Biology Research Faculty

Faculty members in Biology carry out a wide variety of research projects (eg. behavioral genetics, biochemistry, biostatistics, developmental biology, ecology, immunology, molecular biology, neuroscience and reproductive immunology) that expand on the topics you have been studying at York. All these faculty serve as research mentors and are eager to involve interested students in the lab. Visit "Biology" on the York web site or speak to your instructors to get an idea of the types of available research projects that appeal to you, schedule an appointment to meet with faculty members and determine whether they are able to mentor an undergraduate researcher.

Cheryl Adams

adams@york.cuny.edu
(718) 262-2709
Associate Professor of Biology
Biostatistics, Invertebrate Biology
B.A. Southern Illinois University at Carbondale
Ph.D. Universityof Illinois at Urbana-Champaign

My main research interest involves investigating developmental patterns of blister beetles, meloids, under certain environmental conditions. I also have an interest in applications of statistical analysis to biological data, including epidemiological data. I am the faculty advisor for the Plant Club at York College, growing plants with students in the greenhouse.

Ivica Arsov

iarsov@york.cuny.edu
(718) 262-2713
Associate Professor of Biology
Immunology
B.S. Belgrade University; Ph.D. New York University

The main focus of my laboratory is to understand molecular and cellular events regulating T cell development and activation. We are currently using several genetically modified mouse strains to determine if autophagy, a process of cellular self-digestion, is involved in T cell maturation and immune response. Our recent data indicate that Beclin 1, one of the proteins critical for autophagy, plays a role in T cell development and activation. In addition, we have recently demonstrated that Beclin 1 also plays a role in early hematopoiesis in the bone marrow. Our goal is to understand how autophagy affects these processes using state of the art instrumentation and various transgenic and knockout mice.

Selected publications:

Arsov I, Li X, Matthews G, Coradin J, Hartmann B, Simon AK, Sealfon SC, Yue Z. (2008). BAC-mediated transgenic expression of fluorescent autophagic protein Beclin 1 reveals a role for Beclin 1 in lymphocyte development. Cell Death Differ. 15(9):1385-95.

Santori F. R., **Arsov, I.,** Lili, M., and Vukmanovic, S. (2002). Editing autoreactive TCR enables efficient positive selection. J Immunol 169:1729-1734.

Laura Beaton

lbeaton@york.cuny.edu
718-262-5253
Assistant Professor of Biology
Ecology, Plant biology
Ph.D. McMaster University, Hamilton, Ontario

As an evolutionary ecologist/ecophysiologist, Dr. Beaton, is interested in how plants interact with both their biotic and abiotic environments. Her research focuses on the impacts of rapid environmental changes associated with human activity. In particular, she is interested in plant communities in marginal habitats, like roadsides, and invasive species.

Selected Publications:

Beaton, L. L. and Dudley, S. A.. (2007). The impact of solute leaching on the salt tolerance during germination of the common roadside plant *Dipsacus fullonum* subsp. *sylvestris* (Dipsaceae). International Journal of Plant Sciences, 168: 317-324

Guillermina Girardi

ggirardi@york.cuny.edu
718-262-2700
Associate Professor of Biology
Complement Biology. Reproductive Immunology
B.S. Biochemistry National University of Rosario Faculty of Medicine (Argentina);
Ph.D. National University of Rosario Faculty of Medicine (Argentina)

Dr Girardi's Lab studies the mediators and effector of pregnancy complications. The goal of her research is to understand the causes immune mediated pregnancy complications like recurrent miscarriages, intrauterine growth restriction, preeclamopsia and preterm delivery. The maternal-placental-fetal units act in harmony to provide the needs of the fetus while supporting the physiologic changes of the mother. It is recognized that placental vascular insufficiency is a core feature in abnormal pregnancies. Dr Girardi's efforts are aimed at understanding the role of complement, thrombosis and angiogenesis as possible mediators of fetal and placental damage. Identification of the mediators responsible for these serious pregnancy complications is likely to help diagnosis, prevention and therapy. Timely diagnosis and management of pregnancy complications can result in a favorable outcome, reducing fetal and maternal morbidity and mortality.

Selected Publications:

Girardi, G; Redecha, P and Salmon, JE. Heparin prevents antiphospholipid antibody induced fetal loss by inhibiting complement activation.. *Nat Med* 2004 10(11):1222-6

Girardi, G, Yarilin, D , Thurman, JM, Holers, VM and Salmon, J Complement Activation Induces Dysregulation of Angiogenic Factors and Causes Fetal Rejection and Growth Restriction.. *J Exp Med* 2006, 203(9):2165-75.

Redecha, P; Franzke,C ; Ruf, W, Mackman, N and **Girardi, G** Activation of Neutrophils by the Tissue factor - Factor VIIa - PAR-2 Axis Mediates Fetal Death in Antiphospholipid Syndrome.. *J Clin Invest.* 2008; 118(10):3453-61.

Role of tissue factor in placental and fetal injury Pravastatin prevents miscarriages in mice. Redecha P, van Rooijen N, Torry D and **Girardi G.** *Blood* 2009 ;113(17):4101-9

Press releases: http://www.medpagetoday.com/OBGYN/Pregnancy/11317, http://www.medicalnewstoday.com/articles/125226.php

Shao-Ying Hua

ahua@york.cuny.edu
718-262-2700
Assistant Professor of Biology
Neurophysiology, Computational Neuroscience
B.S. Medicine, Shanxi Medical School, Shanxi, China;
M.S. The Second Military Medical University, Shanghai, China;
Ph.D. Saga Medical School, Saga, Japan

Dr. Hua studies synaptic transmission, a biological process by which neurons communicate with each other. She is particularly interested in the speed of neuronal communication. In her previous research, she developed a molecular model that allows fast neurotransmitter release following nerve impulses. Using techniques of electrophysiological recording and microinjection, she studies the roles of several synaptic proteins in the timing control of neurotransmitter release. To explore the signal processing capacity of neural networks, Dr. Hua is seeking collaboration with faculty and students in mathematics, computer science and physics.

Selected Publications:

Yoon AC, Kathpalia V, D'Silva S, Cimenser, A & **Hua S-Y**. (2008). Determining Ca^{2+} - sensor binding time and its variability in evoked neurotransmitter release. *Journal of Physiology, London* 586:1005-1015.

Hua S-Y, Teylan M & Cimenser A. (2007). An antibody to synaptotagmin I facilitates synaptic transmission. 2007. *European Journal of Neuroscience 25*, 3217-3225.

Louis Levinger

llevinger@york.cuny.edu
718-262-2704
Professor of Biology
Biochemistry, Molecular Biology and Enzymology
B.S. Antioch College; Ph.D. University of North Carolina

Dr. Levinger's research on biochemistry and molecular biology of RNA concerns the activity of an enzyme involved in the processing of transfer RNA (tRNA). Mutations in tRNA can cause mitochondrially transmitted diseases including diabetes, deafness, blindness, epilepsy and heart disease. Mutations in the pre-tRNA 3' end processing endonuclease (tRNase Z) have also been suggested to be associated with prostate cancer susceptibility, making the research on this enzyme biomedically significant. The research methods include DNA-based construction, insect cell culture, expression and affinity purification of recombinant proteins, site-specific mutagenesis, *in vitro* transcription and pre-tRNA processing analysis. During the past 18 years at York College, Dr. Levinger has received extensive extramural funding to investigate this and related topics and has trained over 35 students and technicians in biomedical research. Furthermore, within the last few years the

work has taken on an international flavor with productive collaborations including researchers in Japan, Finland, Germany and France.

Selected Publications:

Levinger, L., Hopkinson, A., Desetty, R., and Wilson, C. 2009. Effect of changes in the flexible arm on tRNase Z processing kinetics. *J. Biol. Chem.* 284:15685-15691.

Hopkinson, A., and **Levinger, L**. 2008. Effects of Conserved D/T Loop Substitutions in the Pre-tRNA Substrate on tRNase Z Catalysis. *RNA Biology* **5**(2), 104-111 [Epub ahead of print] PMID: 18421255.

Karkashon, S., Hopkinson, A, and **Levinger, L**. 2007. tRNase Z Catalysis and Conserved Residues on the Carboxy Side of the His Cluster. *Biochemistry* **46**:9380-9387. DOI: 10.1021/bi700578v.

Zareen, N., Hopkinson, A.*, **Levinger, L**. 2006. Residues in two homology blocks on the amino side of the tRNase Z His domain contribute unexpectedly to pre-tRNA 3' end processing. *RNA* **12**:1104-1115.

Margaret A. MacNeil

macneil@york.cuny.edu
718-262-2711
Associate Professor of Biology
Retinal Neuroanatomy
A.B. Smith College; Ph.D. Boston University School of Medicine

Dr. MacNeil uses neuroanatomical techniques to identify the types of neurons in the retina and the circuits that they make up. Currently, she is studying how the retinal circuits between ganglion cells and bipolar cells are established early in development.

Selected Publications:

MacNeil MA, Purrier S, Rushmore RJ. 2009. The organization of the inner nuclear layer of the cat retina. Visual Neuroscience, 26:365-374.

MacNeil MA, Gaul PA. 2008. Biocytin wide-field bipolar cells in rabbit retina selectively contact blue cones. Journal of Comparative Neurology, 506: 73-86.

MacNeil MA, Heussy JK, Dacheux. RF, Raviola E, Masland RH. 2004. The population of bipolar cells in the rabbit retina. Journal of Comparative Neurology, 472: 73-86.

Gerard P. McNeil

mcneil@york.cuny.edu
718-262-2192
Associate Professor of Biology
Molecular Genetics of Development and Chronobiology
B.S., Ph.D. University of Massachusetts

Dr. McNeil studies the molecular mechanisms regulating early development using *Drosophila melanogaster* as a model organism. He is currently studying the role of the RNA-binding protein Lark during Drosophila

oogenesis. These studies are conducted using a variety of genetic, molecular, biochemical, and cellular techniques. Current methodologies include the use of RNAi, microarrays, and Gal4/UAS expression systems.

Selected Publications:

McNeil, G.P., Kaur, M., Purrier S., and R. Kang. 2009. The Drosophila RNA-binding protein Lark is required for localization of Dmoesin to the oocyte cortex during oogenesis. Dev Genes Evol 219: 11-19.

McNeil, G.P., Smith, F., and R. Galioto. (2004). The Drosophila RNA-binding protein Lark is required for the organization of the actin cytoskeleton and Hu-li tao shao localization during oogenesis. Genesis, 40:90-100.

Anne Simon

asimon@york.cuny.edu
718-262-2715
Assistant Professor of Biology
Genetic basis of social behavior in the Fruit-fly
M.S. -Ph.D. University of Paris XI

Dr. Simon's research at York College of CUNY focuses on the analysis of complex behaviors in the fruit-fly, relevant to neuropsychiatric illnesses such as schizophrenia and depression. In particular, with the help of undergraduate students, she developed a new paradigm to study social behavior. Some social interactions have already been studied in the fruit fly, including courtship and aggression. Implicit in these interactions is the recognition that another similar organism is present. However, this even more basic behavior not yet been studied. Dr. Simon will pursue the study of the aggregation pattern of fruit-fly following four main directions: 1/ to characterize further the sensory modalities required for social aggregation, 2/ to get a better understanding the nature of Aggregation Behavior, 3/ to screen for/identify genes required for the social recognition of others, 4/ to analyze the mechanisms by which candidate genes affect social aggregation.

Selected Publications:

Simon AF, Daniels R, Romero-Calderón R, Grygoruk A, Chang H-Y, Rod Najibi*, Shamouelian D*, Salazar E*, Solomon M*, Larry C. Ackerson LC, Maidment NT, DiAntonio A and Krantz DE. (2009) Drosophila vesicular monoamine transporter mutants can adapt to reduced or eliminated vesicular stores of dopamine and serotonin. Genetics, 181(2):525-41.

Simon AF, Krantz DE (2007). Road Rage and Fruit Fly. Nature Genetics 39: 581.

Simon AF, Liang DT, Krantz DE (2006). Differential decline in behavioral performance of Drosophila melanogaster with age. Mechanisms Of Ageing And Development, 127, 647-651.

Simon AF, Shih C, Mack A, Benzer S (2003). *Steroid control of longevity In Drosophila melanogaster*. Science 299: 1407-1410.