Program Background
The Life Sciences Undergraduate Research Opportunity Program (LS UROP) is pleased to announce Research Internships for the 2016 Summer and 2016-2017 Academic Year. Students may apply for a summer internship, academic-year internship, or both a summer and academic-year internship. 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 doctoral 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, Plant Sciences), Arts & Science (Biological Sciences, Chemistry, Physics), Veterinary Medicine (Biomedical Sciences, Medicine & Surgery, Pathobiology), and Medicine (Biochemistry, Medical Pharmacology and Physiology, Molecular Microbiology and Immunology, Ophthalmology, Pathology and Anatomical Sciences), Nutritional Sciences and Bioengineering. Several interdisciplinary programs, including, but not limited to, the Dalton Cardiovascular Research Center, the Food for the 21st Century Program, Interdisciplinary Plant Group, 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 websites for descriptions of faculty mentors' research interests.

Summer 2016 Program
Summer Program interns conduct research on campus with a faculty mentor for a minimum of nine weeks (May 31 - July 30, 2016). There will be a mandatory orientation session on Wednesday June 1. Because ten to twelve weeks of research provides a more meaningful experience, we strongly encourage interns to begin their research project in mid-May.

This is a full-time research program. Students are not allowed to enroll in formal coursework while participating as a LS UROP-funded summer intern. Permission to take a class (other than for research credit with your LS UROP mentor) may be granted only in extremel rarely and exceptional circumstances but must be obtained prior to accepting the internship offer. Interns will be required to attend evening seminars and small group workshops throughout the program. The Summer Program culminates with a recognition ceremony and formal poster session on Thursday, July 28, at which all interns present their research project results.

Summer interns receive a $3,800 stipend, paid in two installments (end of June, end of July). Stipends are considered as 'scholarship income' - please see the special note below. [Note: LS UROP does not cover enrollment fees and educational expenses.] Students are encouraged to enroll for 3 hours of research credit (honors credit if eligible) through their major department. Additionally, students accepting the LS UROP internship may not accept project funding from another source during this time.

The application deadline (including recommendation letters) for the Summer Program is February 15, 2016. Recommendation letters will NOT be accepted after February 15th. Students graduating in May 2016 are not eligible.

Academic Year 2016-2017 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 spring). Interns are required to present their research in a poster format at the Spring Undergraduate Research and Creative Achievements Forum. Interns receive a $3,000 stipend, paid in four separate installments of $750. Stipends are considered as 'scholarship income' - please see the special note below. [Note: LS UROP does not cover enrollment fees and educational expenses.] Students may enroll for 3 hours of research credit (honors credit if eligible) through their major department each semester. Additionally, students accepting the LS UROP internship may not accept project funding from another source during the same time period.

The application deadline (including recommendation letters) for the Academic Year Program is February 15, 2016. Recommendation letters will NOT be accepted after February 15th. Students graduating before May 2017 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 LS UROP 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 LS UROP 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 March to students who are selected for LS UROP 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 LS UROP 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 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 research 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 research 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 Michael Cohen or Dr. 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 2016 are ineligible for funding. Students graduating in August or December 2016 may apply for Summer 2016 funding, but are ineligible for Academic Year funding.

Current MU first-year students ARE eligible to apply, if they will have completed two semesters as a full-time student at MU (Fall 2015 and Spring 2016). 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.

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 student with recommendation letters that clearly rank and compare the students applying to work under his/her mentoring. Letters that lack this information will be returned. As final award decisions are made, the Committee members value this input from the mentor.

If you have questions on eligibility, please contact Michael Cohen at CohenME@missouri.edu or 882-4818.

**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 12 students for the summer and 13 for the academic year with LS UROP funds and other related funds, including MURF (Monsanto Undergraduate Research Fellowship). We anticipate some students will be funded for both periods. We anticipate 50-70 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 2016 Summer and 2016-2017 Academic Year Program is February 15, 2016. 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 courses for Spring 2016 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 20-60 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. Why is it important that this research project is explored?
   - 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. 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 2015 grades. You may print an unofficial transcript on MYZOU. An "official transcript" on blue paper is NOT required.

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 Michael Cohen, 150 Bond Life Sciences Center, by February 15th. Faculty may e-mail letters of recommendation to <UGR@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 15th.

**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 is encouraged.
* 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 outside of your current research team.

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**ANNOUNCEMENTS**

**MU Undergraduate Research & Creative Achievements Forum**

**Tuesday, April 26, 2016**
McQuinn Atrium
Bond Life Sciences Center

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

Abstracts Due online March 15th

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**The Society of Undergraduate Researchers in Life Sciences Student Club**

This student organized and run club holds monthly meetings that will include student and faculty presentations, journal article discussions, and GRE prep ideas. If you are interested in this club, contact President Kevin Bird (kabrx5@mail.missouri.edu). Participation in this club is not a requirement of LS UROP applicants or interns. [But of course, it’s a great opportunity encouraged by the LS UROP!]

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**LS UROP Workshop**

**LS UROP Application Suggestions**

**Thursday, January 21, 2016** - 4:00-5:00 pm
Room 171, Bond Life Sciences Center
and again on **Monday, January 25, 2016** - 3:00-4:00 pm
Room 171, Bond Life Sciences Center

Students are strongly encouraged to attend!!

For more information, contact the Office of Undergraduate Research (150 Bond Life Sciences Center, 882-5979) or e-mail Michael Cohen (CohenME@missouri.edu).

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**MU Life Sciences Week Poster Sessions**

**April 18-22, 2016**

**ABSTRACT SUBMISSION DEADLINE IS IN March 2016**
Other Related Funding Opportunities

MURF - Monsanto Undergraduate Research Fellowships

MURF funding will be distributed, when appropriate, through the LS UROP application/selection process with the deadline of February 15, 2016. Applications will be reviewed by the LS UROP Committee, and after selections are made based on the quality of the application, research projects that may be appropriate for MURF funding will be considered and assigned to a different funding source than LS UROP. No separate application is required. Funding from MURF provides the opportunity for LS UROP to expand the number of positions available for students by targeting funding towards plant biology projects.

Students that are selected for funding from MURF are held to the same guidelines, expectations, policies and benefits as LS UROP interns. Additional questions can be directed to Michael Cohen.

Nutrition & Exercise Physiology Undergraduate Research Internship

The Department of Nutrition & Exercise Physiology (NEP) and Food for the 21st Century-Nutrition Cluster is pleased to sponsor the NEP Undergraduate Research Internship to encourage MU students to gain research experience in the fields of Nutritional Sciences and Exercise Physiology. It is a 9-month (academic year) internship, with an option to apply for a summer extension. The department includes faculty from three MU colleges (Human Environmental Sciences, School of Medicine, and CAFNR.) Faculty mentors must be included in the list of faculty on the departmental web site. Preference will be given to Majors within the department. The deadline is April 1. The stipend is $3000 for the academic year plus $1000 for the faculty mentor to support the costs associated with the student’s research. Students successfully completing the 9-month internship are eligible to apply for the COMPETITIVE summer extension. The stipend for the summer extension is $4000 plus $1000 for faculty mentor to support costs associated with the research. Note that this extension will only go to those students who have demonstrated significant productivity and have the enthusiastic support of their mentors. This is a SEPARATE application process from LS UROP; however, many elements of the LS UROP application can be used (project proposal, recommendation letters).

More information can be found on the website:  http://ns.missouri.edu/ug_summerintern.html

For additional information, please contact: Dr. Catherine Peterson petersonca@missouri.edu

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. Travel Grants are available to enable undergraduates to attend regional, national, and international scientific meetings and conferences. Travel grants to undergraduates, typically $600, 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 Michael Cohen in the Office of Undergraduate Research in 150 Bond Life Sciences Center.

Additional Opportunities

To learn more about funding opportunities, please visit the Office of Undergraduate Research website at

undergradresearch.missouri.edu
Faculty Mentor Information and Form
Summer 2016 and Academic Year 2016-2017

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 you may explain in your application why you did not obtain that letter. If you have questions about this, please speak with Michael Cohen for advice.

5) In some circumstances, a fourth letter may be helpful. If you have questions, please contact Michael Cohen 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.

Letters of recommendation from faculty mentors should include information on previous interactions you have had with the student and 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.)

First-year students are eligible to apply (please 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 (rank) the students applying to work under his/her mentoring. As final award decisions are made, the Committee members value this input from the

mentor. Letters of recommendation from faculty mentors with two or more applicants will be returned if the student applicants are not clearly ranked within the letters.

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

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 ranked 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)

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

Faculty Mentor Signature ________________________________ Date ________________________________