*

Reviews of this book: The truth is that the behaviours of [chromosomes] X and Y are inextricably linked. Bainbridge explores this link in a compelling tale that takes in how the sex chromosomes became sex chromosomes, and the very different consequences of this for women and men. Along the way we encounter the Duke of Kent's testicles, calico cats and non-identical identical twin girls. His story weaves science, history and the history of science (with a little religion for good measure) in a straightforward, anecdotal fashion that will appeal to scientists and non-scientists alike. --Mark T. Ross, *New Scientist (UK)*

Reviews of this book: In his structure/function analysis of the X chromosome, Bainbridge provides a tongue-in-cheek, yet informative, description of one of the two human sex chromosomes. --R. Adler, *Choice*

Reviews of this book: If you have ever been intrigued by some of the puzzles of genetics--why boys tend to get haemophilia or colour blindness while girls are more likely to have an identical twin or to develop rheumatoid arthritis later in life--then *The X in Sex* is for you. --Chris Tyler-Smith, *Times Literary Supplement*

David Bainbridge takes us on a fascinating tour of X chromosomes and explains what the possession of these intricately folded, infinitesimally narrow, two-inch long strings of genetic codes weighing almost nothing, means for their bearers--that is for each one of us, male and female. History and personal anecdotes are woven together with up-to-date summaries of the science, punctuated with Bainbridge's zany--and very British--humor, so that this information-packed book is pure pleasure to read. --Sarah Blaffer Hrdy author of *Mother Nature: A History of Mothers, Infants, and Natural Selection*

The X in Sex is absolutely fascinating, so intriguing, in fact, that I found myself unwilling to put it down. David Bainbridge surveys an astonishing amount of new information from recent genomic studies of the X chromosome, clearly explaining the findings in a way the average person can easily follow. The science is presented via amusing and highly appropriate metaphors and clever turns of phrase, all of which serve to brighten the prose and present the reader with catchy ways to think about complex ideas. This is an informative, authoritative, and thoroughly enjoyable read: one of the best books I have read in recent years. --Jane Lancaster, University of New Mexico

This is wonderful stuff--beautifully written, clear, jargon-free, with anecdotes sure to hold the attention. --other hupauthor Tim Birkhead, author of *Promiscuity: An Evolutionary History of Sperm Competition*

Sex Cells Explanation:

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