

**Indiana University – International Summer Undergraduate Research Program  
(IU-ISURP)**

**Summer Research Experience 2020**

**Position Description**

<b>Professor's Name</b>	<b>Silas Cook</b>
Department	Chemistry
Lab website	<a href="http://www.indiana.edu/~cooklab/index.php">http://www.indiana.edu/~cooklab/index.php</a>
Position Description	The student will synthesize a series of small molecules to test as substrates for new catalysts developed in the group. Sensitive organic chemistry techniques will be used for setting up organic and organometallic reactions, working them up, and purifying and analyzing the desired products from the reactions.
Desired Skills & Background	A good knowledge of basic organic chemistry. Some experience in organic synthesis or organometallic chemistry is necessary.

<b>Professor's Name</b>	<b>David Daleke</b>
Department	Medical Sciences / Biochemistry and Molecular Biology
Lab website	<a href="http://mypages.iu.edu/~dldlab">http://mypages.iu.edu/~dldlab</a>
Position Description	<p>This project is a study of novel proteins (“flippases”) that transport lipids across membrane bilayers. These proteins regulate the organization of lipids in biological membranes.</p> <p>The student will express, using the baculovirus expression system, candidate aminophospholipid transporters and purify the proteins by affinity chromatography. Purified proteins will be reconstituted and lipid transport activity will be measured.</p> <p>A related, alternative project is to synthesize, using enzymatic methods, phospholipid analogs to test the substrate specificity of the purified flippases.</p>
Desired Skills & Background	A good knowledge of basic biochemistry. Some experience in protein purification, enzymology, or membrane biology will be helpful.

<b>Professor's Name</b>	<b>Amar Flood</b>
Department	Chemistry
Lab website	<a href="http://www.indiana.edu/~floodweb/">http://www.indiana.edu/~floodweb/</a>
Position Description	<p>The summer project involves the preparation and study of cyanostar macrocycles and polymers for binding anions.</p> <p>See related paper: Nature Chemistry, 2013, 5, 704</p> <p>The student will synthesize new receptors, and characterize their ability to bind different anions.</p>
Desired Skills & Background	Good experience with synthetic organic chemistry. Some experience with NMR and UV-Vis spectroscopy would be useful.

<b>Professor's Name</b>	<b>David P. Giedroc</b>
Department	Chemistry
Lab website	<a href="https://giedroc.lab.indiana.edu">https://giedroc.lab.indiana.edu</a>
Position Description	We seek individuals interested in understanding the molecular mechanisms of the adaptive response of microbial pathogens to transition metal restriction and hydrogen sulfide toxicity.
Desired Skills & Background	A good knowledge of basic protein purification and other biochemical techniques will be helpful, but not required.

<b>Professor's Name</b>	<b>Stephen C. Jacobson</b>
Department	Chemistry
Lab website	<a href="http://www.indiana.edu/~scjweb/">http://www.indiana.edu/~scjweb/</a>
Position Description	<p>My research group and I are developing micro- and nanofabricated instrumentation and using this instrumentation to study various chemical and biochemical problems. Recently, we have focused our attention in the following areas: (1) microfluidic separations, (2) nanofluidic transport and sensing, (3) photolithographic mapping, and (4) cell-based assays. Participation in any of these project is possible for the summer research program.</p>
Desired Skills & Background	<p>Interest in analytical chemistry and micro- and nanofluidics is necessary. Experience in microfabrication, microfluidics, optical spectroscopy, scanning electron microscopy, separations, or cell-based assays is preferred.</p>

<b>Professor's Name</b>	<b>Sara Skrabalak</b>
<b>Department</b>	Chemistry
<b>Lab website</b>	<a href="http://www.indiana.edu/~skrablo/">http://www.indiana.edu/~skrablo/</a>
<b>Position Description</b>	This project will involve the synthesis of metal nanostructures of defined size, shape, and composition by colloidal methods. In addition to synthesis, the student will be involved in characterizing the prepared materials by electron microscopy and evaluating their properties for applications in chemical sensing and electrocatalysis.
<b>Desired Skills &amp; Background</b>	General chemistry. Advanced inorganic or physical chemistry preferred and/or materials or nanochemistry.

<b>Professor's Name</b>	<b>Nicholas Sokol</b>
Department	Biology
Lab website	<a href="http://sokollab.strikingly.com/">http://sokollab.strikingly.com/</a>
Position Description	The student will participate in a genetic screen to identify novel genes required for stem cell based tissue growth using the fruitfly model system. Initial characterization of resulting mutants can also be performed.
Desired Skills & Background	A good knowledge of basic genetics. Some experience in molecular biology will be helpful.

<b>Professor's Name</b>	<b>Steven Tait</b>
Department	Chemistry
Lab website	<a href="http://tait.chem.indiana.edu">http://tait.chem.indiana.edu</a>
Position Description	Structural and chemical analysis of metal-ligand single-atom catalysts at surfaces.
Desired Skills & Background	This project will involve the structural characterization of metal-ligand single-atom catalysts at surfaces. Students interested in this project should have successfully completed 1-2 years of undergraduate coursework in chemistry or physics. They should have completed chemistry laboratory coursework that involves the preparation and handling of solutions. Prior experience with surface chemistry and catalysis is not necessary. The students should have an interest in how molecular structure impacts larger-scale properties (structure and function) and have an interest in learning state-of-the-art analysis methods (see examples of research studies in the publication list on our website).



<b>Professor's Name</b>	<b>Claire Walczak</b>
Department	Medical Sciences / Biochemistry and Molecular Biology
Lab website	<a href="http://walczaklab-iu.mystrikingly.com/">http://walczaklab-iu.mystrikingly.com/</a>
Position Description	Understanding the molecular mechanisms governing accurate chromosome segregation
Desired Skills & Background	Courses in cell and molecular biology. Some laboratory experience.

<b>Professor's Name</b>	<b>Xingchen Ye</b>
Department	Chemistry
Lab website	<a href="https://www.chem.indiana.edu/faculty/xingchen-ye/">https://www.chem.indiana.edu/faculty/xingchen-ye/</a>
Position Description	Precision synthesis of colloidal nanocrystals and their integration into mesoscale assemblies for energy conversion
Desired Skills & Background	

<b>Professor's Name</b>	<b>Yan Yu</b>
Department	Chemistry
Lab website	<a href="http://www.indiana.edu/~yulab/">http://www.indiana.edu/~yulab/</a>
Position Description	The Yu laboratory develops nanotechnology to understand and engineer cell functions. We design novel nanomaterials, use them to elucidate interactions at the nano-bio interface, and then translate the fundamental knowledge into developing new therapeutic materials.
Desired Skills & Background	Particle fabrication and functionalization; fluorescence imaging.