



LS UROP Office
150 Bond Life Sciences Center
882-5979
www.lsurop.missouri.edu

LS UROP Research Internships - Information & Application for Summer 2008 and Academic Year 2008-2009

Program Background

The Life Sciences Undergraduate Research Opportunity Program (LSUROP) is pleased to announce Research Internships for the 2008 Summer and 2008-2009 Academic Year. Undergraduate interns will participate in basic, theoretical, and/or applied life science research with MU faculty mentors. Research may be conducted in the field and/or in a laboratory setting.

Students *must* make arrangements with a faculty mentor prior to submitting an application. Students are encouraged to seek faculty mentors outside of, as well as within, their own department.

Students who plan to enter masters or doctorate level graduate programs in the life sciences or who are considering a research-related career in the life sciences are strongly encouraged to apply.

Faculty mentors conducting life science research have appointments in a variety of MU colleges, schools, and departments including, but not limited to: Agriculture, Food and Natural Resources (Animal Sciences, Biochemistry, Fisheries & Wildlife, Forestry, Nutritional Sciences, Plant Sciences), Arts & Science (Biological Sciences, Chemistry, Physics), Veterinary Medicine (Biomedical Sciences, Medicine & Surgery, Pathobiology), and Medicine (Anesthesiology, Biochemistry, Medical Pharmacology and Physiology, Molecular Microbiology and Immunology, Ophthalmology, Pathology and Anatomical Sciences). Several interdisciplinary programs, including, but not limited to, the Dalton Cardiovascular Research Center, the Food for the 21st Century Program, Neurosciences, the Genetics Area Program, and the Conservation Biology Program also provide exciting opportunities for undergraduate research. Students are encouraged to check individual department and program web sites for descriptions of faculty mentors' research interests.

Summer 2008 Program

Summer Program interns conduct research on campus with a faculty mentor for a minimum of nine weeks (June 2 - August 1, 2008). There will be a mandatory "team challenge" on Sunday, June 1st and a mandatory orientation session on Monday, June 2nd. Because ten to twelve weeks of research provides a more meaningful experience, we strongly encourage interns to begin their research project in May.

This is a full-time research program. Students are not allowed to enroll in formal coursework while participating as a LSUROP-funded summer intern. Permission to take a class (other than for research credit) may be granted only in extremely rare and exceptional circumstances but must be obtained prior to accepting the internship offer. Interns will be required to attend evening seminars and meet regularly for brown bag lunches to discuss their research projects. The Summer Program culminates with a recognition ceremony and formal poster session on Thursday, July 31st, at which all interns present their research project results.

Summer interns receive a \$3,400 stipend, paid in two installments (end of June, end of July). Stipends are considered as 'scholarship income' - please see the special note below. Students are encouraged to enroll for 3 hours of research credit (honors credit if eligible) through their major department. [Note: LSUROP does not cover enrollment fees and educational expenses.]

The application deadline (including recommendation letters) for the Summer Program is **Thursday, February 14, 2008**. Recommendation letters will NOT be accepted after February 14th. Students graduating in May 2008 are not eligible.

Academic Year 2007-2008 Program

Academic Year Program interns conduct research on campus with a faculty mentor for an average of 15 hours/week during both semesters (fall and winter). Interns will be expected to present their research orally or in a poster format at the Spring Forum.

Interns receive a \$2,400 stipend, paid in four regular installments of \$600. Stipends are considered as 'scholarship income' - please see the special note below. Students are encouraged to enroll for 3 hours of research credit (honors credit if eligible) through their major department each semester. [Note: LSUROP does not cover enrollment fees and educational expenses.]

The application deadline (including recommendation letters) for the Academic Year Program is **Thursday, February 14, 2008**. Recommendation letters will NOT be accepted after February 14th. Students graduating before May 2009 are not eligible.

Intern Stipends

Undergraduate research stipends are considered to be 'scholarship income' and will be processed through the MU Office of Financial Aid. Upon acceptance of the LSUROP internship in April, the MU Office of Financial Aid will be provided with your name, student ID number, and stipend amount. This will be calculated into your financial aid package. The stipend MAY impact your financial aid package. Students are encouraged to discuss this with their MU financial aid advisor prior to accepting the LSUROP award.

After the MU Office of Financial Aid processes the stipend payment, the payment will be placed in your MU student account. If you have any outstanding payments owed to the University (ie, bookstore charges, housing, parking tickets, etc.), these payments will be taken care of first, before a refund check is issued. More detailed information will be provided in April to students who are selected for LSUROP internships.

NCAA Athletes: If you are an intercollegiate athlete, your internship stipend (as scholarship income) may impact your athletic scholarship or eligibility. You should discuss participation in the research internship program with your compliance officer before accepting a LSUROP award.

Finding a Faculty Mentor and Developing a Project

You must identify a MU faculty mentor and, together with your mentor, develop an idea for a research project in the life sciences. You are encouraged to check MU websites with faculty research listings. You are not, however, limited to faculty who appear in these listings. You are strongly encouraged to consider faculty mentors both outside of and within your undergraduate major department.

Your faculty mentor must be able to guide you in the development of your project and mentor you in the laboratory setting. Some projects are best served by faculty co-mentors. If you have co-mentors, one mentor should agree to be the primary mentor. You should request recommendation letters from both faculty mentors. You may wish to include a third letter from a science class instructor if your mentors have not had you in a class.

Your project may be suggested by a course you have taken, the research interests of your faculty mentor, or an idea of your own that challenges you to further exploration. You and your mentor should agree on the nature and scope of your project, your method of inquiry, a timetable, and the means by which you will meet your personal educational goals. If you have questions about the appropriateness of the research project (e.g., does it fall within the general guidelines of life sciences research), you should discuss the project with the Program Director, Linda Blockus, prior to application. Your project should be hypothesis driven and provide a significant intellectual and educational experience. You must demonstrate a clear relationship between your project and important research questions in the life sciences.

The Committee looks favorably on project proposals that are developed and written by the student; however, the initial idea for the project need not be student-generated. The project idea may come from the faculty mentor.

Your faculty mentor will need to provide a letter of recommendation. Please make sure your faculty mentor reads the "Faculty Mentor Information" page found in this packet.

Student Eligibility

Applicants must be MU students who have completed at least two semesters as an MU college student prior to the start of their internship. They must intend to work on a life science research project (basic, theoretical or applied, in the field and/or laboratory) with an MU faculty mentor. Students who will graduate in May 2008 are ineligible for funding. Students graduating in August or December 2008 may apply for Summer 2008 funding, but are ineligible for Academic Year funding.

Current MU freshman ARE eligible to apply, if they will have completed two semesters as a full-time student at MU (Fall 2007 and Winter 2008). It is expected that freshmen will have been working with their faculty mentor for at least three months prior to the application deadline and that their project will be suitable for a research internship. Freshman applicants will be evaluated separately from sophomores and juniors.

Students who have received prior funding from LS UROP programs may apply for additional funding to continue their project with their faculty mentor or seek another mentor/project to broaden their experience. However, applicants who have already had a full year of LS UROP funding may receive lower priority than new applicants.

Students do not have to be majoring in a life sciences discipline to be selected; however, the Committee does expect that the applicant have sufficient background in the life sciences, either through formal coursework or informal learning and/or research experiences, to be able to appreciate the implications of their research to the field of life science.

There is no limit to the number of students that may apply to work with one faculty member. However, the Committee expects that the faculty member will make appropriate arrangements for mentoring the students. It is also expected that the faculty mentor will provide the committee with recommendation letters that clearly compare the students applying to work under his/her mentoring. As final award decisions are made, the Committee members value this input from the mentor.

If you have questions on eligibility, please contact Linda Blockus at BlockusL@missouri.edu or 882-5979.

Intern Selection and Notification

It typically takes four to six weeks to thoroughly review applications and make final selections. As soon as final decisions are made, we will attempt to quickly contact students by e-mail. All students and faculty mentors, regardless of their status, will receive official notification by campus mail (faculty mentors) and U.S. mail (students).

We expect to fund approximately 22 students for the summer and 22 for the academic year with LS UROP funds. We anticipate some students will be funded for both periods. We anticipate 60-90 applications for each period. Students need to indicate on their application form if they wish to be considered for summer, academic year, or both.

Applications

Applications and recommendation letters should be returned to the Life Sciences UROP Office in 150 Bond Life Sciences Center. **The deadline for both the 2008 Summer and 2008-2009 Academic Year Program is Thursday, February 14, 2008.** Students may apply for both funding periods with the same application. A complete application must include:

- 1) Two page application form. The form must be typed or printed neatly in black ink. It must include a list of your classes for Winter 2008 semester. Although prior research experience is not required, if you have prior research experience, you must list it on the application form. Please include the time period (semester/year); your faculty mentor and his/her university/institution; whether you received academic credit, a salary or a stipend; how many hours/week you participated in the research work; and whether it was part of a formal internship program. Part-time lab jobs should also be listed in this section. You are encouraged to expand upon your prior experiences in your personal statement or through a resume'.
- 2) A Brief Project Description (2 typed pages single spaced or 4 pages double spaced). The project description should include the following:
 - Title of your project (between 6-20 words)
 - Introduction: Introduce the topic, explain the problem, put your research into the context of the "big" picture. Explain why the general topic is a significant issue in the life sciences. Refer to the current literature (see below).
 - Purpose: Clear and concise question(s) to be answered or hypothesis(es) to be tested.
 - Methods: A description of research approaches, information to be collected, planned analyses, and activities to be accomplished during the funding period. Do NOT include detailed experimental techniques/protocols -- just cite references or give the standard name of the technique/protocol. Include a description of why these particular methods and approaches are being used to answer your research question.
 - Expected Results/Significance: Explain what you believe your results may yield in terms of filling an important gap in our understanding of a particular question in the life sciences and/or how your research relates to a significant issue or concept in the life sciences.
 - Involvement: Describe what you (the student) will actually DO. Use simple terms to describe how you will contribute to the project indicating how you will spend your time.
 - Literature Review: Students are expected to read appropriate background literature (ie, journal articles) that are closely related to their project or that may provide the student with a broader understanding of how the proposed research project will help answer important questions in the field. Cite 3-5 relevant articles in the body of the project proposal. Inclusion of these citations from other studies (inside or outside of your lab) should be done in the text of your proposal....not as a separate section at the end of your proposal! The list of articles cited; however, should be included at the end of the proposal and may be put on a separate page.

Although you should consult with your mentor, YOU should write the project description. If your research project is not clearly in the life sciences, you must provide an additional statement demonstrating the relationship between your project and important research questions in the life sciences.

Students are advised to use the FULL TWO PAGES (four pages double spaced) for their project proposal. Proposals that are shorter should be revised for more depth and detail (however, this does not mean "fill the space" with experimental protocol detail!) Margins should be 1 inch. Text may be single or double spaced and font size should be 11 - 12 points. Use your discretion and make the proposal readable.

YOU ARE STRONGLY ENCOURAGED TO VISIT THE LS UROP Office (150 Bond Life Sciences Center) to look at the GREEN NOTEBOOK that contains sample project proposals as well as suggestions from faculty reviewers on writing excellent proposals. This information has been gathered for the benefit of student applicants and we expect that students will take advantage of this resource.

- 3) A personal statement (1 typed page single, 2 pages double). Relate your educational objectives for this internship program to your long-range career objectives and professional goals.
- 4) An MU transcript, including Fall 2007 grades. You must go to STARMU and have an unofficial transcript e-mailed to you and then print it out. An "official transcript" on blue paper is NOT required. Jesse Hall no longer prints "Dean's Copies."
- 5) Two letters of recommendation from science faculty or other appropriate mentors/instructors. One letter must be from your proposed research mentor. Letters should be sent directly to Dr. Linda Blockus, Director, 150 Bond Life Sciences Center, by February 14th. Faculty may e-mail letters of recommendation to <BlockusL@missouri.edu>. All letters must be received before your application can be considered complete and ready for review. Faculty recommendation letters will NOT be accepted after February 14th.

Other reminders:

- * Please do NOT staple or bind your application materials. Please use paper clips. All pages should be one-sided. You do not need to use a special envelope or presentation folder.
- * A resume is not required but will be accepted as part of your application materials if you desire.
- * You are encouraged to share your application materials, in addition to your project proposal, with your faculty mentor prior to submission.
- * You should cite references in your project proposal. Please include a reference list (this can be an extra page added to your project proposal).

Letters of Recommendation

- 1) One letter MUST be from your proposed research mentor. Please make sure that he/she has read the "Faculty Mentor Information" page in this packet and returns the form with his/her letter (or includes the requested information in his/her letter).
- 2) Your second letter should be from another regular science faculty member. You may NOT use graduate TAs, lab technicians, or non-science faculty for this second letter. You are encouraged to request a letter from a faculty member from whom you have taken a class, your advisor, or someone with whom you have had prior research or lab experience.
- 3) You MAY include a third recommendation letter; however, this is not required. The third letter may be from another science faculty member, another scientist, a non-science faculty member, or a staff member.
- 4) If you have prior research experience within the past twelve months, you must have your supervisor/mentor from that experience provide a letter of recommendation or explain in your application why you did not obtain that letter. If you have questions about this, please speak with Linda Blockus for advice.
- 5) In some circumstances, a fourth letter may be helpful. If you have questions, please contact Linda Blockus for advice.
- 6) Students should select letter writers that will be able to describe the student's interest/success in the life sciences, their potential as a researcher, and their academic and critical thinking skills. General letters about character and leadership abilities are generally not as helpful for this type of application.

MU Undergraduate Research & Creative Achievements Forum

Monday, April 28, 2008
McQuinn Atrium
Bond Life Sciences Center

For more information
visit the website:
undergradresearch.missouri.edu

Abstracts Due March 15th

January & February LS UROP Workshops

All workshops are in 572 Bond Life Sciences Center.

LS UROP Application Suggestions
Thursday, January 24th - 4:00-5:00 pm

Off-campus Summer Research Programs
Tuesday, January 29th - 4:00-5:00 pm

LS UROP Application Suggestions
Monday, February 4th - 4:00-5:00 pm

For more information, contact the LS UROP Office (150 Bond Life Sciences Center, 882-5979) or e-mail Dr. Linda Blockus (BlockusL@missouri.edu).

NEW STUDENT CLUB FORMING: The Society of Undergraduate Researchers in Life Sciences

This student organized and run club will hold monthly meetings that will include student and faculty presentations, journal article discussions, and GRE prep ideas. If you are interested in being a charter member of this club, contact Tyler Alderson (tlagd8@mizzou.edu). Participation in this club is not a requirement of LS UROP applicants or interns. [But of course, its a great opportunity encouraged by the LS UROP!]

MU LIFE SCIENCES WEEK POSTER SESSIONS

APRIL 14-18, 2008

ABSTRACTS WILL BE DUE BEFORE
SPRING BREAK!

Nutritional Science Research

The Food for the 21st Century Nutrition (F21C) Cluster will fund up to four summer and four academic year undergraduate research internships through the LS UROP application mechanism.

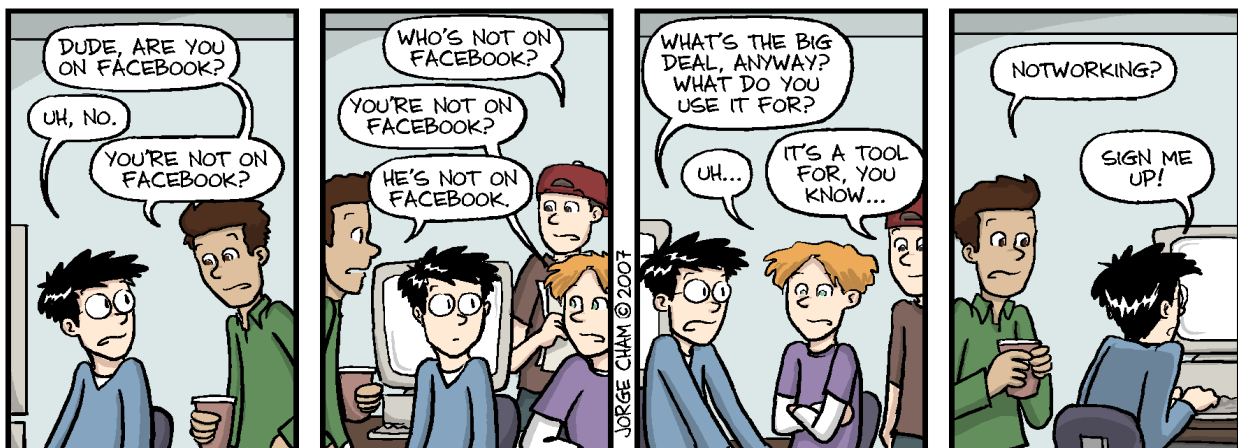
Projects eligible for funding must address an important question in the nutrition field and must be clearly articulated in the project proposal. This source of funding is open to students from all majors with faculty mentors from all departments and programmatic affiliations. Applications will be reviewed by the LS UROP Committee with final decisions on eligibility for Nutritional Sciences funding made by Cluster Leader Dr. Kevin Fritsche. Students selected for funding by the F21C will only be eligible to receive F21C funding for either the summer or academic year; however, may still be selected for funding by LS UROP for the period of time not funded by F21C. Students are encouraged to contact Dr. Kevin Fritsche as they develop their proposals if they are trying to target their applications for the "F21C-nutrition" internship funding. F21C interns will be held to the same guidelines, expectations, policies, and benefits as LS UROP interns, with the additional expectation of presenting their poster at the Nutrition Cluster Poster Session. The funding from F21C provides LS UROP an opportunity to expand the number of positions available for students by targeting funding towards nutritional science projects. Students not selected for F21C funding will still be reviewed within the larger LS UROP pool. Additional questions and requirements can be directed to Dr. Linda Blockus, LS UROP Director. The deadline for consideration is February 14, 2008.

Student Presentations & Travel Grants

Undergraduate researchers are strongly encouraged to publish their research with their faculty mentors and present their research at appropriate campus symposia (e.g., School of Medicine Research Day, Arts & Science Research Showcase, IPG Symposium, Cardiovascular Day). Travel Grants are available to enable undergraduates to attend regional, national, and international scientific meetings and conferences. Travel grants to undergraduates, typically from \$300 to \$800, cover transportation (gas or airfare and ground transportation), lodging, and student registration fees. Students must apply at least six weeks prior to travel. The research to be presented need not have been supported by the LS UROP. For more information and an application, contact Chrystal Graves in the Life Sciences UROP Office in 150 Bond Life Sciences Center.

Training Ecologist Doctors for the 21st Century

UMEB Program - A 14 month research and career training program for underrepresented minority and other underserved students interested in environmental science, environmental health, ecology, biodiversity, or wildlife biology and conservation. The MU UMEB offers research experiences for undergraduate scholars in three inter-related core disciplines central to global environmental health and to the natural environments and resources of the American Midwest: sustainable resources and crop improvement, urban ecology, and forest and grassland ecology. Students conduct two summers of research (with an MU faculty mentor and with an agency/industry partner), earn certification in Environmental Studies, and receive a \$14,000 scholarship. For more information, visit the UMEB website (umeb.missouri.edu). Applications are due Friday, January 15, 2008. For more information, contact Alisa Warren (572-884-1774 or WarrenAl@missouri.edu) in the Office of Undergraduate Research, 150 Bond Life Sciences Center.



WWW.PHDCOMICS.COM

Did you know that undergraduate research had a facebook group? Join today to get the latest information on upcoming events!!

LSURO@P

Life sciences undergraduate
research opportunity program

Faculty Mentor Information and Form Summer 2008 and Academic Year 2008-2009

Letters of recommendation from faculty mentors should include information on previous interactions you have had with the student and the your perception of the academic/scientific potential of the student. Additionally, mentors should provide information on what the student will actually do (i.e., how they will spend their internship time and how they will contribute to the project.)

Freshmen are eligible to apply (see eligibility section).

There is no limit to the number of students that may apply to work with one faculty member. However, the Committee expects that the faculty member will make appropriate arrangements for mentoring the students. It is also expected that the faculty mentor will provide the committee with recommendation letters that clearly compare the students applying to work under his/her mentoring. As final award decisions are made, the Committee members value this input from the mentor.

Faculty mentors should address the educational climate of the research setting (laboratory) in their recommendation letter. Please address who will supervise and interact with the undergraduate intern and the range of educational opportunities provided in the laboratory. Faculty mentors are expected to meet regularly (at least weekly) with the undergraduate intern.

Students MAY apply for continued funding, even if they have already received a year of funding from LS UROP or other sources (McNair, A&S, etc.) However, faculty are expected to describe the anticipated educational benefit the STUDENT would receive with additional funding. Please provide a description in your recommendation letter rationalizing the benefit of continued funding.

Faculty are encouraged to seek other sources of funding for student interns, especially students who have already received LS UROP funding. The Committee appreciates a description of the efforts faculty mentors have made to

secure other sources of funding (ie, NSF REU supplements to faculty grants) for students in their research team. Students that do receive other sources of funding ARE welcome to participate in all LS UROP activities.

The Committee looks favorably on project proposals that are developed and written by the student; however, the initial idea for the project need not be student-generated. The project idea may come from the faculty mentor. The Committee recognizes that student applicants may have been working with the faculty mentor for a very long time (over a year) or for a very short time (less than a month). In evaluating the application and project proposal, *it is helpful for the committee to know how long the student has been working with you, to what extent the applicant was involved in proposal development, and the independence the student demonstrated in organizing and writing their project proposal.* Please use one of these ratings in your letter:

- * Insignificant (e.g., There was no time! or student was too young.)
- * Limited (e.g., Applicant and mentor shared a few brief discussions about the project, student did not have much input into project and/or proposal.)
- * Moderate (e.g., Applicant read research literature or grant and discussed these with the mentor. Prepared an average rough draft.)
- * Considerable (e.g., Applicant prepared a strong rough draft or outline of project prior to mentor's intervention.)
- * Extensive (e.g., Applicant actively participated in the development of the project and/or wrote proposal independently.)

Please include this form with your letter of recommendation sent directly to the LS UROP Office. The student's application will not be considered complete until this form and your letter of recommendation are received. Student applications and letters of recommendation are due **Thursday, February 14th**. Late letters will not be accepted after February 14th. If you are sending your letter via e-mail to the LS UROP Office, you may include this information at the top of your e-mail. (*You do NOT need to send a hard copy of your letter, if you send one by E-mail!*) Please send this form and your letter to: Linda Blockus, LS UROP, 150 Bond Life Sciences Center (BlockusL@missouri.edu). The fax number is 573-884-9395.

Mentor's Name _____ Department _____
Laboratory Address _____ Mailing Address _____
Student Applicant Name _____ Mentor's E-Mail _____

Check List for Faculty Mentor Recommendation Letters (only for Faculty Mentors, *not* needed for other letter writers!)

- ___ 1. If I have more than one student applying to work with me, I have compared the students in my letters of recommendation.
- ___ 2. If a student applying to work with me has already had internship funding through any formal program at MU, I have described in my letter a) any attempts I have made to secure additional funding (through REU supplements from NSF, internal funds, or other means); and b) have described the "value added" to the student's experience provided by continued funding (ie, why should the Committee consider funding the student when he/she has already received funding).
- ___ 3. I have described the educational climate that the student will work in and who will supervise the student.
- ___ 4. I have described what the student will DO over the course of their research experience.
- ___ 5. I have described the extent to which the student was involved in the development of the project
(rate as: insignificant, limited, moderate, considerable, or extensive)
- ___ 6. I have described the extent to which the student wrote the research proposal independently.
(rate as: insignificant, limited, moderate, considerable, or extensive)

Faculty Mentor Signature _____

Date _____