



**UNIVERSITY OF ALBERTA**  
**FACULTY OF MEDICINE & DENTISTRY**  
Department of Laboratory Medicine & Pathology



**ALBERTA PRECISION  
LABORATORIES**  
Leaders in Laboratory Medicine

**CLINICAL FELLOWSHIP PROGRAM IN  
MOLECULAR GENETIC PATHOLOGY**

Department of Pathology and Laboratory Medicine  
University of Alberta, Faculty of Medicine and Dentistry  
and Alberta Precision Laboratories

Contact Information:

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## **OVERVIEW**

Molecular genetic pathology is a subspecialty of pathology, medical genetics, and genomics. Genomic testing is increasingly recognized as an essential part of patient care. Molecular genetic pathologists offer a unique combination of expertise in biochemistry, pathology, technology, and laboratory medicine principles. The fellowship program aims to train pathologists to become future laboratory directors and/or expert consultants to treating clinicians regarding interpreting genomic information related to patient care.

The fellowship is designed to provide comprehensive training in all aspects of molecular genetic pathology, focusing on molecular oncology. A rotation schedule is structured according to the fellows' needs and objectives. The fellows are trained to develop, evaluate, and interpret clinical assays and learn about the day-to-day management issues of running a modern molecular pathology laboratory.

The fellowship encompasses training in the molecular diagnosis of inherited genetic disease, somatic disease (solid and hematolymphoid malignancies), infectious disease, immunogenetics, and bioinformatics. The program provides training in the clinical application of a wide variety of molecular techniques, including DNA and RNA extraction, qualitative and quantitative PCR methods, Sanger sequencing, capillary electrophoresis, fluorescence in situ hybridization and microscopy, Nanostring technology for genomic profiling, and Next Generation Sequencing (NGS). Rotations in clinical cytogenetics, biochemical genetics laboratories, and medical genetics clinics are integrated into the training schedule.

The fellow will be based primarily at the University of Alberta Hospital (UAH) Molecular Pathology Laboratory. The UAH Molecular Pathology Laboratory offers molecular diagnostic services to the clinical oncology practice at the Cross Cancer Institute, the Hematology and Hematopathology Division at the UAH, and UAH Surgical Pathology subspecialties including lung, gastrointestinal, neuropathology, dermatology, and soft tissue pathology. The fellow will participate in clinical consultative and teaching activities within the molecular pathology service, including teaching resident rotators and other learners, primarily supervised by Dr Remegio Maglantay and/or the molecular pathologist(s) on service. A broad array of research opportunities, validation projects, and quality assurance activities are available for the fellow to participate in and complete as a requirement for training.

## **GENERAL PROGRAM OBJECTIVES (CanMEDS)**

### **Medical Expert**

1. Upon completion of the molecular pathology fellowship training, the fellow is expected to demonstrate in-depth knowledge of:
  - a. the basic structure and function of nucleic acids and proteins and their roles in cellular function,
  - b. the types of genetic alterations that occur in various conditions, including (i) Hematologic Neoplasms and (ii) Solid Tumors. (iii) Mendelian/non-Mendelian disorders,
  - c. the different types, performance characteristics, and interpretation of the tests used to detect these alterations, i.e., Multiple PCR-based assays, DNA and RNA sequencing (Next-Generation sequencing), Fluorescence in-situ hybridization (FISH), etc.
2. The fellow is expected to demonstrate an understanding of the various aspects of laboratory management. This includes quality assurance, troubleshooting the above molecular diagnostic tests, and testing and evaluating new assays developed.

### **Communicator**

1. Develop the skill to provide clinical consultative services for pathologists and clinicians in various clinical scenarios applicable to molecular testing.

2. Serve as the primary professional staff contact for laboratory users requiring medical or detailed information and assist residents/learners/rotators in performing this consultative function, including follow-up calls to clinicians for additional information or to arrange additional samples.
3. Follow up on assay progress and report preliminary results to clinicians as requested or by phone when the case is completed.
4. Review final assay results independently and with the laboratory attending. Draft preliminary or final reports for final sign-out in the laboratory information system (LIS).

#### **Collaborator**

1. Assist in the general orientation of rotating and returning residents to the laboratory and its clinical services; this includes initial oversight of resident interactions with other providers and laboratory staff to introduce residents to the consultative functions of a molecular genetic laboratory physician.
2. Present and discuss cases with learners/residents/rotators at weekly consensus conferences.
3. Participate as requested at other intra-divisional or outside conferences (e.g., weekly hematopathology conference, academic half-day molecular lectures, and journal clubs).
4. Participate in laboratory administrative meetings to gain familiarity with laboratory administrative issues.

#### **Leader**

1. Oversee the preliminary review of new cases entering the laboratory to facilitate planning and the appropriate provision of laboratory services to ordering providers and patients.
2. Function as a continuing medical education resource for laboratory technical staff.
3. Understand basic laboratory administration and operation of clinical laboratory services and apply total quality and laboratory management principles.
4. Understand the financial and economic systems within the molecular laboratory, including budgetary considerations and human resources management.

#### **Scholar**

1. Participate in developmental and/or applied clinical research projects of interest to the laboratory (e.g., development or improvement of assays, application of existing or new assays to defined patient populations, and other studies in Molecular Genetic Pathology).
2. Write up results of developmental/clinical research activities for presentations and/or publications, including abstracts or posters for scientific/medical meetings.

#### **Professional**

1. Demonstrate respect and compassion for the patient and ensure patient confidentiality in all stages of clinical testing, including communications with providers and staff.
2. Perform the role of a medical provider with a sensitivity to diverse patient populations.
3. Demonstrate commitment to excellence and ongoing professional development.
4. Perform responsibilities towards patients and interactions with colleagues and staff with the highest ethical and professional standards.

#### **Health Advocate**

1. Develop the understanding and skills to discuss with clinicians and counselors to ensure that molecular testing performed in molecular pathology is used and integrated into patient care in an appropriate and cost-efficient manner.
2. Understand scientific, legal, and ethical issues relating to molecular testing and the impact of maintaining high standards in laboratory medicine on other healthcare professionals, organizations, and society.
3. Practice cost-effective health care and resource allocation that does not compromise the quality of care.

## **PROGRAM CURRICULUM**

The Molecular Genetic Pathology Fellowship program curriculum will include time spent in:

1. Molecular anatomic pathology ~ 3 months
2. Molecular hematopathology ~ 3 months
3. Molecular genetics/HLA ~ 2 months
4. Cytogenetics ~ 1 month
5. Biochemical genetics ~ 2-4 weeks
6. Medical genetics ~ 2 weeks
7. Molecular microbiology/virology ~ 2 weeks
8. Elective/Research ~4-6 weeks

### **Specialty Training Requirements**

Eligible candidates must have completed residency training in Anatomic, General Pathology, or Hematologic Pathology through a recognized program.

### **Duration and Location**

The training duration is 12 months. The fellow will be primarily located in the Molecular Pathology Laboratory at the University of Alberta Hospital, with scheduled rotations in the molecular diagnostic, cytogenetics, and biochemical genetics laboratories.

### **Evaluation**

A pre-test and post-test may be administered at the start and finish of the program. At a minimum, a formal semi-annual and a final written evaluation as specified by the PGME will be provided and discussed with the fellow to ensure that steady progress towards training objectives is met. The molecular pathology fellowship committee will evaluate the successful completion of the fellowship. The fellow is responsible for demonstrating the completion of all fellowship requirements and showing competence in practicing molecular pathology ethically and professionally.

### **Resources**

*Space and Workstation:* A work area, microscope, and computer station will be available for the fellow.

*Funding:* Funding will be provided per Edmonton Zone Department fellowship allocation from the University of Alberta and Alberta Health Services or independently/self-funded, as applicable.

*Salary scale:* PGY 5 level, if applicable.

### **Primary Faculty Responsible for Molecular Genetic Pathology Fellow**

Dr. Remegio Maglantay

### **Faculty Members of the Molecular Pathology Advisory Committee at the UAH Sites**

Dr. Remegio Maglantay  
Dr. Soufiane El Hallani  
Dr. Cheryl Mather

### **Accreditation and Certification**

Upon successful completion, the fellow will be issued a certificate from the Office of Postgraduate Medical Education, Faculty of Medicine, University of Alberta, affirming that 12 months of subspecialty training have been completed.

**How to Apply:**

Please submit the following materials to the program director (email preferred):

- Letter of intent
- Curriculum vitae
- Application form  
<https://www.ualberta.ca/en/laboratory-medicine-and-pathology/media-library/programs/clinical-fellowship-training-application-form.pdf>
- Three letters of reference (please have letters sent directly to the program director from references – email preferred)

Candidates will be offered interviews based on the review of the above documents. Depending on individual circumstances, interviews may be conducted virtually or in person.

**Important Information for Applicants:**

*Medical Practice License:* Applicants must have a valid Certificate of Registration for Postgraduate Education from the College of Physicians and Surgeons of Alberta (CPSA) or a valid CPSA Independent Practice License. The candidate will be required to provide documentation to CPSA, including evidence of English Language Proficiency, references, Certificates of Professional Conduct, and verification of their medical degree through <http://physiciansapply.ca/> if the degree was obtained outside of Canada.

*Malpractice Insurance:* Applicants must have malpractice insurance with the Canadian Medical Protective Association (CMPA). Coverage can be obtained once the CPSA Certificate of Registration is issued. For information, contact the CMPA directly ([www.cmpa-acpm.ca](http://www.cmpa-acpm.ca)).

*Work Permit (visa):* Applicants who are neither Canadian citizens nor Permanent Residents require a work permit. The Faculty of Medicine Postgraduate Medical Education Office provides the necessary document(s) as required by the Canadian government office (Canadian Embassy, Consulate, High Commission, etc.) in the applicant's country of origin. There is a non-refundable visa processing fee at the time of application.