Richard Bodnar
Department: Psychology
Contact info: Richard.Bodnar@qc.cuny.edu
Title of research: Neuroanatomical and neurochemical mechanisms of conditioned flavor preferences and analgesic processes
Research description: Our laboratory examines the neuroanatomical substrates (nucleus accumbens, amygdala, prefrontal cortex and lateral hypothalamus of the neurochemical dopaminergic and opioid modulation of conditioned flavor preferences in rats, studies interactions between GABA and opioid systems in eliciting feeding following microinjections in the nucleus accumbens and ventral tegmental area in rats, and studies the role of estrogen-accumulating hypothalamic nuclei in modulating sex differences in opioid analgesia

Joshua C. Brumberg
Department: Psychology
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Title of research: Neural Circuitry
Research description: We study the development and function of neocortical circuits using the rodent whisker-to-cortical barrel as a model system. Studies use an integration of anatomical, physiological and computational techniques to understand how different neuronal phenotypes develop in response to challenges in the sensory environment and then how these circuits process sensory information in order to compute motor commands.

Susan Croll
Department: Psychology
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Title of research: The role of protein growth factors in neurological disease.
Research description: Our laboratory is interested in the role of protein growth factors in diseases of the nervous system. We are especially interested in factors which affect the neural, immune, and vascular systems simultaneously, as we seek to understand how disrupted interactions between these three systems lead to disease states. Currently, we are most aggressively pursuing the role of VEGF (vascular endothelial growth factor) in epilepsy, BDNF (brain-derived neurotrophic factor) in neurally-mediated autoimmune disease, and IL-1 (interleukin-1) in age-related dementia.

John Dennehy
Biology Department
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Research: Bacteriophage Evolutionary Ecology: Using an inter-disciplinary approach, I employ techniques from ecology, microbiology, population biology, molecular biology and mathematical modeling to study the evolutionary ecology of microorganisms (e.g., nematodes, bacteria and viruses). Primarily I look at how host/prey population dynamics affect the population dynamics and evolution of their parasites/predators. This approach is particularly effective for examining the emergence of infectious diseases, their adaptation to new hosts and the means to combat their spread and persistence. I also study the evolution of bacteriophage life history traits, with a strong emphasis on understanding the evolutionary consequences of stochasticity in gene expression and its effect on the dynamics of holin protein sequence evolution among phage lambda strains. New approaches, including the integration of cutting-edge techniques in flow cytometry, robotics, and microfluidics, will be used to expand the range of evolutionary ecological questions directly amenable to experimental analysis. Students in my laboratory will be encouraged to select questions of significant general interest, choose an appropriate model system to address the question and attack questions aggressively using innovative techniques. By examining biological organization from the level of metapopulations and communities down to genome analysis and single molecule dynamics students will gain an exceptionally broad biological perspective and learn widely applicable techniques, including microbiological, sequencing, cloning, modeling, and population genetic, enhancing subsequent career progress.

Else J. Fjerdingstad
Department: Biology
Contact info: phone 718 997 4321, Email: Else.Fjerdingstad@qc.cuny.edu
Title of research: Evolution of mating systems in social insects
Research description: My groups works at the intersection of three core fields of modern evolutionary genetics and ecology: the evolution of mating systems, social evolution and host-parasite co-evolution. Specifically we are interested in elucidating which selective factors affect the evolution of queen mating strategies and we apply inferential, comparative and experimental studies for that purpose, making use of field studies, molecular genetics, population genetics, quantitative genetics, morphometry and more. We are currently focusing on a Europe-wide study of ant queen mating strategies, using microsatellite DNA markers to test for differences in strategies between populations in divergent environments and studying the genetic structure of populations via the microsatellites and mtDNA sequence information. This will allow us to test for the degree to which queen strategies can be considered local adaptations to environmental variability and parasite prevalence and diversity *versus* are evolving due to genetic drift or are constrained by phylogenetic lags or gene flow from other populations.

Jeffrey Halperin
Department: Psychology
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Title of research: Neurodevelopmental perspectives on ADHD and other disruptive behavior disorders
Research description: Through the use of clinical, neuropsychological, neurochemical, and neuroimaging measures, we have examined the ways in which neural substrates might differ in subgroups of children with ADHD over development. Our most recent focus has been on conducting longitudinal studies that follow children prospectively over time to examine predictors of course and outcome among children with ADHD. This work is currently funded by two grants from the National Institute of Mental Health (NIMH); one focusing on the transition from childhood to adolescence/young adulthood and the other on development from preschool to the school-age years.

Nathalia Glickman Holtzman
Department: Biology
Contact info: Office: SB D328 phone: 718 997 3678
Title of research: Genetic regulation of Cardiac Morphogenesis
Research description: Utilizing zebrafish as a model system, we integrate cell biology, embryology, genetics, time-lapse video microscopy and computer-based cell movement analysis to address two main questions: What signals/patterning events direct cell movement during tissue morphogenesis? How do the cells translate this information into directed movement? During heart formation, cardiac precursors start out as bilateral sheets of cells that move toward the midline, where they converge, surround the central endocardium, and rearrange to create the heart tube. Though the tissue level shape changes that occur during heart tube formation are beginning to be understood, little is known about the cell behaviors or the molecular regulation of this process. We are currently examining the role of the endocardium in directing the movement of the myocardium and determining how the epicardium migrates to cover the developing heart tube.

Corinne A. Michels
Department: Biology
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Title of research: Regulation of the *Saccharomyces MAL*-activator by Hsp90 Molecular Chaperone
Research description: The *Saccharomyces MAL*-activator is a DNA-binding transcription activator that regulates expression of the *MAL* structural genes in response to the inducer maltose. We have shown that the Mal63 *MAL*-activator is a client of the Hsp90/Hsp70 molecular chaperone machine. Using our large nuber of mutant *MAL*-activators that include noninducible, constitutive, and super-inducible alleles, we are able to analyze, *in vivo*, the pathway of *MAL*-activator activation by the Hsp90/Hsp70 molecular chaperone machine. Our current work focuses on an analysis of the role(s) of various co-chaperones in this activation process, with specific interest in Aha1 and Sse1,2 co-chaperones. The results suggest a greater plasticity in the role of these and other co-chaperones than previously anticipated. We plan to expand our analysis to other Hsp90 chaperone-dependent *Saccharomyces* transcription factor.

Tim Short
Department: Biology
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timothy.short@qc.cuny.edu
Title of research: Molecular and cellular signaling in regulating plant physiological and developmental responses to environmental light; developing biotechnology tools for Ceratopteris richardii.
Research description: Using genetic and physiological approaches with the model plant system *Arabidopsis thaliana* and an emerging model fern *Ceratopteris richardii*, we are attempting to elucidate mechanisms by which plants detect light conditions in their environment and integrate that information to alter development, physiology, and gene expression in plants. Because many of the genetic tools commonly used for *Arabidopsis* do not function in the evolutionarily distant fern *Ceratopteris*, we are also developing novel methods for genetic transformation and analysis of ferns.

Gillian Stewart
Department: Earth and Environmental Sciences
Contact info: 718-997-3104; gstewart@qc.cuny.edu
Title of research: Marine Biogeochemistry
Research description: There are multiple projects ongoing in the lab including phytoplankton and zooplankton growth and reproduction experiments, investigations into the role that lithogenic material plays in carbon assimilation in marine grazers, and measurements of natural radionuclides in marine samples as organic carbon tracers.

Daniel C. Weinstein
Department: Biology
Contact info: 718-997-3400; daniel.weinstein@qc.cuny.edu
Title of research: "Signaling mechanisms regulating cell fate and morphogenesis"
Research description: Research in our laboratory is focused on elucidating the signaling mechanisms underlying germ layer formation and patterning in the early vertebrate embryo, using the frog Xenopus laevis as our primary model organism.

Zahra Zakeri
Department: Biology
Contact info: 718-997-3417; zahra.zakeri@qc.cuny.edu
Title of research: "Roles and mechanisms of programmed cell death in development and environmental responses."
Research description: We are interested in understanding how cell death contributes to normal development in mammalian and insect systems, and how various assaults either induce or protect cells from dying. Environmental conditions (e.g. chemicals, pathogens, ultraviolet light, etc.) and genetic components (e.g. the balance of protective/inductive proteins and other cellular components, gender, age, etc.) contribute to determining when a cell will undergo programmed cell death, and we are using molecular, genetic, biochemical, and physiological methods to understand how this decision is made and how it can be changed.