Every year, Rensselaer’s Office of Undergraduate Education sponsors about 700 students participating in the Undergraduate Research Program (URP). The URP is open to all students. Whether you choose to join an ongoing research project or seek faculty guidance in developing your research ideas, the URP will help you make research an integral part of your undergraduate education.

UNDERGRADUATE RESEARCH PROGRAM

The Undergraduate Research Program (URP) helps students identify and facilitate research opportunities. Students may pursue research for academic credit, as a paid assistant in a research project, or for the experience of working in the labs of world-leading Rensselaer faculty researchers. The Office of Undergraduate Education provides funds to students who are working as paid assistants that match the stipends they receive from a sponsoring department or faculty member. URP opportunities are available throughout the academic year.

SUMMER UNDERGRADUATE RESEARCH PROGRAM

The Summer Undergraduate Research Program (SURP) is a unique and exciting opportunity that allows students to spend 10 weeks immersed full-time in leading-edge research with their faculty adviser. Application to this program begins with the submission of a research proposal that is competitively reviewed by a panel of faculty members. With a research stipend included, SURP provides a sustained research experience that is geared to the more seasoned undergraduate researcher. We are confident that your SURP experience will be among the most memorable and rewarding of your academic career.

ADDITIONAL FUNDED RESEARCH OPPORTUNITIES

In addition to URP and SURP, you will find that Rensselaer offers many other undergraduate research opportunities. With the help of faculty members, many students secure external funding to pursue research in their field of interest. Additionally, grants and other funding awarded to faculty members often include a dedicated budget to support undergraduate research experiences. As well, Rensselaer’s varied research centers regularly engage undergraduate researchers during the academic year and in the summer months.

The Office of Undergraduate Education and our faculty researchers can also help connect students with summer research opportunities at federal laboratories around the country as well as with international research internships.
Examples of undergraduate research at Rensselaer include:

- Developing non-invasive methods to deliver drugs to the brain that circumvent the natural blood brain barrier.
- Working with Koala, a new Web-based computer language that uses English-like syntax and visual metaphors to allow for easier writing of code.
- Using information gathered after Hurricane Katrina to create simulations that can predict areas of inundation, structural failures, and storm progress in time and space. These simulations can help prepare for future flood disasters.
- Creating paper batteries using artificial membranes with supercapacitor properties that have been developed for hemodialysis.
- Converting cargo containers into living space to help alleviate housing shortages for Haitian orphans whose residences were destroyed by earthquake activities.
- Refining an online learning game for children to teach them how to speak Mandarin Chinese, making use of modern gaming methodology in a cartoon format.
- Studying nanocomposites composed of biomolecules and their use with nanoscale building blocks to develop a film or coating used for bacterial decontamination.

Brittany Trelly
Lally School of Management and Technology
Faculty Adviser: Lois Peters
Experimental Study of Decision Making Under Uncertainty in Cross-Cultural Entrepreneurial Teams
Are some cultures more conducive for entrepreneurship than others? Recent research indicates that cultural norms can have an impact on management decision-making, as do differences in cognition and underlying language-processing strategies. As a student researcher, Trelly explored how decision making differs as a function of cultural background, using standardized behavioral experiments.

Joshua Murphy Peterson
Biomedical Engineering/ Engineering
Faculty Adviser: Eric Ledet
Spinal Diffusion Factors
As a student researcher, Peterson investigated the various mechanisms that can influence diffusion in the spine. Particular focus was devoted to the transport of molecules into and out of the intervertebral disc. The research team analyzed drug regimens to determine how they can prevent or reverse disc degeneration, observing changes through MRI microCT and histologic techniques.

Kelly Fischbach
Environmental Engineering
Faculty Adviser: James Kilduff
A Fuel Cell Application as a Solution to Solid Waste Disposal
Is it feasible to develop a microbial fuel design that could be used to treat both drinking water and waste water, with a net production of electricity? As a student researcher, Fischbach was responsible for working on the anode and cathode of the fuel cell, taking periodic measurements and polarization curves to check progress.

Alex Papageorgis
Economics/Humanities and Social Sciences
Faculty Adviser: Kenneth Simons
Impact of Efficacy and Price on Diffusion of LED Lighting
LEDs are long-lived and energy efficient, but are they being used to their full potential? Papageorgis joined a research team to explore this question, studying data from the Department of Energy’s Lighting Facts and CALIPER programs. This data “illuminates” the development of LED manufacturing, exploring how the industry is changing and the diffusion of LEDs in the marketplace.

Richard Hutchison
Materials Science and Engineering
Faculty Adviser: Linda Schadler
Expoxy-Zirconia and Silicone-Zirconia Nanocomposites
All light-emitted diodes (LEDs) require an encapsulant that protects them from moisture found in the external environment and other elements. Hutchison was involved with research seeking to produce encapsulant materials for LEDs that have higher refractive indexes and are more optically transparent, thereby allowing for a higher transmission of light.

Anna Peterson
Biology/Science
Faculty Adviser: Patrick Maxwell
Characterizing the Relationship Between Genetic Damage and Lifespan
One prevalent hypothesis regarding the cause of aging is that the accretion of DNA damage limits lifespan. This damage can be seen in the form of gene mutations, among other things. Peterson’s research goal was to determine whether mutations in genes produce corresponding increases or decreases in genetic damage during aging.

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