Thomas Liehr
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Uniparental Disomy (UPD) in Clinical Genetics

A Guide for Clinicians and Patients



R.J.M McKinlay Gardner, Grant R Sutherland, Lisa G. Shaffer

Uniparental Disomy (UPD) in Clinical Genetics Thomas Liehr, 2014-06-26 This book focus on genetic diagnostics for Uniparental Disomy UPD a chromosomal disorder defined by the exceptional presence of a chromosome pair derived from only one parent which leads to a group of rare diseases in humans First the molecular and cytogenetic background of UPD is described in detail subsequently all available information of the various chromosomal origins and the latest findings on genotype phenotype correlations and clinical consequences are discussed Numerous personal reports from families with a child suffering from a UPD induced syndrome serve to complement the scientific and clinical aspects Their experiences with genetic counseling and living with a family member affected by this chromosomal aberration present a vivid picture of what UPD means for its victims Cytogenetics and Molecular Cytogenetics Thomas Liehr, 2022-12-07 Genomic technologies provide the means of diagnosis and management of many human diseases Without insights from cytogenetics correct interpretation of modern high throughput results is difficult if not impossible This book summarizes applications of cytogenetics and molecular cytogenetics for students clinicians and researchers in genetics genomics and diagnostics The book combines the state of the art knowledge and practical expertise from leading researchers and clinicians and provides a comprehensive overview of current medical and research applications of many of these technologies KEY FEATURES Provides clear summaries of fluorescence in situ hybridization technologies and others Comprehensively covers established and emerging methods Chapters from an international team of leading researchers Useful for students researchers and Cytogenomics Thomas Liehr, 2021-05-25 Cytogenomics demonstrates that chromosomes are crucial in clinicians understanding the human genome and that new high throughput approaches are central to advancing cytogenetics in the 21st century After an introduction to molecular cytogenetics being the basic of all cytogenomic research this book highlights the strengths and newfound advantages of cytogenomic research methods and technologies enabling researchers to jump start their own projects and more effectively gather and interpret chromosomal data Methods discussed include banding and molecular cytogenetics molecular combing molecular karyotyping next generation sequencing epigenetic study approaches optical mapping karyomapping and CRISPR cas9 applications for cytogenomics The book s second half demonstrates recent applications of cytogenomic techniques such as characterizing 3D chromosome structure across different tissue types and insights into multilayer organization of chromosomes role of repetitive elements and noncoding RNAs in human genome studies in topologically associated domains interchromosomal interactions and chromoanagenesis This book is an important reference source for researchers students basic and translational scientists and clinicians in the areas of human genetics genomics reproductive medicine gynecology obstetrics internal medicine oncology bioinformatics medical genetics and prenatal testing as well as genetic counselors clinical laboratory geneticists bioethicists and fertility specialists Offers applied approaches empowering a new generation of cytogenomic research using a balanced combination of classical and advanced

technologies Provides a framework for interpreting chromosome structure and how this affects the functioning of the genome in health and disease Features chapter contributions from international leaders in the field **Principles and Practice of** Assisted Reproductive Technology Kamini A Rao, Vyshnavi A Rao, Devi R, 2023-01-18 VOLUME 1 INFERTILITY SECTION 1 ANATOMY AND PHYSIOLOGY 1 Anatomy of the Reproductive System 2 Regulation and Physiology of Menstrual Cycle 3 Oogenesis and Folliculogenesis 4 Spermatogenesis 5 Fertilization and Embryogenesis 6 Implantation 7 Embryo Endometrial Crosstalk and Endometrial Receptivity SECTION 2 REPRODUCTIVE ENDOCRINOLOGY 8 Synthesis and Metabolism of Steroid Hormones 9 Puberty and Aberrations 10 Amenorrhea 11 Endocrine Disorders Affecting Reproduction 12 Hirsutism 13 Luteal Phase Defect 14 Anovulation 15 Declining Fertility SECTION 3 COMBINED TOPICS 16 Evaluation of Infertility 17 Immunology and Infertility 18 Cytogenetics and Subfertility 19 Obesity and Infertility 20 Unexplained Infertility 21 Fertility Preservation 22 Counseling in Infertility 23 Assisted Reproductive Technology in Patients with Chronic Medical Disorders SECTION 4 MALE INFERTILITY 24 Etiopathogenesis of Male Infertility 25 Clinical and Endocrinological Evaluation of Infertile Male 26 Sexual Dysfunction in Male Infertility 27 Ultrasound in Male Infertility 28 Medical Management of Male Infertility 29 Azoospermia Evaluation and Management 30 Varicocele and Infertility 31 Spinal Cord Injuries and Male Infertility 32 Algorithms for Genetic Evaluation of Infertile Males SECTION 5 FEMALE FACTOR INFERTILITY 33 Uterine Factors in Infertility 34 Tubal Factors in Infertility 35 Infections and Infertility 36 Tuberculosis and Infertility 37 Sonoendocrinology and Cycle Monitoring Assisted Reproduction Technology 38 Transvaginal Ultrasound and Doppler in Infertility 39 Polycystic Ovary Syndrome 40 Assessment of Ovarian Reserve 41 Endometriosis 42 Endoscopy in Infertility 43 Reconstructive Surgeries Enhancing Fertility SECTION 6 INTRAUTERINE INSEMINATION 44 Intrauterine Insemination 45 Optimizing Success in Intrauterine Insemination SECTION 7 OVARIAN STIMULATION 46 Drugs for Ovarian Stimulation 47 Ovulation Induction and Ovarian Stimulation Protocols 48 Role of Adjuvants in Ovarian Stimulation 49 Gonadotropinreleasing Hormone Analogs 50 Monitoring of Ovarian Stimulation 51 Ovulation Trigger 52 Individualized Controlled Ovarian Stimulation 53 In Vitro Fertilization Lite 54 Role of Luteinizing Hormone in Ovarian Stimulation 55 Anesthesia in Assisted Reproductive Techniques 56 Oocyte Retrieval 57 Embryo Transfer 58 Troubleshooting in Assisted Reproductive Technology 59 Luteal Phase Support SECTION 8 DILEMMA IN ART 60 Poor Responder 61 Recurrent Implantation Failure 62 Empty Follicle Syndrome 63 Role of Aneuploidy Screening in Preimplantation Embryos 64 Preimplantation Genetic Testing of Embryos 65 Epigenetics and Assisted Reproductive Technology SECTION 9 COMPLICATIONS IN ART 66 Ovarian Hyperstimulation Syndrome 67 Ectopic Pregnancy 68 Multipleorder Births SECTION 10 THIRD PARTY REPRODUCTION 69 Oocyte and Sperm Donation 70 Surrogacy in Assisted Reproductive Technology 71 Assisted Reproductive Technology Guidelines 72 Adoption 73 LGBTQ and Fertility 74 Transgender Population and Fertility SECTION 11 OUTCOME FOLLOWING ASSISTED REPRODUCTIVE TECHNIQUE 75 Maternal and Fetal Outcomes Following Assisted Reproductive

Technique 76 Early Pregnancy Scan 77 Recurrent Pregnancy Loss From Diagnostic Dilemmas to Clinical Decisions SECTION 12 RECENT ADVANCES 78 Bioengineered Human Endometrium In Vitro 79 Recent Trends in A Human Ring Chromosomes Peining Li, Thomas Liehr, 2024-03-19 This book presents chromosome wise clinical cases following an evidence based protocol in addition to providing the scientific background on the mechanisms of human ring chromosome RC formation Presence of RCs in a genome can lead to several rare genetic diseases This book edited by the leading experts Prof Peining Li and Prof Thomas Liehr is the first comprehensive book on this topic Over the past 60 years banding cytogenetics fluorescence in situ hybridization chromosome microarray analysis and whole genome sequencing have been used to diagnose cases with a RC Ring syndrome of sever growth retardation and variable intellectual disability has been considered a common clinical feature for all RCs Clinical heterogeneity of chromosome specific deletion and duplication syndromes gene related organ and tissue defects cancer predisposition to different types of tumors and reproduction failure has been reported in the literature However the cases of RCs reported in the literature account for less than 1% of its real occurrence Current diagnostic practice lacks laboratory standards for analyzing cellular behavior and genomic imbalances of RCs to evaluate its compound effects on patients The under representation of clinical cases and the lack of comprehensive diagnostic analysis make challenging to establish accurate clinico cytogenomic correlations Given recent advances in genomic technology and organized efforts from peer experts standardized cytogenomic diagnosis and evidence based clinical management could be envisioned for all patients with RCs Furthermore supernumerary small ring chromosomes and the patient's perspective are addressed the latter by including family stories of RC carrier relatives Acquired RCs in various cancers are also discussed as well as the potential role of RCs in research applications like iPSC cellular modeling and genomic editing This book is a valuable reference for clinical geneticists personnel in cytogenetics and molecular genetics laboratories genetic counselors and researchers in related fields **Genomics in the Clinic** Antonie D. Kline, Ethylin Wang Jabs, 2023-11-04 Genomics in the Clinic A Practical Guide to Genetic Testing Evaluation and Counseling illustrates the current scope of the practice of genetics for healthcare professionals so they can understand principles applicable to genetic testing and consultation Written by an authoritative well balanced team including experienced clinical geneticists genetic counselors and medical subspecialists this book adopts an accessible easy to follow format Sections are dedicated to basic genetic principles clinical genetic and genomic testing prenatal clinical and cancer genetic diagnosis and counseling and ethical and social implications in genomic medicine Over 100 illustrative cases examine a range of prenatal pediatric and adult genetic conditions and testing putting these concepts and approaches into practice Genomics in the Clinic A Practical Guide to Genetic Testing Evaluation and Counseling is important for primary care providers as patient care evolves in the current genomic influenced world of precision medicine Clearly explains central concepts of genetic testing and genomic medicine for non genetic physicians healthcare providers and trainees Offers clear steps for clinical integration of genetic

concepts genomic technology and interpretation of genetic test results approachable and relevant to clinical practice Descriptive applied case studies illustrate recommended genetic evaluation counseling and management for a range of conditions throughout the lifetime Chromosome Biology as a Key to Understand Disease Mechanisms, Genome Architecture and Evolution Anja Weise, Philipp G. Maass, Ron Hochstenbach, 2021-04-16 This topic has been realized and is in collaboration with Dr Constanze Pentzold Post Doctoral Researcher at the Institute of Human Genetics University Hospital Unravelling the Basis of Non-Invasive Prenatal Screening Results Luigia De Falco, Antonio Novelli, Elisabetta Genomic Imprinting and Uniparental Disomy in Medicine Eric Engel, Stylianos E. Pelo, Joe Oi, 2023-08-07 Antonarakis, 2004-03-24 Eric Engel and Stylianos Antonarakis have written the most authoritative and vital reference on molecular and clinical aspects of uniparental disomy UPD and genomic imprinting to date Genomic Imprinting and Uniparental Disomy in Medicine features comprehensive overviews of a multitude of genetic disorders linked to UPD with a strong emphasis on clinical consequences This book will provide readers with the tools necessary to identify and treat diseases associated with nontraditional chromosomal inheritance Genomic Imprinting and Uniparental Disomy in Medicine features handy tables summarizing clinical phenotypes and chromosomal involvement in UPD as well as clear illustrations on imprinting mechanisms and diagnostic testing This authoritative completely up to date practical reference will be useful for any clinical geneticist genetic counselor physician or researcher encountering patients with such disorders or studying complex disease mechanisms Gardner and Sutherlandas Chromosome Abnormalities and Genetic Counseling David J. Amor, Lorenzo and Pamela Galli Chair David J. Amor, R. J. McKinlay Gardner, 2025-11-14 Chromosome Abnormalities and Genetic Counseling 6th Edition is the genetics professional s definitive guide to navigating chromosome disorders and clinical questions posed by the families they impact Thoroughly updated and building on the beloved five previous editions the book includes three entirely new chapters on copy number variants chromosomal phenotypes and ethical and counseling Gardner and Sutherland's Chromosome Abnormalities and Genetic Counseling R.J. McKinlay issues Gardner, David Amor, 2018-02-06 Chromosome Abnormalities and Genetic Counseling is the genetics professional s definitive guide to navigating both chromosome disorders and the clinical questions of the families they impact Combining a primer on these disorders with the most current approach to their best clinical approaches this classic text is more than just a reference it is a guide to how to think about these disorders even as our technical understanding of them continues to evolve Completely updated and still infused with the warmth and voice that have made it essential reading for professionals across medical genetics this edition of Chromosome Abnormalities and Genetic Counseling represents a leap forward in clinical understanding and communication It is as ever essential reading for the field Chromosome Abnormalities and Genetic Counseling R.J.M McKinlay Gardner, Grant R Sutherland, Lisa G. Shaffer, 2011-11-11 Chromosome abnormalities have been known for over 50 years though the methods of analysis have become increasing more sophisticated and precise Surprisingly

the questions that parents and families raise in genetic counseling have changed little over that period Questions like Why did an abnormality happen Why did it cause the problems we see in our child Would it happen again in a future child How could we avoid it happening again are common concerns for families This new edition of Chromosome Abnormalities and Genetic Counseling deals with these universal questions and in the context of the recent developments in molecular cytogenetic analysis but retaining always the major focus on the needs of the families in which these conditions occur Thoroughly updated once again this richly illustrated text combines basic concepts of chromosomal analysis with practical applications of recent advances in molecular cytogentics. The book will give counselors the information that will enable them to help concerned parents accommodate and adapt to their particular chromosomal challenges and to determine what may be for them the best course of action Genetic Disorders and the Fetus Aubrey Milunsky, Jeff M. Milunsky, 2021-07-06 Explore the latest edition of the definitive resource on prenatal genetic diagnosis In the newly revised eighth edition of Genetic Disorders and the Fetus authors and acclaimed medical doctors Aubrey and Jeff Milunsky deliver a thorough and comprehensive reference perfect for academicians students in post graduate specialization courses and working medical professionals This book incorporates the knowledge wisdom perspectives and recommendations from a renowned team of contributing authors drawing upon their extensive experience in prenatal genetic diagnosis to present the definitive reference work used routinely around the world In addition to fundamental information on established prenatal diagnosis and exhaustively referenced coverage of new techniques you ll find new chapters on preconception genetic counselling preimplantation genetic diagnosis advances in fetal imaging and gene therapy Genetic Disorders and the Fetus is authored by a global team of internationally recognized contributors all of whom are leading voices in the field The eighth edition also contains A thorough discussion of the public policy and ethics of embryo editing including mitochondrial replacement treatment and gene patents prenatal diagnosis and polygenic disease risk prediction An exploration of preimplantation genetic diagnosis pharmacogenetics and prenatal diagnosis and whole genome sequencing A treatment of genetic disorders and pharmacologic therapy including spinal muscular atrophy and fragile X syndrome A discussion of legal issues including the fetus as plaintiff and the increasing liability of physicians due to advances in genetics Perfect for obstetricians clinical geneticists molecular and biochemical geneticists and pediatricians Genetic Disorders and the Fetus will also earn a place in the libraries of neonatologists genetics counsellors ethicists radiologists and professionals working in public policy and health departments Small Supernumerary Marker Chromosomes (sSMC) Thomas Liehr, 2011-11-03 Human beings normally have a total of 46 chromosomes with each chromosome present twice apart from the X and Y chromosomes in males Some three million people worldwide however have 47 chromosomes they have a small supernumerary marker chromosome sSMC in addition to the 46 normal ones This sSMC can originate from any one of the 24 human chromosomes and can have different shapes Approximately one third of sSMC carriers show clinical symptoms while the remaining two thirds manifest

no phenotypic effects This guide represents the first book ever published on this topic It presents the latest research results on sSMC and current knowledge about the genotype phenotype correlation. The focus is on genetic diagnostics as well as on prenatal and fertility related genetic counseling A unique feature is that research meets practice numerous patient reports complement the clinical aspects and depict the experiences of families living with a family member with an sSMC Practical Guide to the Genetic Family History Robin L. Bennett, 2004-03-24 The Practical Guide to The Genetic Family History Robin L Bennett Compiling the most recent genetic developments in medical specialties The Practical Guide to the Genetic Family History is a valuable resource which outlines the proper methods for taking and recording a patient s family medical history allowing primary care physicians to be more efficient in diagnosing conditions with potential genetic components With genetic screening forms an overview of directed questions pedigree nomenclature and outlining common approaches used genetic counselor Robin L Bennett provides readers with the basic foundation in human genetics necessary to recognize inherited disorders and familial disease susceptibility in patients As the only guide which is geared for the physician in this field The Practical Guide to the Genetic Family History includes remarks by renowned medical geneticist Arno Motulsky as well as information on structuring an accurate pedigree and its components including Using a pedigree to identify individuals with an increased susceptibility to cancer Family history adoption and their challenges The connection between the pedigree and assisted reproductive technologies Making referrals for genetic services Neurological and neuromuscular conditions Tables covering hearing loss mental retardation dementia and seizures Five case studies of genetics in practice An essential reference for genetics clinics medical geneticists and counselors The Practical Guide to the Genetic Family History is also an invaluable aid for both primary care and specialist physicians who need an up to date reference that emphasizes both the science and art of modern clinical genetics Chromosome Abnormalities and Genetic Counseling R. J. McKinlay Gardner, Grant R. Sutherland, 2003-08-28 Chromosomal abnormalities can cause disability in children and reproductive difficulty in parents Many parents and couples seek genetic counseling in order to learn why they or a relative may have had a child with a particular collection of medical problems and or intellectual disability There may have been a history of multiple miscarriage or infertility They may want to know the outlook for a pregnancy and what the risks might be These and other questions concerning chromosome abnormalities are addressed in this standard text which will be of interest to genetic counselors medical geneticists pediatricians and obstetricians infertility specialists and laboratory cytogeneticists This third edition has been thorougly updated and is richly illustrated and fully referenced New chapters have been written on preimplantation diagnosis and on reproductive risks due to environmental agents The practical applications of recent advances in molecular cytogentics are noted The book will give counselors the information that will enable them to help concerned parents accommodate to their particular chromosomal situation and to determine what may be for them the best Clinical Genetics Ann M. Willey, Thomas P. Carter, Sally Kelly, 2014-04-24 Clinical Genetics Problems in course of action

Diagnosis and Counseling presents the proceedings of the Twelfth Annual New York State Health Department Birth Defects Symposium The book provides practical information applicable to counseling situations for selected diagnoses and a summary of the limitations of diagnosis and counseling for genetic disorders. The text contains chapters devoted to the description of restriction enzyme site detection and prenatal diagnosis of hemoglobinopathy counseling for mental retardation of unknown etiology for idiopathic dysmorphic syndromes and for psychiatric disorders interpretation of prenatal cytogenetic diagnosis preconceptual vitamin supplementation and cystic fibrosis Geneticists clinicians and physicians will find the book insightful The Bedside Dysmorphologist William Reardon, 2007-09-28 A highly illustrated field guide to dysmorphology a key area of clinical genetics and a vital competency for all clinicians Oxford Genetics is a comprehensive cross searchable collection of resources offering quick and easy access to Oxford University Press s prestigious genetics texts Joining Oxford Medicine Online these resources offer students specialists and clinical researchers the best quality content in an easy to access format Online only benefits include downloading images and figures to PowerPoint and downloading chapters to PDF The Practical Guide to the Genetic Family History, 2004 This book is a concise and accessible resource on how to take and record a patient s family medical history to determine if the patient s affliction has a genetic component In an era of managed care physicians must be selective about which patients are truly in need of specialty medical services such as genetic testing and counseling This book will enable the health care professional to intelligently refer patients for genetic testing and counseling Gardner and Sutherland's Chromosome Abnormalities and Genetic Counseling R. J. M. Gardner, David J. Amor, 2018 This work is the genetics professional s definitive guide to navigating both chromosome disorders and the clinical questions of the families they impact Combining a primer on these disorders with the most current approach to their best clinical approaches this classic text is more than just a reference it is a guide to how to think about these disorders even as our technical understanding of them continues to evolve Completely updated and still infused with the warmth and voice that have made it essential reading for professionals across medical genetics this edition represents a leap forward in clinical understanding and communication

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