



TEHRAN UNIVERSITY OF MEDICAL SCIENCES

In The Name of God

Tehran University of Medical Sciences

Fellowship Programs: Molecular Pathology and Cytogenetic

The Department of Pathology and Laboratory Medicine of TUMS offers 18-month accredited fellowship in Molecular Pathology and Cytogenetic that provides training in all aspects of molecular diagnostics, including DNA and RNA analysis in cancers, genetic disorders and, infectious disease. The fellow will learn diagnostic skills during exposure to cases in Central Children Hospital and Dr. Shariati Hospital as one of the largest pediatric and general centers in TUMS respectively.

The fellow interacts with Pathology and Laboratory Medicine residents, as well as fellows, and faculty in two above hospital. The fellow participates in teaching, conferences, and genetics consult clinics. Fellows are encouraged to develop scholarly or research activities.

The overall goal of the program is to specifically train fellows in the practice of diagnostic molecular pathology and cytogenetic, the use and interpretation of molecular laboratory techniques, and in the independent administration and directing of a molecular and cytogenetic laboratory.

The fellowship program is structured to include didactic, clinical, and laboratory experiences in the following areas:

1- Basics, indications, and techniques in conventional cytogenetics, molecular genetics and cytogenetics in congenital diseases and Prenatal diagnosis, cytogenetics, including prenatal, cancer, and solid and hematopoietic FISH/ISH, and hybridization-based analyses	4 months
2- Genetic counseling	3 months
3- Basics, indications and techniques of molecular and cytogenetic tests for prevention and diagnosis and monitoring of hematologic disorders (coagulation , leukemia, hemoglobinopathies, etc.) and solid organ tumors	3 months
4- Basics, indications and techniques, molecular tests for diagnosis of infectious diseases (bacteriology, parasitology, virology)	2 months
5- Advanced Molecular tests for diagnosis of rheumatologic and Immunologic diseases (HLA typing, special tests for autoimmune and immune deficiency diseases)	1 month
6-Advanced molecular tests for prevention and diagnosis of metabolic and neurologic diseases (congenital hormone /enzyme deficiencies, diabetes, etc.)	1 month
7- Laboratory administration, quality control and quality improvement projects, new assay development, validation and implementation, personnel management, regulatory and fiscal issues	1 month
8- Pharmacogenetics and personalized medicine	1 month
9- Rotation (in forensic medicine, transplant, etc.) Throughout each of the laboratory and clinical rotations, the fellow is expected to accomplish rotation-specific goals, including acquisition of pertinent technical and clinical knowledge, provision of professional patient care, and active contribution to the specific field of molecular diagnostics through clinical service provision, correspondence with clinical and laboratory colleagues, and related scholarly activities.	2 months

- Other scholarly and didactic activities
 - Research project(s)
 - Didactic seminar experiences

References for further reading

- 1- Human molecular genetics (Tom Strachan 2011)
- 2- Henry Clinical Diagnosis and management(2011)
- 3- Molecular Genetic Pathology by Liang Cheng and David Y Zhang Humana Press 2008
- 4- Cell and Tissue based Molecular Pathology by Raymond Tubbs Churchill Livingstone 2009
- 5- Basic and Principals of medical genetics (Emery & rimons)
- 6- Molecular Genetic Testing in Surgical Pathology by Jhon Pfeifer 2006.
- 7- Gene cloning and D.N.A. analysis (T.A. Brown) 6th edition
- 8- Genome 3 (T.A. Brown)
- 9- Gene X (benjamin lewin)
- 10- The AGT Cytogenetic Laboratory Manual by Margaret J Barch 1996.
- 11- Diagnostic Cytogenetics by Rolf Dieter Wegner Springer 2003.
- 12- Cancer Cytogenetics by Sverre Heim Wiley – Blackwell 2009.