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## Molecular Genetic Pathology

Editors: Liang Cheng, Indiana University School of Medicine, Indianapolis, Indiana, and David Zhang,

Mount Sinai Medical Center, New York, New York

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Peter Hu

Author Affiliations

Address correspondence to Peter C. Hu, Ph.D., Molecular Genetic Technology Program, Unit 146, The University of Texas M. D. Anderson Cancer Center, 1515 Holcombe Blvd., Houston, TX 77030, USA; tel 713 563 3095; e-mail: [pchu@mdanderson.org](mailto:pchu@mdanderson.org).

Molecular genetic pathology is a rapidly advancing field that combines pathology with medical genetics and offers molecular-based testing in the clinical setting. This new subspecialty field uses molecular biology and genetics to establish or confirm clinical diagnoses of malignancies, forensics, infectious diseases, and inherited genetic disorders. The information obtained is used by primary care physicians for diagnosis, prognosis, treatment, and, with the rapid advancement of this technology, early detection and prevention. Ever since Karri Mullis's polymerase chain reaction (PCR) transitioned into an automated platform, PCR technologies and their applications have rapidly expanded into not only the research realm but also the clinical realm of anatomic and clinical pathology.

To address the needs of this new field, at the Assembly of American Board of Medical Specialties meeting in 1999, a joint application from the American Board of Pathology and the American Board of Medical Genetics was approved for subspecialty certification in molecular genetic pathology. Institutions that offer this fellowship training program are accredited by the Accreditation Council for Graduation Medical Education.

**Molecular Genetic Pathology**, a new textbook edited by Liang Cheng and David Zhang, is divided into two major sections: Section I gives an overview of general molecular genetics as it relates to pathology and technology. The chapter topics include the principles of clinical molecular biology, clinical cytogenetics, tissue microarrays, laser capture microdissection, flow cytometry, fluorescence in situ hybridization, proteomics, and clinical pharmacogenomics. There are also supportive chapters that bring this section together, including diagnostic methodology and technology, conceptual evolution in cancer biology, clinical genomics in oncology, clonality analysis in oncology, instrumentation, genetic inheritance, population genetics, and genetic counseling.

Section II focuses on the disease-based aspects of molecular testing in relation to four main areas: oncology, infectious diseases, inherited diseases, and forensics. The chapter topics include prenatal diagnosis; familial cancer syndromes; molecular testing for solid tumors; molecular pathology of the nervous system; molecular virology, bacteriology, and mycology; molecular testing for coagulopathies and hemoglobinopathies; molecular diagnostics of lymphoid malignancies; myeloid leukemias; the HLA system; transfusion; and molecular forensic pathology. The book ends with a look at ethical and legal implications of molecular genetic testing, including a chapter on quality assurance and quality control as they relate to laboratory inspections to ensure that various levels of proficiencies and competencies are properly addressed.

This book provides a comprehensive review of the various molecular genetic tests that are currently being conducted at research and clinical laboratories. The textbook is robust and would be useful in an advanced genetics course as part of a clinical-based diagnostic molecular science undergraduate program, human genetics-based graduate program, genetics postdoctoral training program, or molecular genetic

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pathology post-M.D. fellowship training program. In addition, some chapters in this book could be incorporated into advanced cytogenetic courses or upper-level molecular biology courses.

In summary, **Molecular Genetic Pathology** is a comprehensive textbook that covers the various theories and methodologies of molecular genetic testing and delineates the various ways that such testing is being conducted and applied in the clinical arena.

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The Indiana University School of Medicine has nine campuses throughout Indiana; the principal research and medical center is located on the Indiana University – Purdue University Indianapolis campus in Indianapolis. With 1,409 M.D. Program students and 158 Ph.D. students in 2017, IU is one of the largest allopathic medical schools in the United States. The school offers several joint-degree programs, including an MD/MBA, MD/MA, MD/MPH, and an MD-PhD Medical Scientist Training Program. The genetic correlation between the traits was low, thereby implying different aetiologies. Melvin and Bren Simon Cancer Center, Indiana University, Indianapolis, IN, USA. Jiali Han & Xin Li. Institute of Biological Psychiatry, Mental Health Services of Copenhagen, Copenhagen, Denmark. Wellcome Centre for Human Genetics, Nuffield Department of Medicine, University of Oxford, Oxford, UK. Mark I. McCarthy & Cecilia M. Lindgren. Oxford Centre for Diabetes, Endocrinology and Metabolism, University of Oxford, Oxford, UK. Mark I. McCarthy. Oxford NIHR Biomedical Research Centre, Oxford University Hospitals Trust, Oxford, UK. Mark I. McCarthy. Department of Internal Medicine, Erasmus MC, University Medical Center, Rotterdam, The Netherlands. Department of Pathology and Laboratory Medicine. Liang Cheng. Liang Cheng. Indiana University School of Medicine | IUSOM · Department of Pathology and Laboratory Medicine. 53.77. Contact. Both genetic and environmental factors contribute to the development of testicular cancer, for which cryptorchidism is the most common risk factor. Progress has been made in our unders View.