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MOLECULAR GENETIC PATHOLOGY FELLOWSHIP

PATHOLOGY AND LABORATORY MEDICINE AT PENN MEDICINE

While molecular pathology is fast becoming an essential diagnostic and prognostic instrument in the routine practice of medicine, the subspecialty has already been an integral part of the Penn Department of Pathology and Laboratory Medicine since 1985, when the Molecular Pathology Laboratory was founded as one of the first of its kind at a university hospital in the country. Likewise, Penn was among the first Molecular Pathology training programs in the country in the early 1990s and was one of the first two programs to obtain ACGME accreditation in 2002 after molecular genetic pathology (MGP) became a recognized subspecialty. The Penn MGP program is based primarily in the Penn Molecular Pathology Lab which offers services in oncology, infectious diseases, identity testing and inherited disorders as well as other diagnostic services and employs a range of techniques and assays. Numerous diagnostic, prognostic, and predictive applications make molecular pathology one of the cornerstones of personalized medicine spanning across the fields of both anatomic and clinical pathology. The Molecular Pathology Lab together with the Cancer Cytogenetics Lab and the newly formed Penn Center for Personalized Diagnostics are at the forefront of molecular diagnostic testing and development.

THE PENN MOLECULAR PATHOLOGY LABORATORY

Penn's Molecular Pathology operation is a full-service, CAP-accredited and CLIA-certified molecular diagnostic laboratory staffed with highly trained professional medical technologists. Faculty members collectively have more than 40 years practicing and teaching experience in Molecular Pathology and most are Board-Certified in Molecular Genetic Pathology. The laboratory uses a spectrum of molecular techniques and platforms to evaluate nucleic acids isolated from patient samples, including real-time polymerase chain reaction, capillary electrophoresis, pyrosequencing and liquid bead arrays. Notable areas of expertise include identity testing, molecular virology, Bayesian analysis for inherited disorders, and molecular profiling of common liquid and solid tumors. Traditional karyotyping as well as a wide range of fluorescent in-situ hybridization (FISH) assays and SNP arrays are performed in the Department's Cancer Cytogenetics Lab. The Penn Center for Personalized diagnostics is a new CLIA-certified laboratory that will provide clinical next-generation sequencing services.

PROGRAM OVERVIEW

The goal of the Penn MGP program is to train fellows in the practice of molecular pathology and genomics, the application and interpretation of molecular laboratory techniques, and diagnostic laboratory administration. Over the course of the one-year ACGME accredited fellowship the fellow gains experience in the application of molecular pathology through service work, didactic lectures, resident teaching, involvement in laboratory administration, and by hands-on test development and/or research projects. Fellows trained as pathologists are exposed to clinical genetic counseling through rotations in pediatric and adult clinical genetics and biochemical genetics, while those trained as geneticists without a background in pathology are assigned to rotations in surgical and autopsy pathology. Time is also spent in the Cancer Cytogenetics, Prenatal Cytogenetics and HLA Typing Laboratories. Additional electives are available. At the completion of the fellowship the trainee will be eligible to take the Molecular Genetic Pathology Board examination.

ELEMENTS OF PROGRAM

Molecular Pathology Service: The fellow assumes significant and increasing clinical and laboratory responsibility in a state of the art molecular pathology laboratory that performs a broad range of molecular testing in the areas of inherited disorders, hematologic and solid tumor molecular oncology, infectious diseases, and identity testing. Service entails the involvement of the fellow and one or two Pathology residents in all aspects of molecular testing in order to provide optimal patient care. Fellows assist in the training of the residents during the first four weeks of each three-month block, with the residents gradually taking on greater responsibility for the service work. Requests for molecular testing are assessed on a daily basis to ensure the appropriateness of the requested test in the context of the clinical scenario. Test results are reviewed in preparation for reporting by the faculty and communication of critical results to health care providers. Daily afternoon case review sessions are an excellent opportunity for teaching and learning about the application of molecular technologies and the role of molecular diagnosis in clinical decision-making. Over the course of the fellowship, trainees will be directly exposed to hundreds of cases in a wide variety of diseases and clinical situations.

Molecular Anatomic Pathology: Molecular Anatomic Pathology, an innovative clinical service at Penn Medicine, plays a critical role in the molecular evaluation of solid tumors. The principal function of the Molecular Anatomic Pathology service is identifying and processing suitable paraffin-embedded tissue for molecular and cytogenetic analysis. The molecular anatomic pathology service is staffed with anatomic pathologists who have expertise and knowledge related to molecular testing of paraffin-embedded tissue. As important collaborators with the Molecular Pathology Laboratory, the Molecular Anatomic Pathology service provides valuable input not only in the interpretation of patient data, but also in the development and maintenance of molecular and cytogenetic assays. Through close interactions with this service, the fellow will gain practical firsthand experience in the application of molecular diagnostics in solid tumors. During the year, opportunities to participate in the daily signout of the molecular anatomic pathology service will be available to interested individuals.

Genomics: Exposure to clinical genomics and bioinformatics will be obtained through clinical interactions and/or rotations in the Cancer Cytogenetics lab and the Penn Center for Personalized Diagnostics, both a part of the Department of Pathology and Laboratory Medicine.

Electives: Elective rotations are available in laboratories specializing in virology, cytogenetics, cytogenomics, and inherited disorder diagnostics.

Teaching and Conferences: A comprehensive didactic series encompassing approximately 30 lectures and discussion session is given by the faculty and staff for the fellow and residents. The fellow will have ample opportunities to enhance presentation skills through participation in several inter departmental case conferences.

Clinical genetics: Fellows participate in the diagnosis, management, and treatment of patients with genetic disorders and in the counseling of the patient and family during a one-month rotation in the Division of Medical Genetics. A one-month rotation at the award winning Children's Hospital of Philadelphia provides the opportunity to observe and participate in the counseling and care of pediatric genetics patients in areas including general genetics, dysmorphology, metabolic and biochemical genetics.

Laboratory administration: The fellow will have ample opportunities to be involved in the administration of the laboratory as a member of the management team. Activities may include troubleshooting of assays, resolution of laboratory problems, proficiency testing, CAP inspection preparation, and new test development.

Test development: The fellows will assist in the development of a diagnostic molecular test as an ongoing activity throughout the year. This experience will provide training in all aspects of assay validation, from its inception through technical validation, cost analysis, preparation of report templates, and training of technologists. While faculty guidance and monitoring of progress is provided, the fellow is given primary responsibility for implementation of the test.

PROGRAM FACULTY

Vivianna Van Deerlin, MD, PhD
(Director of Molecular Pathology Lab and MGP Fellowship)

Warren Pear, MD, PhD

Christopher Watt, MD, PhD
(Associate Director of Molecular Pathology Lab)

Robert B. Wilson, MD, PhD

Antonia Sepulveda, MD, PhD

APPLICATION INFORMATION

Eligibility: One MGP fellowship position is available each year. Candidates must be Board-eligible in either AP and/or CP or Medical Genetics and have passed the USMLE Part 3 exam prior to the start of the program. They must also be licensed or eligible for licensure in Pennsylvania. Prior experience in genetics and/or molecular biology is recommended.

Applications: Each academic year begins on the first of July. Application forms can be obtained by calling (215) 662-6550 or may be downloaded from the laboratory website (http://pathology.uphs.upenn.edu/ClinicalServices/ClinicalPathology/cs_clinpath_molec.aspx) Applications must be submitted and all references received by December 31st, 18 months prior to the start of the program. The position will be offered by March 1 of the year preceding the program start date. This is subject to change if a Match program for MGP is instituted. Candidates considered for the program will be asked to interview with the program director and selected faculty and staff.