





### Faculty Member Contact Information

<b>Name</b>	Dr. Kevin Tucker
<b>Contact Info</b>	
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<b>Department</b>	Chemistry

### **1 Funded, Unlimited Unfunded URCA Assistant**

	This position is <b>ONLY</b> open to students who have declared a major in this discipline.	<b>M</b>
	This project deals with social justice issues.	
<b>X</b>	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.	<b>I</b>

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

- No, 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)

- 8

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

- Yes; 0-2 credit hours of CHEM 296, 396, or 496

**Location of research/creative activities:**

- 3325 Science West, BLI, and Field locations

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

Dr. Tucker's research focus lies at the nexus of food, energy, and water. Specifically, there are projects concerned with the fermentation process of corn to ethanol, the quality of soil and its effect on agriculture, and on pollution in bodies of water. We focus on the detection of pharmaceutical and personal care products and other contaminants of emerging concern within local and regional waterways and the surrounding soil systems including agricultural fields. These compounds include antibiotics and endocrine disruptors, and agricultural products. The environmental effects of many of these compounds and the concentrations at which these effects begin to be observed is currently not well known or regulated. Through environmental investigations and laboratory modeling, our research aims (1) to determine the environmental levels of various compounds and the geographical relationship between those levels, (2) to elucidate the critical concentration level at which biological and ecological effects begin to take effect for various compounds, and (3) to understand the biological effect of the compounds on various model organisms using environmental samples and models. Students in my lab will learn a variety of techniques including solid-phase extraction, mass spectrometry, and environmental sampling. In addition to these projects, I have collaborations with Biology, University of Illinois: Illinois Sustainable Technology Center, and NIU that allow students the opportunity to explore broader research interests.

**Brief description of student responsibilities?**

Students in my lab are assigned to work in teams based on the project. Each project has a team leader who is responsible for training new students in the methods that are performed in the lab and planning the weekly/monthly experiments. New students in my lab are expected to show up and contribute to the work that is happening in the group. You will learn what is happening very quickly and how to perform all of the different procedures in the lab so you can operate as an independent contributor to your project within the first half of a semester in the lab. The weekly tasks that students perform will vary by project team but may include environmental sampling of soil or water, lab processing of samples using extraction techniques and filtration and providing assistance to senior lab members with data processing.

**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?**

All students who join my lab are expected to buy into the overall goals of the lab and contribute to the big picture projects. By the end of the first semester, you will learn how to be a productive lab member, how to operate independently in the lab, and you will start learning about the primary literature that exists around our work. By continuing to work in the lab, you will gain

experience in leading and training other group members, reading and presenting research papers, presenting your work at conferences, and potentially writing your own proposal for a grant.

Dr. Tucker believes that research is a collaborative endeavor and has active collaborations in chemistry, biology, environmental science, exercise physiology, medicine, geography, and geology. Research topics span from watershed science and environmental toxicology to analytical method development to address measurements in human cancer and agricultural products. Students in my lab will learn a variety of techniques including solid-phase extraction, mass spectrometry, and environmental sampling.

Current Projects: (collaborators)

- Quantitation of Pharmaceuticals, Pesticides, and Herbicides in Fresh Water (along with N, P and other parameters)
- Mass Spectrometry Imaging of Various Substrates
- Quantitation of PPCPs in Tissues
- Quantitation of PPCPs in International Waters (NIU Department of Geology's Dr. Megan Brown and Dr. Melissa Lenczewski)

I am always interested in recruiting independent, self-motivated, bright first-year and sophomore Chemistry and Biochemistry majors as well as majors from Environmental Science and Biology. Please reach out if you have an interest in the types of work that we are performing.

### **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 should be available for group meeting on Friday's from 1-2 PM in the Spring and Friday's from noon-1 PM in the Fall.

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

- Students may need their own transportation to and from BLI (on campus) and field sites occosionally.

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

- CHEM 121A with an A or a B.

**Other requirements or notes to applicants:**

- None