Hello UPBM and welcome back to the Arctic.

The fall semester went by in a blink which means the spring semester will be over in a hot Texas minute.

Graduation will be here before you know it, so seniors should send in pictures to the UPBM office of all the great moments captured at your parties and get-togethers this semester for this year’s senior slide show.

The theme of this issue is OPPORTUNITY! Especially the ones that make the most of your summer and build CV’s ‘A’ gamers, check out the links posted in the “Opportunities” section. So many advertisements have received over past few months it is difficult to capture this information centrally so be sure to check out the UPBM bulletin board in the Hutchison Hall, 4th-floor corridor and above all visit the Gwen Green Career and Internship Center. Remember everything happens with a plan so be sure to launch your investigations early.

Have an awesome semester.
Students with Dr. Sia during the Halloween Trick or Treat Meet and Greet sponsored by SUBS and the UCC on

CONTENTS

UPBM Poster Session .......................................................................................................................... 3
Independent Research BIO 395 Courses................................................................................................. 4
de Kiewiet Summer Fellowship ........................................................................................................... 5
Health Professions Questionnaire (HPQ) ............................................................................................... 5
Discover and Grant Research Innovation Grant Funding Applications...................................................... 6
Upcoming Events 2017-18...................................................................................................................... 7
College Supplement Funding - New......................................................................................................... 7
Hutchison Hall Trick or Treat Meet and Greet ....................................................................................... 7
My Summer Abroad by Audrey Goldfarb ’19, BIO.................................................................................. 8
Opportunities........................................................................................................................................ 9-10
Helpful Links....................................................................................................................................... 11

Contact Us.......................................................................................................................................... 11
Many thanks to the 22 UPBM majors who presented their research in the 2017 UPBM poster session held on October 13th as well as to those who came out to support their colleagues.

The event was a huge success, and we are hoping to get even more presenters next year.

Dr. Benyajati took several pictures so that you can “Relive the Magic.” Click on the following link to view slideshow: https://www.youtube.com/watch?v=qCseTk3y3t=4s

Presenters of Research

- Hassan Beesley ’18, BS BBC
- Abigail Benvie ’18, BS BBC
- Seyed Ali Biashad ’18, BS BMG
- Hayley Chang ’19, BS BCD
- Anne Cheng ’18, BS BBC
- Varun Chowdhry ’19, BS BBC
- Emma Dudley ’18, BS BMG
- Jason Glanzmann ’18, BS BNS
- Kevin Hayes ’18, BS BMG
- Arif Kodza ’18 T5 (’19), BS BMG
- Jina Lee ’18, BS BMB

- Monica Masterson ’18, BS BCD
- Ena Oreskovic ’19, BS BMG
- Reva Peer ’18, BS BMG
- Andrew Pierle ’18, BS BBC
- Karianne Sretavan Wong ’18, BS BNS
- Keegan Stricker ’18, BS BBC
- Jonathon Thomalla ’18, BS BCD
- Thy Vo ’18, BS BMG
- Clara Wolfe ’18, BS BBC
- Isaac Wong ’19, BS BCB
- David Yang ’18, BS BNS
Independent Research (395) courses allow UR undergraduate students to gain research experience in biological science laboratories located in River Campus or the medical center during the academic year.

Students will need to find a faculty research mentor who works within their area of interest and will agree to instruct a research course. For tips on how to find a research mentor visit website or talk with your advisor or a UBPM Peer Advisor to gain their valuable insights.

Typically 4-credit classes need to start and be registered within the first two weeks of the semester (see Spring 2018 deadlines below).

Although independent research is not a typical lecture hall experience, it is still a course that requires defined objectives, learning outcomes, contact hours, and criteria for evaluation usually associated with any traditional credit-bearing course. Students and their 395 instructors should develop a mutual understanding of all of these details before going online to start the registration process.

The research associated with these courses must be rooted within the biological sciences and is non-clinical in nature. Although some scientific arguments may be inspired through clinical studies it is expected that the proposed research will yield data from experimentation that involves laboratory and/or computational methods that is performed and analyzed by the student enrolled in the course.

Independent Research Courses require regular supervision from an instructor who is a member of the UR "Teaching" faculty.

Please note that the process of registering a Bio Sci 395 course is different from the way students enroll in courses within other fields of study in that two online forms need to be submitted. A pre-registration and an Independent Study (IS) form. Additionally, Bio Sci 395 courses require 2 Instructor Permission Codes (IPC) codes. One IPC is received by 395 instructor and the other is received upon approval of the pre-registration form. Instructions for registration are as follows:

**Step 1:** Have a conversation with your faculty with respect to course title, number, credits, start date, description, lab techniques, how they will grade the course, instructor’s permission code, and any safety training that might be needed.

**Step 2:** Submit pre-registration Form. These forms are reviewed by the major advisor and the UPBM Office. The advisor will contact students directly should they have questions or need to meet. Afterward, the form will forward to the UPBM office who will contact the student with the second instructor’s permission code (IPC) and next steps needed to complete registration.

**Step 3:** Submit Independent Study form to the College for further review and registration onto transcripts:

**SPRING 2018 DEADLINES**

- **4 Credit 395 Courses:**
  - Must start course by **Friday 1/26**
  - Submit pre-registration form by **Friday 2/2**
  - Submit Independent Study Form by **Wednesday 2/7**

- **3 Credit 395 Courses:**
  - Must start course by **Friday 2/9**
  - Submit pre-registration form by **Friday 2/16**
  - Submit Independent Study Form by **Wednesday 2/21**

- **2 Credit 395 Courses:**
  - Must start course by **Friday 3/2**
  - Submit pre-registration form by **Friday 3/9**
  - Submit Independent Study Form by **Wednesday 3/14**

Should the deadline for UPBM approval be missed, the course instructor will be required to e-mail the UPBM office to confirm that the course has been meeting regularly.

Please note, that students must submit a final report or poster that summarizes the research performed over the semester by the last day of exams. Students must produce a new and different final report or poster for each semester a 395 course is taken.


**Related:**
- Credit Regulations
- Finding a Research Mentor
- Requirements
- Research Connections Newsletter
de Kiewiet Summer Fellowship 2018
Open to Junior UPBM Majors and Application Process

The de Kiewiet fellowship is an annual summer program that allows students the opportunity to research for ten weeks in a biological science laboratory located either on river campus or in the medical center during the summer between their junior and senior year. Also, fellows will also gain the experience of creating and presenting a poster of their research findings at the UPBM Poster Session in October of their fellowship year.

The Fellowship is open to officially declared UPBM majors in their junior only. Take five students are not eligible to apply to the fellowship in their 4th year.

The Undergraduate Program in Biology and Medicine (UPBM) include the following tracks:

- BA BIO (Biology)
- BS BBC (Biochemistry)
- BS BCD (Cell and Developmental Biology)
- BS BCB (Computational Biology)
- BS BEB (Ecology and Evolutionary Biology)
- BS BMB (Microbiology)
- BS BMG (Molecular Genetics)
- BS BNS (Neuroscience).

How to Apply:
1. Find a research mentor
2. Email "Letter of Intent" to Marianne Arcoraci by Friday, March 2nd.
3. Upload to Blackboard by Monday March 19th:
   a. Formal Scientific Proposal
   b. Summary of “Relevant Professional Experience”
   c. Summary of “Research and Career Goals”
4. Ask the faculty who have agreed to mentor the project to submit a Letter of Recommendation and Statement of Authorship directly to the UPBM administrator by Monday March 19th
5. Ask another faculty member (preferably within the scientific field) to write a letter recommendation and send it directly to the UBPM Administrator by Monday March 19th.

The UPBM Advising committee will review and rank all proposals. Decisions are usually communicated by mid April.

Health Professions Questionnaire (HPQ)
Deadline February 3rd, 2018

Are you planning to apply to Medical, Dental or Veterinary School this summer for 2019 matriculation? If so, you may be eligible to receive a Health Committee Letter from the University of Rochester in support of your application.

Most professional schools will look for a Health Committee Letter (HCL) from Rochester applicants. This letter is prepared through the Health Professions Questionnaire (HPQ), and will include information from your questionnaire, interview, academic record and relationship with the career advising staff in the Gwen M. Greene Center.

In order to receive a Health Committee Letter you must complete the necessary steps by the designated deadlines, which are strictly enforced. The Health Professions website has tips for making your application more competitive in addition to detailed application timelines.

If you have questions or need to review your candidacy, please schedule an appointment with a career advisor through Handshake.
Honors in Research
Interested Seniors Submit Application for Candidacy by March 5, 2018

Students who have developed their skills in Biological research have the opportunity to receive honors by successfully writing and defending a thesis during their senior year. Officially declared UPBM majors with data of exceptional quality and a minimum BIO GPA of 2.7 qualify.

Candidates must have developed a novel body of work that includes publication quality data from which to generate a senior thesis. Also, candidates must successfully present and defend their senior thesis before a faculty examination committee.

The planning of a senior thesis begins before or at the beginning of the senior year. Students should consult both their major/track coordinator and research advisor before applying.

Research data obtained through Independent Research (395) courses, fellowships, internships, and voluntary work may be used to support the thesis. Also, research performed at other institutions may be used as long as the thesis is written under the supervision of a U of R full-time faculty member.

Data collected from other institutions outside of the university may be used to support a portion of the thesis; however, all facts and figures reported as results in the thesis must be derived by the candidate and must be part of the collaboration with the UR faculty who is overseeing the writing of student's thesis.

Interested students and the faculty who is supervising their thesis must submit an Application for Candidacy online by Monday, March 5th, 2018. The form will ask for some preliminary information, a summary of the thesis along with the student’s and faculty’s recommendations for 1 to 2 faculty to serve on the defense committee. All applications are reviewed and approved by the student’s major advisor and the UPBM office. Further instructions on committee formation are available on the Application for Candidacy.

Once the candidate’s application is approved the student must complete and submit a thesis to an evaluation committee approximately one week before the scheduled defense.

The defense consists of a 20-minute open presentation to a faculty committee followed by a private evaluation.

A defense committee for a senior thesis consists of three UR faculty members who work within a relevant field of study and are qualified to examine the candidate’s thesis.

The research mentor serves on the committee and will need to provide at least 1 - 2 names of “Teaching Faculty” who work within a relevant field of study, are qualified to evaluate the thesis and would be willing to serve. The candidate’s advisor may also serve on the committee or may choose to delegate. Additionally, a fourth member may be added at the discretion of the student’s advisor.

Please note that students do not need to register an Independent Research (395) course for a senior thesis unless necessary to complete experimentation.

Please visit the Honors in Research Website and application for more information on the senior thesis, defense committees, and planning timelines.

Fourteen students from the class of 2017 successfully wrote and defended a senior thesis. See UPBM E-newsletter June 2017 Edition for further details on last year’s participants.

Related:
Application for Candidacy
Honors in Research Website

Discover & Research Innovation Grant Funding Applications

Trying to find a way to get your research funded over the summer? Visit the UR office of undergraduate research website to read up on available grant funding. and how to apply for it. Please note there are deadlines for each.

Discover Grants for Undergraduates
https://www.rochester.edu/college/ugresearch/discover.html

Research and Innovation Grant
https://www.rochester.edu/college/ugresearch/rig.html
Upcoming Dates
Will email majors more information as we get closer to the events

03.02.2018 (Friday)  
**de Kiewiet Fellowship Letter of Intent e-mail due (Juniors only)**

03.05.2018 (Monday)  
**Honors in Research Application for candidacy due (Seniors only)**

03.19.2018 (Monday)  
**de Kiewiet Fellowship application materials due (Juniors only)**

May 2018 (TBD)  
**UPBM Pizza Break - usually during reading period**

05.04.2018 (Friday)  
**Honors in Research candidates must defend thesis by first Friday in May**

05.20.2018 (Sunday)  
**Biology Department Diploma Ceremony (Commencement)**

College Supplemental Fund  
For Programs, Conferences Competitions, and Events

Students may complete the College Supplemental Fund Application in order to request supplemental funding to attend or participate in academic, professional, or experiential programs. Funding is available on a rolling basis. Relevant departments may be asked to contribute funding toward the overall need as indicated on the application. Students may request funds as individuals, or on behalf of a group. Only one representative from each group should complete an application.

The College Supplemental Fund Application is not intended to replace existing funding opportunities, such as the funding available from the Student Association Appropriations Committee (SAAC). Groups that would like to request funding from the Student Association are required to complete a separate application through the Campus Community Connection.

**Process**

1.) Prepare  
Familiarize yourself with the application components by reviewing the sample application.

2.) Discuss  
Meet with your Primary Advisor or Sarah Van Munster in the College Dean’s Office to discuss the activity and application as needed.

3.) Submit  
Submit complete College Supplemental Fund Application in Perfect Forms.

4.) Review  
Watch for an email from the College Funding inbox to notify you of departmental contributions.

Visit the following website for more information: [http://www.rochester.edu/college/student-funding/college-supplemental-fund.html](http://www.rochester.edu/college/student-funding/college-supplemental-fund.html)

Hutchison Hall Trick or Treat Meet and Greet
Sponsored by the Society of Undergraduate Biology Students (SUBS) and the

The Society of Undergraduate Biology Students (SUBS) together with the Undergraduate Chemistry Council (UCC) held the Hutchison Hall Trick or Treat Meet and Greet on Friday, October 27th. Students visited the instructors listed on the passports provided and were able to network while enjoying candy, cider, and donuts!

“We hold these truths to be self-evident: that all scientists are created equal, that they are endowed by the University with certain unalienable rights, that among these are life, liberty, and the pursuit of Halloween candy”- Excerpt from the Declaration of SUBS AND UCC“

Related:
Society for Undergraduate Biology Students Website  
On-line SUBS T-shirt Order Form
This summer, I worked in Professor Richard Festenstein's Lab, which studies epigenetic mechanisms and disease, at the Hammersmith Hospital campus of Imperial College London. This experience was funded in part by a Discover grant from the University of Rochester.

To find a position, I emailed dozens of PIs around London to inquire if they were able to take on a summer student. Only two were able to accommodate an intern. I decided upon the Festenstein Lab after interviewing in December during a visit to London, finding myself fascinated by Professor Festenstein's work.

Epigenetic modifications of chromatin play many roles in chromatin structure and gene expression. It has been suggested that abnormalities in the epigenetic code might lead to sexual dimorphic diseases. Heterochromatin protein 1 (HP1)-alpha, beta and gamma are epigenetic modifiers of chromatin important for regulating gene expression, centromere stability, and telomere capping. Unlike the other two HP1 isoforms, HP1γ is present in both euchromain and heterochromatin, and previous data shows that it plays a role in both the repression and expression of genes in a sexually dimorphic fashion. This finding that HP1γ is crucial for regulating sexually dimorphic autosomal gene expression has important implications for understanding physiological sex differences and sex bias in disease. I began working on a project with a Ph.D. student and Masters student to elucidate the mechanism with which this protein functions. Once I became acclimated in the lab and had familiarized myself with some of the lab's preliminary results and the literature on HP1γ, I began my own side project to investigate the role that HP1γ plays in telomere maintenance.

Based on preliminary data suggesting that HP1 gamma binds preferentially to female telomeres, we hypothesized that HP1 gamma plays a sexually dimorphic role in telomere maintenance. In this preliminary study, wild type and HP1γ knock-out primary mouse embryo fibroblasts were assayed for telomere instability, fusion and loss. Our results obtained from HP1γ-/- female cells showed significantly higher telomere instability compared with cells from wildtype littermates. These results implicate HP1γ in preventing telomere fragility, which, due to its preferential binding to female telomeres, may provide a novel mechanism for sexual dimorphism.

In females, the inactivated X chromosome may be acting as a sink for HP1γ, resulting in the observed sex dimorphism. Experiments are currently underway to test this hypothesis.

During my time as a student researcher there, I was able to attend talks by leading researchers from all around Europe, present my work at the annual London Institute of Medical Sciences Retreat, and speak with DNA damage repair researchers at the Francis Crick Institute. As well as having an amazing learning and research experience at Imperial College London, I also had the opportunity to travel to Paris, Bath, Bristol, Wales, and Edinburgh. Exploring London as well as other areas of the U.K. and Europe made the summer a truly valuable and unforgettable experience.
Opportunities

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

Albert Einstein College of Medicine
Summer Undergraduate Research Program

Amgen Scholars
Amgen-UROP Scholars Program

Amgen Scholars
Program Homepage

Cornell University
Boyce Thompson Institute (BTI)
Summer Internships in Plant Genomics and Bioinformatics

Case Western Reserve University
Summer Programs

Chariot Learning
GRE Prep Courses

Cincinnati Children's Hospital
Summer Undergraduate Research Fellowship (SURF)

City Internships
Program Overview

Cleveland Clinic Center for Reproductive Medicine
Summer Internship Program

Cold Spring Harbor Watson School of Biological Sciences
Summer Undergraduate Research Program

Columbia University / Barnard College
Amgen Scholars Summer Research Program

Cornell University
Boyce Thompson Institute for Plant Research Internships

Danforth Plant Science Center
REU Summer Internship Program

Davis Projects for Peace
Kathryn W. Davis Projects For Peace

Deutscher Akademischer Austausch Dienst (DAAD)
Paid Research Internships in Germany

Duke University / Robert Noyce
Teacher Fellowship Program

EPA Internships
Medical Research and Health Science Internships Available in Europe!

Fred Hutchinson Cancer Research Center
Summer Undergraduate Research Program

Fulbright Scholarship
US Student Program

Gerstner Sloan-Kettering
Summer Undergraduate Research Program

GEHI
Ghana Health and Education Initiative

Global Health Corps fellowship

Go Eco Volunteer
Volunteer Opportunities

Goldwater (Barry)
Scholarship & Excellent in Education Program

Harvard School of Public Health
Summer Program in Biological Sciences Public Health

Harvard University
Harvard Forest Summer Research Program

Hutchinson (Fred) Cancer Research Center
Summer Undergraduate Research Program

Hutchinson (Fred) Cancer Research Center
Internships in Scientific Research or Medicine

Homeland Security DHS Education Programs
HS-STEM Summer Internship Program

Institute for Health Metrics and Evaluation (IHME)
Post-Bachelor Fellowship

Journal of Young Investigators
Author Guidelines Requirements

Kaplan Test Prep
Study Support

Louisiana University Marine Consortium
Summer Field Course Information

MATCH Education
Teacher Residency

Mayo Clinic
Summer Undergraduate Research Fellowship

MedLife
Opportunities

Duke University
Masters in Bioethics & Science Policy

Harvard Medical School
Master of Medical Sciences of Immunology

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

Harvard School of Public Health

Multidisciplinary International Research Training (MIRT Program)

University of Colorado
IQ Biology Ph.D. Program

University of Maryland
Biophysics Program

Salisbury University
Masters in Applied Biology
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.