Trends in Polyploidy Research in Animals and Plants

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A new vision to understanding medicine

Handbook of Clinical Gender Medicine

Editors: Karin Schenck-Gustafsson (Stockholm), Paula R. DeCola, Donald W. Pfaff (New York, N.Y.), David S. Pisetsky (Durham N.C.)

In well-referenced chapters, experts cogently and concisely explain how the incorporation of gender issues into research can affect the medical understanding and treatment of heart disease, osteoporosis, arthritis, pain as well as malaria among other conditions.

This intriguing and unique medical textbook provides readers with a valuable new perspective on how to incorporate gender issues into the different branches of medicine.
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The Hemiphractid Frogs
Phylogeny, Embryology, Life History, and Cytogenetics

Editors
M. Schmid
J.P. Bogart
S.B. Hedges

This monograph is an exhaustive analysis of the biology of hemiphractid frogs, presenting results obtained over a 43-year period on 16 expeditions to Central and South America, Trinidad and Tobago and from several laboratories (Canada, Ecuador, Germany, and USA). The focus of this study is on chromosomes, but it also includes very detailed chapters on phylogeny, classification, biogeography, and especially on reproduction, oogenesis, spermatogenesis, and embryogenesis. Further notable sections are devoted to developmental biology, life history and population declines in hemiphractids.

The major proportion of this book describes the karyotypes of 397 individuals representing 23 hemiphractid species. All karyotypes are illustrated by superb photographs selected from many hundreds taken. Modern techniques of preparation including special staining, molecular probes, in situ hybridization, and genome size measurements were used to generate these data which are also interpreted in context with the cytogenetic data published for other amphibian taxa or vertebrates.

Providing a wealth of current and archival information on hemiphractid biology and cytogenetics, this monograph is recommended for specialists in the fields of zoology, herpetology, embryology and cytogenetics, as well as for students with an interest in vertebrate cytogenetics.

Main Headings
- Foreword by Jay M. Savage
- Introduction
- Materials and Methods
- Results and Discussion
- References, Appendices, Species Index

For the complete contents please go to www.karger.com/TheHemiphractidFrogs
Evolutionary Dynamics of Mammalian Karyotypes

Editors
Roscoe Stanyon
Alexander Graphodatsky

This publication both reviews and synthesizes the cytogenetic data pertinent to mammalian genome evolution including the most recent advances in molecular cytogenetics with an emphasis on chromosome painting in mammals. The volume begins with an overview of molecular cytogenetics in mammals offering original perspectives on genome evolution in mammals and in other vertebrates as well as on syntenic and associational evolution. Furthermore it discusses the evolution of genome size in mammals and details the cytogenetic findings in: Monotremata and Marsupialia, Afrotheria, Xenarthra, Chiroptera, Eulipotyphla, Carnivora and Pholidota, Cetartiodactyla, Perissodactyla, Rodentia, Lagamorpha and Sciuromorpha, New World Primates, Catarrhine Primates.

Leading experts in the field summarize the karyological and molecular cytogenetic data of mammals and pay particular attention to the last decades of intense activity in this field. Comparative and phylogenomic implications are thoroughly explored and integrated with sequencing information.

The synthesis and new interpretations of mammalian karyotypes found in this volume have wide implications for those interested in the evolution of the vertebrate genome and for researchers involved in molecular cytogenetics, mammalian evolution, zoology, primatology, and comparative genomics.

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Orders may be placed with any bookseller, subscription agency, directly with the publisher or through a Karger distributor.
Aneuploidy is the most commonly occurring type of chromosome abnormality. It occurs usually because of segregation errors that take place during female meiosis. Most aneuploid pregnancies do not survive in utero and in the great majority of cases demise happens during the first few weeks of uterine life.

This publication investigates the causes of aneuploidy in humans and its effects at different life stages. This issue is accordingly divided into three main sections: the first, ‘Aneuploidy at Different Life Stages’, provides an overview of abnormalities in sperm and oocytes. In addition, current literature dealing with inherited aneuploidy arising from germinal mosaicism is reviewed. The second section provides in-depth coverage of aneuploidy during embryogenesis together with articles about somatic changes. Furthermore, an exciting collection of up-to-date articles by highly regarded experts in the field explore the topic of genetic regulation of chromosome segregation. The final section is devoted to ‘Environment and Epigenetics’, two critical factors in the genesis of aneuploidy.

Providing a valuable overview this issue will be of interest not only to those engaged in genetic research but also to clinicians concerned with fetal medicine and with infertility. Furthermore, embryologists who need to be familiar with the latest findings relating to embryonic aneuploidy will doubtless appreciate these reviews.

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Aneuploidy

Editors
Joy D.A. Delhanty
Franck Pellestor

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Is There a Paternal Age Effect for Aneuploidy?

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New discoveries and their genome-wide application to disease-oriented research

Medical Epigenetics

The journal’s aim is to increase the distribution of scientific knowledge in the new discipline of medical epigenetics. Epigenetics, a rapidly emerging scientific discipline, seeks to define how the genome is regulated to produce distinct normal and diseased phenotypes. Epigenomics, the genome-wide application of epigenetic techniques, is at the core of systems biology extending the power of genomics, proteomics, and other high throughput techniques for the analyses of complex phenotypes.

The journal Medical Epigenetics seeks to catalyze discoveries and genome-wide applications in the areas of gene regulation, chromatin dynamics, and epigenetic inheritance to disease-oriented research. Articles will be focused on disseminating scientific advances and applications of this field to mapping DNA methylation, histone modifications, chromatin accessibility and small RNA transcripts in cells, tissues and organ systems frequently involved in human disease. This journal is also committed to support development, standardization and sharing of protocols, reagents and analytical tools to enable the research community to utilize, integrate and expand upon this new exciting biomedical discipline.
Infectious diseases are the second leading cause of death worldwide. Their dynamic nature due to persistent, emerging, and re-emerging infections continues to challenge health care systems around the world. In addition, individuals do not respond equally to infection, and pathogens of the same species are more disparate than once thought. It is incontrovertible that much of this diversity is attributable to genetic variation. Over the past two decades, genomics has provided remarkable insight into susceptibility, resistance, and progression of infection, yet the gap between genomics research and public health application remains large.

This special issue highlights the role of genomics in advancing our understanding of host-pathogen interactions and in improving the quality of mainstay public health tools including genomic epidemiology, diagnostics/screening, and vaccines.

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Author and Subject Index

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Up-to-date review on clinical, developmental, and molecular aspects of VACTERL association

VACTERL Association
Editor
Benjamin D. Solomon

This collection of articles describes the current medical and biological knowledge related to VACTERL/VATER association. VACTERL association is a fascinating condition involving malformations that can affect the skeletal, gastrointestinal (and genitourinary), cardiac, pulmonary, and renal systems. The disorder is also related to many other clinically and biologically related conditions. This publication presents cutting-edge summaries and research describing diverse aspects of these conditions, including the latest knowledge related to clinical aspects of disease manifestations and pathogenesis, embryology and developmental biology, key implicated signaling pathways, animal models of disease pathogenesis, techniques of molecular discovery related to the causes of human disease, and important considerations involving the differential diagnosis. This compendium should serve as a touchstone for future clinical and research endeavors as the growing body of medical research continues to unravel the mysteries of VACTERL association.

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During the last decades, Cytogenetic and Genome Research has been the leading forum for original reports and reviews in human and animal cytogenetics, including molecular, clinical and comparative cytogenetics. In recent years, most of its papers have centered on genome research, including gene cloning and sequencing, gene mapping, gene regulation and expression, cancer genetics, comparative genetics, gene linkage and related areas. The journal also publishes key papers on chromosome aberrations in somatic, meiotic and malignant cells. Its scope has expanded to include studies on invertebrate and plant cytogenetics and genomics. Also featured are the vast majority of the reports of the International Workshops on Human Chromosome Mapping, the reports of international human and animal chromosome nomenclature committees, and proceedings of the American and European cytogenetic conferences and other events. In addition to regular issues, the journal has been publishing since 2002 a series of topical issues on a broad variety of themes from cytogenetic and genome research.
Recent research into ploidy changes and gene and genome duplications encompasses a wide spectrum of fascinating topics. Like most fields of modern biology, polyploidy research experiences an ongoing transformation thanks to next and beyond-next generation sequencing technologies.

More than 30 years ago, Lewis edited his comprehensive work on polyploid plants and animals. Although there have been efforts to bring together polyploidy researchers from botany and zoology in recent conferences, collaboration between them is still scarce. Therefore, the editors of this thematic issue have made a special attempt to mirror and contrast research on polyploid animals with that on plants. Featuring 15 articles on various hot topics in polyploidy research ranging from cytology to evolution, this publication provides an inspiring overview and will be useful reading to both animal and plant researchers.

Cover illustration
Title illustration by Jörg Wachtel, Halle/Saale, Germany, using a chromosome photograph of a triploid hybrid from the Ambystoma laterale/A. jeffersonianum complex by James Bogart, Guelph, Canada.