

Sex Chromosomes Of A Female

The 7 Sexes - Elof Axel
Carlson 2013

Few of us know much about the biology of sex determination, but what could be more interesting than to discover how we are shaped into males and females? In this book, Elof Carlson tells the incredible story of the difficult quest to understand how the body forms girls and boys. Carlson's history takes us from antiquity to the present day to detail how each component of human reproduction and sexuality was identified and studied, how this knowledge enlarged our understanding of sex determination, and how it was employed to interpret such little understood aspects of human biology as the origin of intersex births.

Sex Itself - Sarah S. Richardson
2013-12-13

Human genomes are 99.9 percent identical—with one prominent exception. Instead of a matching pair of X chromosomes, men carry a single X, coupled with a tiny chromosome called the Y. Tracking the emergence of a new and distinctive way of thinking about sex represented by the unalterable, simple, and visually compelling binary of the X and Y chromosomes, *Sex Itself* examines the interaction between cultural gender norms and genetic theories of sex from the beginning of the twentieth century to the present, postgenomic age. Using methods from history, philosophy, and gender studies of science, Sarah S. Richardson uncovers how gender has helped to shape the research practices, questions asked, theories and models, and

descriptive language used in sex chromosome research. From the earliest theories of chromosomal sex determination, to the mid-century hypothesis of the aggressive XYY supermale, to the debate about Y chromosome degeneration, to the recent claim that male and female genomes are more different than those of humans and chimpanzees, Richardson shows how cultural gender conceptions influence the genetic science of sex. Richardson shows how sexual science of the past continues to resonate, in ways both subtle and explicit, in contemporary research on the genetics of sex and gender. With the completion of the Human Genome Project, genes and chromosomes are moving to the center of the biology of sex. Sex Itself offers a compelling argument for the importance of ongoing critical dialogue on how cultural conceptions of gender operate within the science of sex.

Sex Chromosomes - Cynthia N. Weingarten 2009

Sex chromosomes determine the sex of an organism. A human somatic cell has two sex chromosomes: XY in male and XX in female. A human germ cell has one sex chromosome: X or Y in a sperm and X in an egg. When an X-sperm is combined with an egg, the resulting zygote (fertilised egg) will contain two X chromosomes. A person developed from the XX-zygote will have the characteristics of a female. Combination of a Y-sperm and an egg will produce a male. Usually, a woman has two X chromosomes (XX) and a man one X and one Y (XY). However, both male and female characteristics can sometimes be found in one individual, and it is possible to have XY women and XX men. Analysis of such individuals has revealed some of the molecules involved in sex determination, including one called SRY, which is important for testis formation. SRY (which stands for sex-determining region Y gene) is found on the Y chromosome. In the cell, it binds to other DNA and in

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doing so distorts it dramatically out of shape. This alters the properties of the DNA and likely alters the expression of a number of genes, leading to testis formation. Most XX men who lack a Y chromosome do still have a copy of the SRY gene on one of their X chromosomes (moved there by chromosomal translocation). This copy accounts for their maleness. However, because the remainder of the Y chromosome is missing they frequently do not develop secondary sexual characteristics in the usual way. This book presents the latest research in the field from around the world.

Gender Differences: Their Ontogeny and Significance - Christopher Ounsted 1972

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, *Banelia viridis*, the minute males are parasites in the female. Larvae that become attached to the proboscis of an adult female become males,

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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.

Sex Determination - Guido Bacci 1965

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.

Evolution of Sex Determining Mechanisms - James J. Bull 1983

Molecular Genetics of Sex

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Determination - Stephen S. Wachtel 2014-07-23

In this era of accelerated discovery and prolific output, *Molecular Genetics of Sex Determination* keeps readers abreast of this field's fast-moving biology. Its chapters were completed by experts in each area only months before publication. The text is organized into two parts. First, it reviews the basic biology of sex determination and summarizes ground-breaking work in mouse, marsupial, and *Drosophila* systems. Second, it covers current human genetics, clinical studies, and the syndromes of abnormal sex differentiation. With chapters by preeminent reproductive biologists, this is a capital work. Ohno's law is described by Ohno; the Lyon hypothesis, by Lyon; Sinclair tells how he cloned the testis-determining gene; and so on. *Molecular Genetics of Sex Determination* is authoritative, comprehensive, and current. It is prime reading for geneticists, developmental biologists, graduate students in

these and related fields, clinical researchers, physicians, and medical students. Reviews the genetics of sex determination in 19 up-to-date chapters. Features research on sex chromosomes and sex-determining genes. Includes abnormalities of sex determination and clinical genetics. Written by scientists who pioneered work in this field.

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

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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.

Females Are Mosaics - Barbara Migeon 2007-03-15

Women can be described as genetic mosaics because they have two distinctly different

types of cells throughout their bodies. Unlike males, who have one X chromosome (inherited from their mother), females have two X chromosomes in every cell (one from each parent). The fathers copy works in some cells, while the mothers copy works in others. These two X chromosomes often function differently, especially if one carries a defective gene. Much has been written about the Y chromosome and its role in inducing maleness. This will be the first book about the X chromosome as a key to female development and the role of X-related factors in the etiology of sex differences in human disease. Barbara Migeon, from the renowned McKusick-Nathan Institute at Johns Hopkins, is a major figure in clinical genetics and is eminently qualified to write this book, and she writes clearly and effectively. She describes both the underlying molecular mechanisms and the remarkable genetic consequences of X inactivation and its role in determining the

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biological concepts characteristic of women. Females are Mosaics will be valuable to geneticists, biologists, and all health professionals interested in women's health.

Temperature-Dependent Sex Determination in Vertebrates -

Nicole Valenzuela 2004

Edited by the world's foremost authorities on the subject, with essays by leading scholars in the field, this work shows how the sex of reptiles and many fish is determined not by the chromosomes they inherit but by the temperature at which incubation takes place.

Understanding Genetics -

Genetic Alliance 2009

The purpose of this manual is to provide an educational genetics resource for individuals, families, and health professionals in the New York - Mid-Atlantic region and increase awareness of specialty care in genetics. The manual begins with a basic introduction to genetics concepts, followed by a description of the different types and applications of

genetic tests. It also provides information about diagnosis of genetic disease, family history, newborn screening, and genetic counseling. Resources are included to assist in patient care, patient and professional education, and identification of specialty genetics services within the New York - Mid-Atlantic region. At the end of each section, a list of references is provided for additional information.

Appendices can be copied for reference and offered to patients. These take-home resources are critical to helping both providers and patients understand some of the basic concepts and applications of genetics and genomics.

Sex Chromosomes and Sex-determining Genes -

Ken Reed 1993

The emphasis throughout is on the genetic determinants of sex. The major issues addressed are sex chromosome differentiation, X-chromosome inactivation and the role of the Y-linked gene SRY in gonad differentiation. A combination

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of authoritative reviews and original articles drawn from experiment and observation on a variety of systems is complemented by the editors thoughtful introductions. 'Sex is compelling in its benefits, elegant in its conception, startling in its manifestations.' So begins this timely and thoughtful review of the most fascinating property of life. For centuries we have puzzled over the differences between males and females but only recently have we begun to understand the genetic switches that trigger the dramatic differences in form and function between the sexes.

This book brings together contributions from many of the scientists who have been responsible for recent stunning advances in our understanding of sex determination and sexual differentiation. The editors have

Sex Chromosome Evolution of Papaya - Jennifer Han (Ph. D.)
2014

Sex chromosomes are found throughout many diverse lineages across the animal and

plant kingdom. Most of the sex chromosomes that have been studied are well established and have already experienced many evolutionary forces, making it difficult to reconstruct the dynamic changes involved in the evolution of sex chromosomes. Sex chromosomes are evolved from a pair of autosomes with closely linked sex determining genes that have stopped recombining. Papaya has many qualities that make it attractive for studying sex chromosome genetics. It is trioecious (male, female, and hermaphrodite) with sex determined by a pair of nascent sex chromosomes approximately 7 million years old. The genome is relatively small (442.5 Mb) and the sex determining region of the sex chromosomes is small and well characterized; the hermaphrodite and male specific region of the Yh and Y chromosome respectively is 8.1 Mb and the corresponding X is 3.5 Mb. These sex specific regions of the X and Y chromosomes not only contain the genes that control sex type,

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but they also have genes associated with the different sexes. While the vegetative forms of the three sexes are phenotypically identical, the reproductive structures are unique. In stark contrast to female and hermaphrodite flowers on male plants are borne on long pendulous peduncles (60-90 cm) at the leaf axis. Female and hermaphrodite flowers are borne on short peduncles (0-4 cm). Gynodioecious varieties SunUp, SunUp Diminutive mutant and dioecious AU9 were used to test the response of papaya to gibberellic acid (GA3). Gibberellic acid is a hormone known to cause elongation of stems throughout the plant kingdom. It is also known as a masculinizing hormone. Exogenous applications of GA3 on female and hermaphrodite papaya did not yield any sex reversals but there was a significant increase in peduncle length and inflorescence branch number in all treated plants. There was an increase in plant height for all treated plants except SunUp

Diminutive mutant, suggesting that the mechanism causing the dwarf phenotype is independent of gibberellins. Gibberellin metabolism genes were identified in the papaya genome, none of which mapped to the sex-determining region of either the male- or hermaphrodite-specific region of papaya Y or Yh chromosome. We hypothesize that a trans-acting regulatory element that enhances gibberellin biosynthesis plays a role in the extreme length of the male papaya peduncle Sex chromosomes experience several evolutionary forces. To further study the structure of the sex chromosomes, a mapping population was created to generate a high density genetic map. A female AU9 was crossed with a hermaphrodite SunUp, the resulting offspring was backcrossed to the hermaphrodite SunUp. Fifty-one individuals derived from this cross were used to create restriction-site associated DNA sequencing (RAD-seq) libraries. A total of 228 RAD-seq markers

were mapped to 9 major and 2 minor linkage groups. Previous studies have shown that the Y chromosome experiences severe recombination suppression along the sex determining region. The resulting map from this study showed that the X chromosome is not experiencing recombination suppression. Additionally, possible centromere locations were identified for the other chromosomes. Sex chromosomes also undergo degeneration of genetic material. The effective population size of the sex chromosomes is reduced compared to the autosome. The lack of recombination, especially for the Y chromosome also increases the rate of degeneration. RNA seq data was generated using flower and leaf tissue from females, males, and hermaphrodite individuals to determine the rate at which the Y chromosome is experiencing degeneration. Expression levels were compared between the X and Y linked alleles in

males and hermaphrodites. If there is no Y degeneration, then the expression levels between the sex linked alleles should be equal. Expression of male leaf tissue had significantly less expression of the Y allele compared to the X allele. This was not found in hermaphrodites and in all flower tissue. Dosage compensation is a phenomenon utilized by many organisms with sex chromosomes to account for the heterogametic sex having only one allele for many of the genes on the sex chromosome. While many organisms compensate expression levels in the heterogametic sex, this is not true of all animals. Very few studies have been conducted to determine if plants undergo the same evolutionary forces as animals and also evolve dosage compensation. There was no detectable dosage compensation in the primitive papaya sex chromosome.

Sex Determination in Fish -

T. J. Pandian 2011-09-02

This book is the first to report that research in

allogenics/xenogenics has conclusively shown that fishes have retained bisexual potency even after sexual maturity and spermiation. The XY genotype found in the unexpected female phenotypes sired by supermales (Y1Y2) and androgenic males (Y2Y2) points out the need to employ sex specific molecular ma

Sex Chromosomes - Mario D'Aquino 2013

In this book, the authors present new research in the study of sex chromosomes. Topics discussed in this compilation include the evolution of mammalian X chromosomes and X chromosome inactivation; the role of sex chromosomes in mammalian female fertility; the fate of the Y chromosome; the role of Y chromosome genes on tumour development risk in disgenetic gonads; deletion of amelogenin Y-locus; non-invasive prenatal diagnosis for foetal sex determination; and application of X chromosomal STR polymorphisms to individual identification.

Genetics of Sex Determination -

R.S. Verma 1996-04-23
The Genetical Theory of Natural Selection by R.A. Fisher (1930) dictated that sexual dimorphisms may depend upon a single medelian factor. This could be true for some species but his suggestion could not take off the ground as gender in *Drosophila* is determined by the number of X chromosomes. Technical advances in molecular biology have revived the initial thinking of Fisher and dictate that TDF or SRY genes in humans or Tdy in mice are sex determining genes. The fortuitous findings of XX males and XY female, which are generally termed sex reversal phenomenon, are quite bewildering traits that have caused much amazement concerning the pairing mechanism(s) of the pseudoautosomal regions of human X and Y chromosomes at meiosis. These findings have opened new avenues to explore further the genetic basis of sex determination at the single gene level. The aim of the fourth volume, titled *Genetics*

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of Sex Determination is to reflect on the latest advances and future investigative directions, encompassing 10 chapters. Commissioned several distinguished scientists, all pre-eminent authorities in each field to shed their thoughts concisely but epitomise their chapters with an extended bibliography. Obviously, during the past 60 years, the metric advances are voluminous and to cover every account of genes, chromosomes, and sex in a single volume format would be a herculean task. Therefore, a few specific topics are chosen, which may be of great interest to scientists and clinicians. The seasoned scientists who love to inquire about the role of genes in sex determination should find the original work of these notable contributors very enlightening. This volume is intended for advanced students who want to keep abreast as well as for those who indulge in the search for genes of sex determination.

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

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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

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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.

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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 hupauthorTim Birkhead, author of *Promiscuity: An Evolutionary History of Sperm Competition* *The Evolution of Sex Determination* - Leo Beukeboom 2014-06-12 Sexual reproduction is a fundamental aspect of life. It is

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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.

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