Research Assistant at the Department of Biomedical Engineering
at Drexel University

**Majors**
Biomedical Engineering (preferred), Biology, Chemical Engineering

**Supervisor**
Dr. Kara Spiller

**Project**
Research Assistant:
The inflammatory response plays a major role in the body’s response to injury, disease, or implantation of a biomaterial. When the inflammatory response functions normally, it can be a powerful force that promotes tissue repair and regeneration, but when it goes awry, disease takes hold and healing is impaired. The goal of the Biomaterials and Regenerative Medicine Laboratory at Drexel University is to understand the mechanisms by which the inflammatory response orchestrates successful tissue regeneration and to develop novel biomaterial strategies that apply these principles to situations in which tissue regeneration is impaired. In particular, we focus on the behavior of the macrophage, the primary cell of the innate immune system, which can rapidly change behavior in response to environmental stimuli to promote inflammation (M1), tissue deposition (M2a), or remodeling (M2c). Through their dynamic phenotypic changes, macrophages function as major regulators of healing.

This project focuses on vascularization of tissue engineering scaffolds. Recently, our lab has shown that macrophages have significant effects on promoting vascularization of scaffolds. However, the mechanisms by which macrophages promote vascularization are not well understood. In this project, the student will focus on determining the mechanism by which macrophages recruit cells involved in blood vessel development, including endothelial cells, pericytes, and mesenchymal stem cells. Relevant assays include co-culture studies and cell migration assays in 2D and 3D. Time-permitting, biomaterials will be designed to control macrophage behavior in order to promote vascularization.

**Requirements**
- Basic lab skills
- Cell culture experience

**Language Skills**
Adequate oral and written communication skills in English

**Possible beginning**
Flexible (exact starting date depends on the visa process). Internship spots are not available before spring 2018.

**Duration**
Timing of the position is flexible

**Costs**
Travel/Housing/Living/Health Insurance Costs must be paid by selected candidates. Visa will be provided by Drexel University.

**Payment/Stipend**
The position is unpaid. Drexel University will provide a $1000 stipend upon arrival.
Interface Programmer at the Department of Computer Science at Drexel University

**Majors**  
Computer Science, Informatics, Engineering, Math

**Supervisor**  
David Breen

**Project**  
**Interface Programmer:** Work within the Drexel Geometric Biomedical Computing Group to develop a web-based interface for research software that automatically calculates the Courtship Index from videos of fruit flies. This is a joint project with a research group in Drexel’s Biology Department. Working with biologists who are the users of the software is an important part of the job. Once the interface is completed, the machine learning aspects of the video analysis software will be enhanced. For more information about the related research project go to https://www.cs.drexel.edu/~david/geom_bimed_comp.html#fly_analysis

**Requirements**  
- Programming experience (C++, Java or python) within a Unix/Linux environment, including shell scripting, is a must.
- Web programming experience, along with some experience with image/video processing, would be very helpful
- Ability to work in a goal-oriented environment with minimal time/task management, and to learn on your own.

**Language Skills**  
Strong oral and written communication skills in English

**Possible beginning**  
Flexible (exact starting date depends on the visa process)

**Duration**  
Timing of the position is flexible

**Costs**  
Travel/Housing/Living/Health Insurance Costs must be paid by selected candidates. Visa will be provided by Drexel University.

**Payment/Stipend**  
The position is unpaid. Drexel University will provide a $1000 stipend upon arrival.
ICE Lab Research Co-op Assistant at the Department of Electrical and Computer Engineering at Drexel University

**Majors**
- Electrical Engineering, Computer Engineering, Computer Science, Applied Physics

**Supervisor**
- Prof. Ioannis Savidis, Director, Integrated Circuits and Electronics (ICE) Design and Analysis Laboratory

**Project**
**ICE Lab Research Co-op Assistant**: The research position involves working with a Drexel University faculty and doctoral student to develop circuit and architecture level techniques and methodologies to protect against third party circuit attacks including intellectual property (IP) theft, integrated circuit cloning and counterfeiting, and insertion of malicious circuit components (hardware Trojans). The student will develop runtime detection and countermeasure techniques that will protect an integrated circuit from adversarial attack. Novel circuits and methodologies will be developed that monitor side-channels such as power noise, thermal variation, and/or electromagnetic interference to detect and locate circuit manipulation. Countermeasures that neutralize foreign circuit functions while maintaining the intended circuit operation will also be developed.

**Requirements**
- Prior coursework or knowledge in electronic circuits, digital logic, and digital circuits is required.
- Knowledge of electronic design automation software (Cadence, Mentor Graphics, and/or Synopsys) for custom integrated circuit design is a must.
- Prior coursework or knowledge in computer architecture and VLSI design is a benefit but not a requirement.

**Language Skills**
- Excellent oral and written communication skills in English

**Duration**
- 4-6 months

**Possible beginning**
- flexible (exact starting date depends on the visa process)

**Costs**
- Travel/Housing/Living/Health Insurance Costs must be paid by selected candidates. Visa will be provided by Drexel University.

**Payment/Stipend**
- The position is unpaid. Drexel University will provide a $1000 stipend upon arrival.
## Co-Op opportunity in the Department of Civil, Architectural and Environmental Engineering at Drexel University

<table>
<thead>
<tr>
<th>Majors</th>
<th>Civil or Environmental Engineering/Environmental Science/Computer Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor</td>
<td>Prof. Franco Montalto</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td><strong>Green Infrastructure Research:</strong> This project takes place at the Sustainable Water Resource Engineering Lab at Drexel University. The Lab is currently studying the ability of green stormwater infrastructure to provide ecosystem services. The field work of this project involves continuous monitoring of climatic, hydrologic, and hydraulic conditions at ~30 different green infrastructure sites such as green roofs, stormwater wetlands, permeable pavements, bioretention “Greenstreets”. The sensors are wired to on-site dataloggers that transmit the data to a Drexel server in real time using cell modems, and other wireless technologies. All of the monitoring setups need regular servicing, and the data is continuously being analyzed, interpreted, and converted into reports. The laboratory work is performed under our rainfall simulator, in our greenhouse, and at an outdoor canopy interception study site.</td>
</tr>
<tr>
<td><strong>Tasks</strong></td>
<td>• Work with researchers at the Sustainable Water Resource Lab&lt;br&gt;• Assist in running experiments at these laboratory facilities&lt;br&gt;• Assist in interpreting research findings</td>
</tr>
<tr>
<td><strong>Requirements</strong></td>
<td>• Basic understanding of hydrology&lt;br&gt;• Interest in working both in the lab and in the field&lt;br&gt;• Willingness to troubleshoot sensors (involves basic electronics work, soldering, splicing wires, changing batteries, troubleshooting data transmission problems, etc.)&lt;br&gt;• Well-organized / excellent time management skills&lt;br&gt;• Strong academic track record&lt;br&gt;Desired, but not required: Experience in Python, R, SPSS, SQL Server, MATLAB, AutoCAD, MS Illustrator</td>
</tr>
<tr>
<td><strong>Language Skills</strong></td>
<td>Excellent oral and written communication skills in English</td>
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<tr>
<td><strong>Duration</strong></td>
<td>5 - 6 months</td>
</tr>
<tr>
<td><strong>Possible Beginning</strong></td>
<td>Flexible (exact starting date depends on the visa process)</td>
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<tr>
<td><strong>Costs</strong></td>
<td>Travel/Housing/Living/Health Insurance costs must be paid by selected candidates. Visa will be provided by Drexel University.</td>
</tr>
<tr>
<td><strong>Payment/Stipend</strong></td>
<td>The position is unpaid. Drexel University will provide a $1000 stipend upon arrival.</td>
</tr>
<tr>
<td><strong>Co-Op opportunity at the Department of Civil, Architectural and Environmental Engineering at Drexel University</strong></td>
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<tr>
<td><strong>Majors</strong></td>
<td>Biology, Chemistry, Environmental Science, Chemical Engineering, Environmental Engineering</td>
</tr>
<tr>
<td><strong>Supervisor</strong></td>
<td>Dr. Christopher Sales, PhD</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td>Environmental Engineering Laboratory: This co-op position involves working with a Drexel University faculty and doctoral student on algal biotechnologies for conversion of waste to energy or other valuable bioproducts. This will require learning laboratory procedures to culture algae in the laboratory and collect and analyze biological and chemical samples from algal photobioreactors and microcosms. Biological analyses may involve extracting DNA, RNA, and proteins from algae. Chemical analyses may involve working with gas chromatographs, liquid chromatographs, and spectrophotometers. The co-op will be required to take Environmental Health &amp; Safety training at Drexel University prior to starting the position.</td>
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</tbody>
</table>
| **Requirements** | • Prior coursework or knowledge in general chemistry and biology is required  
• Prior laboratory experience is a benefit but not a requirement.  
• Excellent work ethic and communication skills.  
• Strong academic track record |
| **Language Skills** | Excellent oral and written communication skills in English |
| **Duration** | 5 - 6 months |
| **Possible Beginning** | Flexible (exact starting date depends on the visa process) |
| **Costs** | Travel/Housing/Living/Health Insurance costs must be paid by selected candidates. Visa will be provided by Drexel University. |
| **Payment/Stipend** | The position is unpaid. Drexel University will provide a $1000 stipend upon arrival. |
## Co-Op in the Department of Mechanical Engineering & Mechanics at Drexel University

<table>
<thead>
<tr>
<th><strong>Majors</strong></th>
<th>Mechanical Engineering, Aerospace Engineering, Materials Engineering, Computer Science, Mathematics, Physics</th>
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<tbody>
<tr>
<td><strong>Supervisor</strong></td>
<td>Dr. Antonios Kontsos, PhD P.C. Endowed Professor in Mechanical Engineering Director, Theoretical &amp; Applied Mechanics Group (TAMG)</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td><strong>Use of Nondestructive Evaluation (NDE) in Experimental Mechanics:</strong> This job is based on the research conducted in TAMG related to use of optical, acoustic and thermal for materials characterization and damage detection (<a href="http://tamg.mem.drexel.edu">http://tamg.mem.drexel.edu</a>).</td>
</tr>
</tbody>
</table>
| **Requirements** | • Knowledge of basic mechanics  
• Prior laboratory experience  
• Computational skills primarily with methods to simulate deformation and failure of materials will be positively viewed  
• Strong academic track record |
| **Language Skills** | Excellent oral and written communication skills in English |
| **Duration** | 5 - 6 months |
| **Possible Beginning** | flexible (exact starting date depends on the visa process) |
| **Costs** | Travel/Housing/Living/Health Insurance costs must be paid by selected candidates. Visa will be provided by Drexel University. |
| **Payment/Stipend** | The position is unpaid. Drexel University will provide a $1000 stipend upon arrival. |