PATHOLOGY AND MOLECULAR MEDICINE

Fields of Research
Pathology is a study of disease and the mechanisms leading to injury. It involves a wide range of biochemical, molecular, cellular and clinical approaches. Fields of interest in the department include: cancer biology, drug resistance, metastasis, programmed cell death and cell cycle regulation, transgenic mouse models of gene function, cell differentiation and gene regulation, hemostasis/thrombosis, amyloidosis and Alzheimer’s disease, disturbances in protein synthesis, and human genetics (including human gene mapping). Detailed information on faculty research interests is presented in a brochure which is available on request. See also the Department of Pathology WEB Page: http://www.path.queensu.ca/.

Departmental Facilities
Excellent facilities are available for training in experimental pathology and basic research in cell and molecular biology. Facilities and techniques include hemotological analysis, electron microscopy, histochemistry, immunohistology, flow cytometry, two-photo confocal fluorescence microscopy, microinjection with fluorescence image analysis and time lapse capability, transgenic mice facilities for production of transgenic over-expressing and gene-knock out models, cell fractionation, tissue culture; column chromatography, DNA, RNA and protein electrophoresis; gene cloning and sequencing, using of isotopes and microarray-based global gene expression profiling.

Financial Assistance
Graduate students are encouraged to apply for financial support in the form of fellowships and studentships from external granting agencies. Graduate research assistantships, funded from grants to staff members, and teaching assistantships, funded by the University, are also available. Departmental policy ensures a minimum stipend support for graduate students.

Postgraduate Activities
Postgraduate training programs leading to certification and fellowship in the Royal College of Physicians and Surgeons of Canada and the American Board of Pathology are offered through the Faculty of Medicine to medical graduates.

Faculty
Head
Boag, A.H.

Coordinator of Graduate Studies
Greer, P. A.

Professor

Associate Professor
Berman, D., Boag, A.H., Davey, S., Feilotter, H., Hurlbut, D.J., Rossiter, J.P.

Assistant Professor
Chen, J.C.-H., Childs, T., Davidson, C.M., Farmer, P., Good, D., Isotalo, P., Manduch, M., Nicol, C., Rauh, M.

Professor Emeritus
Kisilevsky, R., Ludwin, S.K.

Adjunct Professor
Zoutman, D.

Adjunct Associate Professor
Chan, M.

Adjunct Assistant Professor
Crocker, S., Hough, C., Sangrar, W., Tam, S-P.

Cross-Appointed

Programs
• Pathology and Molecular Medicine - Doctor of Philosophy (https://queensu-ca-public.courseleaf.com/graduate-studies/programs-study/pathology-molecular-medicine/pathology-molecular-medicine-phd/)
• Pathology and Molecular Medicine - Master of Science (https://queensu-ca-public.courseleaf.com/graduate-studies/programs-study/pathology-molecular-medicine/pathology-molecular-medicine-ms/)

Courses
All courses are 3.0 credit units except PATH 899 and 999, which are 6.0 credit units.

PATH 822 Experimental Cancer Therapeutics
Intended for students engaged or interested in pre-clinical cancer research. Both medical and basic science trainees are encouraged to take this course. Specific areas to be covered include introduction to new drug development,
Research projects in the physiological, biological, genetic and molecular basis of disease. Students will review the literature related to their proposed graduate research thesis project and write a series of essays on topics selected in consultation with a supervisory committee consisting of their supervisor and two other faculty. They will also develop a written draft research proposal that will be presented to their supervisory committee and defended in a final oral examination. To be taken by all students in the first full term of the graduate program. P. Greer (course coordinator).

PATH 828 Bioinformatics for Cancer Research
Bioinformatics is an essential component of biological and health science research given the ongoing developments in generating large amounts of data in short periods of time. This course introduces tools and methods to manage and analyze the results obtained in cancer research. Topics include study design, basic statistics for clinical and genetic research, data-mining approaches and alternative methods to statistics for data analysis, and signaling pathways analysis. The course will cover the appropriate pre-processing and data analysis techniques for various genetic data types such as microarray, tissue microarrays, methylation, NanoString, RNAseq, miRNAseq, proteomics and qRT-PCR. Students with little computing background, but who are interested in pursuing or collaborating with bioinformatic research, are encouraged to enroll.

PATH 830 (MSc)  
PATH 930 (PhD) Pathology and Molecular Medicine Research Seminar Series
This seminar series consists of weekly presentations by visiting external speakers, Queen's faculty, and Departmental MSc and PhD students. Internal faculty and external visiting speakers will be selected by the Graduate Program Coordinator with input from faculty and students. MSc students will give 1/2 hour seminars in their first year, and one hour seminars in their second year; PhD students will give 1 hour seminars in their first and third years, and an exit seminar in their final year. Attendance by all Departmental graduate students is compulsory and will be monitored by the Graduate Program Coordinator. Departmental faculty will provide evaluations of student presentations consisting of a mark and written comments relating to introduction and background, presentation of results and response to questions. A final mark and summary of faculty evaluations will be compiled by the coordinator and provided to the student and supervisor. Students are required to provide a written summary outlining their research progress to their supervisory committee five days prior to their seminar. Fall/Winter terms. P. Greer

PATH 899 Master's Thesis Research