

BioNews

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Message from the Chairman . . .

Greetings and welcome to this latest edition of BioNews. Here at UB we are in the midst of the academic year and it is turning out to be an interesting one, full of exciting new developments and harbingers of an even more promising future.

As you may recall, last year our University administration underwent a large change with the installation of a new President, Satish Tripathi, and a new Dean for the College of Arts and Sciences, Dr. E. Bruce Pitman. Late last academic year, UB announced the appointment of our new Provost, Charles (Chip) Zukoski. Dr. Zukoski, a member of the National Academy of Engineering, joins us from the University of Illinois Urbana-Champaign. A dynamic administrator, Dr. Zukoski 'hit the ground running' and has launched a program that will begin to define "Why UB?" - a question whose answer will delineate and strengthen what makes UB unique and will capitalize on UB's 'triple threat' of excellence in teaching, research and service/entrepreneurship. Helping UB to realize its vision is a new commitment for underwriting its programs by the State of New York. Through the NYSUNY2020 project, UB has, for the first time, been given the opportunity to set a specific set of goals and have a guaranteed budget for achieving those goals. This program will benefit the University and most importantly its students, in myriad ways, ranging from increased faculty:student ratio, increased financial aid and greater access to a wider range of classes. The Department of Biological Sciences is an active player in the NYSUNY2020 plan, already having increased the amount of credit hours it teaches in the freshman year by over 15%, with additional

increases in the second year and beyond anticipated in the next several years. Beyond that, the Department anticipates growing its faculty to meet the demands of providing research and education to a growing number of students in what has been called the "Century of Biology".

As described in the last issue of BioNews, work continues apace on the Department's plans to renovate its home in Cooke-Hochstetter-Dorsheimer. With the assistance of Ellenzweig, a renowned architectural firm with vast expertise in programming and designing academic science facilities, the Department has completed a programming plan for our newly renovated space. We anticipate that this plan will move to the design phase early in 2013, with construction beginning somewhere later in 2013. We look forward to having a new platform from which we can launch our new educational and research programs.

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
Professor and Chair



Names in the news . . .

Lindqvist Part of International Research Team Looking at Polar Bear Evolution



Greenpeace/European Press Photo Agency

Excerpted from New York Times Article July 23, 2012

It has been a busy couple of years for studies of polar bear evolution. In 2010, a mitochondrial DNA study of modern bears suggested that the polar bears might have been a recent offshoot of brown bears, perhaps only 130,000 years old. But mitochondria are little energy factories passed down in the mother's egg, and they tell the story of the female line only.

The study that pushed back polar bears' origin to about 600,000 years ago was based on snippets of nuclear DNA, which comes from both sexes.

But those snippets represented only selected bits; the new study, by Webb Miller and Stephan C. Schuster of Penn State, **Charlotte Lindqvist of the University at Buffalo**, and an international team of 23 other scientists, looked at the full genomes of polar bears, brown bears and black bears. Dr. Lindqvist, the senior author, said the full-genome approach enabled the scientists to look at polar bear history in new depth. She was also the first author of the mitochondrial DNA study.

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To read the entire article follow this link:

<http://www.nytimes.com/2012/07/24/science/brown-bears-and--polar-bears-split-up-but-continued-coupling.html>

In the brain, "Ormosil" nanoparticles hold promise as a potential vehicle for drug delivery

Dr. Shermali Gunawardena's research with a novel class of nanoparticles was featured in the January 9th edition of The Reporter. The particles, which were tagged with fluorescent proteins, successfully penetrated the insects' brains.

The cells and the flies themselves remained unharmed after long-term exposure.

Dr. Gunawardena hopes to use these nanoparticles to target drugs to protein jams (possible contributors to disorders such as Alzheimer's or Parkinson's diseases) along axons, breaking up the accumulations.

To read the full story, please go to:

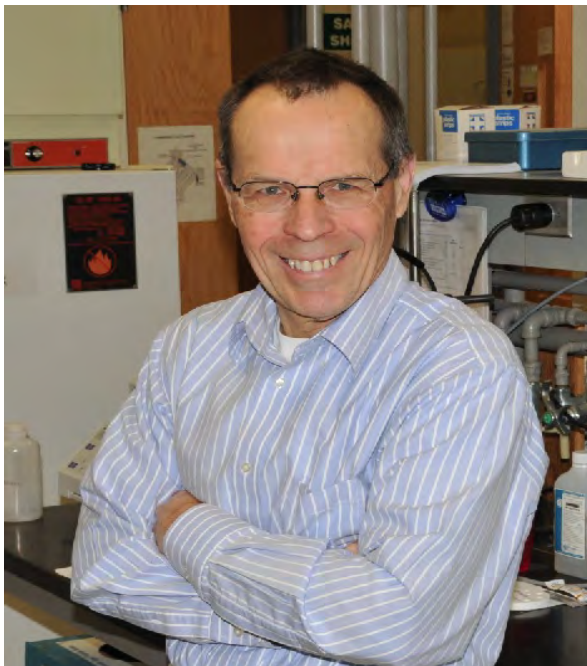
<http://www.buffalo.edu/news/13116>



Dr. Gunawardena (photo by Douglas Levere)

Department plays role in SUNY Innovative Instruction Technology Grant (IITG)

Dr. Christopher Loretz is a partner in a \$20,000 IITG grant awarded to Dr. Adam Rich of SUNY/Brockport. The pilot project, entitled "Creation, Implementation, and Assessment of Anatomy and Physiology Online Laboratory Modules" will develop pre-laboratory learning modules for Anatomy & Physiology students that will be easily accessible outside of the teaching laboratory on a variety of computing platforms, including mobile devices. The learning modules will feature course instructors in video presentations of introductory material appropriate to anatomy and physiology laboratory exercises. Advance exposure to basic principles and background information will serve as a foundation for more efficient and in-depth practical laboratory experiences by the students. The pilot project will field test modules on multiple campuses in order to assess their effectiveness in advancing student learning. The overall goal of the project is to use instructional technology to improve teaching laboratory efficiency while maintaining learning outcomes, and to identify the most important features of this approach that will facilitate faculty adoption of the technology.



Dr. Chris Loretz

Dr. Charlotte Lindqvist, Assistant Professor, has been awarded a 2 year, \$100,000 grant from the National Fish and Wildlife Foundation (NFWF) to look at admixture between polar and brown bears in Alaska as a possible response to climate change. Her research is broadly concerned with the processes and patterns of morphological and genetic diversification in natural populations, in particular rapid speciation and divergence. Dr. Lindqvist is the senior author of a report that appeared in the Proceedings of the National Academy of Science early this year entitled "Polar and brown bear genomes reveal ancient admixture and demographic footprints of past climate change" and which received extensive coverage in print and electronic media, most notably the New York Times, New Scientist, Nature, and National Public Radio.



Dr. Katharina Dittmar has been promoted to Associate Professor effective September 1, 2012. Dr. Dittmar is an evolutionary biologist and teaches graduate and undergraduate courses in Evolutionary Genetics and Medical Parasitology/Entomology. In connection with her teaching, she is currently a co-investigator on a National Science Foundation (NSF) Cyberinfrastructure-TEAM grant, to develop a virtual, cloud-deployed population genetic teaching tool. She is also a principal investigator on an intramural SUNY Innovative Teaching Technology Grant to develop mobile teaching apps for Android and Apple operating systems. Dr. Dittmar has an active research lab that is currently funded by a 3 year NSF grant to study the microbial associates of blood-feeding parasites, with an emphasis on bat parasites. Her research interests are the evolution of parasitism and microbial symbiosis using phylogenetic, genomic, and *in-situ* imaging approaches; Additionally, Dr. Dittmar has 26 publications, and five book chapters since working at UB. She is currently a research associate at the Field Museum of Natural History (Chicago), and an International Guest Researcher at the Division of Vector Borne Diseases of the Center for Disease Control and Prevention.

In Fly DNA, the Footprint of a Fly Virus - The discovery of virus-like genes in the DNA of a commonly studied fruit fly could enable research on whether animals hijack viral genes as an anti-viral defense

By Charlotte Hsu

Reprinted from UB Reporter, August 1, 2012

BUFFALO, N.Y. -- In a curious evolutionary twist, several species of a commonly studied fruit fly appear to have incorporated genetic material from a virus into their genomes, according to new research by University at Buffalo biologists.

The study found that several types of fruit fly -- scientific name *Drosophila* -- harbored genes similar to those that code for the sigma virus, a fly virus in the same family as rabies. The authors believe the genetic information was acquired during past viral infections and passed on from fruit fly parent to offspring through many generations.

The discovery could open the door for research on why flies and other organisms selectively retain viral genes -- dubbed "fossil" genes -- through evolution, said lead author Matthew Ballinger, a PhD candidate in UB's Department of Biological Sciences.

One hypothesis is that viral genes provide an anti-viral defense, but scientists have had trouble testing this theory because viral genes found in animals are often millions of years old -- ancient enough that the genes' genetic sequence differs significantly from that of modern-day viruses.

The new study, in contrast, uncovered a viral gene that appears to be relatively young, with genetic material closely mirroring that of a modern sigma virus.

"We don't know that these genes have an anti-viral function, but it's something we'd like to test," Ballinger said. "It's tempting to think that these genes are retained and express RNA because there's some kind of advantage to the host."

He and his co-authors -- Professor Jeremy Bruenn and Associate Professor Derek Taylor in UB's Department of Biological

Sciences -- reported their results online on June 26 in the journal *Molecular Phylogenetics and Evolution*. The research, supported in part by UB's Center for Advanced Molecular Biology and Immunology, will also appear in a forthcoming print edition of the journal.

"Our findings establish that sigma virus-like (genes) are present in *Drosophila* species and that these infection scars represent a rich evolutionary history between virus and host," the researchers wrote in their paper.

Another important contribution the study makes is advancing our understanding of how flies and other organisms acquire copies of virus-like genes in the first place.

The sigma virus belongs to a class of RNA viruses that lack an important enzyme, reverse transcriptase, that enables other viruses to convert their genetic material into DNA for integration into host genomes.

Given this limitation, how did sigma virus genes get into fly genomes?

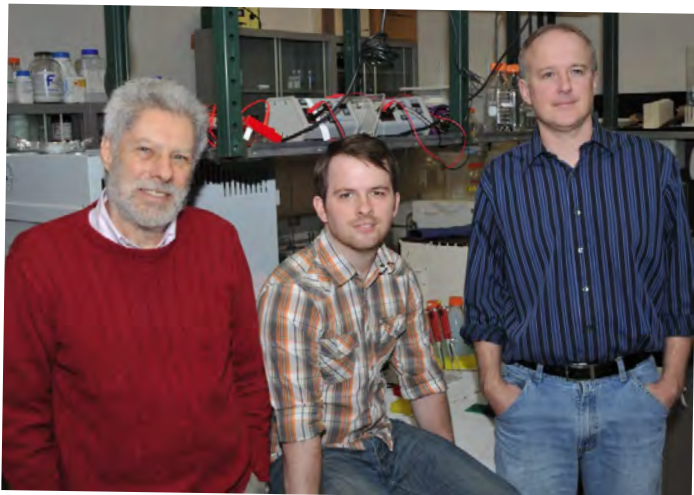
The new study supplies one possible answer, suggesting that viruses may use reverse transcriptase present in host cells to facilitate incorporation of viral genes into host DNA.

In the genome of one fly, the researchers found a sigma fossil gene right in the middle of a retrotransposon, a genetic sequence that produces reverse transcriptase for the purpose of making new copies of itself to paste into the genome.

The position and context of the viral gene suggests that the retrotransposon made a copying error and copied and pasted virus genes into the fly genome. This is the clearest evidence yet that non-retroviral RNA virus genes naturally enter host genomes by the action of enzymes already present in the cell, Ballinger said.

The study builds on prior research by Taylor and Bruenn, who previously co-authored a paper showing that bats, rodents and wallabies harbor fossil copies of genes that code for filoviruses, which cause deadly Ebola and Marburg hemorrhagic fevers in humans.

The next step in the research is to continue exploring how and why flies and other organisms acquire copies of virus genes. To find out whether sigma virus-like genes have an anti-viral function in fruit flies, scientists could splice the genes into flies that can contract modern sigma viruses, or introduce modern sigma viruses into flies that already harbor the genes.



Faculty news cont . . .

Dr. James Berry was invited to give a research seminar and three lectures to undergraduate students at Capital Normal University (CNU) College of Life Sciences in Beijing, China as part of an exchange program UB has with CNU. His research seminar was the "Post-Transcriptional Control of Photosynthetic Gene Expression in C4 Plants" and his lectures were on the topics of microRNAs, RNA silencing, and infection of plants by an RNA virus. Dr. Berry was in China from June 9th to June 17th, 2012, at the invitation of Professor LiPing Yin, who worked in his lab from November 2001 to August 2002.



Dr. Berry lecturing to students during his visit



Dr. Paul Cullen received invitation from Carlsberg



Dr. Cullen in front of the Carlsberg Brewery - One of the perks of yeast!

Paul Cullen was invited to Copenhagen Denmark to give a talk on his work at the Carlsberg Breweries. Carlsberg breweries is one of the oldest breweries in the world and is widely credited with where yeast genetics began. Carlsberg was also the site where the property of pH was first studied. Yeast is the ingredient in beer that produces alcohol.

Paul Cullen talked about his work on signal transduction in yeast, which is relevant to understanding what yeast are "thinking about" when put into new environments, such as a vat of sugar, wheat and hops. One distinguishing feature of the seminar program is that the speaker drinks a beer (or 2) during the seminar, which often leads to interesting public discussions. Incidentally, Paul also used the beer bottle as a pointer for his slides. Paul was invited to the breweries by Jurgen Wendland, who sequenced the Carlsberg yeast's genome and introduced the first genetically modified yeast to replace and improve on Carlsberg's fermenting strain. Better beer, better taste, thanks to yeast.



Professor Emeritus Chuck Fournier retired in February of this year, after 37 years of distinguished service to the department and UB. A zoologist by training, he authored 43 research publications, 9 book chapters and reviews, and co-authored one book. He is a member of the AAAS and NY Academy of Sciences, and was an external reviewer for numerous journals and governmental and non-profit agencies.

Dr. Fournier taught a wide-range of courses during his career in the Department including: Evolutionary Biology, Comparative Animal Physiology, Neurobiology, Cell Physiology, and Scientific Inquiry (with focus on the Erie Canal). He also co-developed, with Dr. Mike Hudecki, a one year Perspectives in Human Biology course with lab which still serves a large component of incoming freshmen. In 2005, he was named recipient of the SUNY Chancellor's Award for Excellence in Teaching.

Extremely active in matters of university administration and governance, Dr. Fournier has been a member of departmental,

decanal and university-wide committees too numerous to list, serving as Chairman on a number of them. He also held the position of Associate Dean during the mid-eighties in what was then the Faculty of Natural Sciences and Mathematics. Currently, he and his wife, Anne, are active volunteers at the Iroquois National Wildlife Refuge, located mid-way between Rochester and Buffalo, NY. Both are on the Board of Directors of the Friends of Iroquois National Wildlife Refuge, Inc., where he serves as Treasurer and his wife as Vice President.



Departmental News . . .

Two Longtime Staff Members Recognized

Eileen Sylves, an Instructional Support Technician, has completed 30 years of service to UB. A graduate of Niagara University with a B.A. in Biology, she has primary responsibility for the technical support of several of the department's upper-level teaching lab courses, namely Genetics Lab, Developmental Biology Lab, and Advanced Molecular Biology Lab. Secondary duties involve providing support to the Physiology, Cell Biology, and Evolutionary Biology labs. She has also taught a laboratory course entitled 'Techniques in Immunology' on occasion. Eileen is a past recipient of the SUNY Chancellor's Award for Excellence.



Provost Zukoski, Eileen Sylves, and President Tripathi



Dean Bruce Pitman, Provost Zukoski, Jim Stamos, and President Tripathi

Jim Stamos was one of only three honorees who have completed 50 years of service to the university. As Senior Lab Illustrator and photographer, Jim has been involved in all aspects of the department's teaching and research, using state-of-the-art computer graphics software, digital photography, and Internet capabilities to assist in the preparation and presentation of charts, slides, graphs, diagrams, newsletters, photographs, illustrations, and posters. Jim is also the department's webmaster.

What's New . . .

Department adds new courses to its curriculum

Continuing with an initiative that began last year, the department continues to develop Special Topics courses which offer students an opportunity to explore emerging research or specialized content in a more focused course setting. Taught by faculty whose research expertise is in the particular topic, these courses have been well received by students at both the undergraduate and graduate levels. The following special topics are new for the 2012-2013 academic year:

Research Methods in Evolutionary Genomics – this course will teach computerized analysis of genomic and biological information, using computers to introduce students to the modern computerized tools of biology: R statistical and graphing language, Text/file manipulation expressions, and Introduction to Python (a computer programming language) for biology. Students in this course will learn basic data exploration, graphing and statistical analysis, and basic programming skills in Python.

cont'd

What's New cont'd . . .

new courses continued

Development and Evolution - this class explores the growing field of evolutionary developmental biology. In recent years, developmental biologists have realized that an evolutionary perspective provides great power for understanding organismal development at all biological levels. Likewise, evolutionary biologists now understand that (particularly molecular) studies of development are important for understanding key transitions in body plans and for understanding factors underlying diversification. The course reviews important findings from recent decades and explores topics on the recent cutting edge.

Topics in Signal Transduction - This course focuses on the basic concepts of how cells communicate with each other and how signals are transmitted within a cell in response to stimulation. Students will learn three representative signal transduction pathways in detail (Wnt, GPCR, Notch) and will read and present primary literature that has helped to build our understanding of these pathways.

Genes in Cancer - This course covers the functions of oncogenes and tumor suppressors in genome regulation and the pathways that lead to uncontrolled cell proliferation. Topics discussed include the cell cycle, transcription factors, signaling pathways, and metastasis.

Biological Chemistry of Human Diseases - This course considers the molecular basis of eight human diseases and their treatments. Examples and their physiological systems include high blood pressure or blood clotting problems (circulation), cystic fibrosis (lungs), Pompe disease (muscles), Graves disease (thyroid), celiac disease (digestion), and PKU and MCADD (phenylalanine and fatty acid metabolism defects in the liver). Data come from biochemistry and medical journals, including new approaches for treatment.

Genetics and Development of Zebrafish - provides an in-depth look at primary research in developmental biology, with an emphasis on genetic approaches used to study one of the most popular and rapidly-growing model systems - the zebrafish (*Danio rerio*). Topics include embryonic development of the zebrafish in comparison to other vertebrate systems, forward genetic screens, and reverse genetics methods including antisense technology, TILLING, and zinc finger nucleases.

New Arrivals . . .



Mr. William Nichols is our newest staff hire, having begun work in August as an Instructional Support Technician. Bill received his B.S. in Biology with a concentration in entomology from SUNY Oswego and an M.S. from Northern Illinois University. His primary duties include responsibility for Cytogenetics Lab, Developmental Biology Lab, and Cell Biology Lab. He also assists with inventory and specimen maintenance. Previously, he has worked as a Quality Control Technician for CSM Bakery Products, a Biologist for U.S. Fish and Wildlife Service, and a Biology lecturer and laboratory instructor at a community college in Illinois. Away from work, he prefers to fish, take photos, play various sports, and play miniature board games competitively.

What's New cont'd . . .

Department plays key role in innovative teacher development through partnership with the Buffalo Public School system.

A coalition of partners in WNY, including UB, has been awarded a five-year, \$9.8M grant from the NSF to transform how science is taught in select middle and high schools within the Buffalo Public School District. The Interdisciplinary Science and Engineering Partnership (ISEP), led by Dr. Joe Gardella in the Department of Chemistry, uses an innovative approach to teacher professional development, combining novel mentoring approaches through courses and interdisciplinary research experiences, with the goal of cultivating mentoring relationships involving middle and high school teachers and their students. The idea is that as teachers gain new skills and knowledge to share with their students, students benefit from hands-on learning and exposure to interdisciplinary research and problem solving. The summer program for teachers, in particular, serves a two-fold purpose - to aid in the professional development of the teachers involved by giving them first-hand experience about how science is being done in a research setting, and to develop a new lesson or activity that they can bring back to their respective schools. The following departmental faculty members have hosted Buffalo Public School teachers in their laboratories this past summer:

Dr. Lara Hutson hosted a high school biology teacher from the Math Science Technology Prep School (PS 197). Her host studied fish husbandry and zebrafish genetics, how to set up mating pairs and collect eggs, and analyze the effects of raising embryos in water collected from local freshwater lakes and streams. Toward the end of the summer, ISEP purchased a new LED excitation fluorescence dissecting microscope for analyzing zebrafish GFP lines which was sufficiently user-friendly and portable enough to be deployed in high school biology classrooms.

Dr. Jeremy Bruenn hosted a teacher from East High School in Buffalo for two months in his lab. She acquired basic microbiology skills as well as some basic biochemistry. She also learned how to do agarose gel electrophoresis of DNA and RNA and was supplied with all the reagents and equipment to carry out experiments in her own school laboratory.

Dr. James Berry – also hosted a science teacher at East High School, who studied the specialized and highly efficient C4 pathway of photosynthesis. For his project, the host teacher localized photosynthetic proteins within the leaf cells of C4 plants, using a method called immunolocalization. He learned this technique from start to finish from growing plants,

/fixing/embedding/sectioning leaves and reacting them with specific antibodies, and visualization with a microscope. The host teacher also analyzed the effects of environmental carbon dioxide (CO₂) on the growth of these plants. The methods that he learned will be incorporated into his high school biology class this academic year.

Dr. Stephen Free hosted a High School Special Education teacher from Riverside High School who was trained to use an LED epi-fluorescent microscope attachment to convert a regular microscope into a fluorescence microscope. Using the microscope, he examined a number of different types of microbes and developed a laboratory exercise that can be used to teach high school students about the use of the microscope.

Dr. Gerald Koudelka hosted two teachers from Hutchinson Technical High School whose summer project involved learning how to detect various types of pathogenic and non-pathogenic bacteria in recreational beach waters from several Lake Erie beaches. The teachers first learned the PCR techniques needed to detect these bacteria by examining laboratory samples. Subsequently they had the opportunity to collect and analyze water samples from Beaver Island and Woodlawn State Park beaches. In the spring 2013 the teachers and Dr. Koudelka will teach these techniques to the high school students in their classes. The students will then hopefully begin a long-term area-wide study of bacterial content of these beach waters that will be included in a regional study of recreational beach water quality in eastern Lake Erie.

Additionally, two doctoral students, **Amy Zielinski** and **Katherine Hofer**, in their capacities as graduate assistants, are involved year-round in some aspect of classroom teaching, including developing new labs to fit the curriculum of the courses taught by our summer guests and acquiring supplies necessary to implement these labs, using ISEP funding. They also serve as additional classroom support and help the students carry out the labs by giving instruction, providing demonstrations, and being available for questions. Ms. Zielinski in particular has been involved this academic year with a newly piloted after school "Science Club" program where she and other graduate students do fun experiments and demonstrations with a group of high school students that voluntarily (and eagerly) participate in this club. The ultimate goal is to cover a broad range of science concepts in the hope of identifying and preparing a group of students from East High to participate in the 2013 New York State Science Olympiad.

New Arrivals cont'd . . .



Dr. Laura Rusche joined the department as an Assistant Professor this fall, coming from Duke University where she was an Assistant Professor of Biochemistry at the Duke University School of Medicine and the Institute for Genome Sciences & Policy. Prior to her appointment at Duke, she completed her postdoctoral work in the Department of Molecular and Cell Biology at the University of California at Berkeley. Her research focuses on chromatin and its impact on gene expression, genome stability, and chromosome function. In particular, she studies Sir2 proteins, which deacetylate histones to repress transcription and are proposed to link life cycle progression with nutrient availability. The two main questions she is investigating is how Sir2-containing heterochromatin assembly is restricted to appropriate genomic locations, and how Sir2 and its partner proteins have evolved to confer new adaptive traits. In her free time, she plays the violin and recently joined the Cheek-towaga Community Symphony Orchestra.

Undergraduate student news and events . . .

Undergraduate Honors Symposium

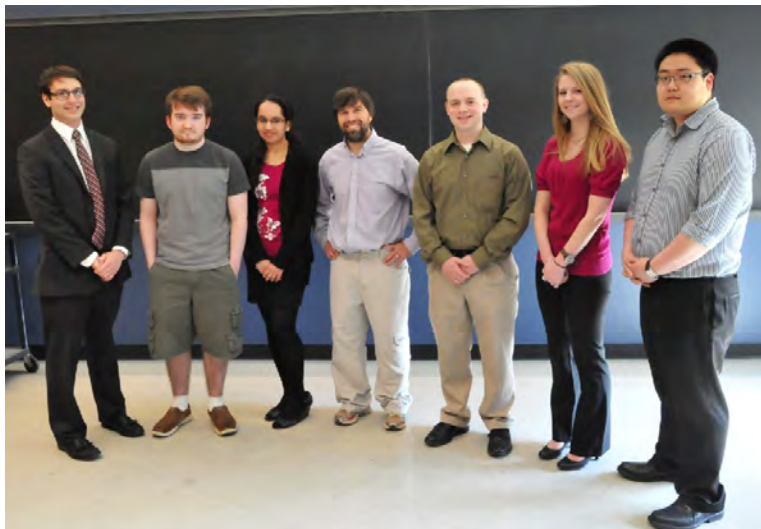
Biological Sciences majors in B.A. or the B.S. program may participate in the departmental Honors Program provided they maintain a GPA of 3.25 or higher in all biological science and basic science (chemistry, physics and math) coursework. Requirements for departmental honors also include 6 credits of Honors Research (BIO497), typically conducted over two semesters, supervised by a faculty member. This research

culminates in an oral presentation at the Honors Symposium-held at the end of the academic year. Students who meet all the criteria have an honors designation added to their transcript. Held on April 27th, 2012, this year's participants, research topics, and faculty advisers are:

Sungwon Byun, research advisor: Dr. Ashu Sharma. "Study of AmpG gene function in *Tannerella forsythia*". Sungwon is currently a Research Scientist in the Department of Oral Biology at UB and hopes to attend Dental School in the fall of 2013.

Unati Dev, Research Advisor: Dr. Paul Cullen. "Transmembrane protein Opy2 interacts with Mig2". Unati is currently enrolled at Texas A&M University in their Professional Science Masters Program in Biotechnology.

Nadav I. Weinstock, research advisor: Joan S. Baizer. "The cytoarchitecture and neurochemical properties of the human dorsal cochlear nucleus". Nadav is currently in his first semester of medical school at UB in the MD/PhD program. He hopes to complete his thesis in molecular biology geared toward translational neuroscience, and aspires to pursue a residency in neurology.



L to R: Nadav Weinstock, Logan Cole, Unati Dev, Dr. Paul Cullen, Jamieson Brady, Kristen Morris, and Sungwon Byun.

Undergraduate Honors Symposium cont'd

Logan Wyatt Cole, research advisor: Charlotte Lindqvist. "Phylogenetic analyses of low-copy nuclear loci show reticulate evolutionary patterns among Hawaiian endemic labiates and New World Stachys relatives (Lamioideae, Lamiaceae)". Logan is a Ph.D. student in evolutionary biology at Indiana University in Bloomington, Indiana.

Kristen Morris, faculty advisor: Dr. Berezney. "3D Organization and Morphology of Chromosome Territories in Human WI38 Cells". Kristen is currently enrolled in the Pharm D program at Virginia Commonwealth University. After graduation, she plans on working in a community pharmacy practice.

Jamieson Brady, research advisor: Dr. James LaFountain. "Meiosis in Crane Fly Spermatocytes: Mechanisms of Chromosome Movement During Prometaphase". Jamieson is pursuing his D.D.S. degree at the UB Dental School.



Undergraduate Research Fellowship awarded by the American Society for Microbiology

Biological Sciences senior **Courtney Szyjka** has received the American Society for Microbiology's 2012 Undergraduate Research Fellowship, one of 56 fellows selected from a field of 122 applications. The ASM is the oldest and largest single biological membership organization, with over 40,000 members world wide. The award, which comes with a \$4,000 stipend, recognizes highly competitive students who wish to pursue graduate careers in microbiology. Fellows receive an opportunity to conduct full-time summer research with an American Society for Microbiology mentor.

Courtney's research mentor is Gerald Koudelka, professor and chairman of the department. The title of their research project is "Characterization of the DNA Binding and Gene Regulatory Activities of Bacteriophage VT2_phi272 Repressor." In addition to the stipend, she received funding for travel expenses to the society's Presentation Institute and General Meeting to present their research results in May 2013 in Denver, Colorado.



Undergraduate Scholarship and Fellowship awardees announced

The department continues to expand its offerings of scholarship and fellowship support of undergraduate students, either through the establishment of endowments or the continued and sustained contributions of our friends and alumni.

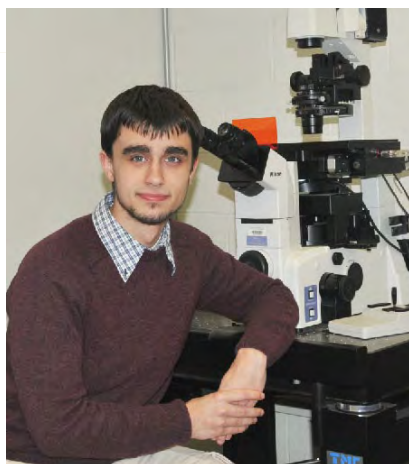
Sidney M. and Marjorie I. McCroskey Scholarships were awarded to **Henry Fung**, **Jennifer Trapani**, and **Mansu Shim**.

The **Irving W. and Natalie A. Knobloch Scholarship** was awarded to **Courtney Szyjka**. Courtney has also been awarded the American Society for Microbiology's 2012 Undergraduate Research Fellowship, which is highlighted in the previous news item above.

The following research fellowships offer students the experiential learning that will result in dividends when applying for graduate study and professional school. In many cases, students can devote significantly more time to research, rather than having to work a part-time job. This year's fellowship awardees are:

Alumni Undergraduate Research Fellowship – Gary Iacobucci, who is in his senior year, is working under the guidance of Dr. Shermali Gunawardena. He uses *Drosophila melanogaster* (fruit fly) to study the molecular mechanisms underlying the pathology of neurodegenerative diseases. Given that the proper movement and trafficking of proteins along the axons of neurons must be precise and highly coordinated, it is believed that defects in this axonal transport pathway may be a factor contributing to the massive cell death observed in disease. Accordingly, he is studying the dynamics of

Undergraduate Scholarship and Fellowship awardees announced *cont'd*



Gary Iacobucci

protein and vesicle movement within axons to elucidate what potential roles that defects in axonal transport play in neurodegenerative disease initiation and progression. Related to this, Gary has received a travel award from the Genetics Society of America to attend the 54th annual Drosophila Conference in April 2013. When not doing research or studying, he likes to play and learn about various musical instruments. Currently, he is composing the musical scores for an upcoming videogame design company. Although he writes for and appreciates many instruments, his primary and favorite instrument is the piano. After graduation, Gary plans to attend graduate school to obtain a PhD in neuroscience and continue being on the frontiers of science.

Dr. Daryl L. Raszl Undergraduate Research Fellowship – junior student Vivaswath Ayyar's research interests have taken him to the research lab of Drs. Richard Almon and Deborah DuBois, where his research primarily investigates the time course and pattern of expression of a particular gene mRNA which has been found to be one of the regulators in the anti-inflammatory and immunosuppressive response against inflammation caused by diseases like sepsis, rheumatoid arthritis, autoimmune syndromes, etc. A citizen of India, Viva chose UB because of its reputation as a research university, its quality of education, and its extremely qualified and distinguished faculty. Apart from academics, he volunteers at the Erie County Medical Center, works on the Late Night UB student programming board and serves as a student justice in the Student-Wide Judiciary. After graduation, he hopes to be admitted into an MD/PhD program.

Philip G. Miles Undergraduate Research Fund – senior Delnessaw Hirpa is also conducting research in the Gunawardena lab, where he is trying to understand the role of Parkinson's Disease (PD) genes in axonal transport and is currently analyzing an extensive set of in vivo data to evaluate the movement dynamics of vesicles within larval neurons in Drosophila models of PD. The recipient of a fall 2011 CURCA grant award from UB, Mr. Hirpa is a member of the Alpha Epsilon Delta Health Preprofessional Honor Society and Pre-Meds without Borders. He has volunteered at St. Joseph's Neighborhood Center and Buffalo General Hospital and plans to attend Medical School beginning fall 2013.



D. Jamieson Brady Receives College of Arts and Sciences Outstanding Senior Award



Each year the Dean honors the top senior graduating from each department in the College with the "Dean's Outstanding Senior Award", comprising a medal and a certificate, which is presented at the University Commencement ceremony. This year's nominee is D. Jamieson Brady of Waterville, N.Y. He graduated summa cum laude with a B.S. in

biological sciences, was on the Dean's List and is a recipient of the Provost Scholarship. A participant in the departmental honors program, he conducted research in two UB faculty laboratories, in the field of molecular virology with Professor Jeremy Bruenn, and cell biology with Professor James LaFountain. Mr. Brady received a Gilman International Scholarship from the U.S. State Department as a Study Abroad Scholar, spending a semester studying in Utrecht, The Netherlands. Brady also was a tutor in organic chemistry. He is currently a first-year dental student in UB's School of Dental Medicine.

7th Annual Graduate Student Research Symposium

The graduate student body once again organized their annual, and highly successful, Graduate Student Research Symposium of the Biological Sciences last March. Students presented the results of their research in 18 posters and 12 presentations during this all-day event. They also invited, as their keynote speaker, Dr. Loren Williams, Professor in the School of Chemistry & Biochemistry at the Georgia Institute of Technology. His talk was entitled "RNA: Still Catalyzing After all These Years".

Best Presentation and a \$1000 Darrell Doyle Travel Award was given to Jason Arnold for his talk "The Trojan Horse of the microbiological arms race: Phage encoded bacterial toxins". Best poster and a \$500 Doyle Travel Award went to Christopher Mure for "An RbcL-Specific mRNA Binding Protein Regulates Photosynthetic Gene Expression and Development in Maize".

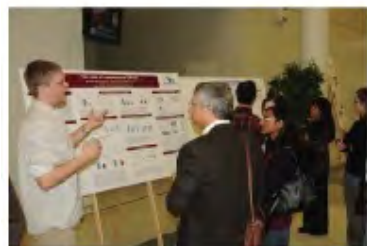
To view more photos from the symposium, go to:
http://biology.buffalo.edu/Symposium_2012/2012_Grad_Symposium.html



Dr. Mary Bisson, Dr. Chris Loretz, Amanda Herberger and Dr. Gerald Koudelka

Herberger Recognized as an Outstanding Graduate Teaching Assistant

Amanda Herberger, a fifth-year student in the Ph.D. program, was awarded the prestigious 2012 Excellence in Teaching Award for Graduate Teaching Assistants. As a TA, Amanda has provided exemplary service to five undergraduate courses: BIO 130, Perspectives in Human Biology II; BIO 200 Evolutionary Biology; BIO 201 Cell Biology; BIO 213 Physiology Laboratory with Recitation; and BIO 370 Developmental Biology Laboratory. For the past two summers (2011 and 2012), Ms. Herberger has been the sole instructor of the summer school offering of BIO 213 Physiology Laboratory. In his nomination letter, Dr. Christopher Loretz states that the key to her success is "her comfortable, encouraging, and professional style; her conscientious and thorough preparation; and her patience to see every week's activity through to completion. Her outstanding performance in the classroom also rests, and depends, on a sound background of scientific knowledge acquired through her graduate study." The department is proud to count such a deserving student as one of its own.



Dr. Philip J. Fay honored as Distinguished Alumni Speaker for 2012

Our Distinguished Alumni Awardee for 2012 is Dr. Philip Fay from the University of Rochester School of Medicine, where he is Professor in the Department of Biochemistry and Biophysics. Dr. Fay received a M.S. degree from our department (then the Division of Cell and Molecular Biology) in 1977. He then went on to develop an outstanding career at the University of Rochester where he is now an internationally recognized leader in the field of blood clotting proteins. In particular, his research focuses on the structure/function of factor VIII and its role in the regulation of the blood clotting pathway. Dr. Fay's research has been continuously funded by NIH for over 25 years and he currently has two major NIH grants.

The title of his October 11th talk was "Down-regulation of the Intrinsic Factor Xase in Blood Coagulation: Insights for the Development of Superior Factor VIII Therapeutics". For more information about Dr. Fay and his research, please visit:

www.urmc.rochester.edu/people/20356811-philip-j-fay



Dr. Gerald Koudelka, Chairman, Dr. Philip J. Fay, and Dr. Ron Berezney, Distinguished Alumni Co-ordinator

Newest Gift to Department Will Fund Graduate Student Research

The creation of the Paul Pizzella (B.A., 1986) and Marta Ayala Award memorializes their desire and willingness to provide graduate students in biological sciences with financial support to either attend or present at a scientific conference or go work in another research lab outside the department. The inaugural award will be presented at the annual Graduate Student Research Symposium, to be held in March, 2013, for best student presentation. By creating and supporting this award, the department will be able to attract and retain more high-achieving students with a talent and interest for science, enabling them to enter their fields with a world-class education.

Paul F. Pizzella (B.A., 1986), M.D., is a graduate of Chicago Medical School. After completing his surgical internship at the Naval Medical Center in Portsmouth, Va. he completed his residency in diagnostic radiology at the National Capitol Region Health Care Consortium. Board certified in radiology, Pizzella was recognized by Who's Who in 2012 as an outstanding professional in the field of radiology. He is currently a managing partner at Southtowns Radiology, a practice with multiple offices in Western New York, and also a member of the Dean's Advisory Council in the College of Arts and Sciences at the University at Buffalo. He resides in Amherst.

Our Alumni cont'd . . .

Kelly (Pelton) Ryan (B.S. 1985), a teacher at Shaker High School, North Colonie Central School District, has been awarded the 2012-13 Outstanding Biology Teacher Award for New York State. This OBTA award is recognition by a national organization of excellence in the teaching of biology/life science. Ryan has immersed herself in the subject of biology over her 25 years in the teaching profession. In 2010, she became the Living Environment Subject Area Representative (SAR) for the Eastern Section of the Science Teachers Association of New York State (STANYS). In this role, she presents at conferences both locally and throughout the state, and contributes articles four times a year for the Science Teachers Association of New York State newsletter

Karl Havens (B.S. 1979) is a Professor of Fisheries and Aquatic Sciences at the University of Florida and Director of the Florida Sea Grant College Program. He also is a member of Florida's Ocean and Coastal Council, a member of the Board of Directors of the Florida Institute of Oceanography, and Secretary of the Florida Ocean Alliance. Havens worked as a faculty member at Kent State University in Ohio before coming to UF, and in his career he has published over 150 journal articles, book chapters and books in his area of expertise -- water quality of lakes and estuaries, bioenergetics of aquatic food webs, and effects of climate change on lake and estuary ecosystem dynamics.

Ansar Khan (B.S. 2011) has been named to Forbes magazine's list of 2012 All-Star Student Entrepreneurs, one of nine young men and women who launched significant businesses while still in school. He co-founded Refulgent Software with a fellow UB classmate. The company developed a point-of-sale software application for the iPad and iPod that is sold to restaurants. The app saves waiters time by enabling them to take orders, send requests to the kitchen, and process credit cards on the iPad. The app can be purchased on the Apple Store and is now installed in 265 restaurants in 14 countries.. He resides in Amherst.

Ronald Uva (B.A. 1970) attended Medical School in Bologna, Italy and graduated with an M.D. in 1976. He completed his residency in Ob-gyn in 1980 and has practiced in Oswego N.Y. since that time. He's currently a member of the New York State Board for Medicine and Vice Chair of the American College of Ob-Gyn for New York State, having recently completed a three year stint as Legislative Chair for New York. Dr. Uva was a McCain fellow and spent last April in Washington advocating for issues pertinent to women's health care. He writes a monthly column entitled "Today's Health for the Empowered Woman" for the local paper and book reviews for the Medical Society.

Undergraduate student news and events cont'd from Page 11 . . .

Department undergraduates exhibit their research at The 9th Annual Celebration of Academic Excellence: A University-Wide Celebration of Scholarly, Research and Creative Excellence

On April 5th, 2012, undergraduate students from the department presented their research posters at the University's Annual Celebration of Academic Excellence. Student presenters were nominated by their Deans to participate in this event which showcases undergraduate students and their faculty mentors who are engaged in innovative work and scholarly research. The students and their research titles were:

Vivaswath Ayyar, "Effect of drug Memantine in blocking activity of open channel N-methyl-D-aspartate (NMDA) glutamate receptors."

Alexandra Curtis, "Losing and gaining endosymbionts: A complex evolutionary history of bloodfeeding parasites and their bat hosts"

Delnessaw Hirpa and **Christina Zheng**, "Characterizing Parkinson's Disease (PD) Proteins in Axonal Transport"

Gary Iacobucci, "Spatial and temporal analysis of axonal transport in primary neuronal cultures from *Drosophila* Larvae" Mr. Iacobucci's original research was also selected as a poster presentation to elected officials and SUNY Chancellor Nancy Zimpher as part of "Discovery—An Undergraduate Showcase," a symposium on undergraduate research and creative activities presented by the SUNY Faculty Senate on Feb. 29 in Albany. In all, more than 90 original projects were introduced by 125 SUNY undergraduates and 40-plus faculty research mentors who hailed from 23 of SUNY's four-year college campuses and university centers, and from 13 community college campuses. He is mentored by Dr. Shermali Gunawardena.

Alia Syed, "Information Satisfaction And Distress In A Low SES Cancer Population: Identification Of Critical Educational Domains"

Our Generous Donors over the past year . . .

The Department of Biological Sciences is grateful to all our alumni and friends for their contributions. Your gifts, large and small, to any of our various University at Buffalo Foundation accounts enhance our ability to provide UB Biological Sciences students with a quality education in modern biology. To contribute electronically, please visit:

www.biologicalsciences.buffalo.edu/alumni/donate_now.html

For more information about any of our funds, the department in general or to arrange a visit, please contact Dr. Gerald Koudelka, Professor and Chairman at [716] 645-4940 or koudelka@buffalo.edu



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