

Studies in Biology no 70

# **Population Cytogenetics**

**Bernard John**



# Population Cytogenetics

**Judd E. Hollander**



## **Population Cytogenetics:**

Population Cytogenetics Bernard John, 1976      Population Cytogenetics Ernest B. Hook, Ian H. Porter, 1977      **Human Population Cytogenetics** William Michael Court Brown, 1967      Population Cytogenetics and Population Radiation Ecology V. N. Orlov, N. S. Bulatova, 1989      *The Principles of Clinical Cytogenetics* Steven L. Gersen, Martha B. Keagle, 2008-08-17

In the summer of 1989 one of us SLG along with his mentor Dorothy Warb ton attended the Tenth International Workshop on Human Gene Mapping The me ing was held at Yale University in celebration of the first such event which also took place there This meeting was not open to the general public one had to have contributed to mapping a gene to be permitted to attend The posters of course were therefore all related to gene mapping and many were covered with pretty colorful pictures of a novel fluorescent application of an old technology in situ hybridization Walking through the room Dorothy remarked that because of this new FISH technique ch mosomes which had become yesterday s news were once again back in style

Approximately three years later a commercial genetics company launched a FISH assay for prenatal ploidy detection A substantial number of cytogeneticists across the country reacted with a combination of outrage and panic Many were concerned that physicians would be quick to adopt this newfangled upstart test and put us all on the unemployment line They did not at the time realize what Dorothy instinctively already knew that FISH would not spell the doom of the cytogenetics laboratory but it would rather take it to new heights

**Population Cytogenetics of the Common Chimpanzee Pan Troglodytes** Jonathan Mitchell Marks, 1987      **Atlas of Human Chromosome Heteromorphisms** H.E. Wyandt, Vijay S. Tonk, 2013-03-09

Critical to the accurate diagnosis of human illness is the need to distinguish clinical features that fall within the normal range from those that do not That distinction is often challenging and not infrequently requires considerable experience at the bedside It is not surprising that accurate cytogenetic diagnosis is also often a challenge especially when chromosome study reveals morphologic findings that raise the question of normality Given the realization that modern human cytogenetics is just over five decades old it is noteworthy that thorough documentation of normal chromosome variation has not yet been accomplished One key diagnostic consequence of the inability to distinguish a normal variation in chromosome structure from a pathologic change is a missed or inaccurate diagnosis Clinical cytogeneticists have not however been idle Rather progressive biotechnological advances coupled with virtual completion of the human genome project have yielded increasingly better microscopic resolution of chromosome structure Witness the progress from the early short condensed chromosomes to the later visualization of chromosomes through banding techniques hi resolution analysis in prophase and more recently to analysis by fluorescent in situ hybridization FISH

*Domestic Animal Cytogenetics* Richard A. McFeely, 1990-01-01

Advances in Veterinary Science and Comparative Medicine Volume 34 Domestic Animal Cytogenetics aims to provide a comprehensive review of the status of domestic animal chromosomes The book starts by giving an overview of domestic animal cytogenetics and the terms chromosomes chromosome abnormalities genes and molecular genetics The

text then discusses chromosome preparation and identification the chromosomes of the cow and bull pig sheep and goat horse chicken and fish and chromosome abnormalities and pregnancy failure in domestic animals Gene mapping in the cow and the pig is also encompassed Veterinarians cytogeneticists veterinary pathologists those studying these fields of science and those involved in animal husbandry will find the book useful

**Amphibian Cytogenetics and Evolution** David M. Green, Stanley K. Sessions, 2012-12-02 This book appears at a time when molecular cytogenetics is positioned to make a significant impact upon evolutionary studies enabling problems of chromosomal structure and change to be critically assessed It is an up to date and comprehensive survey of the cytogenetics of a major class of animals including all three amphibian orders with chapters authored by international leaders in the field Amphibian Cytogenetics and Evolution will be of interest to classical and molecular cytogeneticists systematicists evolutionary biologists herpetologists and anyone using amphibians in genetic research Offers the only current and comprehensive survey of amphibian cytogenetics Gives authoritative and in depth coverage of topics of present interest Reviews general cytogenetic topics Presents new insights into evolutionary changes in chromosome structure and amphibian phylogeny and relationships including Phylogenetic analysis of chromosome data Current techniques of cytogenetic analysis Examination of all three amphibian orders

Current Bibliography of Epidemiology, 1977 Research Awards Index, 1989 **Human Chromosomes** Eva Therman, 2012-12-06 This book provides an introduction to human cytogenetics It is also suitable for use as a text in a general cytogenetics course since the basic features of chromosome structure and behavior are shared by all eukaryotes Because my own background includes plant and animal cytogenetics many of the examples are taken from organisms other than man Since the book is written from a cytogeneticist's point of view human syndromes are described only as illustrations of the effects of abnormal chromosome constitutions on the phenotype The selection of the phenomena to be discussed and of the photographs to illustrate them is in many cases subjective and arbitrary and is naturally influenced by my interests and the work done in our laboratory The approach to citations is the exact opposite of that usually used in scientific papers Whenever possible the latest and most comprehensive review has been cited instead of the original publication Thus the reader is encouraged to delve deeper into any question of interest to him or her I am greatly indebted to many colleagues for suggestions and criticism However my special thanks are due to Dr JAMES F CROW Dr TRAUTE M SCHROEDER and Dr CARTER DENNISTON for their courage in reading the entire manuscript I wish to express my gratitude also to the cytogeneticists and editors who have generously permitted the use of published and unpublished photographs

Human Population Cytogenetics, 1970 **Evolution and Speciation** William R. Atchley, David S. Woodruff, 1981-05-29 This 1981 collection focuses on a wide range of topics in the general field of evolutionary biology The authors have all been associated with Professor M J D White who was the world authority on chromosomal evolution and speciation to whom this volume was presented on his seventieth birthday

**Paediatric Research** M. Adinolfi, P. Benson, F. Giannelli, M. Seller, 1982-04-22 The

subjects reviewed in this Monograph span a wide and exciting field reflecting many different specialities They are however also closely interrelated as they reflect the eclectic nature of Professor Paul Polani s intellectual interests The chapters are written by present and past members of his Unit a Unit internationally recognized for its astute and stimulating discoveries and innovations The chapters pay tribute to the fact that Paul Polani s viewpoint is that a multidisciplinary approach to the subject of disease is most effective when motivated by genetic philosophy On this theme the book provides insight into the latest ideas on the genetics of handicap including counselling population cytogenetics prevention of biochemical genetic disorders repairing genetic damage the epidemiology of congenital defects and the prevention of neural tube defects All these and the other chapters provide an essential basis for understanding the fields of prevention and treatment

**Genetic Translocations and Other Chromosome Aberrations** Guy T. Leyden, 2008 Chromosomal aberrations are disruptions in the normal chromosomal content of a cell and are a major cause of genetic conditions in humans such as Down syndrome Some chromosome abnormalities do not cause disease in carriers such as translocations or chromosomal inversions although they may lead to a higher chance of having a child with a chromosome disorder Abnormal numbers of chromosomes or chromosome sets aneuploidy may be lethal or give rise to genetic disorders Genetic counseling is offered for families that may carry a chromosome rearrangement This book offers leading edge research from around the world

Issues and Reviews in Teratology Harold Kalter, 2012-12-06 Teratology is at once among the oldest and youngest of human preoccupations Coincident with man s first observations of the stars were his recordings of human and animal deformities But such aberrancies must have occurred even earlier for although it is one of those things like evolution that cannot be proven it is nevertheless indisputable that dysmorphogenesis must have occurred from the time complex forms of life first arose on our planet and that from the beginnings of human awareness our species was conscious of such happenings From the earliest recordings of this fascination with the form and meaning of abnormality a tortuous but continuous line extends to modern struggles to understand and control these manifestations And now after long occupying an honorable but peripheral place in the halls of philosophical and scientific pursuits teratology has quite suddenly come to take a prominent position at the hub of a complex crossroads of human concerns This shift in its fortune has taken several forms Fetal maldevelopment has become the concern of environmentalists activists of various persuasions industrial organizations government agencies ethicists parents i e individuals and groups whose actions are impelled by apprehension Such motives are of course not without basis the trauma of thalidomide left a scar yet raw For still others clinicians academics experimentalists the upsurge in the interest in fetal mal development is at a different level and their pursuits are broad taking external agents as but one of the causes of defective development

*Chromosome identification: Medicine and Natural Sciences* Torbjörn Caspersson, 1973-01-01 Chromosome Identification Technique and Applications in Biology and Medicine contains the proceedings of the Twenty Third Nobel Symposium held at the Royal Swedish Academy of Sciences in Stockholm Sweden on

September 25 27 1972 The papers review advances in chromosome banding techniques and their applications in biology and medicine Techniques for the study of pattern constancy and for rapid karyotype analysis are discussed along with cytological procedures karyotypes in different organisms somatic cell hybridization and chemical composition of chromosomes This book is comprised of 51 chapters divided into nine sections and begins with a survey of the cytological procedures including fluorescence banding techniques constitutive heterochromatin C band technique and Giemsa banding technique The following chapters explore computerized statistical analysis of banding pattern the use of distribution functions to describe integrated profiles of human chromosomes the uniqueness of the human karyotype and the application of somatic cell hybridization to the study of gene linkage and complementation The mechanisms for certain chromosome aberration are also analyzed together with fluorescent banding agents and differential staining of human chromosomes after oxidation treatment This monograph will be of interest to practitioners in the fields of biology and medicine      *Species Evolution* Max

King, 1995-01-26 What are species What are the factors involved in their evolution Dr Max King presents an up to date synthesis of theoretical experimental and descriptive perspectives on speciation in higher organisms The book provides a fresh insight into the processes involved in speciation utilizing the multi dimensional databases now available The author clearly and concisely analyses the most recent research in plant and animal populations concentrating on the evolutionary processes the role of chromosomes and the genetic mechanisms involved in speciation This book will be essential reading for research workers in genetics evolutionary studies botany and zoology as well as being of interest to advanced students entering the field      *Human Chromosome Variation: Heteromorphism, Polymorphism and Pathogenesis* Herman E.

Wyandt, Golder N. Wilson, Vijay S. Tonk, 2017-03-28 This new edition now titled Human Chromosome Variation Heteromorphism Polymorphism and Pathogenesis provides the reader with an up to date overview of microarrays fragile sites copy number variations and whole genome sequencing Greatly expanding the discussion of microarray analysis in the previous edition of the book are new chapters on microarray and genomic analysis plus comprehensive tables on the subtle microdeletions and microduplications that are found on each chromosome including 235 recurring copy number variants that are associated with well established or emerging chromosomal syndromes The current edition features concise information on cytogenetic methods and applications extending these discussions to DNA analysis and genome sequencing Sections on euchromatin heterochromatin FISH pattern fragile site copy number and DNA sequence variation are integrated with actual clinical examples from cytogenetic laboratories and from clinical practice The principles that allow for the distinction between benign chromosome DNA variation and pathogenic heteromorphisms polymorphisms are discussed and include references to the latest organizational guidelines and genomic or population databases The two previous incarnations of this book the Atlas of Human Chromosome Heteromorphism and Human Chromosome Variation Heteromorphism and Polymorphism have been standard reference works in most cytogenetic laboratories used by laboratory directors and

clinicians all around the world While widely used sections from the previous edition on cytogenetic technologies and heteromorphisms are retained intact the present volume adds extensive material on copy number variations polymorphisms detected by microarray analysis fragile sites in disease and cancer and practical views on interpreting emerging technologies including whole exome sequencing This book should be of interest to clinicians technicians and students who are or will be exposed to DNA and or chromosome analysis and the data derived from these continuously developing techniques This fully updated book volume will bring the reader up to speed on the latest technologies their applications benefits and drawbacks and as such is a must read for anyone with an interest in DNA and chromosome analysis and the distinction between benign variation and pathogenic mistakes

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