



STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Step I

Funding Criteria

A. General Rules

1. Students, faculty, and staff are encouraged to submit requests for funding. Student-led projects require a faculty or staff sponsor in order to have funds awarded.
2. Funding can only go to university-affiliated projects from students, faculty, staff, and departments.
3. All SSC projects must make a substantial impact on students. All SSC funding is 100% from student green fees, so the projects funded by the students must benefit them.

B. Things SSC Can Fund, On A Case-By-Case Basis

1. SSC can fund feasibility studies and design work; however, it must work toward ultimately addressing a sustainability need on campus.
2. SSC can fund staff positions that are related to improving campus sustainability. Strong preference will be given to proposals receiving matching funding from departments and/or plans for maintaining continuity of the position after the end of the initial grant.
3. SSC can fund outreach events with a central theme of sustainability, provided their primary audience is the general campus community.
4. SSC discourages requests for food and prizes but will consider proposals on a case by case basis.
5. SSC can fund repairs and improvements to existing building systems as long as it works toward the goal of improving campus sustainability.
6. SSC can provide departments with loans for projects with a distinct payback. Loans will require a separate memorandum of understanding between SSC and departmental leadership pledging to repay the award in full and detailing the payback plan.

C. Things SSC Will Not Fund:

1. SSC will not fund projects with a primary end goal of generating revenue for non-University entities.
2. SSC will not fund personal lodging, food, beverage, and other travel expenses.
3. SSC will not fund any travel expenses.
4. SSC will not fund tuition or other forms of personal financial assistance.

Instructions

Submit this completed application and one map, graphic, or picture to Sustainability-Committee@Illinois.edu. Please adhere to the session word counts. The committee holds the right to decline applications over the designated word counts. If you have any questions about the application process, please contact the Student Sustainability Committee Coordinator at sustainability-committee@illinois.edu.

Project Name: Establishing high-efficiency cold storage capacity for the Miller Lab

Total Amount Requested from SSC: \$30,691.36

Primary Project Leader Name & Email: Dan Miller, millerdj@illinois.edu

Project Abstract: In less than 100 words, briefly describe your project.

The Miller Lab in the Department of Evolution, Ecology and Behavior is brand new and looking to purchase energy efficient fridge and freezer space for the lab to meet sustainability goals of our unit and the University. We need 4C refrigeration and -20C freezers for conventional histology and wet lab, as well as -80C freezer space for molecular work. We currently do not have any freezer storage, and are seeking to purchase highly energy efficient options to minimize our energy consumption needs.

	Education	Energy	Food & Waste	Land & Water	Transportation
Project Category		x			

Project Team Member List (student projects must include their faculty/staff advisor’s information)

Name	RSO/Department	Email Address
Dan Miller (PI)	Evolution, Ecology and Behavior	millerdj@illinois.edu

Questions	Yes	No
Is this a student-led project?		x
If applicable, have you received approval from Facilities & Services and/or site manager?	x	
Do you have a plan for ongoing funding beyond SSC? (SSC cannot guarantee ongoing financial support)		x
Beyond SSC, do you have sources contributing funding or support (ex. staff time, external grants, etc.) to this project?	x	
Have you applied for SSC funding previously?		x

Project Timeline

SSC funding agreements remain active for two years. Please list your project’s timeline and/or milestones.

We are a new lab trying to get set up for histological and molecular work that requires 4C, -20C, and -80C storage. Our lab studies the evolution of intelligent systems, and as such we have projects with short and long timelines; we have an immediate need to establish cold storage in the lab so that we can get started with (all) our experiments, and are excited to begin! Specifically, we are studying the fundamental cellular composition of the brain, and are interested in learning more about cell structure and function.

Project Description

In 250 words or less, describe your project. What does your project hope to accomplish? What are your project's deliverables? Bullet points welcome.

Purchasing energy efficient options saves the lab nearly \$15,000 dollars over 20 years (see attached graphs). The overall goal of research in the Miller Lab is to understand the evolution of cellular organization in the brain. We combine traditional histological methods and advanced computational methods to integrate measurements of brain structure and function from the level of single-cell transcriptomics and deep-learning morphometrics through single-unit receptive fields mapping to parcellation and tractography using ultra high field MRI to create holistic maps of the brain. We are specifically interested in understanding the fundamental organization of the cerebral cortex as a laminated feature of the mammalian brain in order to develop and validate the biomarkers of neurophysiological organization needed to understand the evolutionary history of the human brain, as well as to identify injured and diseased from healthy tissue. We will be collecting brain samples from humans (i.e. brain banks), mice, rats, and birds for molecular and histological analyses and to store samples at 4C, -20C, and -80C. The storage of these samples would allow comparative and longitudinal analyses of brain development and regeneration after injury. These data are extremely valuable, and these samples require careful handling, placing great emphasis upon high quality sample and reagent preservation.

- single cell RNA-sequencing requires -80C
- conventional and molecular histological reagents and samples require 4C and -20C

Environmental Impact

In 200 words or less, how does your project increase environmental stewardship at UIUC? If applicable, what is the carbon, water, waste, and/or energy savings? Does your project relate to the iCAP? Bullet points welcome.

The latest sustainable cold storage offers considerable improvements in energy efficiency compared to their predecessors (see graphs). For example, the models we are looking at (Thermo Scientific energy efficient series) offers the following advantages:

- Uses less energy (kWh/day)
- Produces less environmental heat emissions and lowers HVAC costs
- SNAP compliant, natural hydrocarbon refrigerants
- SNAP compliant, environmentally- friendly, water-blown foam insulation
- HIPAA compliant

Specs about the models we intend to purchase are included, and over 20 years of use, will save approximately \$15,000 in energy costs (see attached graphs).

Student Impact

In 200 words or less, how will this project benefit students? How will students be involved with this project? What educational components are in your project? Bullet points welcome.

The Miller lab is currently training a dozen undergraduate researchers, most of whom intend on pursuing careers in science and graduate school. Many undergraduate students in the Miller lab have come from groups under-represented in science, and/or are first generation college students. Furthermore, the Miller

lab is currently training 2 PhD students, both of whom plan on careers in science. Current undergraduate students play a critical role in the lab of collecting data for our deep learning pipeline and they earn research credits for their projects. Some complete research projects for graduation with distinction and some plan to complete honor theses under the supervision of the lab. Energy efficient cold storage is not only critical for the success of the research in the lab, but also enables student-led research projects.