





Faculty Member Contact Information

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Contact Info	
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Department	Environmental Sciences

1 Funded, 2 Unfunded URCA Assistant

	This position is ONLY open to students who have declared a major in this discipline.	M
	This project deals with social justice issues.	
	This project deals with sustainability (green) issues.	
	This project deals with human health and wellness issues.	
	This project deals with community outreach.	
	This mentor's project is interdisciplinary in nature.	I

Are you willing to work with students from outside of your discipline? If yes, which other disciplines?

- I am open to taking students outside of my discipline, but only those in similar fields.

How many hours per week will your student(s) be required to work in this position?

(Minimum is 6 hours per week; typical is 9)

- 3-9

Will it be possible for your student(s) to earn course credit?

- Yes; 1-3 credit hours of ENSC 499, BIOL 493

Location of research/creative activities:

- SW 2120

Brief description of the nature of the research/creative activity?

Altered perfluorooctane sulfonate toxicity in fruit flies after co-treatments of chemicals acting on ion channels

Perfluorooctane sulfonate (PFOS), one of the environmentally ubiquitous and persistent polyfluorinated compounds (PFCs), is an anthropogenic pollutant. A growing body of evidence clearly shows that humans, including newborn babies fed with breastmilk, are frequently exposed to PFCs through dietary intake. The half-life of PFOS in humans is surprisingly longer (~5.4 years) than that in other animals (e.g., 17-19 days in mice). Additionally, epidemiological investigations have demonstrated significant correlations between exposures to PFCs, including PFOS, and neurological disorders, such as reduced spatial learning and memory ability and attention deficit/hyperactivity disorder. While the exact mechanisms how PFOS and other PFCs elicit the neurological disorders are not clear to date, several groups of researchers have suggested that increased level of intracellular Ca^{2+} in neurons may cause apparent neurotoxicity in animal and cell culture models.

We have found that sublethal exposures of ivermectin (IVM) significantly decreased mortality in fruit flies co-treated with lethal amounts of PFOS. The overall goal of the project is to validate neurotoxicity of PFOS using other ion channel modifiers such as fipronil. Its mode of actions on GABA_A receptors have been described and relatively well-understood. We will use sub-lethal amounts of the ion channel modifiers to determine PFOS toxicity change.

Brief description of student responsibilities?

Students will be responsible for participating various research activities including fruit fly laboratory maintenance, perform fruit fly mortality bioassays, and data analysis using PoloPlus and Sigma Plot software.

URCA Assistant positions are designed to provide students with *research or creative activities* experience. As such, there should be measurable, appropriate outcome goals.

What exactly should your student(s) have learned by the end of this experience?

Students will learn fruit fly development and basic insect biology through participation of fruit fly laboratory maintenance, dose-response relationship and how sublethal amounts of fipronil alter the fly mortality caused by PFOS.

Requirements of Students

If the position(s) require students to be available at certain times each week (as opposed to them being able to set their own hours) please indicate all required days and times:

- Student research schedule for URCA can be set and adjusted based on student's semester schedule.

If the location of the research/creative activities involves off campus work, must students provide their own transportation?

- SW 2120

Must students have taken any prerequisite classes? Please list classes and preferred grades:

- BIOL 150

Other requirements or notes to applicants:

- None