

SERVICE DE MÉDECINE GÉNÉTIQUE - DIVISION OF MEDICAL GENETICS
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Annual Report
Division of Medical Genetics
Department of Specialized Medicine - Jewish General Hospital
January 1 - December 31, 2019

PREAMBLE

Medical Genetics had been a Department at the Jewish General Hospital from 2005-2018. Since the end of 2018, with the restructuring of hospital departments in Quebec by the MSSS, Medical Genetics has become a Division in the Department of Specialized Medicine, at the Jewish General Hospital. The academic activities of Dr. David Rosenblatt can be found in the annual report of the Finestone laboratory (<https://publications.mcgill.ca/humangenetics/faculty-profiles/finestone/>). Information on academic and research activities of all McGill faculty members can also be found in the annual report of the McGill Department of Human Genetics.

DIVISION STATUS UPDATE

Mission and objectives of the Division

Medical Genetics at the Jewish General Hospital is committed to the best possible patient care and teaching in the area of prenatal diagnosis. It is committed to excellence patient care, teaching and research in Hereditary Cancer. In the area of Hereditary Cancer Research, it aspires to being among the best centers in the world.

The Division strives to provide comprehensive service to our clientele. Its priority is to assure that sufficient resources are available for prenatal, cancer and other general genetics services at the Jewish General Hospital. The Division of Medical Genetics at the Jewish General Hospital attempts to make the needs of both individuals and families in the area of medical genetics better known to the hospital and the community at large.

A nominative list of academic staff, their academic rank at McGill University

Janine El Helou	Faculty Lecture
William Foulkes	Professor
Maria Lalous	Faculty Lecturer
Marie Jeanjean	Faculty Lecturer (On leave in Florida as of August 2019)
Lynn Macrae	Faculty Lecturer
David Rosenblatt	Professor
Nora Wong	Faculty Lecturer

Nora Wong, Lynn Macrae (0.6 FTE), Marie Jeanjean and Janine El Helou (0.4 FTE), are genetic counsellors who are provide service in cancer genetics. Maria Lalous and Janine El Helou (0.6

FTE) are genetic counsellors in the area of prenatal diagnosis. Rose-Mary Scigliano and Martah Urquilla provide administrative support for the department, with various other individuals providing help on an ad hoc basis.

Laura Hayes has the responsibility to help patients who carry mutations in cancer susceptibility genes navigate the medical system and obtain the follow-up care they require.

Dr. Laura Russell, Dr. Bettina Mucha-Le Ny, and Dr. Thomas Kitzler are Medical Geneticists based at the MUHC with associate appointments in the JGH Division.

Dr. William Foulkes supervises the clinical and research aspects of hereditary cancer predisposition at the JGH. In his role as Director of the Program in Cancer Genetics, housed in the Departments of Human Genetics and Oncology at McGill, he has succeeded in bringing expertise together from these two different but crucially important disciplines. Dr. Foulkes divides his time between the MUHC and the JGH. His close links to the Departments of Oncology and Pathology, and to a number of surgical divisions, reflects the multidisciplinary nature of the clinical service.

Dr. David Rosenblatt is the Division Chief. His PEM moved from the MUHC to the JGH in 2019. His research laboratory has remained at the Research Institute of the MUHC. His area of research centres around inherited metabolic disease. Dr. Rosenblatt provides medical supervision of the activities in prenatal diagnosis at the JGH.

Clinical Activities

On the eighth floor of the A Pavilion, the division has administrative space and a dedicated counselling room, primarily used for prenatal diagnosis. Plans are in place for the renovation of this area in 2020.

The genetic counsellors in prenatal diagnosis also see patients in Obstetrical Ultrasound in Pavilion H. Much of the clinical work in cancer genetics takes place in the Cancer Prevention Centre in the Segal Cancer Centre in Pavilion E, providing state of the art facilities for managing individuals and families with a hereditary predisposition to cancer.

In the **Hereditary Cancer Clinic**, there were 549 new visits and 390 follow-up visits and 421 phone consultations in 2019.

The Hereditary Cancer team is piloting a new approach to genetic testing of women recently diagnosed with breast cancer – the GREAT/AGATA clinic, whereby a research genetic counsellor (Zoulikha Rezoug) is responsible for counselling and arranging *BRCA1*, *BRCA2* and *PALB2* genetic testing for all women diagnosed with first primary breast cancer, without regard to family history or age. The program is set to run for 3 years at the JGH, MUHC and St Mary's Hospitals, and was funded by the JGH and the Quebec Breast Cancer Foundation. Thus far, approximately 80 women have received results, of which 4 were positive for pathogenic mutations in *BRCA1* or *BRCA2*.

In the **Prenatal Diagnosis Clinic** there were 375 new visits and 331 follow-up visits in 2019 as compared to 319 new visits and 220 follow-up visits in 2018. In addition there were 834 total phone calls in 2019 as compared to 384 in 2018.

The growth of non-invasive techniques for prenatal diagnosis and the rapid advances in next generation genetic technologies continue to have significant impact on current counselling models of practice. The genetic counsellors are currently evaluating new counselling approaches to ensure patients benefit from state of the art genetic services, while ensuring education and patient guided-care. Genetic counsellors share their knowledge with many McGill University students registered in the Genetic Counselling master program, the medical faculty or residents, and fellows from McGill and other universities.

PND Annual Statistics (2005-2013; 2018-2019)
Clinical Activities

Consultation Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2018	2019
new consultations	245	281	260	203	304	283	301	371	316	319	375
return visits	75	162	112	306	156	97	123	204	217	220	331
phone consults	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3*	384	834
Total	320	443	372	509	460	380	424	575	536	923	1540
Increase over 2018 (%)											167

Teaching and learning (undergraduate and graduate):

Dr. Foulkes and Dr. Rosenblatt are involved in teaching at all levels-undergraduate, graduate and residency training. The genetic counsellors are actively involved in teaching in the M.Sc. program in Genetic Counselling and with residents in several specialty programs, in particular Medical Genetics and Obstetrics and Gynecology.

McGill Genetic Counselling MSc Program: Role of Genetic Counsellors:

Maria Lalous

Student supervision

- Two first year genetic counselling students supervised for 4 weeks each
- Two second year genetic counselling student supervised for 6 weeks each
- One external Student (Sarah Lawrence) summer rotation student supervised for 4 weeks
- One MFM supervised in genetic counselling rotation for 4 weeks
- One Medical genetics Resident (R4) supervised for 4 weeks
- One GREI Resident – supervised for 4 weeks
- One Genetic Counselling student supervised for 3 weeks

Janine El Helou

Teaching

Class coordinator of HGEN-600D1

Classes taught HGEN-617, HGEN-600D1, HGEN-600D2

Application review and interview of genetic counselling candidates

Student supervision

Two first year genetic counselling students supervised for 8 weeks each

One first year genetic counselling student supervised for 4 weeks

Presentations at external institutions given

May 2019 at the CHUM Réunion académique : Title: 'Analyses somatiques et la boîte de Pandore'

Committees and other activities

Member of the board of Directors of the Canadian Association of Genetic Counsellors (Eastern Representative)

Co-chair of the genetic counselling awareness committee of the Canadian Association of Genetic Counsellors

Individuals who are interested in a career in genetic counselling shadowing in cancer clinics

Nora Wong

Teaching

HGEN 610, HGEN 611

Independent study project committee reviewer

Student supervision

Clinical Training Supervisor-Genetic Counselling Trainees (McGill)

Nellie Fotopoulos 2019 (Y1)

Robyn Hebert 2020 (Y2)

Clinical Training Supervisor-Medical Genetics Residents (McGill)

Abdu Alayoubi MD

Tutor 1st year medical students (Block A)

Small group sessions for on Family History Taking and Risk Assessment

Community/Advisory Boards

Genetic Counselling Admissions Committee McGill: Application reviewer

McGill University: Executive Board Member

Communities of Practice: The Society of Gynecologic Oncology of Canada

Lynn Macrae

Teaching

HBOC lecture taught in HGEN-600

Application review of genetic counselling candidates

Student supervision

Two second year genetic counselling student supervised for 5 weeks each

Presentations at external institutions given

Septembre 2019 : « Les cancers héréditaires pour l'omnipraticien » given to a group of private practice family physicians

Partnerships

The faculty of the JGH Division has close working relationships with the hospital and university Departments of Medicine, Oncology, Pediatrics, and Obstetrics.

Honours, awards and prizes

Dr. Rosenblatt is the Chair holder of the Dodd Q. Chu and Family Chair in Medical Genetics at McGill. In 2018, he was the recipient of the Founders Award of the Canadian College of Medical Geneticists.

Dr. Foulkes won the Distinguished Scientist award of the Canadian Society for Clinical Investigation in 2019, was elected to the Royal Society of Canada in 2015, the Canadian Academy of Health Sciences in 2014 and was awarded the O. Harold Warwick Prize of the Canadian Cancer Society (Cancer Control) for 2013. Dr. Foulkes is a James McGill Professor of Medicine at McGill University.

Fundraising

Laura Hayes is supported by funds from the Hereditary Breast and Ovarian Foundation (HBOC).

Grants, Publications, and Service

Highlights of the year for Dr. Foulkes were - 1) Brief Report on DICER1 and mesenchymal hamartoma of the liver published in NEJM (PMID: 31067372); 2) Discovery of a new syndrome caused by germline DGCR8 mutation – published in JCI – 31805011; 3) Two papers in Nature Communications – both as penultimate author (one as co-corresponding) 30718512, 30718506; 4) Three substantial reviews of DICER1 published – 31620849, 31342592, 30953130).

Current Research Funding

Dr. W.D. Foulkes

(PI)Canadian Institutes for Health Research, Foundation Award. Inherited susceptibility to cancer: from gene discovery to mechanisms to clinical applications. 2016-2023: \$2,533,601 CAD

(PI)McGill University. James McGill Professor Research endowment. 2016-2022, \$75,000 CAD.

(PI)Québec Breast Cancer Foundation/Jewish General Hospital Foundation. Genetic Rapid, Easy-Access Testing program for women with breast cancer. 2018-2021: \$400,000 CAD

(PI), Majewski J (co-A), Tonin P (co-A), Riazalhosseini Y (co-A), Rousseau F (co-A). Québec Breast Cancer Foundation/Cancer Research Society, The genetics of breast cancer in Quebec populations: twenty years after BRCA1/2. 2014-2019: \$500,000 CAD

Mes-Masson, A-M (PI); Foulkes WD (Co-PI), *multiple other Co-PIs*. Fonds de Recherche du Québec - Santé, Budget alloué dans le cadre du projet FRQS-Réseau de recherche sur le cancer - Axe de recherche et de banques de tissus et données en cancers solides (BTD). 2017-2019: \$60,000 CAD

Dr. David Rosenblatt

CIHR Project Grant: Next generation sequencing for the discovery of inborn errors of cobalamin metabolism 16/09-19/08

NIH (R01): Ronin (THAP11) in Neural Crest Cell Development 19/07-24/06
PI: Ross A.Poché Collaborator (PI): David Rosenblatt

Publications in 2019

Dr. David Rosenblatt

1. Wang T, Azeddine B, Mah W, Harvey EJ, **Rosenblatt D**, Séguin C. Osteonecrosis of the femoral head: genetic basis. *International Orthopaedics* 43:519-530, 2019.

2. Ruetz M, Campanello GC, McDevitt L, Yokom AL, Watkins D, **Rosenblatt DS**, Ohi MD, Southworth DR, Banerjee R. Allosteric regulation of oligomerization by a B₁₂ trafficking G-protein is corrupted in methylmalonic aciduria. *Cell Chem Biol* 26:960-969, 2019
3. Wehbe Z, Behringer S, Altabi KI, Watkins D, **Rosenblatt DS**, Spierkerkoetter U, Tucci S. The emerging role of the mitochondrial fatty acid synthase (mtFSII) in the regulation of energy metabolism. *Biochim Biophys Acta Mol Cell Biol Lipids* 1864:1629-1643, 2019
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5. Watkins D, Venditti CP, **Rosenblatt DS**. Vitamins: cobalamin and folate. In Rosenberg's *Molecular and Genetic Basis of Neurological and Psychiatric Disease*, 6th Edition (Rosenberg RN, Pascual JM, eds.) in press.

Dr. William Foulkes

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5. de Kock L, Wu MK, **Foulkes WD**. Ten years of DICER1 mutations: Provenance, distribution, and associated phenotypes. *Hum Mutat.* 2019 Nov;40(11):1939-1953. doi: 10.1002/humu.23877. Epub 2019 Aug 17.
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Academic and community engagement service outside of McGill

Dr. William Foulkes

December 16, 2019

Title: Inherited defects in microRNA biogenesis and susceptibility to neoplasia and hyperplasia

UCLA Dept Human Genetics Lecture
UCLA, California

November 9, 2019

Title: Cancer Genetics – one family at a time. Distinguished Scientist Award Lecture
2019 Annual Scientific Meeting of CSCI-CITAC, Banff, Alberta

October 26, 2019

Title: Performance of an e-health decision-support tool for identifying cancer predisposition syndromes in Canadian pediatric oncology centres

51st congress of the international society of paediatric oncology (SIOP), Lyon, France

Sep 9, 2019

Title: How can we best identify those with (or at risk for) hereditary breast and ovarian cancer?

Benzon Symposium No. 65 – Targeting Breast and Ovarian Cancers, Copenhagen, Denmark

Jul 24, 2019

Title: It all starts with the family: a human genetics approach to rare tumors

Very Rare Cancer Workshop, New York Genome Center, New York, United States

July 11, 2019

Title: Mutational Signatures for Disease and Variant Classification

Mutographs Annual Meeting, Lyon, France

June 5, 2019

Title: The Mooring of Starting Out: Families, Genes and Cancer, Keynote Lecture

Department of Pathology and Laboratory Medicine Annual 22nd Laurence Becker Symposium, SickKids, Toronto, Canada

May 23, 2019

Title: Families, Genes and Cancer

Federation CJA (Combined Jewish Appeal), Dollard-Des-Ormeaux, Canada

May 13, 2019

How do we identify all those at risk for hereditary cancer?

Norwegian Centres of Excellence, Centre for Biomarkers in Cancer, University of Bergen, Bergen, Norway

May 3-4, 2019

Title: CNS manifestations of DICER1 syndrome.

SNO Pediatric Neuro-Oncology, Basic and Translational Research Conference, San Francisco, United States

Supplemental Information

Consulting activities: Both Dr. Foulkes and Dr. Rosenblatt are involved in editorial reviews of manuscripts, and on various committees at the local, provincial and national levels. Dr. Rosenblatt serves on the committee of INESSS that evaluated the introduction of new laboratory tests in Quebec. He is a Corresponding Editor of the journals, Molecular Genetics and Metabolism and Human Mutation.

Respectfully submitted,

David S. Rosenblatt, MD

Chief, Division of Medical Genetics, Department of Specializes Medicine, Jewish General Hospital

April 15, 2020