

In the Name of God

**Islamic Republic of Iran**  
**Ministry of Health and Medical Education**  
**Deputy for Education**

**Molecular pathology and cytogenetics**

**Degree: Fellowship**

**Introduction:**

Genes and proteins are now recognized as the cause of many diseases, and diagnosis based on RNA, DNA, and proteins of the pathogens are more accurate. Having access to different types of nucleic acids, such as DNA, RNA, and micro RNA, whether in fresh samples, such as blood, serum, and tissue biopsy or in paraffin-fixed tissues has made human or microorganisms genome recognition possible. These molecular methods help diagnose many diseases in different clinical laboratories. Given the extension and variety of diagnostic procedures and the rapid emergence of new techniques for a wide range of human diseases, it is necessary that the specialists in charge of paraclinical laboratory diagnosis become familiar with the latest diagnostic techniques in this field. We hope that the diagnosis and treatment of diseases become possible in different academic centers through the development and improvement of this curriculum and the need to send samples abroad be alleviated by training experts in this field.

**Definition and Duration of the Training Program:**

Molecular Pathology and Cytogenetics is a fellowship Program on the Basis of Pathology and Genetics in Molecular and Chromosomal Disease Diagnosis. The Specialists can recognize Chromosomal and Genetic disorders through laboratory tests on different specimens like Blood, Bone marrow, placental cell, sperm and invitro cultured cells and also PGD (Pregestational Diagnosis).

Duration of this course is 18 months.

## AIMS:

1-To train Physicians who are knowledgeable, competent, responsible, and sensitive to the health of individuals and society in this specialized field and provide the society with medical diagnostic services in accordance with the curriculum and their expertise in the areas of prevention, diagnosis, education, and research.

2-In the next 10 years, we will be among the top countries in terms of educational standards, research production, and providing people with medical diagnostic services in this field .

## General Competencies\*

### Specific Competencies and Skills (diagnostic-therapeutic procedures)

Procedure
Sampling , preparation of different samples (tissues, blood, fluids, etc.) for molecular pathology and cytogenetics
Autopsy and genetic study of aborted fetuses
PCR (different types)
Cytogenetics
Different types of CGH array
Molecular cytogenetic, FISH, CISH
Blotting techniques
Sequencing

## Educational Strategies, Methods and Techniques\*

### Student Assessment:

#### I. Assessment Methods:

MCQ, oral, computer interaction test, OSCE, DOPS, logbook assessment, 360-degree feedback, paper-based assessment, portfolio assessment

#### II. Periods of Assessment:

At the end of each three-month course

. At the end of the fellowship course, each student is obliged to design a diagnostic test related to the subspecialized diseases in his educational setting.

The student should publish an article in one of the Iranian scientific-research journals as the first author

### **Ethical Considerations\***


\*Note: The related document(s) can be found at <http://hcmep.behdasht.gov.ir/>.

## Overall Structure of the Course

Educational ward, unit, or setting	Syllabus- Measures	Duration (month)
Consultation clinic	Patient Selection , filing medical records, and hospitalization, - following up, performing outpatient procedures, teaching the lower-level classes, responding to expert consultations requested, and other measures ...	1 day a week during the course
Laboratory	Participating in procedures and experiments by observation, assisting or performing independently according to the curriculum organized by the ward	5 days a week during the course or as a case study in specific laboratories
		Totally 15 months
Hematology-Oncology ward	Familiarity with different types of oncologic patients and diagnostic-therapeutic procedures	1 month
Forensic Medicine department and IVF	Familiarity with laboratory procedures and diagnostic-therapeutic procedures, including paternity and PGD	1 month
Optional ward	pediatric endocrinology clinic, rheumatology and immunology clinic, infectious diseases clinic...	1 month

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