Happy December UPBM!

You did it! The Fall 2019 semester has come to a close. You all have worked so hard these last few months and your dedication truly shows.

Make sure to check the opportunities section at the end of this newsletter to see when the deadlines are for scholarships or summer research programs.

Have a great break and we’ll see you in the new year!
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Attention Seniors!

Don’t forget to submit your photos for the Class of 2020 Senior Slideshow. Commemorate your time here at the University by taking a trip down memory lane.

You can submit photos by emailing them to Marcie Sherlock

Make sure to follow us on Facebook to keep up to date with the latest UPBM events, opportunities, and important deadlines!

University of Rochester Undergraduate Program in Biology and Medicine UPBM

Learned something interesting recently? Travelled somewhere new and want to share your experiences? Let us know and we can feature your story in upcoming e-newsletters.

You can email submissions to Marcie Sherlock in the UPBM office.

12/20: Winter recess begins
1/15: Spring semester begins
1/20: Martin Luther King Jr. Day (no classes)
2/05: Last Day to add/drop courses in current schedule
SGE’s: Selfish Genetic Elements

According to Dr. Amanda Larracuente a selfish genetic element is “anything that manages to increase its transmission to the next generation, but without doing anything good for the host genome.” Dr. John (Jack) Werren, along with his colleagues Dr. Uzi Nur and Dr. Chung-I Wu were the first to formally coin the term in 1988.

Many of the labs and researchers here in the Biology department study SGE’s. Arvid Agreed, the Wenner-Gren fellow at Harvard University in the department of organismic and evolutionary biology has even gone on to say that “the University of Rochester has one of the highest concentrations of researchers working on selfish genetic elements in North America, if not the world.”

One of the main focuses of researchers here at the University is how SGE’s have impacted evolution. This has helped synthetic biologists understand both the risks and the benefits of genetic systems. For example, biologists could engineer something to stop the spread of malaria in mosquitoes, or have impacts on human medicine.

To learn more about selfish genetic elements and the work researchers are doing in our labs, visit the video titled Why are some genes selfish?

Biology Graduate Student Offered National Institutes of Health Fellowship Grant

Marcus Kilwein ’18 (MS), who is currently a PhD candidate in the biology program here at the University, was just offered a National Institutes of Health F31 fellowship grant. This grant is part of a federally sponsored program and will provide 3 years of financial support to students that are pursuing their doctorate or a research-related degree in health.

Kilwein’s research is about lipid droplets. LD’s are organelles that are “transported within cells and linked to fat metabolism and a multitude of human diseases, including obesity.” His project title is “Effects of Cellular Lipid Droplet Allocation on Lipid Droplet Consumption and Drosophila Embryogenesis”. Kilwein also works in the Welte Lab where he studies the implications of lipid droplet allocation.

He’s also taken on mentoring an undergraduate student. When asked, he said “I mentor Ethan Fisher in the Welte lab who is graduating this semester and applying for jobs as a lab technician. I have trained Ethan in Drosophila genetics, microscopy, and scientific communication. He has developed into a competent scientist who I am glad to have had the opportunity to work with.”

After he receives his PhD, he hopes to receive a post-doctoral research appointment and then go on to becoming a professor. Marcus was a huge help with the May 2019 Diploma Ceremony and we couldn’t be prouder of his achievements. Congratulations!

Click here to read more about Marcus and the other NIH Fellowship recipients.
Graduate with Honors in Research/Defend a Senior Thesis

Want to be recognized for your outstanding accomplishments in research? Officially declared UPBM majors with a minimum biology GPA of 2.7 can apply in their senior year to graduate with honors in research.

Students must have “a novel body of work that includes publication-quality data” that will allow them to generate a senior thesis. Students will have to present and defend their thesis in front of a faculty examination committee in the spring semester. Students that are able to successfully fulfill these requirements will have “Honors in Research” noted on their transcripts and will receive a certificate at their diploma ceremony in May.

How to Apply

Students interested in applying should submit an Application for Candidacy by the first Monday in March of their senior year. For the Class of 2020 the due date is March 2nd. *If you are a Take-5 Scholar, you may choose to defend your thesis in your 5th year.

Planning the Senior Thesis

While the application for candidacy isn’t due until March, students should start planning their thesis at the beginning of their senior year. It is wise to meet with your track advisor and research mentor to keep them up to date. You can use any research that you have obtained through internships, fellowships, voluntary work, or independent research courses to develop your thesis. You can also use data gathered from other institutions to support your claims, however all facts and figures should be derived from you and be part of a collaboration with your research mentor or another faculty member.

You will also need to compile a defense committee who will oversee your thesis defense. They should be 3 faculty members who field of study is relevant to your project. Typically your research mentor will be one of these committee members and will need to recommend one or two other faculty members who would be a good fit. These recommendations MUST be in your application for candidacy. Additionally, these recommendations need to be reviewed and approved by your major advisor.

Thesis Defense

Once your committee has been approved, it will be up to you to coordinate a date, time, and location for your thesis defense. It is advised to have the defense coordinated and the room reserved by mid-April due to the difficulty in room reservations the closer it is to the end of the semester.

Your thesis should be a minimum of 20 pages. It must be a scientific paper and have supporting text, figures, diagrams, and correct references. You must provide copies of your paper to your committee members and the UPBM administrator at least one week prior to your defense. The presentation should be 20 minutes and you must be prepared to answer questions afterward in an oral examination.

Your defense and the results must be communicated to the UPBM office in writing by the end of the first week in May.
de Kiewiet Summer Research Fellowship

Looking to complete research over the summer? Apply to be a de Kiewiet fellow for Summer 2020! Fellows will work for 10 weeks in June, July, and August in the lab of their research mentor. They will receive a $4,000 stipend and will present their research at the UPBM Poster Session the following October.

Eligibility and Project Requirements

To be eligible to apply, you MUST be an officially declared UPBM major in your junior year. Your summer project must be rooted in the biological sciences and non-clinical in nature. This means that the data you yield will be through experimentation and will be analyzed through laboratory work and/or computational methods.

Application Process

1. Find a research mentor. They must be part of the UR teaching faculty. For tips on finding a mentor, visit our website.

2. Submit Intent to Apply online form by March 2nd.

3. Prepare the following 3 documents and upload by March 16th.
   - **Formal Scientific Research Proposal** (6 pages)
     - Background and Significance (up to 2 pages)
       - Explain the background of the proposal and evaluate any existing knowledge. Make note of any data you obtained from current lab workers that is helping base your proposal. You must identify questions that your research/project is meant to answer as well as the significance of your proposed work.
     - Preliminary Studies Conducted by Applicant
       - Most students will not have any but if there is any preliminary data you have obtained related to your proposal, it must be noted.
     - Experimental Design (up to 2 pages)
       - You will need to outline and explain the rationale for the experimental approach you plan to take. List any new techniques you will need to learn in order to complete your research. Do NOT included experimental detail (i.e., buffer concentrations)
     - Literature Citations (only 1 page)
       - Citations should be in alphabetical order
   - **Relevant Professional Experience** (1 or 2 pages)
     - summarize any previous research experience and training that you have done
   - **Research and Career Goals** (1 page)
     - Explain why research is important to both your educational and career goals
4. Ask your research mentor and an additional faculty member to write a letter of support to the UPBM committee. The letter may be emailed directly to BioDeptUgOffice@rochester.edu by March 16th.

5. Ask your research mentor to prepare a Statement of Authorship. This must be emailed to BioDeptUgOffice@rochester.edu by March 16th.

*All work is to be typed, double-spaced, 11-point font, with one-inch margins.

Selection Process
There are only a limited amount of positions available to students, therefore the fellowship is competitive. Once all submissions have been received, the UPBM committee will review and rank this information. The decisions should be made and conveyed to the applicants by mid-April.

For more information about the de Kiewiet Summer Research Fellowship, please visit our website.

Past Research Fellows

2019
First Row Left: Melissa Proven, Valeria Guerra, Michaela Burrell, Simon Ra, Daniel Barnett, Sylvia Lin
Back Row Left: Kamel Awayda, Alex Trapp, Austin Varela

2018
Left to Right: Stephanie Busch, Iyad Sayed Issa, Hayley Chang, Abhishek Dede, Sarah Sandkuhler, Krista Pipho (Not pictured: Joshua Brown)

2017
Left to Right: Jason Glanzman, Andrew Pierle, Reva Peer, Bina Lee, Hasan Beesley, Keegan Stricker
Independent Research Courses in Biological Sciences

Have a research topic in mind and want to get academic credit for it? Take an independent research course this spring! The course can be taken for either two, three, or four credits.

Find a research mentor

Before you can register, you will need to find a faculty member in your area of interest that will agree to instruct your independent research course. Faculty members can work on River Campus or in the Medical Center. The only requirement is that they are part of the University's teaching faculty. For tips on how to find a research mentor, visit our website.

Develop a Course Description

Once a research mentor is found, the next step is to create a course description. The following components will be needed:

- Course Prefix
- Amount of credit hours
- Start Date
- Title (28 characters including spaces)
- Course objectives and learning outcomes (250 characters)
- Laboratory Techniques (250 characters)
- Criteria for how you will be graded (250 characters)
- Exposures to biohazards/safety training (250 characters)
- Instructors permission code

Fill out online UPBM Pre-Registration Form

To register the course with the Registrar's office, two IPC codes are needed. The first is obtained from your research mentor. The second is obtained by filling out the the online UPBM Pre-Registration Form. Besides the course description information, you will need to submit dates for a meeting should any information need to be discussed further. The UPBM office will then follow up with your second IP code.

Submit the CCAS Independent Study Form

Once your course has been approved by the UPBM office, you will need to submit the online CCAS Independent Study Form. Details for completing this form will be given to you upon approval of the previous step.

Important deadlines for Spring 2020:

4 Credit 395 Courses:
- Must start course by 1/24
- Submit UPBM Pre-Registration form by 1/31
- Submit CCAS Independent Study Form by 2/8
- Submit UPBM Pre-Registration Form by 2/14
- Submit CCAS Independent Study Form by 2/21

3 Credit 395 Course:
- Must start course by Friday 2/7
- Submit UPBM Pre-Registration Form by 3/6
- Submit CCAS Independent Study Form by 3/13
- Submit CCAS Independent Study Form by 3/20

For more detailed information visit our Independent Research webpage!
Are you an undergraduate applying for discover grant funding to do research over the summer?

Application Process Changes in 2020

Students and faculty:

The Office of Undergraduate Research at the University of Rochester provides a number of funding mechanisms for supporting undergraduate research experiences. Historically, one of our most popular programs has been the Discover Grant, which provides financial support for undergraduate research experiences during the summer.

Starting in 2020, we are making a number of important changes to this award. In brief:

- All research must take place under the mentorship of a UR faculty member
- The student competition will open in January and close on March 20. Supervisors and recommenders have until March 27 to submit their materials.
- All awards will be $2,500 to support a minimum of 300 hours of research. There will be no partial awards
- Awards will be competitive (we anticipate a success rate of ~50%)
- After the 2020 award cycle, students may receive ONE Discover Grant during their time as an undergraduate (previous awardees may reapply in 2020 only)
- Factors that will be taken into consideration in evaluating applications include the merit of the research plan, educational impact of the research experience, and financial need
- Research supervisors must supply a brief mentorship plan as part of the application
- An optional letter of support will be accepted—from the research mentor, supervisor, or anyone. The letter is not required, although it may strengthen the student's application
- Researchers will be expected to present their work at a research symposium
- Application preview available on our website.

We are very excited about these changes as they will allow us to standardize the offerings of the program and fund students at a level that will enable them to carry out a full-time summer research experience. In the meantime, please do not hesitate to contact our office if you have any concerns or questions.

Sincerely,
Sina Ghaemmaghami
Director, Office of Undergraduate Research
Professor of Biology
Opportunities

Alaskan Observers North Pacific Ground Fish Observer
North Pacific Ground Fish Observer Position Openings

Albert Einstein College of Medicine
Summer Undergraduate Research Program
*Deadline to apply 2/1/20

Amgen Scholars
Amgen Scholars Program *Deadline to apply 2/3/20 or 2/15/20 (dependent on program)

Animal Care Sanctuary
Pre-Veterinary and Animal Science Internships

Boyce Thompson Institute
Summer Internship *Deadline to apply 2/7/20

Caltech
Wave Fellows *Deadline to apply 1/12/20

Case Western Reserve University
Summer Programs

Cincinnati Children’s Hospital
Summer Undergraduate Research Fellowship (SURF) *Deadline to apply 2/1/20

City Internships
Program Overview

Cleveland Clinic Center for Reproductive Medicine
Summer Mentorship Program *Deadline to apply 3/13/20

Cold Spring Harbor Watson School of Biological Sciences
Summer Undergraduate Research Program *Deadline to apply 1/15/20

Cornell University
Boyce Thompson Institute for Plant Research Internships *Deadline to apply 2/1/20
Agritech *Deadline to apply 2/2/20

Coastal Marine Education and Research Academy
Summer Field Research

Davis Projects for Peace
Kathryn W. Davis Projects For Peace

Deutscher Akademischer Austausch Dienst (DAAD)
Paid Research Internships in Germany
*Deadline to apply 12/15/19

Donald Danforth Plant Science Center
Danforth Center Summer Internship Program
*Deadline to apply 2/5/20

Duke University
Science & Society Leadership Award *Deadline to apply 1/31/20

EPA Internships
Medical Research and Health Science Internships Available in Europe! *Deadline to apply for summer session 2/1/20

Fred Hutch Cancer Research Center
Internships in Scientific Research or Medicine
Summer Undergraduate Research Program *Deadline to apply 1/10/20

Fulbright Scholarship
US Student Program

Gerstner Sloan-Kettering
Summer Undergraduate Research Program
*Deadline to apply 2/3/20

GEHI
Ghana Health and Education Initiative

Goldwater (Barry) Scholarship
Scholarship & Excellence in Education Program

Harvard Forest
Summer Research Program in Ecology

Harvard School of Public Health
Summer Program in Biological Sciences Public Health *Deadline to apply 2/1/20

Institute for Health Metrics and Evaluation (IHME)
Post-Bachelor Fellowship *Deadline to apply 1/6/20

Journal of Young Investigators
Article Submission Requirements
Louisiana University Marine Consortium  
Research Experience for Undergraduates  
*Summer 2020 details coming soon

MATCH Education  
Teacher Residency  
*Priority deadline 12/2/19

Mayo Clinic  
Summer Undergraduate Research Fellowship  
*Deadline to apply 2/1/20

MedLife  
Student Opportunities

National Collegiate Research Conference (NCRC)  
NCRC 2020 Applications  
*Deadline to apply 12/15/19

Nemours/Alfred I. duPont Hospital for Children and Nemours Office of Health Equity and Inclusion  
Summer Undergraduate Research Scholarship  
*Deadline to apply 1/15/20

TCS Research Institute  
Scholars in Agriculture  
*Deadline to apply 12/31/19  
Scholars in Plant Science  
*Deadline to apply 12/31/19

University of Iowa  
Summer Undergraduate MSTP Research Program  
*Deadline to apply 1/21/20

University of Michigan  
Summer at Michigan for Undergraduate Research Training  
*Deadline to apply 1/17/20

University of Missouri  
MU-ARTSS Internship  
*Deadline to apply 2/16/20

University of Notre Dame Environmental Research Center  
Research

University of Rochester  
deKiewiet Summer Fellowship  
*Intent to apply due 3/2/20. Subsequent documents due 3/16/20
Research Initiative Award for Undergraduates  
*Deadline to apply 11/22/19
Udall Undergraduate Scholarship  
*First deadline due 11/25/19
Undergraduate Research Exposition (URE)  
*Deadline to apply 3/1/20

University of Texas South Western  
Amgen Scholars Program  
*Deadline to apply 2/3/20
Summer Undergraduate Research Fellowship SURF  
*Deadline to apply 2/3/20

University of Utah  
Summer Program for Undergraduate Research (SPUR)  
*Deadline to apply 1/26/20

University of Virginia / Mountain Lake Biological Station  
Summer Research Experiences of Undergraduates  
*Deadline to apply 2/20/20
Upstate Medical University  
**Summer Undergraduate Research Fellowship**  
*Deadline to apply 2/3/20*

West Virginia University Center for Neuroscience  
**Summer Undergraduate Internship SURI Program**

The Woodrow Wilson National Fellowship Foundation  
**Teaching Fellowships**

**Graduate Studies**

Albert Einstein College of Medicine  
**Biomedical Sciences**

Arizona State University  
**Science and Technology Policy**

UC Berkley  
**Metabolic Biology**  
**Molecular Toxicology**

Cedars-Sinai Medical Center  
**Ph.D. in Biomedical and Transitional Sciences**

Cornell University  
**Ecology & Evolutionary Biology**

Duke University  
**Neurobiology** | **Program in Genetics & Genomics**

George Washington University  
**Environmental Resource Policy Program**

Harvard Medical School  
**Master of Medical Science in Immunology**

Harvard-School of Public Health  
**Ph.D. Program in Biological Sciences in Public Health**

Icahn School of Medicine at Mount Sinai  
**Graduate School of Biomedical Sciences**

Indiana University  
**Biochemistry Graduate Program**

Louisiana State University  
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Seton Hall University  
**MS Biology** | **MS Microbiology** | **Ph.D. Molecular Bioscience**

St. Jude Graduate School  
**Biomedical Sciences**

Stowers Institute for Medical Research  
**Stowers PhD Program**

Stony Book University  
**Neuroscience Masters and Ph.D. Program**

Texas Tech University  
**School of Biomedical Sciences**

University at Buffalo  
**Ph.D. Biomedical Science**

University of California, Los Angeles  
**Ecology & Evolutionary Biology**

University of Colorado  
**Structural Biology & Biochemistry Program**

University of Iowa  
**College of Medicine Degree Programs**

World Teach  
**Programs**

Yale Autism Center of Excellence  
**Yale Fellowship in Developmental Neuroscience of Autism**  
*Deadline to apply 1/15/20*
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- Center for Study Abroad
- Counseling Center
- Dining
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- English Language Program
- The Greene Center for Career Education & Connections
- Facilities
- Journal of Undergraduate Research (JUR)
- Kaplan Test Prep and Admissions
- Libraries
- Multidisciplinary Studies Center
- Pre-Med and Allied Health Professions Advising
- Research Connections Newsletter
- Rochester Academy of Science
- Undergraduate Program in Biology and Medicine
Feedback and Submissions

Have any interesting stories or events coming up you want featured in future newsletters? Please let us know! We would also love to hear your feedback so that we can improve upon future newsletters. You can email marcella.sherlock@rochester.edu with comments, questions, or concerns.

UPBM e-news is produced by the Department Of Biology, Undergraduate Program in Biology & Medicine during the academic year. You are receiving this message as a member of the UPBM community. Please note that the opportunities noted in this issue are not an endorsement. Do not forward this newsletter to other distribution lists. If you are receiving multiple copies or believe this message was sent to you in error, please contact the UPBM Administrator.

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