





Faculty Member Contact Information

Name	Dr. Kyong-Sup Yoon
Contact Info	
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Department	Environmental Sciences

1 Funded, 1-2 Unfunded URCA Assistant(s)

	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.	
X	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?

- Only 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)

- 6-9 hours

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

- Yes-- ENSC 499, BIOL 493 (1 credit hour)

Location of research/creative activities:

- SW 2120

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

Characterization of perfluorooctane sulfonate toxicity in *Drosophila melanogaster* and *Schmidtea mediterranea*

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 Ca²⁺ in neurons may cause apparent neurotoxicity in animal and cell culture models.

We have found that fruit flies exposed to sublethal concentrations of PFOS (0, 0.02, 0.2, 2, 20, & 200 nM) showed significantly decreased daytime activity at 0.2 nM and significantly increased the daytime activity at 200 nM ($P < 0.05$). Planarians are currently undergoing mortality bioassay studies to determine acute mortality responses. These responses will be used to determine sublethal concentrations for monitoring locomotor activity as well as regenerative developmental exposure. The outcomes in this study are expected to provide behavioral evidence for further understanding PFOS neurotoxicity and its impact on fruit fly and planarian circadian rhythm.

Brief description of student responsibilities?

Students will be responsible for participating various research activities including fruit fly and planarian 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 and planarian development and basic invertebrate biology through participation of fruit fly and planarian laboratory maintenance, dose-response relationship and how sublethal amounts of various chemicals 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:

- Students will be able to control the schedule of their research time with clear communications.

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

- N/A

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

- BIOL 150, 151

Other requirements or notes to applicants:

- N/A