

Job Posting: Postdoctoral Fellow

Translational Epigenetics and Immuno-Oncology in Gynecologic Cancers

- *Location: Lady Davis Institute for Medical Research, Jewish General Hospital, McGill University*
- *Start Date: Fall 2026 (or as mutually agreed upon)*
- *Status: Full-time Postdoctoral Fellowship*
- *Research Supervisor: Dr. Melica N. Brodeur*

Project Overview

We are seeking a highly motivated, independent Postdoctoral Fellow with strong expertise in molecular biology and animal experimentation to lead a cutting-edge translational research project. Ovarian cancer (OC) remains the most lethal gynecologic malignancy, primarily due to the development of chemoresistant disease and a highly immunosuppressive tumor microenvironment (TME) that limits the efficacy of current immune checkpoint blockade (ICB) therapies.

Funded on the basis of innovative preliminary data, this project aims to evaluate a novel combinatorial therapeutic strategy. By combining targeted epi-therapies (inhibitors of the catalytic subunits of the SWI/SNF chromatin remodeling complex, BRG1/BRM, and the DNA methyltransferase), we seek to restore the intrinsic immunogenicity of tumor cells and sensitize epithelial OC to ICB (anti-PD1). The postdoctoral fellow will play a leading role in characterizing inflammatory signaling pathways and conducting pre-clinical in vivo validation of these synergistic combinations.

Research Objectives & Responsibilities

1. In Vitro Characterization of Immunogenicity and Signaling Pathways (Aim 1)

- **Phenotypic Evaluation:** Determine the in vitro effects of combined BRG1/BRM and DNMT inhibition using murine OC cell lines (ID8 and MP), human cell lines (OAW28, OV90) as well as primary tumor cells isolated from freshly collected ascites fluid of consented ovarian cancer patients.
- **Molecular Mapping:** Lead RNA sequencing (RNA-seq) analyses, validate interferon-stimulated gene (ISG) panels using RT-qPCR, and analyze key components of the type I IFN pathway via Western blot and chemokines (e.g., CXCL10, CCL8).
- **Antigen Presentation:** Quantify surface expression of Major Histocompatibility Complex class I (MHCI/HLA) using multi-parameter flow cytometry.
- **Upstream Mechanism:** Elucidate the dependence of ISG activation on key innate immune regulators (IRF3, STING, IFNAR) using shRNA-mediated knockdown and antibody blocking experiments. Knockdown and knockout experimentation.

2. In Vivo Pre-clinical Evaluation of the Tumor Microenvironment (Aim 2 & Aim 3)

- **Animal Modeling:** Supervise and analyze syngeneic tumorigenesis experiments via intraperitoneal (IP) injections in immunocompetent (C57BL/6J) and immunodeficient (RAG2) mice.
- **Kinetic Tracking:** Monitor longitudinal tumor burden using in vivo bioluminescence imaging and quantify associated ascites fluid volume accumulation.
- **Multiparameter Flow Cytometry:** Design and execute a complex 20-marker cell/activation flow cytometry panel to comprehensively profile the infiltration and activation states of innate and adaptive immune cell populations (CD45, CD3, CD4, CD8a, NK1.1, Granzyme B, PD-1, FoxP3, ICOS, etc.) within the TME. Alternatively, mpIF with Phenocycler may be used in lieu of MPFC.
- **Therapeutic Combinations:** Validate the translational efficacy of a triple-combination therapy merging a BRG1/BRM inhibitor, an DNMT inhibitor, and an anti-PD1 checkpoint inhibitor in long-term survival studies (up to 90 days).

3. Scientific Dissemination and Mentorship

- **Publications:** Draft high-impact scientific manuscripts for publication in leading international peer-reviewed journals.
- **Dissemination:** Present research findings at prominent national and international scientific conferences.
- **Mentorship:** Actively participate in the day-to-day training, technical instruction, and scientific development of graduate students (MSc and PhD) and technical staff in the laboratory.

Training Environment

The Postdoctoral Fellow will be fully integrated into a dynamic, multidisciplinary team comprising clinician-scientists, pathologists, oncologists, and clinical biologists. The laboratory provides direct access to state-of-the-art technological infrastructure (genomics platforms, mass/flow cytometry cores, and small animal imaging at the LDI) along with annotated clinical biorepositories, offering an exceptional training environment for a career in precision oncology.

Required Profile

- **Degree:** A recently obtained PhD (or nearing defense) in Molecular Biology, Immuno-Oncology, Genetics, Biomedical Sciences, or a closely related discipline.
- **Technical Expertise:** Substantial hands-on experience in molecular biology (RT-qPCR, Western blot, knockout/knockdown experimentation) and proficiency in multicolor flow cytometry and data analysis (FlowJo).
- **Animal Experimentation:** Competency in handling rodent models
- **Bioinformatics / Biostatistics:** Autonomy or familiarity with high-throughput sequencing data analysis pipelines (RNA-seq) and standard statistical software.
- **Scientific Productivity:** A strong track record of first-author publications in well-regarded, peer-reviewed journals.

- **Professional Skills:** Strong leadership capabilities, absolute scientific integrity, exceptional organizational skills, and a demonstrated ability to drive projects independently while collaborating effectively within a team.
- **Communication:** Excellent written and oral communication skills in English (indispensable for manuscript writing and international presentations); bilingualism (English/French) is an asset.

Funding & Salary

Funding is competitive, guaranteed by the laboratory, and commensurate with the standard scales of the Lady Davis Institute and McGill University. The successful candidate will be actively supported and expected to apply for competitive postdoctoral fellowship awards from provincial and federal funding agencies (e.g., FRQS, CIHR).

How to Apply

Interested applicants must submit their application package as a single PDF file containing:

- **1.** A cover letter (maximum 2 pages) outlining technical expertise, previous research achievements, and specific interest in this translational project.
- **2.** A comprehensive Curriculum Vitae (CV) including a complete list of peer-reviewed publications and presentations.
- **3.** Contact information for 3 academic or professional references who can provide letters of recommendation.

Applications should be sent via email to: melica.brodeur@mcgill.ca. Review of applications will begin immediately and continue until the position is filled.

Work Environment & Principal Investigator

- Lady Davis Institute for Medical Research, Cancer Axis
- Dr. Melica Brodeur, M.D., MSc: Assistant Professor, Department of Obstetrics and Gynecology & Department of Oncology, McGill University | Jewish General Hospital (JGH) and Lady Davis Institute for Medical Research (LDI)

We thank all applicants for their interest. Only those selected for an interview will be contacted.

The Lady Davis Institute for Medical Research (LDI) is committed to promoting equity, diversity, and inclusion within its community. The LDI implements an Equal Opportunity Employment program and welcomes applications from all qualified candidates, regardless of their characteristics, who possess the skills and knowledge necessary to productively interact with diverse communities. Accommodations can be provided at any stage of the application process to individuals with disabilities upon request.

In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents.