



A publication of the Department of Biological Sciences - College of Arts & Sciences at the State University of New York at Buffalo - Issue No. 16, January 2015

Dear Alumni and Friends of the Department of Biological Sciences

It is my privilege to send you the newest edition of BioNews, the annual newsletter of the Department of Biological Sciences at the University at Buffalo. We hope that this newsletter is informative and of interest to you.

Over the past year, the Department has continued make changes that will enable us to achieve our goal of being a nationally recognized center for innovative, interdisciplinary life sciences research and education.

In our undergraduate program, the curriculum changes we are implementing are aimed at providing these students with broad and deep training at the cutting edge of modern biology with a learn-by-doing philosophy. Since the research and education programs in the Department Biological Sciences are inextricably intertwined, the undergraduate program leverages the comprehensive expertise of our faculty. The breadth and depth of our faculty's research expertise allows us to provide biology students with cross-disciplinary training in life sciences, an approach that prepares students to take advantage of the accelerating pace of discovery in biological sciences in the 21st century. New to our undergraduate program this year, we instituted a completely revamped second semester freshman biology course, Cell Biology. With all new laboratories and a revamped emphasis, this course now complements our recently revised first semester Evolutionary Biology course. Together these courses provide undergraduate students with first rate instruction using cutting-edge technology. These courses prepare our students for the five new upper division undergraduate courses our faculty designed and offered in the last year alone! By exploiting the breadth and depth of our faculty's research expertise and outstanding teaching and mentoring skills, we feel the Department is on its way towards achieving its goal of being the "destination of choice" for life sciences- interested high school students in the northeast.

Graduate students enrolled in the Graduate Programs in the Department of Biological Sciences are also able to take advantage of the interdisciplinary focus of our faculty's research interests. As such our graduate students gain a deep understanding of their own discipline as well as the skills and experience to think across multiple levels of biological organization, from molecules to ecosystems. This unique cross-disciplinary approach to life sciences

training prepares students to become leaders in fields. Consequently, our graduate programs continue to attract the best students from around the world. With support from our alumni, these students have been afforded the opportunity to present their exciting research findings at international conferences all over the globe.

Consistent with our goal of being one of the most innovative research life sciences departments, the research of the faculty of the Department of Biological Sciences made many headlines this year. As published in Science and featured in the New York Times, UB biologist Victor Albert and colleagues reported the sequence the genome of the coffee species *Coffea canephora*. The research could help farmers breed plants that are better able to survive drought and disease. The project also sheds light on the history of caffeine, finding that this economically valuable substance evolved independently in coffee and tea. Also featured in the New York Times, a UB team led by Professor Derek J. Taylor traced Ebola's evolutionary roots back to ancient times. Experts once thought that known filoviruses — the family to which Ebola belongs — came into being some 10,000 years ago. His new study pushes the family's age back to the time when great apes arose. As reported on NPR, a UB biologist Kathryn Medler's research team found that mice that are severely overweight are impaired in their ability to detect sweets. They found that compared with slimmer counterparts, the plump mice had fewer taste cells that responded to sweet stimuli. These findings show how obesity alters our relationship to food.

We are proud and inspired by the accomplishments of our current faculty and students, as well as the accomplishments of you, our alumni and friends. We look forward to an exciting future and learning of the new frontiers being explored by the community of UB biologists!

In closing I hope you find this latest issue of BioNews both enjoyable and informative. As always I welcome your comments and questions. If you desire further information on any aspect of our Departmental activities or future directions, I invite you to contact me directly. We look forward to hearing from you or seeing you at our next departmental event.

Happy reading!


Gerald B. Koudelka, Ph.D.

Departmental News . . .

BIO 201, Cell Biology undergoes extensive redevelopment

Having recently completed the redevelopment of BIO 200, the Department of Biological Sciences has undertaken the process of redeveloping BIO 201 with the goals of increasing the number and relevance of the labs; better preparing students for upper division courses in the major; and improving articulation with other schools in the SUNY system. Dr. Lara Hutson is coordinating this effort.

In spring 2014 we rolled out a new lab program with 9 labs, ranging from classic to cutting-edge. The new labs are designed not only to enhance critical thinking skills, but also require extensive data analysis and interpretation. In spring 2015 we will be adding one additional lab. Because of the increase in the number of labs without a concomitant increase in resources, we also developed a virtual lab program that directly mirrors the traditional "wet" labs for students in majors that do not require a hands-on lab experience. Although there is quite a bit of excitement in the scientific community surrounding virtual labs, their value is so far essentially untested. We therefore assessed learning in virtual vis-a-vis traditional labs, finding that learning gains in the two types of labs were nearly identical. We will continue and expand on these assessments in spring 2015 to continue to improve both virtual and traditional labs and to inform the broader conversation pertaining to virtual labs at UB and beyond.

The virtual labs will take place in a new computer laboratory that has just been completely outfitted with 24 new Dell Optiplex all-in-one computers with 23" full HD display and touch screens, new tables and chairs, and an updated audio-visual system. This facility will be operational in time for the start of the spring 2015 semester. The vast majority of the cost of this lab was funded by donations from friends and alumni to our departmental account, administered by the University at Buffalo Foundation. These generous contributions will

enhance the undergraduate learning experience and, thanks to our loyal donors, confirms our mission of providing a high-quality education.



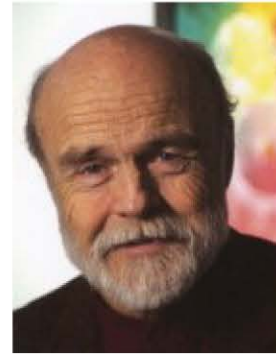
Cooke Hall Tower

The Department recently acquired an unusual gift - an oil painting of the man whose name is on the building, Walter Platt Cooke. The portrait of Mr. Cooke hung in the administrative offices of HSBC Bank in downtown Buffalo until its closure. It was then donated to University Archives and stored there until someone from that office recommended that it be placed in a prominent yet safe spot inside the building. The painting now resides in a protective glass case in the main hallway. Mr. Cooke was a lawyer, financier, and civic leader and served on the University Council from 1920 to 1931. He was responsible for bringing Samuel Capen to UB as Chancellor and is credited with spurring the development of both the physical campus and the College of Arts and Sciences as a distinct entity. To read more about Mr. Cooke click [here](#). Welcome home Mr. Cooke.



Dr. Steve Free is recipient of the 2014 Meyerson Award

Dr. Steve Free was selected as a recipient of the 2014 President Emeritus and Mrs. Meyerson Award for Distinguished Undergraduate Teaching and Mentoring Award. The Meyerson Award was established through a generous gift by the late UB President Emeritus Martin Meyerson and his wife, Margy Ellen, to recognize exceptional teaching and mentoring at UB. Faculty members who exemplify these qualities are foundational to the University at Buffalo and its academic mission. They provide the guidance and support needed to help undergraduate students develop the skills necessary for not only research and creativity but also for critical thinking and innovation. The Meyerson award is the ONLY University-administered award given in recognition of excellence in undergraduate teaching and mentorship.



Dr. Kipp Herreid wrote several chapters and edited a 549 page book for the National Science Teachers Association, recently published and being advertised on Amazon called "Stories You Can Count On: 51 Case Studies With Quantitative Reasoning in Biology" by C.F. Herreid, N.A. Schiller, and K. Herreid. He also organized a two day program and gave four workshops at UB's National Center for Case Study Teaching annual conference in September, attended by 125 faculty from across Canada and the USA. In October, he was one of three invited speakers for the National Academy of Sciences' Committee on Preparing the Next Generation of Policy Makers for Science-Based Decisions.

In November, he was an invited participant at the inaugural meeting of the Faculty Developer Network for Undergraduate Biology Education (FDN-UBE), an NSF-funded RCN-UBE (Research Coordination Networks – Undergraduate Biology Education) network.

Dr. Herreid is currently in the second year of a three year grant funded by the National Science Foundation to develop case studies and videos to be used in teaching biology using the Flipped Classroom approach. This is where a teacher has students prepare for classroom work by viewing short videos before engaging in discussions in class; the latter involve real life case studies applying general principles of biology. The funding is used to train faculty from across the country how to write these cases and produce the videos, concentrating this year on the subjects of cell biology, genetics, ecology and evolution.

Assistant Professor **Dr. Charlotte Lindqvist** was invited to give a talk at the 30th National Congress of the Mexican Biochemical Society (XXX Congreso Nacional de Bioquímica) on November 6th, 2014 in Guadalajara. She spoke on her genome-scale analyses of polar, brown, and black bears. Based on distinct differences in morphology, physiology, and behavior, polar bears and brown bears are recognized as separate species. Yet, data from mitochondrial genomes indicate an intricate relationship between the two species, suggesting a maternal origin of polar bears from



within brown bears. Using genomic sequencing Lindqvist and collaborators have recently discovered millions of genome-wide polymorphisms, facilitating evolutionary genomic studies among bear populations and providing a genomic window into polar bear adaptation to the Arctic environment. Although analyses of genomes from these bear species clearly demonstrate that they have had largely independent evolutionary histories, they also indicate ancient hybridization between polar and brown bears. Furthermore, paleodemographic estimates reveal that these bears have experienced considerable fluctuations in population size with prolonged and drastic declines during the last few hundred thousand years. Taking such demographic factors into account has suggested a much more recent divergence date estimate, leaving the exact split time between the two species unresolved. In any



Dr. Charlotte Lindqvist

case, the polar bear is a prime example of adaptive evolution in response to the extremes of life in the high Arctic, extending from evident morphological features to more subtle physiological traits, and open questions remain whether candidate genes and positive selection played a significant impact in the evolution of the polar bear.

Lindqvist's lab uses different approaches to examine the polar, brown and black bear nuclear genomes to identify candidate genes involved in adaptation to life in the Arctic environment. Based on enrichment of functional categories in genes with fixed variants in polar bears, they recently found evidence for adaptations related to cellular respiration. To read the full article follow this [link](#).

With expanded scans for positive selection comparing the polar bear genome with genomes of panda, dog, brown and black bear, many genes have been found to be under positive selection in polar bear, including genes involved with components of the visual cycle. More targeted analyses have also identified possible candidate genes associated with lipid metabolism, hibernation, and pigmentation, which are of importance in the functional divergence of the polar bear.



Dr. Victor Albert, Empire Innovation Professor, played a key role in leading the research effort that reveals new information about the origins of flowers on Earth. *Amborella* is a small understory tree found only on the main island of New Caledonia in the South Pacific, and hails from an ancient evolutionary lineage that traces back to the last common ancestor of all flowering plants, according to the research team of which Dr. Albert was a member. Scientists who sequenced its genome say its DNA provides conclusive evidence that the common ancestor of all flowering plants, including *Amborella*, evolved following a “polyploidy event,” during which an organism’s entire genome is duplicated. This happened about 200 million years ago. Says Dr. Albert, “In the same way that the genome sequence of the platypus — a survivor of an ancient lineage — can help us study the evolution of all mammals, the genome sequence of *Amborella* can help us learn about the evolution of all flowers.” Click on this [link](#) to read the full article as it appeared in UB’s *The Reporter*. Dr. Albert is also co-author of a paper entitled “The coffee genome provides insight into the convergent evolution of caffeine biosynthesis” that appeared in *Science* in September of this year and which is ranked in the top 5% of all journal articles ever tracked, as measured by the web application Altmetric. Altmetric tracks and analyses the online activity of scholarly literature, allowing authors and publishers to see what people are saying about a scholarly paper and how much attention a paper is receiving relative to their peers. It tracks approximately five thousand

papers a day, articles from hundreds of different publishers, preprint databases, and institutional repositories. If somebody has recently tweeted, blogged or posted a public link to an article, then it’s very likely that Altmetric has picked up on it as well. It then brings all the attention together to compile article level metrics. This article has been the subject of news stories from such outlets as The New York Times, The Washington Post, Los Angeles Times, ScienceNow, and ScienceNews.



Dr. Shermali Gunawardena’s research approach of analyzing isolated nerve cells and the neuronal pathways of living fruit fly larvae rather than still images of dead larvae as is typically done, is yielding new insight into the cellular blockages in nerve cells of the insect’s brain and has been published in PLoS ONE. Says Dr. Gunawardena, “Our research suggests that fixed, permanent blocks may impede the transport of important cellular components and, ultimately, lead to cellular degeneration and death. Conversely, blocks that resolve themselves may be benign. This is an important distinction that could help researchers decide which kind or type of blocks to focus on when developing drugs and other forms of therapy for some of these debilitating diseases”. To read the full article in the *UB Reporter*, follow this [link](#).

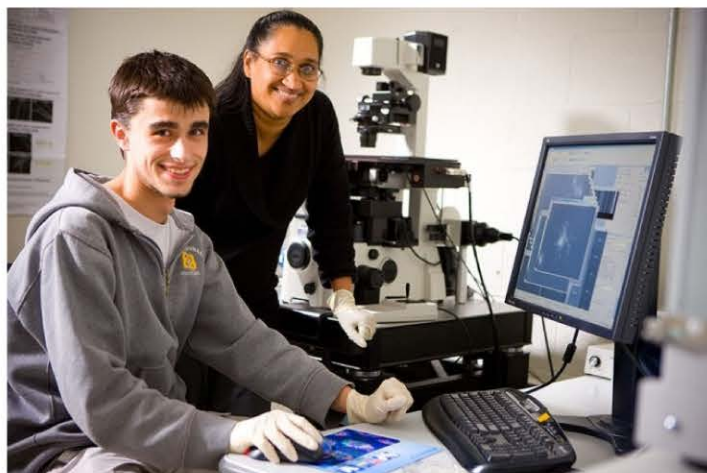


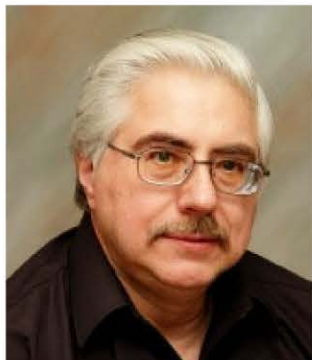
Photo: Douglas Levere, UB Reporter

Faculty News . . .

Dr. Michael C. Yu

received a Fulbright Senior Scholar award that partially funded his sabbatical leave from June to Dec. 2014, during which time he conducted research in Dr. Soo-Chen Cheng's laboratory in the Institute of Molecular Biology at Academia Sinica, Taiwan. In Dr. Cheng's laboratory, Dr. Yu learned biochemical approaches used in dissecting the mechanism of pre-mRNA splicing in the budding yeast. While in Taiwan, he was invited to give a number of seminars and attended a number of conferences.

In April, a joint project between **Dr. Yu** and **Dr. Denise Ferkey** (also a faculty member in the Department of Biological Sciences) that examines the role of protein arginine methylation in GPCR signaling received an NIH R21 award.



Dr. Ron Berezney was recently appointed to the managing editorial board of *Frontiers in Biosciences* and as an inaugural member of the International Advisory Editorial Board for the new journal *Inside Cells* to be launched in 2015.

He and his colleague, Jinhui Xu in the Department of Computer Science and Engineering were recently awarded a three year NSF grant (8/2014-7/2017) to continue their collaborative research on the application of computational data mining and pattern recognition approaches for understanding the higher order organization and function of the human genome inside the cell nucleus. Ron has also developed a new course in cell biology designed for upper level undergraduates called Intermediate Cell Biology which he will teach for the first time in the spring, 2015 semester.

Dr. Katharina Dittmar, Associate Professor, was a panel speaker at an Educational Technology Forum hosted in October by UB's Office of Educational Innovation and Assessment entitled "What technology will change university teaching?" The workshop took a look at New Media Consortium's *Horizon Report > 2014 Higher Education Edition*. Six key trends, six significant challenges, and six emerging technologies are identified across three adoption horizons over the next one to five years, giving campus leaders and practitioners a valuable guide for strategic technology planning. The Horizon Project was designed to identify and describe emerging technologies likely to have an impact on learning, teaching and creative inquiry in education.



Dr. Katharina Dittmar - Rio de Janeiro



Dr. Kathryn Medler was an invited speaker at the 13th International Meeting of the European Calcium Society, held September 13-17, 2014, in Aix-en-Provence, France. Her's was the Keynote Lecture for one of the sessions and was titled

"Calcium signaling in taste cells". The talk was focused on how taste cells form and regulate calcium signals and some of the unique mechanisms that are used by taste cells to control this signaling process, which is required for the transmission of peripheral taste information to the brain.

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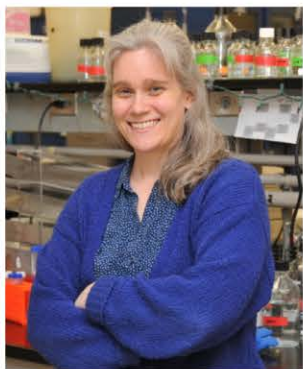
Dr. Paul Cullen was invited this past November to Gothenburg, Sweden to give a seminar on Signaling Mucins and Scaffolds in Regulating MAPK Pathways. While there, he was invited by a PhD student to visit the lab of Dr. Stefan Hohmann, a leader in the field of MAPK signaling in yeast.

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This summer, **Dr. Laura Rusche** was promoted to Associate Professor. Dr. Rusche studies how DNA is packaged and organized into chromosomes and the role that a deacetylase called Sir2 plays in this process.

Her research is currently funded by the National Science Foundation. Dr. Rusche teaches undergraduate genetics as well as advanced molecular genetics, and she serves on the Graduate Affairs Committee. In her spare time she plays the violin in the Cheektowaga community orchestra.



A discovery by two professors in the department is attracting attention from across the world.

A British production company is producing a documentary, including Ebola's family history and how that history is being completely rewritten. They're researching a discovery made by **Dr. Jeremy Bruenn** and **Dr. Derek Taylor**.

Taylor and Bruenn released a study saying Ebola, and its relative Marburg — filoviruses which experts formerly believed were only about 10,000 years old — actually date back 16-23 million years. "What we can see is some animals like hamsters and voles have an insert," Taylor said. The viruses had found their way into their genetic structures. The discovery is important because it could open doors for a vaccine. "So it gives you hints as to how to develop vaccines that might have a broad spectrum," Bruenn said.

"If we can look at some of these ancient sequences," said Dr. Taylor, "We might be able to identify stretches that don't change in the virus and then design antiviral approaches that attack those stretches of sequence". Developing a vaccine is a priority, as governments across the world create policy to avoid allowing Ebola to breach their borders. Researchers believe "bush meat" — or meat from animals like bats infected by filoviruses — is to blame for the first outbreak of Ebola in humans in West Africa in 1976. Dr. Taylor says, "The more we can know about the evolution of the virus, the more we can learn about who the players might be in the system."

Alumni News . . .

Annual Distinguished Alumni Event

This year's annual Distinguished Alumni Speaker was **Dr. David Rothstein** from the University of Pittsburgh Medical School. Dr. Rothstein received his B.A. degree from our department in 1976 and published his first research article based on his undergraduate research. He has gone on to a stellar career in basic and clinical research where he is in the forefront of studies on the immunological regulation of factors involved in organ transplantation. He is currently a Professor in three Departments and the Pittsburgh Steelers Chair in Transplantation at the University of Pittsburgh Medical School. The title of his talk was "New pathways to promote immunological tolerance".

He was introduced by his father, Dr. Mort Rothstein, who is Professor Emeritus in our department.

Dr. Rothstein spent time in the department renewing old acquaintances, touring the department, and meeting with our graduate students. To view his November 13th seminar online, please click on this [link](#)



Dr. Ron Berezney, Dr. Morton Rothstein, Dr. David Rothstein, and Dr. Gerald Koudleka

Graduate Student News . . .

The Paul Pizzella and Marta Ayala Award continues to support graduate student research. This student funding is made possible through a generous donation from Paul Pizzella (B.A., 1986) and his wife Marta Ayala, which provides financial support for graduate students to either attend or present their research findings at a scientific conference or to work in another research lab outside the department. This year two awards were made.



Ms. Hema Adhikari, a doctoral student in Dr. Paul Cullen's lab, received one of them. It helped to defray her expense of attending the Yeast Genetics Meeting in Seattle, Washington this past summer, where she presented a poster entitled "ER Stress Stimulates Mucin Receptor Signaling From the Secretory Pathway".

The other award was made to **Mr. Pradeep Yerramsetty**, a doctoral student in Dr. Jim Berry's lab. Pradeep used his funding to attend the 34th Phytologist Symposium: Systems biology and ecology of CAM plants, in Lake Tahoe, Nevada, also this past summer.



Neuroscience Research Day

Graduate student research from the Department of Biological Sciences was on display at the 8th Annual Neuroscience Research Day held on September 5, 2014 at the Center for the Arts on the North Campus. The meeting was sponsored by the Buffalo Chapter of the Society for Neuroscience and the University at Buffalo Neuroscience Program.

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Graduate Student News . . .

Neuroscience continued

Yankun Gao gave one of the four student talks. Her presentation was entitled “WT1 regulates the development of the posterior taste field”. Faculty advisors were Drs. Stefan Roberts and Kathryn Medler.

Other students presenting the results of their research in poster format were:

Tenzin Ngodup (faculty advisor Dr. Matthew Xu-Friedman), “Functional effects of noise-rearing on cochlear nucleus”

Xiaowen Zhuang (faculty advisor Dr. Matthew Xu-Friedman), “Release probability changes in

the cochlear nucleus following ear-plugging”

Zachary Ahart (faculty advisor Dr. Kathryn Medler), “Defining the Relationship between Diet-Induced Obesity and Peripheral Taste Responses”

Eric Anderson (faculty advisor Dr. Shermali Gunawardena), “Abnormal α -synuclein disrupts Rab3 movement in *Drosophila* larval axons”

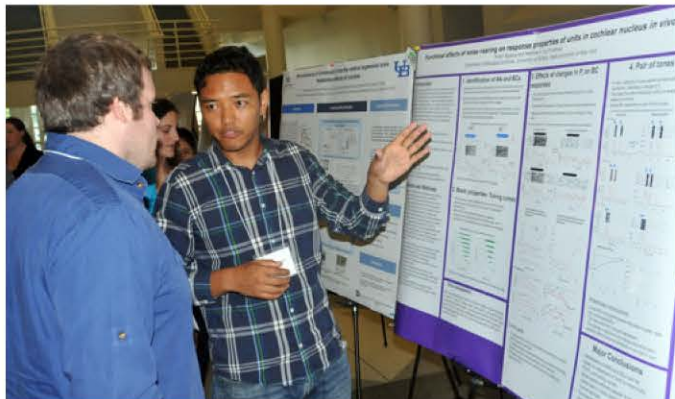
Joseph White (faculty advisor Dr. Shermali Gunawardena), “Huntingtin transports a novel class of vesicles on *Drosophila* larval axons”. Joe won second place for his poster among the 48 that were on display that day.



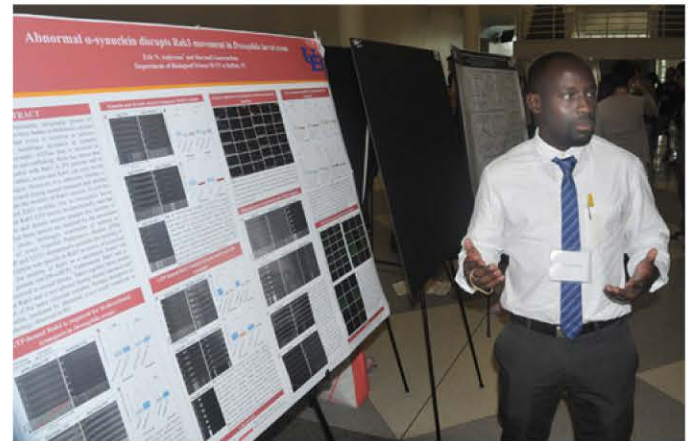
Ms. Yankun Gao



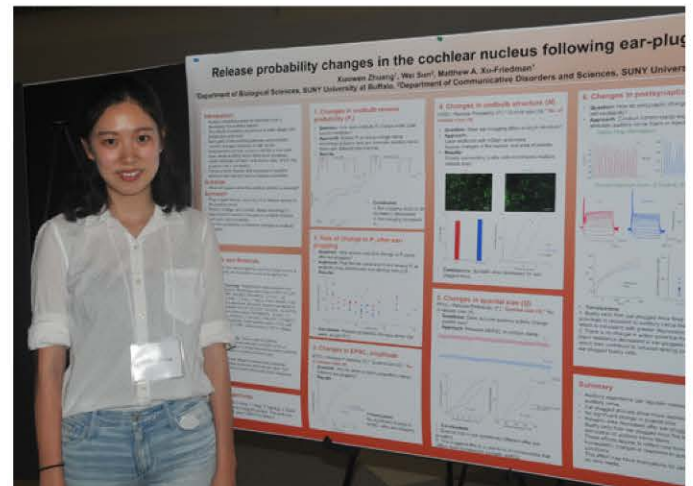
Mr. Joseph White



Mr. Tenzin Ngodup



Mr. Eric Anderson



Ms. Xiaowen Zhuang

9th Annual Graduate Student Research Symposium is most successful to date

Graduate students in the department once again organized their annual Graduate Student Research Symposium of the Biological Sciences. This highly successful event was held at the Center for the Arts building in March 2014. Students presented the results of their research with a record number of posters (34) and presentations (13) during this all-day event. They also invited, as their keynote speaker, **Dr. Rowan F. Sage** from the Department of Ecology and Evolutionary Biology, University of Toronto. The title of his talk was "System Flaws Create Opportunities for Diversification: A Case Study with Rubisco, Photorespiration, and C4 Photosynthesis". Darrell Doyle Memorial Travel Awards were awarded for best platform presentation and poster, respectively, as determined by departmental faculty. 1st place and a \$1,000 Darrell Doyle Travel Award for Best Presentation was given to **Neah Likhite** for her talk "Arginine methylation modulates *C. elegans* behavior." 2nd

place and a \$500 Travel Award went to **Jason Arnold** for "Receptor Mediated Endocytosis of Bacterial Prey by *Acanthamoeba*; LPS-MBP Interaction as a Mechanism for Recognition and/or Avoidance" and 3rd place and a \$250 award was given to **Ryan Hindman**, whose talk was "Nucleoside Triphosphate Phosphohydrolase I (NPH I) DNA Template Requirements in *Vaccinia* Early Gene Transcription Termination". Best Poster and a \$500 Doyle Travel Award went to **Joseph White** for "Huntingtin transports a novel class of vesicles on *Drosophila* larval axons"; 2nd place and \$250 went to **Courtney Szyjka** for her poster entitled "Investigation of a novel role for TRAP in transcriptional regulation of the *trp* operon"; 3rd place and a \$100 Travel Award went to **Matt Ballinger** for his poster "Discovery and evolution of ancient bunyaviruses in arctic phantom midges and diverse insect hosts". To view more photos from the symposium, follow this [link](#)



Chris Mure, Ashleigh Hanner, Clark Driscoll, Jacky Chow, Dr. Jim Berry, Dr. Rowan Sage, Dr. and Chairman Jerry Koudelka, Pradeep Yerramsetty



Neah Likhite



Jason Arnold



Ryan Hindman



Joseph White



Courtney Szyjka



Matt Ballinger

Undergraduate Student News . . .

Undergraduate Honors Symposium exceeds expectations

The department's annual **Undergraduate Honors Symposium** was held on Saturday, May 10th in the Student Union Theater on the North Campus. The Symposium is held each spring as a chance for our undergraduate honors research students to present the [results of their work in poster format](#). Each of the students needed to have met a GPA requirement,

be accepted into a UB lab doing biological research, and complete an independent project. The students' transcripts note that they have graduated as Biological Science majors with honors and many of them also graduate with Latin honors and distinction from the Honors College as well. For 2014 we had 22 successful honors students graduate from the department, the biggest group in departmental memory!



Aryn Andrzejewski



Viva Ayyar



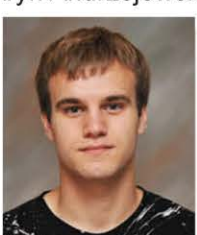
Genesis Capellan



Ryan Carpenter



James Catlin



Nathan Catlin



Kelly Coughlin



Andrew Croft



John Habert



Tim Hansen



Imani Henry



Tara Hogan



Julia Newman



Brian Niedzwecki



Jessica Petterson



Maria Pollack



Kristie Price



Megan Rosen



Lisa Samuels



Catherine Seaman



Needa Shihadeh



Alex Trujillo

Undergraduate Scholarship and Fellowship awardees announced

Through the generosity of our many friends and alumni donors, either through the establishment of endowments or the continued and sustained contributions of our friends and alumni, the department is fortunate to offer scholarship and fellowship support to its undergraduate students.

Sidney M. and Marjorie I. McCroskey Scholarships were awarded to Ronald Aaron Bola and Colin Flanagan. The McCroskey Endowment was established in honor of Sidney M. and his wife, Marjorie, both strong supporters of UB. The award is made to an entering senior student in biological sciences with a record of high academic achievement and demonstrated financial need. Colin has been a research assistant for the Alcohol Research Laboratory and is currently in the lab of Dr. Omer Gokcumen where he is working on methodological developments, including cutting-edge genomics applications. He is a volunteer at Kaleida Health, has been a Teaching Assistant for BIO 200 (Evolutionary Biology) and BIO 201 (Cell Biology), and is a member of the Golden Key Honor Society and Alpha Sigma Pi, a leadership society.

Ronald has spent his summers as a research intern at the Children's Hospital of Pittsburgh, where one of his research projects entitled "Cerebrospinal Fluid Levels of Mitochondrial DNA (DAMPs) in Pediatric Traumatic Brain Injury" was presented at the 43rd annual Critical Care Congress. The same project was published online ahead of print in the Journal *Shock*. He is a member of the UB Quidditch Association, tutors Biology, Chemistry, and Mathematics courses, and works part-time in the Chemistry Department stockroom. Ronald is currently engaged in undergraduate research in Dr. Denise Ferkey's lab.

The Philip G. Miles Undergraduate Research Fund enables students in the department to undertake independent research in a faculty member's laboratory during the summer months. This year's recipients are Matthew Fenigstein and William Richardson. Matthew's research was done in Dr. Denise Ferkey's lab, where he studied *C. Elegans* pain receptors, the goal of which was to find a way to inactivate the transduction pathway, thus blocking the pain signal from being sent to the body. If the ability to inactivate this organism's pain receptors becomes known, the hope is that the same principle could be applied to humans to aid in the treatment of chronic pain. William spent his summer in Dr. Laura Rusche's lab, where he researched the specific recruitment of telomeric proteins in yeast, specifically *Saccharomyces cerevisiae*. If the process of protein recruitment on the telomere can be understood, more will be known about its genetic interactions, which may bring new discoveries on the process of aging and the evolution of protein-DNA binding caused by genetic duplications.

Dr. Daryl L. Raszl Undergraduate Research Fellowship for the 2014-2015 academic year was awarded to Ms. Leeann Le. Leeann has joined the lab of Dr. Charlotte Lindqvist, and is working on a molecular evolutionary project investigating signals of positive Darwinian selection in circadian clock genes in polar and brown bears. This is part of a larger effort studying the molecular adaptation of polar bears, taking both a genome-wide approach and a more targeted approach selecting genes based on previous polar bear genomic research and their known functions in other mammalian systems. Leeann is spearheading this bioinformatics effort. Outside of her academics, Leeann is a volunteer at an area nursing home, Secretary of the national Society of Collegiate Scholars, Public Relations Officer of the UB Pre-Dental Association, and a member of both Alpha Epsilon Delta and the Undergraduate Biology Association.

Undergraduate Student News . . .

Undergraduate Scholarship and Fellowship awardees cont'd

The Irving W. and Natalie A. Knobloch Scholarship was awarded to Hannah Norris. Endowed by the late Professor Emeritus, Irving R. Knobloch (B.A. magna cum laude 1930, M.S. 1932), it is intended for students who demonstrate scholarship, service to UB and their community, and financial need. Hannah has completed undergraduate research studying the symbiosis between soft corals and the dinoflagellate algae *Symbiodinium*, and served as an undergraduate Teaching Assistant in BIO 201 (Cell Biology) during the spring 2014 semester. She is currently engaged in a departmental research project under the guidance of Dr. Jeremy Bruenn. Hannah's project is on non-retroviral integrated RNA viruses (NIRVs). It involves understanding the nature of viral interference mediated by integrated copies of totivirus genes and requires developing techniques for viral transduction, since totiviruses are generally non-infectious. Says Hannah, "I have already learned many lab techniques for this project, including sterile microbiological techniques, DNA and RNA isolation, cloning, and transformation. I plan to use colony RT-PCR to screen for the virus. I am learning how to design effective experiments using the primary literature".



Dean's Outstanding Senior Award goes to Rachel L. LaRosa

This year's outstanding senior was chosen from a pool of faculty-nominated students, with review and final selection by the Department's Undergraduate Affairs Committee. Ms. La Rosa completed the Bachelor of Science degree in Biological Sciences with a Concentration in

Neuroscience. Additionally, she graduated with Latin honors (summa cum laude) and with departmental honors, and as a member of Phi Beta Kappa. She has been recognized many times on the Dean's List for her



academic achievement. Each summer during her undergraduate years, she has participated at the University of Rochester Medical Center in a research internship studying methicillin-resistant bacterial infections. Ms. La Rosa has annually presented her research data and outcomes, and she is co-author with her research supervisors on a published report. In the summer of 2013, she was selected to join the University of Rochester Medical Center Summer Scholars Program that targets students interested in pursuing a doctoral degree in biological or biomedical sciences. Her senior year honors research project was conducted in the laboratory of Dr. Matthew Xu-Friedman, where she explored synaptic plasticity in the auditory nerve. Additionally, Ms. La Rosa served as an undergraduate teaching assistant in our Department's BIO 201 Cell Biology course and assisted in the BIO 370 Developmental Biology Laboratory. Rachel also served as a STEP (Science and Technology Entry Program) volunteer tutor at the UB School of Medicine. This program encourages minority and economically disadvantaged high school students to pursue careers in medicine and other health-related professions

For her future career, Ms. La Rosa looks to a combined M.D./Ph.D. degree that will afford her the opportunities for both basic research and clinical service. And in May of 2014, Rachel was the student speaker at the departmental commencement convocation.

Undergraduate Student News . . .

This past year's **Celebration of Academic Excellence** took place on Wednesday April 23, 2014 in the Center for the Arts on UB's North Campus. This event provides an excellent opportunity for undergraduates to showcase their research and creative projects. The following students presented their posters that day:

Mark Asirwatham, Alveera Tabbasum, and Oscar Lee, "Cadmium toxicity in the macrophytic alga *Chara*: role of reactive oxygen species and effect of zinc". Research mentor: Dr. Mary Bisson.

Nathan Catlin, "Phylogenetic Analyses of New World Mints Using Nuclear and Chloroplast DNA Datasets". Research mentor: Dr. Charlotte Lindqvist.

Timothy Hansen, "Investigating the Role of Molecular Motors in Retrograde Bone Morphogenetic Protein (BMP) Signaling". Research mentor: Dr. Shermali Gunawardena.

Farhana Hasan, "The Story of the Food Chain and Nepali L2 Learners". Research mentor: Dr. Shermali Gunawardena.

Katherine Zimmerman, "Investigating the role HTT plays on Rab19 and Rab3 motility in *Drosophila* larval axons". Research mentor: Dr. Shermali Gunawardena.

Julia Newman, "The Role of Post-Translational Modifications on Protein-Protein Interactions". Research mentor: Dr. Michael Yu.

Vivaswath Ayyar, "Time-course and magnitude of GILZ mRNA expression in healthy, glucocorticoid-treated and LPS-induced inflammatory model rats". Research mentors: Dr. Debra DuBois and Dr. Richard Almon.



Undergraduate Convocation 2014

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