

DEPARTMENT OF

# BIOLOGY

Summer Newsletter 2017

## New Computational Biology Major Graduates First Two Students

FULL STORY PAGE 7

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SCHOOL OF  
**ARTS & SCIENCES**  
UNIVERSITY of ROCHESTER



## A Message from the Chair

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**Michael Welte**

### **Dear Biology Alumni and Friends,**

Welcome back to the newest edition of the Department of Biology newsletter. It has been a year full of changes and new developments. The department continues to be an exciting and vibrant place for research and teaching, and I hope you will enjoy hearing about some of the highlights gathered in this newsletter. And when you return to campus for Meliora weekend or other occasions, please stop by the department and say hi to old friends.

This year, 196 students graduated with degrees in areas covered by the Undergraduate Program in Biology and Medicine (UPBM), including the BA in biology and BS degrees in biochemistry, cell and developmental biology, ecology and evolutionary biology, microbiology, molecular genetics, and neuroscience. In addition, we had the first graduates with a BS in computational biology, our newest, rapidly growing major. More than half of our graduates took advantage of the opportunity to directly participate in research by joining one of the many research laboratories here, rubbing shoulders with graduate students, postdoctoral fellows, and professors.

Our department takes pride in its teaching mission, and I am therefore particularly pleased that this year the University has recognized two of our own for their outstanding teaching contributions. Tom Eickbush is a professor of biology and former chair; he was honored at commencement with the Edward Peck Curtis Award for Excellence in Undergraduate Teaching. Adam Johnson is a senior graduate student in the department, and he is the recipient of the Edward Peck Curtis Award for Excellence in Teaching by a Graduate Student. These are University-wide awards, and there is stiff competition for them.

Our UPBM office has undergone major restructuring and expansion over the last year. After nearly nine years of service, Jennifer Baylark left to pursue new opportunities. We recruited two new staff members, Allyson Withey and Patricia Aloï, and—under the leadership of Marianne Arcoraci—reorganized and updated the office. Additional changes and innovation to the UPBM are in the works, so stay tuned for more news soon. Our goal is to ever better serve our undergraduates.

We also said goodbye to a number of faculty over the past year. Daniel Garrigan moved to the Bay Area for a new career in the industrial sector, Christian Rabeling joined the University of Arizona to collaborate with a large group of investigators studying social insects, and Daniel McNabney just accepted a teaching position at the University of Georgia. And in May we received the sad news that

former faculty member William Muchmore had passed away. Dr. Muchmore joined the University in 1950 and was a beloved teacher. In fact, in 1966, he was one of the inaugural recipients of a newly established University award to recognize faculty members for outstanding teaching.

We also had an influx of new faculty that bring exciting, cutting-edge research to the department. Last August, Dan Bergstrahl opened his lab and established his cell biology research group in Hutchison Hall. Dan studies fundamental aspects of cell division, using microscopy, fruit fly genetics, and cell culture. An article in last summer's newsletter has lots more information about him. Patrick Oakes is a new assistant professor in the Department of Physics and Astronomy with a secondary appointment in the Department of Biology; his research on the cytoskeleton and the forces that shape cells straddles the intersection between biology and physics. In July 2017, Justin Fay joined our department as an associate professor. Justin is a yeast evolutionary biologist with expertise in computational biology. He comes from Washington University in St. Louis

and brought two graduate students and one postdoctoral fellow with him. His laboratory is already humming. Finally, we recruited a new assistant professor, Nancy Chen, who studies birds to address basic questions in ecology, evolution, and genomics. Nancy will complete one more year of postdoctoral research and join the faculty at the University of Rochester in the summer of 2018.

As you can see, there is always lots of news from the department, and you don't have to wait for the next newsletter to stay in touch with us. You can follow the latest news, as well as coverage of ongoing research projects and other departmental activities, on our [website](#). We would also be delighted to hear from you and use this newsletter to pass on your news to friends, classmates, and fellow alumni.

**Michael Welte**

## WANT TO GET INVOLVED?

**Supporting the Department of Biology is easy!  
Watch for opportunities in this issue!**

Gifts to the biology department help create academic and research opportunities for students and faculty that will have a profound effect on human health.

***To make your gift or discuss opportunities to support the department, please contact***

**Kate Clyde**

Associate Director of Advancement  
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# Department Works with Upward Bound Program to Reach Students in the Rochester Community

by Jennifer Brisson

The Department of Biology was delighted to welcome students from the Upward Bound (UB) Program for six afternoon lab sessions during the month of July. This marks the third summer that faculty, students, and staff have volunteered for this activity. We're hoping to make it a summer tradition.

The David T. Kearns Center for Leadership and Diversity in Arts, Sciences & Engineering runs the UB program, working with high school students who are potential first-generation college students and/or have a low income according to federal guidelines. Students come from local schools in the Rochester City School District.

The first week of labs included ninth- and tenth-grade UB students. Everyone had a lot of fun with these hands-on experiences. The Sia lab showed the students the amazing amount of DNA contained in strawberries; the Brisson lab demonstrated how ladybugs can be voracious predators of aphids; and the Ghaemmaghami and Fu labs tested food's biochemical properties and revealed how exercise changes our physiology. The second week of classes has not yet happened as of this writing but promises to be an action-packed week of biology with the Bi, Bergstralh, and Welte labs. In many cases, biology PhD students were the driving forces behind the labs. In particular, Kyle Swovick, Jillian Ramos, Nicole Dawney, Mary Grantham, Binshuang Li, and Jasmine Siler helped design and implement the labs, with funding for their efforts provided by the Center for the Integration of Research, Teaching and Learning (CIRTL).

Many people from the department participated in this endeavor. Faculty, staff, graduate students, and

undergraduates all helped to prepare, teach, and interact. In addition, numerous UB staff helped make it happen. We are grateful for everyone's support and enthusiasm.



*An incoming University of Rochester undergraduate works with UB high school students testing hypotheses about ladybug predation.*

We are also pleased to announce that the Department of Biology is now hosting UB students as summer interns, with each intern learning real-world science in individual research laboratories. Four interns spent three afternoons a week in the lab for four weeks. Research mentors also received funding from CIRTL. We hope to make this a yearly tradition as well.



*PhD student mentors Binshuang Li, Longjun Wu, Adam Johnson, Nicole Dawney, and Mary Grantham (not shown: Jasmine Siler) with interns Ty-Asia Edwards, Patience Girigiri, Aye Wathy Mya, and Erika Fernandes*

Please consider making a tax-deductible contribution to the Department of Biology's "U-ROC" (University of Rochester Outreach Committee) fund. All contributions will be used to enhance our expanding programs.

To donate, please make your check out to the University of Rochester and mail it to Kathy Giardina, Box 270211, Rochester, New York 14627. Please feel free to contact [Brenna Rybak](#) for more information.

# New Course Emphasizes Community Engagement with Hands-On Experience

By Daniel Bergstralh

Starting this fall, the Department of Biology will offer a new undergraduate course: Practicum in Community Engagement, BIO 399. The first of its kind at the University of Rochester, BIO 399 will prepare 14 seniors in education theory and practice before they enter Rochester City School District (RCSD) classrooms and teach hands-on laboratory exercises. The course is being developed and run by codirectors David Goldfarb (Biology) and Michael Occhino (Warner School of Education), Mike Daley (Warner School), and Alexis Stein (Biology). Development of the laboratory exercises and curriculum are supported by a grant from Dean Richard Feldman and administered by Stuart Jordan (director of the Center for Excellence in Teaching and Learning).

The University is increasingly committed to community engagement, especially with regard to STEM education. While there is already a strong tradition of cocurricular service activities, Dr. Jordan has been working for several years to try to place outreach within the undergraduate curriculum (for credit). He notes that the opportunity to develop a course in which students earn credit specifically for community engagement “is potentially transformative for us. Instead of more or less ‘one-off’ cocurricular events, we can develop an ongoing program that benefits our undergraduates, high school students and their teachers . . . The hope is that permanent resources, facilities and staffing will become more permanent once community engagement becomes part of the formal curriculum.”

Michael Occhino, a Warner School graduate with extensive experience in K–12 teaching, is committed to leveraging the resources of the University to benefit local education. Over the past several years he has helped lay the groundwork for BIO 399 by building relationships between the University and the schools involved, and particularly among the teachers. These strong connections allow the BIO 399 staff to undertake a pilot program; an unprecedented



attempt to bridge the University and high school communities through academics. In the future, after the template has been established, similar courses might be offered in other disciplines, such as chemistry and earth and environmental sciences.

## SO WHY START WITH BIOLOGY?

The Department of Biology was approached because our department has a long-established record of participation in, and enthusiasm for, community outreach. Included among past efforts of the department’s Outreach Committee (cochaired by professors Goldfarb and Brisson) are a number of educational programs targeting Rochester City Schools and, in general, communities whose children are less likely to graduate or go to college. Biology faculty also contribute to summer programs such as the Upward Bound program run by the Kearns Center and the Horizons summer program run by the Warner School. During her PhD studies in Elaine Sia’s lab, Dr. Stein participated in a lot of outreach activities organized through the Department of Biology, including school science visits.

The course is ambitious. One of the goals, according to Occhino, is “to give undergraduates an experience that is social-justice oriented and creates

opportunities for expanding their world.” This speaks to the possibility that science communication could provide broader perspective for the undergraduate participants on issues ranging from public perception of science to potential careers—among them science teaching. (This last point is underlined by the “fifth-year” master’s in education program offered by the Warner School.) On the other hand, to be successful, the course also must be beneficial for the community, not just the undergraduates.

The labs themselves will be designed to enrich the high school curriculum, and it will be equally important to fascinate and excite the high school students about biology. Implementing the labs requires educational rigor. The BIO 399 undergraduates will receive formal training in science pedagogy, diversity awareness, and hands-on teaching. In collaboration with Professor Goldfarb and in consultation with Occhino and Daley, Alexis Stein will develop the hands-on laboratory exercises. Dr. Stein is experienced in the challenges of designing lab exercises; she has had several years of involvement with outreach, during which she designed “Biology in Box”-style practical labs aimed at teaching biology in a hands-on way. In addition, Dr. Stein has played a central role in developing five new laboratories for our freshman biology courses. The coursework will be led by Michael Occhino and Michael Daley, who are exceptionally well qualified; Occhino’s background is in science education, and Daley also has career experience working in science. Undergraduates will take full responsibility for learning the labs and teaching them in actual ninth-grade RCSD classrooms, and their performance will be assessed and evaluated.

All of the people I spoke with emphasized, though each in different ways, that the lab demonstration experience is bidirectional. Effective outreach requires the University of Rochester students to not simply relay their knowledge of biology but to share it with the larger community. The undergraduate instructors must therefore engage actively with the students. What perspectives do the high school students bring to the demonstration? How can these be brought into a common aim with the instructors? Put another way, engagement means

learning from the audience, not just teaching. One way this will be achieved is by sending the undergraduate students to the same high school classrooms to help build relationships. The undergraduates also will create five-minute videos that introduce themselves and the exercises to the students. These videos will be shown to the class the day before the exercises.

For Dr. Stein, an additional reward of the “two-way street” approach comes from the curiosity of the high school students and from the opportunity to answer their questions about science topics ranging from genetically modified organisms to sickle cell anemia. Therefore, among Stein’s goals as an instructor is to ensure that undergraduate students are prepared to answer these questions so that the high school students can lead the discussion. “We understand that high school students respond very well to being taught by peers or near-peers” says Occhino. “The undergraduate students will approach their teaching as a partnership in learning, with both the undergrad and high school students benefiting. We believe this context will enable a better, more collaborative learning environment. In addition, we hope the high school students will see themselves in the undergraduates and better imagine themselves in college. . . . Undergraduates are not that different from them. This message will be explicitly communicated by the undergraduates as part of their training.” Alexis Stein sees the potential for an additional benefit; undergraduate biologists could help illustrate that science is not only a subject in school but also the basis for a set of viable career options, including research.

Enthusiasm on the part of the undergraduate population exceeds expectation. While the long-term hope is that enrollment will be open to juniors and seniors, this first iteration of the course was limited to seniors. Nevertheless, it was oversubscribed, with twice as many biology majors seeking enrollment as there were spaces available. Though their individual motivations aren’t known for certain, Jordan notes that “many of us at the U of R are starving for opportunities to contribute to our community. I think this desire resonates with the students enrolled in BIO 399.”

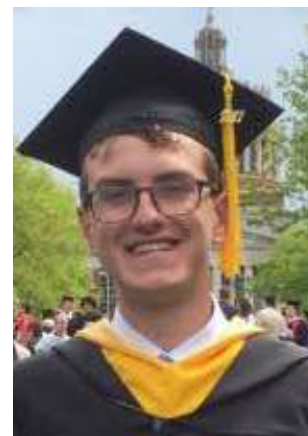
# New Computational Biology Major Graduates First Two Students

by Amanda Larracuente

The Department of Biology recently offered a new major in computational biology—an area that combines biology, computer science, and math. Recent technological advances in nearly every field in biology and medicine require computational skills to organize and extract information from vast amounts of data. For example, the field of genomics recently burgeoned due to the reduced costs of genome sequencing. When scientists completed the first draft of the human genome in 2001, it cost well over \$100 million dollars just to do the sequencing. To sequence a human genome in 2006 it cost approximately \$12 million, and in 2016 it cost less than \$1,500. Today, we have thousands of human genome sequences in public databases that are used to study human populations and disease. Biomedical researchers use statistical and computational methods to analyze these data and make discoveries.

The new and exciting undergraduate program in computational biology is attracting excellent students who want to receive training at the cutting edge of biological and biomedical research. These skills are in increasing demand as fields shift their focus toward analyzing and integrating large datasets. The computational biology major is flexible and helps students prepare for advanced programs in medicine, biology, and bioinformatics.

Our first two computational biology majors graduated this spring: Nathaniel Kuhrt and Thanatcha (Kwan) Khunkhet. This new track is growing rapidly, with 17 officially declared majors and 5 minors who will graduate in the next two years. We look forward to the continued growth of this exciting program.



*Nathaniel Kuhrt*



*Thanatcha (Kwan) Khunkhet*

<sup>1</sup> Estimates from the National Institutes of Health: [www.genome.gov/sequencingcostsdata](http://www.genome.gov/sequencingcostsdata)

## WAYS TO HELP

### Interested in directly affecting the experience of our undergrads?

Help move the **lab experience** to the next level by providing resources to support people and state-of-the-art equipment and facilities.

Or contribute funds to enhance the **innovative workshop program** that enables peer-to-peer learning and one-to-one interactions for students, teaching assistants, and professors—even in large lecture classes.

Or help to fund the department's **community outreach program** or **essential instrumentation** that makes computational biology and bioinformatics possible and keeps Rochester competitive within the rapidly growing field of data science.

# Graduating Student Profiles

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**Peggie Chien '17**  
Cell and Developmental  
Biology

One of the primary things I learned from being a biology major at the U of R was how to be resourceful. To be successful in college, I have learned that it is crucial

to always keep your eyes peeled for opportunities as well as sources of guidance and inspiration, whether that is by asking for advice from professors; applying for internships, fellowships, and job positions that fit you and your needs; or even developing friendships with supportive and passionate peers. It is much more challenging to succeed all on your own. I would urge biology students to utilize any resources they can obtain, both within and outside of the University, to help direct them in their college education. Oftentimes, these resources can prove to be useful post graduation.

Likewise, I would recommend to students to not forget to give back. The biology department is here to help you, but it needs you in order to bring success to its students. Consider putting yourself in a leadership role in the department by being a teaching assistant. This ultimately helps you out a tremendous amount, too, by improving your mentorship skills and by giving you the chance to step outside of your comfort zone. Through engaging with the biology department in the ways I have mentioned, I have found that it has prepared me well for my future. This upcoming fall, I will be heading to UCLA to pursue a PhD in cell and developmental biology.



**Benjamin Gerstner '17**  
Ecology and  
Evolutionary Biology

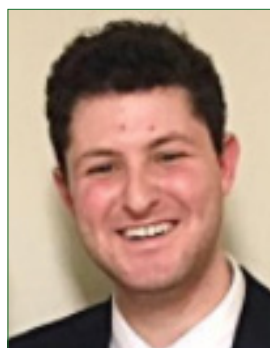
The most important thing I've learned studying biology here at the U of R is that higher education is often perceived as a source of facts, when

really it shouldn't be. Rather, studying and working in the biology department has taught me that higher education is about learning and developing critical-thinking abilities. Thus, it's really about learning how to find the facts through research and experimentation.

The program in biology prepared me well by exposing me to things and by providing the opportunity to work in a research lab for three years. I built a very strong relationship with my research mentor. He helped introduce me to various careers within the field, which led me to find my current career pursuit in a PhD program at the University of New Mexico.

I advise biology majors to be proactive in the planning of your academic plan of study. You don't have to accept all the advice you are given—seek out direction from your peers and from other campus services. If you think you want to study abroad, *do it!* I've never heard of someone who said it wasn't an incredible experience.

The majority of my free time was spent enjoying the city, taking breaks to go to the Public Market downtown on Saturday mornings, or sitting at Starry Nights café. There are great places in the city to get away from campus for a break.



**Michael Gilbert '17**  
Biochemistry

Studying biology has taught me the collaborative nature of science. Whether for a research project or studying for an exam, the insight of others is

invaluable. With that said, working here has taught me that there is always more to learn. New literature is so frequent that learning becomes a lifestyle.

Working in the Gorbunova Lab has been the most influential part of my college years for post-graduate preparation. Invested mentors, coupled with independent research projects, have prepared me for any graduate program that I may pursue.



I would advise biology majors to get familiar with various fields of biology during undergrad. Even if you're a biochemistry major, having experience with cell biology and computational biology is unequivocally helpful. Given the collaborative nature of biology, having diverse skills is marketable and self-fulfilling.

In addition to working in the Gorbunova Lab for three years, I was also president of the new fraternity Beta Theta Pi and of Relay for Life, which is an organization dedicated to fundraising for cancer research. Running Relay for Life was a good supplement to working in a lab because the fundraisers form the foundation of the grants that labs receive.



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**Michael Haft '17**  
**Cell and Developmental Biology**

The most important thing I've learned studying biology is that there's still so much we don't know yet. With every major publication in a journal of the biological sciences, one door closes

but five more open. It can seem daunting, but every new question brings us closer to fully understanding what we call life. It's incredible to think that by combining biology and big data we may accomplish more in the next 100 years than we have in the past two millennia.

The rigor of the biology department at the U of R is definitely greater than that of many other major institutions with such programs. Many might consider this a burden, yet I see it as beneficial, since diving into complex publications and learning about complex systems can give individuals an edge in further education and research. The demanding nature of the program has definitely prepared me for medical school next year.

I would advise biology majors to get a feel for some of the classes before choosing a specific biology concentration, since those classes will give you a sense of what's to come in your concentration of interest. Also, try to get to know many of the faculty and administrators in the department. It's good to

be appreciative of the individuals who really make the department work fluidly.

Outside of classes, I was the undergraduate class coordinator and business manager for the Society of Undergraduate Biology Students, a teaching assistant for cell biology, a laboratory assistant for Dr. Fu, a brother of the Delta Upsilon fraternity, and a member of the REMS program.



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**Stephanie Hao '17**  
**Cell and Developmental Biology**

I think the most important thing that I've learned studying biology and working here as a teaching assistant is how to think critically, analyze data, and make connections.

The program forced me to reflect introspectively on what I truly want and am passionate about, which is why I'm taking a gap year before I dive into my next adventure.

I would tell biology majors to be open to all experiences and try out courses that may be outside of your comfort zone. Don't be afraid to make mistakes.

In my spare time, I was involved in GlobeMed on campus and heavily involved in workshop leadership in the biology department. That's what I dedicated most of my time to besides studying.



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**Chaewon Hwang '17**  
**Molecular Genetics**

While studying biology at the University of Rochester, I have learned to be an independent researcher and to get into the habit of asking questions to create my own path of investigation.

I had great mentors and teachers along the way, like

Dr. Gorbunova, Dr. Seluanov, and Dr. Benyajati from the biology department, who have guided me.

One of the many things I love about the University of Rochester is its many opportunities for undergraduates to be a teaching assistant or a study group leader. I was a teaching assistant in molecular biology. I absolutely enjoyed my time getting to know my students and helping them understand and apply the concepts. I realized this passion for teaching and these experiences have motivated me to pursue a service year with Blue Engine, an AmeriCorps program, to teach high school algebra in the Bronx or Washington Heights.

I would say to students pursuing biology majors, speaking from my personal experiences, do not be afraid to ask questions and suggest new ideas. Sure, some ideas may not work, but some ideas may lead to new research paths that you and the lab could pursue. So be a go-getter and don't be afraid to try new things.

In my spare time, I like to compose music and then I post it on SoundCloud. It's a great way to de-stress. I was also involved with various advisory committees and was on the executive board for the Korean American Students' Association.



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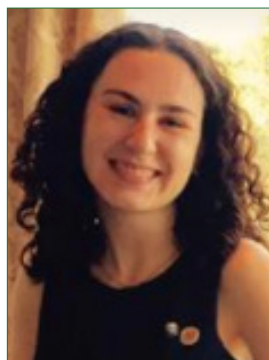
**Thanatcha  
Khunkhet '17**  
Computational  
Biology/Data Science

One of the most important things I've learned studying biology here at the U of R is that computational skills are important nowadays for studying biology.

The program here makes me feel confident to go work in the bioinformatics field. I'm pretty sure there are not that many graduates studying computational biology.

I would advise biology majors to take statistics and programming courses.

When I was not studying or programming, I played squash on the UR Women's Squash team. I also liked learning and sharing new data science tools with people in my Data Science Undergraduate Council.



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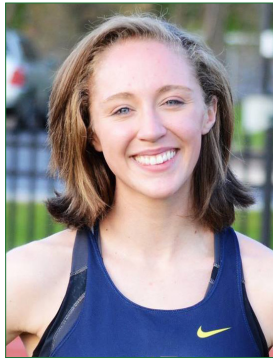
**Rachel Levene '17**  
Microbiology

In July, I will begin my graduate studies as a PhD student in the molecular microbiology/MERGE-ID program at Tufts University. This would not have been possible without the education and

guidance I received from the biology department. While studying microbiology at the University of Rochester, I learned science is always changing. Even the smallest of organisms must continue to change. What we think we understand may only be a tiny fraction of the true picture. This inspired my curiosity and encouraged me to read current literature and to develop and synthesize my own ideas.

My advice to biology students is to look at the material presented to you through multiple lenses. Memorizing facts is not sufficient to gain a deeper understanding. If something in a lecture ignites your curiosity, read more about it and ask questions about it. You can learn from everything around you, especially your peers. Biology is a time-consuming major, but classroom education is only one piece of it.

Outside of class, I was an undergraduate researcher in the Bucher Lab at New York Medical College, which sparked my interest in infectious disease vaccine and therapeutics research. Most importantly, it taught me how to think critically and creatively when faced with a biological question. With these skills and the strong education from the biology department, I am excited for my next steps as a graduate student.



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### **Laura Lockard '17** **Microbiology**

The most important thing I've learned in my time studying biology at U of R was that the best way to improve myself academically and personally is to challenge myself. Any time I entered

a course or opportunity that seemed intimidating to me, those were the periods when I experienced the greatest individual growth.

I think the biology department has left me well prepared for life after graduation. I've been planning on going to medical school since before I even entered college, and I think the biology department has given me the academic experience and organizational skills to be a well-rounded and competitive candidate.

My advice to students also pursuing biology majors is to seize any and every opportunity you find to deepen your passion for the field. The biggest obstacle you'll often face is your own hesitation—don't let that prevent you from achieving something truly great.

In addition to pursuing a biology major, I also obtained a chemistry minor and ran on Rochester's track and field team. I also was able to do immunology research at U of R's Medical Center during my junior year and studied abroad at the University of Bristol the fall semester of my senior year.



### **Rosa Park '17** **Biochemistry**

Given that biology is a field that is especially heavy in terminology and therefore necessitates one to carry around an encyclopedically detailed body of knowledge to feel comfortable in the

discipline, I learned that time and repetition are indispensable to mastering biology. I would often complain with peers about the repetitive nature

of the curriculum: how many times do we have to memorize the amino acids or learn the steps of DNA replication or the life cycle of a virus? Will I ever remember them for longer than a semester? However, I learned that every time you see the same detailed concept presented again, albeit on a more advanced level than before, you are able to retain more of it. And eventually, you feel "fluent" in the language of biology and gain an intuition for how biological processes work.

The UPBM provided outstanding preparation for my post-graduation plans to pursue MD-PhD training. Due to our classes being taught by professors conducting cutting-edge research, we are fortunate to learn biology that is infused with the excitement and real-world impact of ongoing research. For students such as myself who were initially interested in medicine but not necessarily in biomedical research, the UPBM fostered intellectual curiosity and a desire to not only practice medicine but to also contribute to medical advances by engaging in scientific research. Without the UPBM, I would not have been prepared to apply and gain acceptance to multiple MSTP programs before graduation.

Find a way of engaging yourself in biology besides just studying for your lectures, such as by teaching fellow students as a workshop leader, conducting research as a member of a lab, being part of the Society of Undergraduate Biology Students (SUBS), etc. Doing so (and enjoying it!) will make biology relevant to your life outside of the classroom. You will find the motivation and support to study hard and maintain your interest in biology, even as your classes become more challenging—and perhaps you will uncover a passion for teaching, research, scientific writing, or leadership. In a society where college graduates increasingly regret their majors, engaging in activities related to your studies that also enable you to develop professional interests and widely applicable real-life, interpersonal skills will help ensure that your choice of major was holistically worthwhile.

Starting in the spring of my sophomore year, I began conducting research in the laboratory of Dr. Vera Gorbunova and Dr. Andrei Seluanov in the biology department. Aside from research, I chose extracurricular activities that allowed me to practice my love for teaching and engage with

the surrounding Rochester community. I served as a general chemistry workshop leader for three years. I volunteered as a tutor for refugees in the Rochester community through Refugee Student Alliance. In my junior year, I also began to volunteer at a local hospice to gain more substantial patient care experience.



**Eugenia Zeng '17**  
Cell and  
Developmental  
Biology

I think my professors have really drilled in the idea of analyzing data and drawing logical conclusions. I believe that the way science and the scientific method are

set up is to help us search for truth. Data does not lie; it's simply up to us to interpret the data correctly and move forward with more complex hypotheses and experiments that further prove certain theories or rule out other ones.

I feel that the biology program has allowed me to apply what we learned in lecture to real-world settings. Once I started to take the advanced courses, the professors really started tying together the information we learn with how we learn about processes through research. I feel like I tied together these concepts in my own research experiences, and that I was prepared to ask deeper and harder questions.

Biology is an ever-growing and changing field! Sure, it's important to learn the information for a test because there is a lot of information that is taught to us. But more importantly, it's important to synthesize information, understand how and why things work the way they do, and ultimately fill in the blanks on already existing knowledge. Many years down the line, much of the information may not be relevant, but the way I learned to consume and process information will definitely be helpful in the future.

Outside of biology and research, I was able to work in various clinical settings, most notably at the hospice and as a scribe at Rochester General Hospital. These experiences really helped me see the effect of research and medicine in everyday life. I also worked as Peer Career Advisor for the Career Center and was a sister of Chi Omega on campus.

## Interested in our Grads?

[Click here](#) for a list of our recent graduates and to read the *Undergraduate Program in Biology and Medicine e-Newsletter*.

## GRADUATE EDUCATION

### Consider a gift that keeps on giving . . .

Are you more interested in our PhD program? Create or contribute to a **graduate scholarship**. Competitive graduate fellowships and stipends help us to attract the most qualified students.

*Check out some of the existing Graduate Fellowships and Awards.*

# Profiling New Faculty: Justin Fay



**Justin Fay**

by Jennifer Brisson

The Department of Biology welcomes new Associate Professor Justin Fay to our faculty. Justin is an evolutionary biologist interested in the genetic basis of evolutionary change. He joined the faculty on July 1 after a move from Washington

University in St. Louis, Missouri.

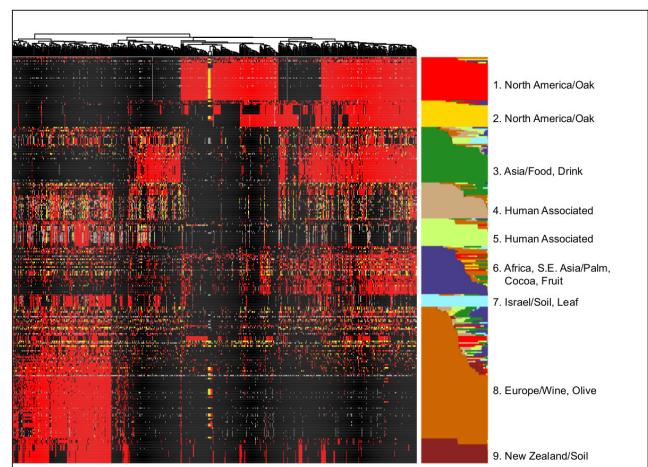
Justin grew up in Chicago for 10 years and then in the Boston area until he left for college. He was always interested in biology but became particularly inspired by an enthusiastic high school biology teacher. Justin went to Cornell University as an undergraduate, where an initial love of genetic engineering, a strength in mathematics, and the slight misguidance of a counselor resulted in his enrollment in a biomedical engineering program. Upon seeing that biomedical engineers had virtually no biology classes in their curriculum, he switched to a biology major and never looked back. He started lab research in Bill Fry's plant pathology lab but eventually landed in Chip Aquadro's lab, where he began to investigate genetic variation and how selection influences its distribution within and between populations of fruit flies (*Drosophila*).

With a strong interest in population genetics, Justin began a PhD program in the Department of Ecology and Evolution at the University of Chicago, which he completed in an amazingly short four years. He says he was at the right place at the right time for his burgeoning interest in population genetics: he was developing new methods to detect signatures of natural selection in genomes, and at that time relatively large genomic data sets were beginning to be produced in organisms such as *Drosophila* and humans. As a graduate student, he was on the forefront of population genomics,

using statistics and modeling to show that, in contrast to predictions of the neutral theory, large portions of those genomes were influenced by selection.

For his postdoctoral appointment, Justin moved to the Lawrence Berkeley National Laboratory to work in Michael Eisen's lab, where he explored how gene expression variation correlated with phenotypic variation among natural isolates of yeast. This was Justin's first foray into evolution of gene expression in yeast, which would become a hallmark of his later work. Like all organisms, gene expression in yeast is controlled by cis-regulatory regions, sequences of DNA that affect when, where, and at what level a gene is expressed. Justin examined the genetic differences that accumulate within and between species in these regulatory regions and their resulting effect on phenotype and fitness. He continued this work as an assistant and then associate professor at Washington University in St. Louis and now at the University of Rochester, where his lab aims to characterize functionally important changes in cis-regulatory sequences and their evolutionary consequences. This is challenging but incredibly important work that illuminates a fundamental aspect of organismal function and evolution.

More recently, Justin's lab has embarked on research to understand the domestication and diversification of yeast. Most of us are aware that yeast is integral for production of beer, wine,



coffee, and bread. *Saccharomyces cerevisiae* is the species responsible for the fermentation process involved in the preparation of these delicious items. Justin and his group have examined DNA sequence variation from yeast strains isolated from many sources and discovered that *S. cerevisiae* lines can be sorted into “wild” and “domesticated” populations, and that at least two domestication events have taken place in the past. The Fay lab is also making progress in understanding the molecular changes that allow *S. cerevisiae* to outcompete other yeast species during fermentation, why *S. cerevisiae* has been domesticated multiple times, and whether or not other yeast species may be unable to be domesticated.

The third major project in Justin’s lab is in a nonyeast system: humans. Preterm birth is a problem that affects many women, yet little is known about the underlying molecular mechanisms associated with it. In this collaborative project, Justin’s lab is working to identify genetic factors tied to the timing of labor. He’s particularly interested in the role that vaginal microbial communities play in this process.

Two PhD students and a postdoc moved from St. Louis with Justin. Emery Longan, a second-year PhD student, has joined the E2G2 graduate program. He’s testing if *S. paradoxus*, another species of yeast, has the ability to adapt to a vineyard way of life. Xueying Li is a fifth-year PhD student, and although she has moved to Rochester, she will remain a student in the graduate program

at Washington University. She’s working to identify loci underlying the heat tolerance of *S. cerevisiae* relative to the cryotolerance of another species, *S. uvarum*. Ching-Hua Shih has been working as a postdoc in Justin’s lab for more than three years. His focus is on yeast transcriptional dynamics, testing how small changes in promoters affect gene expression levels.

Justin has extensive experience in statistics, modeling, and programming. With this expertise, Justin will teach a key course for the new computational biology major, BIO 253 (Computational Biology). This course will introduce students to important algorithms used for analyzing genomic data.

Justin is married to Maia Dorsett, who will be a physician in the emergency medicine department at URMC starting in August. They have three boys: Eitan, 11; Aaron, 10; and Isaac, 5. All three are karate aficionados. They left their lizard and chickens behind in St. Louis but did bring along their dog, Louis, and their cats, Ren, Koko, and Kari. They look forward to a new batch of chickens in the near future, especially because Justin thinks he has finally found the perfect chicken coop design to foil potential predators.

Justin and his family are excited about their move to Rochester and the new opportunities it offers. They enjoy water tubing, skiing, fishing, and rock climbing. Justin fondly remembers upstate New York from his time at Cornell, and he looks forward to exploring the area with his family.

# Spotlight on New Staff

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*Over the last two years, the Department of Biology has welcomed several new administrative staff to our team. Each of them has contributed quickly and in countless ways, and we take a moment here to highlight them.*



**Alessandro Aiezza**  
**Biocomputing Specialist**

**Started November 16, 2016**

Since I began in this position, I have been met with nothing but the best company. Assisting with the technical needs of

the faculty and staff continues to be an incredible learning experience.

Prior to this, I was a department resource in the Medical Center's Cardiovascular Research Institute, collaborating with investigators and providing bioinformatic analysis.

With an MS in bioinformatics from Rochester Institute of Technology, I learned basic wet-lab techniques and a variety of biologically related data science and computer science topics. I have always had a passion for teaching, and so, aside from the IT aspects of my position, I have been able to convene hands-on workshops for the department to better equip faculty, postdocs, and grad students with computational knowledge applicable to their research.

It has been an honor collaborating directly with Dragony Fu's lab, and I hope to find involvement in the research of other labs in the department should they desire computational consult.

My future plans for the department are to continue collaborations and workshops, continue the effort of erecting a central resource of data storage for faculty and staff, and to continue properly stewarding the existing department resources entrusted to me.

My wife, Kristina, also works at the University as a phlebotomist. She and I are expecting our first baby boy late this summer. Having both been born and raised in Rochester, we are thrilled that we didn't have to search far to find such great fits in the University. I look forward to continuing work in the biology department and making more beautiful memories here.



**Patricia Aloï**  
**Undergraduate Course Coordinator**

**Started May 1, 2017**

I was born in Syracuse but transplanted to Rochester in 1993 to raise my family. I am a graduate of both SUNY Cortland and

Syracuse University where I received my master's degree in business administration. I have a passion for the sciences and have prior experience working as a Clinical Medical Technologist in microbiology for eleven years. Prior to coming to U of R, I worked in both payroll and human resources at RIT and Rochester Regional Health. In my spare time, I enjoy yoga, paddle-boarding and remodeling my 1836 house on the Erie Canal.



**Kenny Brumfield**  
**Stockroom Data Control Clerk**

**Started June 15, 2015**

I grew up in Rochester as one of four kids. As the eldest male, I was the first in my family to graduate from high school. In 2005,

I studied computer electronics technology at the ITT Technical Institute in Buffalo. In 2008, I joined the Army and spent 13 months in Iraq. After that, I worked various industrial jobs such as machine operator, mold auditor, quality control inspector, painter assistant, and powder coater. I joined the University family in 2015. Outside of work, I enjoy hanging out with friends and family and fixing and working on cars.



**Lisa Rossow**  
**Purchasing Agent**

**Started May 4, 2015**

I grew up in East Rochester and currently live in Pittsford with my husband, Marc, and two kids. In November, we'll be celebrating 20 years of marriage. Our oldest child,

Jack, will be going to the University of Pittsburgh to start his freshman year this fall. Our daughter, Brooke, will be a sophomore at Mendon High School. Prior to working at the UR, I was a stay-at-home mom for 16 years. During that time, I kept very busy with activities involving the kids. I was always the room mom, soccer team manager, Girl Scout leader, and the Registrar/Board member for Pittsford Crew. In my time off, I like to keep busy gardening, decorating, walking my dog, Winnie, and traveling with my family. Whether it's a ski trip or beach trip, we love to experience somewhere new. Before having kids, I was at OppenheimerFunds for six years. Working in the academic field is something new for me, but I enjoy all the different types of people I get to interact with every day. The job keeps me hopping, and the work days fly by. I feel fortunate that I was able to transition into a new career after so many years at home.



**Michelle Sellix**  
**Data Entry Clerk**

**Started December 7, 2015**

I moved to New York from Virginia in 2011, but I grew up in New Jersey. I really like Rochester; it's an excellent place to raise a family. My husband

is a PI at the School of Medicine and Dentistry. I have an eight-year-old son who is going into third grade. I love the beach, reading, summertime, college football (go, 'Noles!), and dogs. I'm a bit of a homebody, but I try to get the family out to do fun things, such as a hike on the trails next to Durand Eastman or the bird sanctuary at Mendon Ponds Park.



**Allyson Withey**  
**Undergraduate Secretary**

**Started February 20, 2017**

Before coming to the University of Rochester, I worked as a barista in my hometown of Medina, New York, while

completing my BS in criminal justice at Empire State College. I have recently been accepted to the University at Buffalo's MS in school librarianship program and will be taking classes online beginning in the fall.

When I'm not in the office, I enjoy reading, cooking, and spending time outdoors. I also spend time as a wine guide for Traveling Vineyard, which provides private, in-home wine tastings.

I am currently planning a wedding with my fiancé, David, and I am excited to become a stepmom to David's two daughters: Amiley, 10, and Isla, 7. We will be getting married in May of 2019.

My responsibilities in the undergraduate office include providing Blackboard management and support, teaching assistant coordination, payroll for undergraduate student employees, and grade entry. I am thrilled to be a part of the biology department and am looking forward to the upcoming fall semester!





## Thomas Eickbush Receives Edward Peck Curtis Award for Excellence in Undergraduate Teaching

Thomas Eickbush is one of the Department of Biology's most highly regarded teachers. Known for his innovative approaches, he has led important efforts to improve both the ways students learn imposing material and the teaching and mentoring skills of younger faculty.

His commitment to teaching was recognized in 2002 with a Goergen Award for Excellence in Undergraduate Teaching. Eickbush has helped transform a key introductory course for biology majors, bolstering the course's peer-led workshop initiative, introducing online and other nonclassroom components, and launching a mentor-based version of the course for students whose background lacked the academic richness necessary to succeed in biology. He has also introduced a hands-on, conceptual context to the course by adding a laboratory component.

His nationally recognized research has largely focused on segments of DNA that can proliferate across the genome, a process that can result in mutations, including those that can lead to cancer. From 1983 to 2014, his work was continuously supported by the National Institutes of Health, the National Science Foundation, or the American Cancer Society.

Eickbush was presented with the [Edward Peck Curtis Award for Excellence in Undergraduate Teaching](#) during the commencement ceremony on Sunday, March 21, 2017.

**HELP SUPPORT OUR FACULTY**

### **Do you have fond memories of a favorite University of Rochester professor?**

Endowed professorships help to attract and retain faculty of exceptional talent. They are also visible honors recognized across the University and by other top institutions. An endowed professorship can link your—or your loved one's—name to academic excellence and innovation.

# Faculty Headlines

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## **Jack Werren Talks Moonlighting Genes (July 11, 2017)**

"I've been working on parasitoid wasps for a very long time," remarked [Jack Werren](#), a professor of biology at the University of Rochester. His fascination with these animals centers on their specialized venoms, which allow the wasps to be masterful physiological puppeteers.

[Read more...](#)

## **Werren Lab Uncovers New Gene Process in Wasp Venom (June 21, 2017)**

Amid the incredible diversity of living things on our planet, there is a common theme. Organisms need to acquire new genes, or change the functions of existing genes, in order to adapt and survive.

[Read more...](#)

## **John Jaenike spotlighted by the *Scientist* for work on e-book (June 19, 2017)**

On a clear, cool day in mid-September back in 2012, [John Jaenike](#) and [Thomas Werner](#) maneuvered their way through the forested Tech Trails in Houghton, Michigan, to the mushroom and tomato fruit fly traps Werner had planted a few days prior. Jaenike, an evolutionary ecologist from the University of Rochester, poised his net over a trap that had enticed several *Drosophila* specimens—each no more than two to four millimeters long. He bent down to begin collecting. "Oh, cool, *Drosophila neotestacea*!" Werner recalls Jaenike exclaiming as he spotted the very species he planned to discuss during his seminar at Michigan Tech the next day.

[Read more...](#)

## **High schoolers come face-to-face with fruit flies (May 25, 2017)**

Fifteen ninth graders from Rochester's East High School experienced science at its most exciting—when something startling happened during a fruit fly experiment in a lab at the University of Rochester's Department of Biology.

[Read more...](#)

## **Jack Werren, the Nathaniel and Helen Wisch Professor of Biology, comments on new research on the genetics of the nematode (May 15, 2017)**

A strain of wild Hawaiian worms has helped unmask long-studied genes as just plain selfish. The scammers beat the usual odds of inheritance and spread extra fast by making mother worms poison some of their offspring.

[Read more...](#)

## **John Jaenike publishes free e-book *Drosophilids of the Midwest and Northeast* (May 11, 2017)**

*Drosophilids of the Midwest and Northeast* provides an introduction to the flies of the family Drosophilidae of the Midwest and Northeast of the United States, as well as nearby regions in Canada. The book strives to facilitate identification of most of the drosophilid species in this region and provides remarks on interesting aspects of their biology and suggestions for future research on them. The book is intended for researchers, teachers, and students wishing to discover the diversity of these flies.

[Read more...](#)

## **Fruit Flies Offer Gut Check on Bacteria (April 26, 2017)**

The common fruit fly is widely used in laboratory experiments because it can provide insights into the biological processes of other, more complex organisms, including humans. However, what is seen in fruit flies in the lab may bear little resemblance to what is seen in fruit flies in the wild—especially when it comes to the bacteria found in their intestinal tracts, University researchers find.

[Read more...](#)

## **Rochester scientists made two important contributions to DNA damage research (March 3, 2017)**

In a recent study, Rochester scientists made two important contributions to DNA damage research. First, though scientists could previously point to

an association between DNA damage and aging, the Rochester group has demonstrated a causal relationship between reduced DNA damage and extended lifespan. Second, the researchers have identified a cellular factor—an enzyme called topoisomerase 2, or Top2, implicated in DNA damage—that can be targeted to reduce that damage. [The findings are published in the journal \*Aging\*.](#)  
[Read more...](#)

### **Gorbunova and Seluanov Find Protein That Initiates DNA Repair (September 12, 2016)**

Biologists, geneticists, and other scientists who study the cellular processes of aging have long focused on a gene known as sirtuin 6 (*SIRT6*)—so much so that it’s been identified as a “longevity gene.” Mice lacking the gene age prematurely, while mice with extra copies live longer. One of the molecular functions of *SIRT6* is to help repair DNA when the strands of the molecule break.

While such disruptions are a result of normal chemical processes that take place in cells, the damage has been linked to aging, as well as several age-related diseases. But how *SIRT6* is activated has been unknown. Now a research team led by Vera Gorbunova and Andrei Seluanov, professors of biology at the University of Rochester, has discovered a protein that may serve as a first responder, activating *SIRT6* and setting in motion a cascade of molecular activity to repair the damaged DNA.

[Read more...](#)

### **Whales Could Help Solve the Mystery of Cancer (August 10, 2016)**

Vera Gorbunova, a biology professor at the University of Rochester in New York, cultured bowhead skin and lung cells gathered in Barrow two years ago and is trying to make them cancerous, which at first appears to be more difficult than it is with human beings. But the work is ongoing.

[Read more...](#)

## Graduate Student News

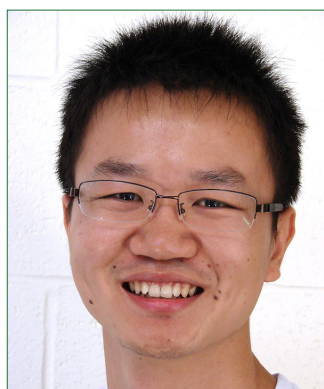
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### **Adam Johnson Awarded the Edward Peck Curtis Award for Excellence in Teaching by a Graduate Student**

Established to encourage excellence in the work of graduate students who assist undergraduate instruction, the Edward Peck Curtis Award for Graduate Students is awarded to a small number of full-time graduate students with a role in undergraduate education. Nominees are expected to have had significant face-to-face interaction with undergraduate students in the classroom or laboratory. Awards are determined by the vice provost and University dean of graduate studies based on nominations from individual departments or undergraduate student groups. Adam was presented with the award at a [special departmental TGIF event on May 5, 2017](#).

[List of Recipients](#)



### **Zhonghe Ke Awarded Messersmith Dissertation Fellowship for 2017–18**

The Messersmith Fellowship is a one-year fellowship for students in the preclinical departments of the School of Medicine and Dentistry or in biology, chemistry, optics or physics. Appropriate candidates have passed the qualifying exam and are in the process of writing their dissertations or are at least engaged in full-time research. The fellowship provides stipend support for the student and is highly competitive.

# Alumni Updates

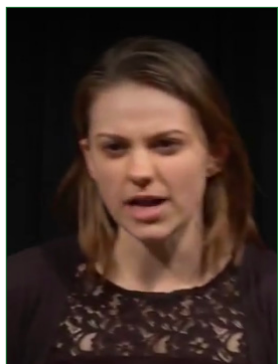


**Michael Gilbert**

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## **Michael Gilbert '17** Biochemistry

[Michael](#) was awarded a 2017–18 grant in the prestigious [Fulbright U.S. Student Grant program](#). He has accepted the State Department–sponsored grant to pursue advanced studies, conduct research, and teach English language and U.S. culture abroad. Michael is bound for the University of Hong Kong, where he'll be part of a lab studying cancer and aging.

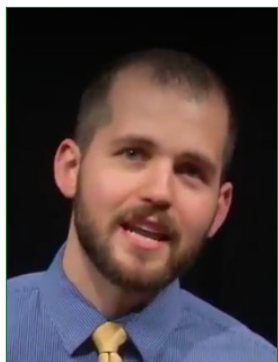


**Sarah Catheline**

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## **Sarah Catheline '12 and Scott Friedland '11** Molecular Genetics

The Center for Professional Development in the University of Rochester School of Medicine and Dentistry held its second annual [Three Minute Thesis \(3MT\) competition](#) this spring. The 3MT Challenge, which was founded by the University of Queensland in Australia, pushes PhD students to boil years of grueling study into a three-minute elevator talk for a general audience. This year 34 graduate students from across the University of Rochester competed in 3MT for a chance to win up to \$1,000 in travel awards. Scott Friedland took second place and a \$500 travel award. Sarah Catheline won the \$250 “People’s Choice” travel award for her presentation on osteoarthritis.



**Scott Friedland**

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## **Seema Bhopale '04** Biology/Computer Science

My maiden name is Seema Bhopale. I graduated with a BA in biology (and a BS double major in computer science) in 2004. After graduation from U of R, I attended UCLA for graduate school. I used computational biology analysis and molecular biology skills I learned in college to study signal processing in cancer cells. I graduated with a PhD in 2010. That year my first daughter, Aashna, was born and my second in 2013. I have been taking some time off to raise my young girls, but I have squeezed in some consulting work studying melanoma, developed a bioinformatics course for a nearby college, and done a lot of science enrichment with kids. Hope everyone is doing well. If any current or past students are interested in any of what I have worked on, please feel free to contact me with any questions.



**Seema Bhopale's family**



# Biology Department Fall Retreat— Bristol Harbour Lodge & Golf Club

October 18, 2016



For the second year in a row, the Department of Biology held its [annual fall retreat](#) at the magnificent Bristol Harbour Lodge & Golf Club in Canandaigua, New York. The retreat coincided with the peak of the fall foliage season in the Finger Lakes region, providing a colorful backdrop for the two-day event. Many of the students and faculty arrived the evening before and stayed overnight at the resort in shared cabins overlooking Canandaigua Lake. The group held a barbecue and participated in a number of social activities and friendly competitions, including the annual “Biology Pictionary” contest.

The next morning, the retreat featured scientific talks by two department alumni: Dr. Nitin Phadnis and Dr. Russell DiGate. The first speaker, Dr. Nitin Phadnis, received his PhD at the University of Rochester under the supervision of Drs. Allen Orr and James Fry. He is currently a member of the Department of Biology at the University of Utah, where he studies the molecular basis of speciation, selection, and genomic conflict. Dr. Phadnis’s talk was entitled “The checkpoints in speciation.” Many pairs of closely related species are able to mate but fail to produce viable and fertile offspring because their genomes are incompatible. Dr. Phadnis focused on the genetic

incompatibilities between two different pairs of fruit fly species. His presentation described his lab’s progress in identifying the genes underlying these incompatibilities and in exploring their molecular functions.

The second speaker was Dr. Russell DiGate, who received his PhD in our department in 1986 under the supervision of Dr. David Hinkle. Dr. DiGate is currently the dean at St. John’s College of Pharmacy and Health Sciences. His talk was entitled “From Graduate Student to Provost: An Academic Life.” The talk described the interesting trajectory of Dr. DiGate’s career from academic research to administration and provided career advice to students and postdocs.

In addition to the scientific talks, attendees were treated to lunch, dinner, wine tasting, a hike through Ontario County Park, lawn games, a number of fun contests, and a scientific poster session presented by graduate students and postdocs. The retreat concluded with the awarding of prizes for best poster, the graduate student teaching award, the “golden pipette” award for the winners of the activities contest, and a “spirit” award. Per recent tradition, we closed out the evening by watching the [video](#) produced by the second-year graduate students.

# Celebrating Dr. William Muchmore

“While many people are amazed that we are still discovering new species, Professor Muchmore was able to describe more than 290 new pseudoscorpion species during his career, providing valuable information on how to identify each species.”



**Dr. William Muchmore**

By Robert Marcotte

At the height of his career, only a half dozen other researchers in North America shared William Muchmore’s interest in pseudoscorpions – small arachnids with pear-shaped bodies and pincers similar to scorpions, but without

the tails. After all, they were not known to have any economic or medical importance. They were also small and “tedious to study,” said the former University of Rochester biology professor, who died in May at the age of 96.

But that did not deter him from becoming a leading authority on the “fake scorpions,” discovering and naming more than 290 new species during a research career than spanned nearly four decades.

“These interesting and very tiny creatures are related to true scorpions but live quite secretive lives,” says Jerome Kaye, a professor emeritus who served in the department with Muchmore. “Only a dedicated expert is likely to find and recognize one. Bill became known internationally as one such an expert.”

Muchmore’s research continues to be highly regarded and cited, according to Mark Harvey, senior curator of arachnology at Western Australian Museum and a leading expert in the field. “His insights into pseudoscorpion taxonomy have led to many new discoveries, such as new genera and species,” Harvey says. “While many people are amazed that we are still discovering new species, Professor Muchmore was able to describe more than 290 new pseudoscorpion species during his career, providing valuable information on how to identify each species.”

In honor of his outstanding research, Muchmore’s peers named seven species and a new genus after him.

## AN EXPERT IN THE DIVERSIFICATION OF LIVING FORMS

Muchmore said that he enjoyed the opportunity to “uncover knowledge about things in the world that are not known.”

He was a specialist in systematic zoology—the study of the diversification of living forms, both past and present, to understand the evolutionary history of life on Earth. He studied the relationships of pseudoscorpion species to each other and to their geographic distributions, and what this might reveal about their evolutionary adaptations.

In 1970, his collection of 1,900 samples of North American pseudoscorpions, some saved in small vials and some mounted on microscope slides, was considered one of the largest in the world. He published nearly 150 papers and book chapters on pseudoscorpions, and was supported in his research with several National Science Foundation grants.

He also studied embryonic development. “Bill was an experimental embryologist who asked how the fates of different tissues in the embryo were determined by their locations in the developing embryo,” Kaye says. “He used salamander embryos in this work and did exquisitely delicate surgical techniques to transplant





parts of embryos from one site to another.” Kaye recalls collecting salamander eggs with Muchmore one spring, “wading in a pond at night with the sounds of spring around us, frogs and toads and spring peepers all calling for mates. Quite a treat for a biologist.”

### **A VALUED COLLEAGUE AND TEACHER**

Born in 1920 in Cincinnati, Ohio, Muchmore received an AB degree in zoology from Oberlin College in 1942. He served as a US Army medical laboratory technician in the Pacific during World War II, then attended Washington University in St. Louis where he received his PhD in 1950, the same year he joined the Rochester faculty.

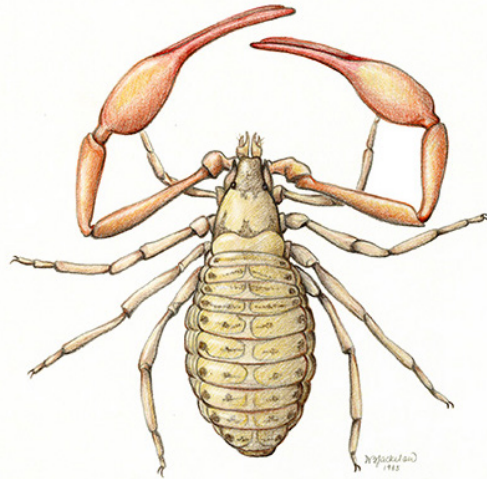
Kaye, who joined the department in 1959, says his first impression “was that Bill would be both a good colleague in academic affairs and someone with a positive, likable personality who would be an excellent teacher. My subsequent experience bore out and amplified this initial impression. In fact, Bill was simply an all-round valuable member of our department.”

Professor emeritus Stan Hattman, another colleague, says he was “always impressed with [Muchmore’s] insights on education and departmental political issues, which he always

presented in a clear and calm voice. I’m sure that demeanor endeared him to his students as well.”

In 1966, Muchmore was one of 14 inaugural recipients of a newly established University award to recognize faculty members for outstanding teaching, as voted by juniors and seniors.

Count Wendy Beth Jackelow ’83 among them.



Jackelow took Muchmore’s vertebrate zoology class her junior year. But she enjoyed art classes as much as biology and would illustrate her notebooks with detailed drawings of specimens. “He said to me, ‘Do you know there is a career in medical and scientific illustration?’” she says. “I had no idea such a thing existed; but I knew, the minute he said it, that this was what I was meant to do.”

After she enrolled in the medical illustration program at nearby Rochester Institute of Technology, Jackelow contacted Muchmore to brainstorm ideas for her master’s thesis. He suggested that she illustrate a checklist he was preparing on the terrestrial invertebrates of the Virgin Islands. “I knew I had hit the jackpot,” she says. “It was exactly what I wanted to do and [he was] exactly the kind of person I wanted to work with.”

After completing her master’s degree, Jackelow worked as a medical and scientific illustrator for hospitals and a publishing company before going into business on her own.

She says she thinks about Muchmore every day. After all, “he set the course of my life.”

*[This article](#) originally appeared on the University of Rochester Newscenter on July 20, 2017.*

# Specimen Collection

by Robert Minckley

## Update

The [historical specimen collection](#) continues to expose interesting aspects of the Department of Biology from years past. Since the collection was moved from the downtown campus (where the Memorial Art Gallery is today) to Dewey Hall and then to Hutchison Hall, where it was downsized, it probably reflects changes in the Department of Biology's interest and space limitations on the River Campus. When downtown, the collection was a public showcase that filled both levels of a cavernous two-story building. Life-size casts of extinct animals took up much of the space alongside many taxidermy specimens of extant birds and mammals. In the 1890s the museum followed only the Smithsonian Institution and Harvard University in size.

The material in the department today contains only a few casts of small mammals and some taxidermy specimens. We have not found many records of the collection while it was housed in Dewey Hall, so it is not clear if the casts of extinct animals made the move. It is also not clear if it was open to the public or used only for teaching. However, we do know that most of the second floor of Dewey Hall was filled, suggesting the collection was still quite large.

As we identify more of the material in the department, we are finding that much of it represents relictual groups that are rare today or endangered. The gorilla on display in the hallway of the second floor is a good example.

The collection of biological specimens, skulls, models, and fossils is on its way back to being on the public radar. The Departments of Biology, Earth and Environmental Sciences, and Rare Books and Special Collections along with the Digital Humanities Center are developing a website centered around the specimens in Hutchison Hall and the substantial historical paperwork in Rare Books and Special Collections associated with the original University of Rochester natural history museum and Ward's Natural Science Establishment (the firm from Rochester, New







York, that sold the museum to the University). Rare Books and Special Collections has the most complete collection in the world of bulletins, catalogs, and letters from the museum and the Ward's Natural Science Establishment. Among these papers is information about the natural history of the organisms, their provenance, and how much they were sold for to other collectors and museums. The website will link the specimens in Hutchison Hall to the articles, catalogs, and letters where they are discussed. Our aim is to attract people interested in the early development of natural history museums and others who enjoy learning about the extinct (fossils) and extant animals housed at the University of Rochester. A seminar scheduled in early December will introduce the website and lay out how it will grow in the future. Stay tuned for more news about this exciting project!

## Help Support our Specimen Collection and Archives

*If you are interested in making a gift or discussing opportunities to help support the department, please contact:*

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