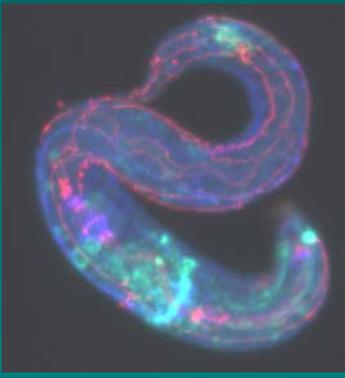
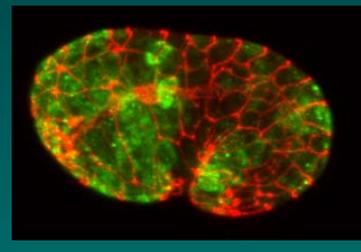
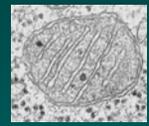
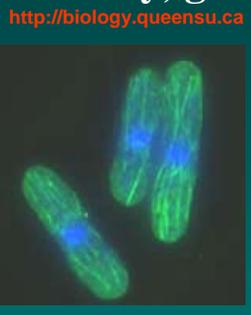
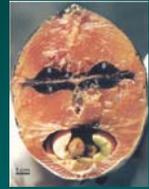


# DEPARTMENT OF BIOLOGY

## GRADUATE STUDIES

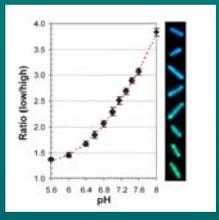
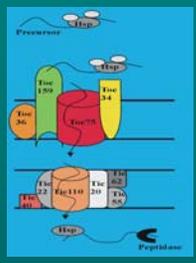
in molecular and cell biology, development, biochemistry, genetics



Shrimp Neurobiology and Enhanced Food production



Shrimp oostegite, neural control center for growth and reproduction



The Biology Department at Queen's is housed in the modern and well-equipped Bioscience Complex. Many of the graduates from our program have gone on to successful careers in the academic, medical, and biotech communities. For more information on our Graduate Studies Program, visit our web site at <http://biology.queensu.ca/> or email faculty members directly. Some of the faculty working in various areas of biochemistry, cell, and molecular biology, are listed below.

**WILLIAM BENDENA:** Although a cockroach and a lobster seem dissimilar they are in fact related as are all insects and crustacea. The similarity is more evident at the molecular level where related families of neuropeptides and hormones appear to control growth and reproduction. Understanding the control of neural regulators and hormone biosynthesis may provide a bio-rationale mechanism for birth control in insects and/or mechanism(s) of increasing reproduction in edible crustacea such as lobster and shrimp. The latter is important in developing successful aquacultural programs in Canada. [bendena@biology.queensu.ca](mailto:bendena@biology.queensu.ca)

**IAN CHIN-SANG:** What are the molecules that regulate the behaviour of cells as they change their shape, position and adhesiveness to generate their three-dimensional form during development? We use the genetic model organism *Caenorhabditis elegans* to study simple examples of morphogenetic movements. My lab uses genetic, molecular biology, biochemistry, and state of the art video microscopy techniques to elucidate the mechanisms by which tissues and organs are generated. [chinsang@biology.queensu.ca](mailto:chinsang@biology.queensu.ca)

**KENTON KO:** Plastids and mitochondria are "life-driving" organelles, capturing and producing energy for the cell. These organelles interact with other cellular compartments via protein trafficking networks. The dynamic act of protein delivery itself governs how proteome networks react and work together in response to different needs, and more importantly, how organelles and the whole organism develop for adaptation to the changing environment. We currently employ bioinformatics and functional proteomics to study dynamic aspects of protein delivery. [kok@biology.queensu.ca](mailto:kok@biology.queensu.ca)

**CHRISTOPHER MOYES:** My lab studies the nature of mitochondrial variation in vertebrate muscle, focusing on the links between bioenergetics and gene expression. We study variation that arises in development, during adaptive remodelling, and between species over evolutionary time. [moyesc@biology.queensu.ca](mailto:moyesc@biology.queensu.ca)

**WILLIAM PLAXTON:** Our research integrates classical and modern biochemical tools to characterize plant enzyme proteins for assessing the: (i) organization and control of plant carbohydrate metabolism, & (ii) biochemical adaptations of phosphate starved plants. The ability to carry out protein and enzyme/metabolic biochemistry has many direct applications to the biotech industry and molecular biology research in general. [plaxton@biology.queensu.ca](mailto:plaxton@biology.queensu.ca)

**LAURENT SEROUDÉ:** *Drosophila* is a proven model system for many aspects of human biology. *Drosophila* research has led to breakthrough discoveries in many human processes such as development, immunity, behavior and pathological disorders. The research in our group uses molecular genetics to dissect the molecular changes associated with aging and identify genes controlling how we age. The general strategy is to use *Drosophila* as a model system in which to identify and isolate genes homologous to humans, using the fly for experimental analysis of their basic functions. [seroude@biology.queensu.ca](mailto:seroude@biology.queensu.ca)

**WAYNE SNEDDEN:** My laboratory investigates signal transduction mechanisms used by plant cells during response to abiotic and biotic stimuli such as pathogen attack, drought, and salinity. We employ modern methods in molecular biology, biochemistry, and genetics to address questions of interest to both the academic and biotechnology communities. [sneddenw@biology.queensu.ca](mailto:sneddenw@biology.queensu.ca)

**VIRGINIA WALKER:** Our research interests concern the regulation of gene expression during development and in response to environmental and chemical stress. We address this problem in insects in two related, and overlapping, efforts: (i) the control of gene expression and resistance, (ii) hormonal control of gene regulation. [walkervk@biology.queensu.ca](mailto:walkervk@biology.queensu.ca)

**PAUL YOUNG:** My laboratory studies the regulation of cell division and some aspects of ion transport in the fission yeast. The work is multidisciplinary with strong genetics, molecular biology, biochemistry, cell biology and imaging aspects to it. Most of the projects currently focus on the regulation of mitotic control and the coupling of the decision for a cell to undergo nuclear division to the activation of the necessary machinery. <http://paulyoung.com>

