

BIOscope

WINTER 2014

MESSAGE FROM THE DEPARTMENT CHAIR

Congratulations to Drs. George Mourad and Ahmed Mustafa who have been selected as featured faculty for 2014-2015. They will be presenting honored lectures on Wednesday, February 19 and 26 to the IPFW community. Please attend these distinguished lectures on Wednesdays at noon and hear about all the wonderful and exciting work completed by these two distinguished biology faculty and the students who have worked with them over the years. We now have 2 new Biology degree "Concentrations" approved with one in "Ecology and Evolutionary Biology" and another in "Microbiology and Immunology." These concentrations will show up on your transcripts when you receive a BS Biology degree. These concentrations will allow Biology majors, in the areas listed above, to better market their IPFW Biology degree when looking for a job, as well as complete courses that will better focus their studies on elective biology classes that train them for jobs they want in these special "Concentrations" or areas of biology. As a biology major you still complete the core 5 biology lab classes and general education classwork that all biology majors take, but can better market your skills and better focus your training toward the job market you want. Thanks to Dr. Mark Jordan and the biology Curriculum Committee members for working out the details for these first two "Concentrations". We anticipate that by next year we will also have a "Pre-Vet as well as a Pre-Pharmacy" concentration. These are exciting new options for all our majors and will serve the over 150 students who are interested in these programs at IPFW and as students who also still want to transfer to Purdue. Please welcome Dr. Vamsi Nalam as a Visiting Assistant professor in biology researching and teaching for the biology department.

Have a great year!

Frank V. Paladino, Ph.D. FAAAS
Jack W. Schrey Distinguished Professor
Chair of Biology

CONGRATULATIONS TO FALL 2013 GRADUATES

The following students received the Bachelor of Science degree:

Landers Barber
Matthew Blosser
Parker Booth

Kristyn Botts
Jessica Cline
Jason Furge

Melissa Garringer
Jessica Grabowski
Samantha Hartmann

Carly Mannes
LeAnna Oberhausen
Jesse Sherman

Sean Tavernier
Rick Thomas

These students received the Master of Science degree:

Adam Bauer
Jacob Bryan

Tiffany Hough
Rachel Hunnicutt

Kevin Ann Hunt
Janet Minton

BIOscope is an information bulletin published three times during the academic year by the IPFW Department of Biology. It is posted electronically in PDF format on the Department of Biology website (IPFW.edu/biology). Students wishing to submit items for the next issue should contact the editor, Professor Ahmed Mustafa, at 481-6328 or mustafaa@ipfw.edu.

NEW GRADUATE TEACHING ASSISTANT

Jacob Hill

Advisor: Professor Frank Paladino

NEW GRADUATE RESEARCH ASSISTANTS

Alicia Conrad

Advisor: Associate Professor Robert Gillespie

Stacy Keough

Advisor: Assistant Professor Punya Nachappa

BIOLOGY SCHOLARSHIPS

Each spring semester the Biology Department awards a number of scholarships for undergraduate biology majors. Two things are different this year. Most of the awards will be for \$1,000. The Office of Financial Aid is requiring that all IPFW students seeking scholarships fill out a common online application found on the Financial Aid web site, which can be reached by selecting "Paying for college" at the top of the IPFW home page. Then click on and fill out the "common scholarship application." The application takes approximately 10-15 minutes to complete.

As chair of the biology welfare committee that awards biology scholarships, Professor DeMott wants to encourage every biology major to fill out the common scholarship application before the March 10, 2014, deadline. If you miss the deadline, you can contact the Financial Aid office to see if you can still apply. This will make you eligible for a variety of university scholarships as well as biology scholarships. These scholarships do not require information about your parents' income or other evidence of financial need. The biology scholarships require minimum GPA's ranging from 2.5 to 3.25 on a 4.0 scale. They also require that you will be a full time student at IPFW both semesters during the 2014-2015 school year and that you have completed at least 20 credit hours at IPFW before the 2014 fall semester.

COURSE REGISTRATION

Students should have already registered for and attending classes for the Spring 2014 session. Students were also able to register for Summer I and Summer II sessions at the same time. The last days to register for Summer I session are Thursday, May 15th and Friday, May 16th, 2014; and on-line late registration for Summer II session are Monday, June 30, 2014 through Wednesday July 2, 2014.

The Web-based version of the IPFW Schedule of Classes for Fall 2014 will be available online Monday, March 3, 2014. Printed schedule of classes are no longer available. All information regarding classes are online through the Registrar's website and Browse Classes on the IPFW.edu website.

We strongly encourage you to speak to your advisor before registering for classes.

Registration for Fall Classes

Seniors, Grad Students, Fall Degree Candidates....begins Monday, March 31, 2014

Juniors, Honors Students, Student Athletes, Students with Disabilities....Monday, April 7, 2014

Sophomores....begins Monday, April 14, 2014

Freshmen and all other students....begins Monday, April 21, 2014

Registering Online

Some students are registering for the wrong courses and getting off schedule. We strongly encourage you to speak to your advisor. If you are a senior registering online and expect to graduate at the end of this semester, be sure to check the box to initiate a graduation audit.

FALL 2014-BIOLOGY ELECTIVES

A Electives

BIOL 50100 – Field Botany (lecture and lab)
BIOL 59500-02 – Insect Vector-Borne Diseases (lecture)
BIOL 59800 – Biology of Fish (lecture and lab)
ENTM 20600 – General Applied Entomology (lecture)
ENTM 20700 – General Applied Entomology (lab)

B Electives

BIOL 21500 – Basic Human Anatomy (lecture and lab)
BIOL 38100 – Cell Biology (lecture)
BIOL 43700 – General Microbiology (lecture and lab)
BIOL 50600 – Human Molecular Genetics (lecture)
BIOL 51600 – Molecular Biology Cancer (lecture)
BIOL 53300 – Medical Microbiology (lecture)
BIOL 59500-01 – Proteins Structure Function (lecture)

RESEARCH OPPORTUNITIES

Professor Bruce Kingsbury invites student inquiries about opportunities for fieldwork with graduate students in his lab as well as other members of the Environmental Resources Center. If you like the idea of tracking turtles on the river, listening for frog calls at night or netting tadpoles during the day, then he might have something for you. A limited amount of funds are available for wages, and signing up for college credit is also a possibility. Professor Kingsbury is also looking for students interested in web design, social media, and graphic arts.

STUDENT NEWS

Chris Culkin (Research supervisor: Assistant Professor Punya Nachappa) has received an Indiana Academy of Sciences Senior Research Grant for \$2,970 to study the efficiency of salicylate and jasmonate signaling elicitors in conferring acquired systemic resistance against soybean aphid and soybean mosaic virus.

Chris Culkin (Research supervisor: Assistant Professor Punya Nachappa) has won first place at the Annual National Meeting of the Entomological Society of America, 2013. For his poster presentation entitled, "Drought Stress in Soybean: Impacts on Soybean Aphid Populations and Soybean Mosaic Virus."

Jacob Bryan (Research supervisor: Professor Frank Paladino) has been accepted to the Western University School of Veterinary Medicine in Pomona, California.

Mohammed Rumman Hossain (Research supervisor: Associate Professor Ahmed Mustafa) has been admitted in fall 2013 in the Ph.D. program, at the University of Akron, Ohio.

Kevin Ann Hunt (Research supervisor: Professor George Mourad), has been admitted in fall 2013 in the Ph.D. program, with a tuition free full Research Assistantship \$26,000/year, at the University of Chicago, Chicago, Illinois.

Justin Lothamer (Research supervisor: Assistant Professor Tanya Soule) was awarded the IPFW Undergraduate Summer Research Support Program grant of \$1,000. Justin's research involved measuring the expression of genes associated with extracellular polymeric substances in *Nostoc punctiforme*.

Priti Pal, a recent undergraduate of the Biology Department was accepted to University of Illinois at Chicago Graduate School in Chicago, Illinois.

Micah Rapp (Research supervisor: Professor George Mourad) was awarded a RESP Undergraduate Summer Research Grant \$1,000 to study the nucleobase cation symporter 1 of the monocot plants *Zea mays* and *Setaria viridis*.

Micah Rapp (Research supervisor: Professor George Mourad) was selected as 1st place winner at the Sigma Xi Undergraduate Research Competition held on April 12, 2013, for his research presentation. Micah received a monetary award, a certificate, and membership to the National Sigma Xi Research Society.

Sanjana Sai (Research supervisors: Assistant Professors Vamsi Nalam and Punya Nachappa) has received an Indiana Academy of Sciences Junior Research Grant for \$300 to study the effect of soybean-rhizobia symbiosis on soybean aphid populations.

Jessica Schein (Research supervisor: Professor George Mourad) has been admitted in fall 2013 in the Ph.D. program, with a tuition free full Research Assistantship \$26,000/year, at Michigan State University, East Lansing, Michigan.

Jessica Schein (Research supervisor: Professor George Mourad) was selected as 2nd place winner for her research presentation at the 16th Annual Research and Creative Endeavor held on April 12, 2013. Jessica received a plaque for her award.

Amanda Stoffer (Research supervisor: Professor George Mourad) was awarded a RESP Undergraduate Summer Research Grant \$1,000 to study to identify the role of L-tyrosine and uric acid as signaling factors involved in the uptake of nitrogenous rich compounds by the membrane transporter of a pathogenic bacteria that infects larvae of honey bee.

Savanna Vaughn (Research supervisor: Professor Bruce Kingsbury) is completing a six-month internship on Preserve Management Plans. She is currently pursuing her Masters of Science in Biology with a concentration in Wildlife Ecology from IPFW Fort Wayne. Thank you to the Olive B. Cole Foundation for providing this and other internships.

Victoria Wesolowski, a M.S. thesis student advised by Associate Professor Mark Jordan in the department of biology, is one of 15 graduate students selected from across the nation to participate in the UCLA/La Kretz Workshop in Conservation Genomics, March 22-27, 2014. Instructors are world experts in the field from UCLA, UC Davis, and UC Berkeley. Victoria will use the opportunity to enhance her research on the Blanding's Turtle, an endangered species that occurs in northeast Indiana.

On behalf of the Honors Program, we would like to congratulate the following students who will receive their Honors Certificate. The Honors Showcase will be Friday, April 11, 2014, at 11:00 a.m. Please email Michele Shawver at shawverm@ipfw.edu or call the Honors Program at 481-6024, if you are attending. Refreshments will be served. Those students who are receiving the certificate are as follows:

- **Kayla Boyles**, "Dendrochronological Assessment of Ash Growth Rates"
[Major: Biology; Faculty Mentor: Dr. Jordan Marshall (Biology)]
- **Rachel Habegger**, "Comparison of Fertilizers on Turfgrass"
[Major: Biology/History; Faculty Mentor: Dr. Jordan Marshall (Biology)]
- **Heidi Nissley**, "Measuring Macrophage Function in Fish"
[Major: Biology; Faculty Mentor: Dr. Ahmed Mustafa (Biology)]
- **Maja Slijivar**, "Ecological and Evolutionary Trade-Offs in Algae"
[Major: Biology; Faculty Mentor: Dr. Bill DeMott (Biology)]
- **Laura Trent**, "Functional Characterization of the Nucleobase Cation Symporter 1 in *Picea glauca*"
[Major: Biology; Faculty Mentor: Dr. George Mourad (Biology)]

DEPARTMENT NEWS

Associate Professor Elliott Blumenthal has been awarded with the Students Choice Award for Teaching in 2013. Dr. Blumenthal's areas of expertise includes Immunology and Microbiology. His knowledge extends to biochemical (kinase and proteolytic activity) alterations in the murine immune system in the following model systems: dietary restriction and aging, hypertension, dietary PCB, and human prostate cancer, as well as the isolation and characterization of the immune cell type exhibiting changes and correlation of these changes with immune dysfunction.

Professor Emeritus William Cooper has published an article titled, "*Island tameness: living on islands reduces flight initiation distance*" in the January 2014 print edition of the Proceedings of the Royal Society B, the Royal Society's flagship biological research journal.

Assistant Professor Jaiyanth Daniel has been awarded with the Purdue Research Foundation Summer Faculty Grant 2014.

Associate Professor Mark Jordan and Professor Bruce Kingsbury together with their research students have been awarded with several grant supports by the Fort Wayne Children's Zoo to run the following projects associated with Biology and the Environmental Resources Center: "Conservation Genetics of the Blanding's Turtle, *Emys blandingii*, Using Whole-genome Analyses"- **Victoria Wesolowski** and Mark Jordan; "Life in the City: Urban River Ecology of the Common Snapping Turtle in Fort Wayne, Indiana" - Kevin McLane and Bruce Kingsbury; "Amphibian Occupancy in a System of Restored

Wetlands" - Emily Stulik and Bruce Kingsbury; "Response of Eastern Massasauga to Habitat Alterations by Fire and Forest Management at Camp Grayling, Michigan" - **Sasha Tetzlaff**, **Michael Ravesi**, and Bruce Kingsbury. Each of the awards is for \$1,700.

Assistant Professor Jordan Marshall is one of five faculty members who have been selected for a new service learning initiative funded by the Office of Research, Engagement, and Special Programs. The IPFW Faculty Fellows program offers opportunities for service learning course development in the form of \$500 "mini-grants" available for new course training, project creation (or modification of existing course), and conference presentations for select faculty member fellows across multiple disciplines.

Associate Professor Ahmed Mustafa has received \$1,000 travel grant from Indiana University to present his recent research entitled, "Effects of Omega-3 fatty acid supplementation on aquaponic system-raised tilapia pthysiology, immunology, and muscle tissue retention" at the Asia Pacific Aquaculture Conference, held in Vietnam in December 2013.

Assistant Professor Tanya Soule has been selected to serve as an editor for Fine Focus, an undergraduate research journal in microbiology. Fine Focus is the first microbiology research journal for undergraduate students that plans to release its first issue in 2014.

BIOLOGY IN SCIENCE OLYMPIAD 2014

Nine teams from different schools converged on the IPFW campus, Saturday, February 1, to take part in the 2014 Science Olympiad. Twenty-three varied events, each of which contained one or more elements of Science, Technology, Engineering, and Mathematics were undertaken by the student teams. Associate Professor of Biology Ahmed Mustafa and Associate Professor of Education Jeff Nowak were the co-directors of this year's event. Among several IPFW faculty, Bob Gillespie, Jordan Marshall, Punya Nachappa, Vamsi Nalam, and Parveen Quarrar from biology have participated as event coordinators. Several biology students have also volunteered for the event.



Photo: Biology students with their displays at the 2014 Science Olympiad
(Photo: Ahmed Mustafa)

RECENT BIOLOGY PUBLICATIONS

- Adam Bauer** (2013). Landscape level predictors of a suite of imperiled wetland associated herpetofauna. M.S. Thesis, Department of Biology. (Major Advisor: Professor Bruce Kingsbury).
- Bieser, K. L., Wibbels, T., Mourad, G., and Paladino, F.** 2013. The cloning and expression Analysis of *Lhx9* during gonadal sex differentiation in the red-eared slider turtle, *Trachemys scripta*, a species with temperature-dependent sex determination. *Journal of Experimental Zoology (Molecular and Developmental Evolution)*, 9999B:1–9.
- Bryan Eads** (2013). Behavioral responses of two syntopic snakes (Genus *Thamnophis*) to roads and culverts. M.S. Thesis, Department of Biology. (Major Advisor: Professor Bruce Kingsbury).
- Sharif Abu Hayat** (2013). Understanding physiological responses and development of stress biomarker from tilapia treated with Vitamin C during chronic stress induced by crowding. M.S. Thesis, Department of Biology (Major Advisor: Associate Professor Ahmed Mustafa).
- Tiffany Hough** (2013). Effects of Omega-3 fatty acid supplementation on aquaponic system raised tilapia (*Oreochromis niloticus* x *Oreochromis aureus*) physiology, immunology, and muscle tissue retention. M.S. Thesis, Department of Biology (Major Advisor: Associate Professor Ahmed Mustafa).
- Kevin A. Hunt** (2013). Functional characterization of the nucleobase-ascorbate transporter family of *Arabidopsis thaliana*. M.S. Thesis, Department of Biology (Major Advisor: Professor George Mourad).
- Mohammed Rumman Hossain** and Ahmed Mustafa. Effects of puerarin on the modulation of health in chronically stressed Chinook salmon (*Oncorhynchus tshawytscha*). *Journal of Applied Aquaculture* (in press).
- Mohammed Rumman Hossain**, Elliott Blumenthal, and Ahmed Mustafa. 2013. Effects of puerarin on the reduction of glucose and promotion overall health in acutely stressed Chinook salmon (*Oncorhynchus tshawytscha*). *ACTA Ichthyologica et Piscatoria*, 43: 85–93.
- Mohammed Rumman Hossain** and Ahmed Mustafa. 2013. Kudzu Component: Stress reliever for fish? *Global Aquaculture Alliance Magazine- The Advocate*, November-December 2013, Page 82-83.
- Mohammed Rumman Hossain** (2013). Puerarin: from the roots of Kudzu to the front lines of stress modulation in farmed fish. M.S. Thesis, Department of Biology (Major Advisor: Associate Professor Ahmed Mustafa).
- Hasina Karki**, Ahmed Mustafa, Arlis LaMaster, and Shree Dhawale. 2013. Antibiotic resistant bacteria in the gut of hatchery-reared tilapia and Coho salmon. *Universal Journal of Microbiology Research*, 1: 43-46.
- Hasina Karki** (2013). Survey of antibiotic resistant bacteria collected from fish gut from selected sites. M.S. Thesis, Department of Biology (Major Advisors: Associate Professors Shree Dhawale and Ahmed Mustafa).
- Keene, E. L., Soule, T., and Paladino, F. V.** 2013. Microbial isolations from Olive ridley (*Lepidochelys olivacea*) and Eastern Pacific green (*Chelonia mydas agassizii*) sea turtle nests in Guanacaste, Costa Rica, and standard testing of cloacal fluid antimicrobial properties. *Chelonian Conservation and Biology* (in press).
- Paul McCain** (2013). Capsaicin supplemented feed and its effects on stress modulation in Nile tilapia and Coho salmon. M.S. Thesis, Department of Biology (Major Advisor: Associate Professor Ahmed Mustafa).
- Janet A. Minton** (2013). Functional characterization of the two nucleobase cation symporters of *Physcomitrella patens* reveals their solute specificity. M.S. Thesis, Department of Biology (Major Advisor: Professor George Mourad).
- Ahmed Mustafa, **Sharif Hayat**, and Parveen Quarrar. 2013. Stress modulated physiological responses in Nile tilapia, *Oreochromis niloticus*, treated with non-ascorbic acid supplemented feed. *Advances in Zoology and Botany*, 1: 39-45, 2013 (DOI: 10.13189/azb.2013.010204).
- Ahmed Mustafa, **Laura Randolph** and Shree Dhawale. 2013. Effects of nutritional supplements Phosphatidylcholine and Beta-Carotene on growth and selected stress and immune parameters in Nile tilapia, *Oreochromis niloticus* (L.). *Advances in Zoology and Botany*, 1: 57-61/ DOI: 10.13189/azb.2013.010302.
- Ahmed Mustafa, Shree Dhawale, **Jiwon Park** and Jin Soung Yoo. 2013. The validation of effect of nutraceuticals on growth and immune response of Nile tilapia in cool water using a Cluster-Based approach. *Journal of Applied Aquaculture*, 25: 132-147.
- Nalam, V.J. and Nachappa, P. The role of roots in plant defense responses. In Ajit Varma and Asuncion Morte (eds) *Root Engineering*, Springer Editorial (Heidelberg, Germany) (in press).

Schein, J. R., Hunt, K. A., Minton, J. A., Schultes, N. P. and George S. Mourad. 2013. The nucleobase cation symporter 1 of *Chlamydomonas reinhardtii* and that of the evolutionarily distant *Arabidopsis thaliana* display parallel function and establish a plant-specific solute transport profile. *Plant Physiology and Biochemistry*, 70: 52-60.

Jessica R. Schein (2013). The nucleobase cation symporter 1 of *Chlamydomonas reinhardtii* and that of the evolutionary distant *Arabidopsis thaliana* display parallel function and establish a plant specific solute transport profile. M.S. Thesis, Department of Biology (Major Advisor: Professor George Mourad).

Mourad, G. S., Tippmann-Crosby, J., **Hunt, K. A., Gicheru, Y., Bade, K., Mansfield, T. A.,** and Schultes, N. P. 2012. Genetic and molecular characterization reveals a unique nucleobase cation symporter 1 in *Arabidopsis*. *FEBS Letters*, 586: 1370-1378.

BIOLOGY FACULTY RECOGNITION

IPFW FEATURED FACULTY 2014

Four IPFW faculty members were formally introduced on January 22, 2014 as the 2014 IPFW Featured Faculty. Featured Faculty is the university campaign that publicizes the range and significance of the intellectual contributions of the IPFW faculty. Each year, IPFW selects the Featured Faculty from the Outstanding Research Award nominees. Two of the four Featured Faculty of 2014 are from the Department of Biology. They are: Professor George Mourad and Associate Professor Ahmed Mustafa. Below are short descriptions of their accomplishments.

PROFESSOR GEORGE MOURAD

Since his arrival at IPFW 20 years ago, Professor George Mourad has established an active and highly productive research program in plant genetics and biochemistry with an emphasis on involving undergraduate and graduate students in hands-on research. Co-authored with his students, he holds five international and U.S. patents, published 30 research articles in peer-reviewed journals and 78 meeting abstracts of presentations in international, national & regional meetings. Dr. Mourad has a profound interest in seeing his students succeed. Over the years he served as the major research advisor of dozens of M.S. thesis-option graduate students and honors students, several of whom went on to earn a Ph.D. or M.D. from prestigious institutions. Under his tutelage, his students have been awarded summer research grants and several times won best presentations in meetings such as Sigma Xi Student Research Competition and Indiana Academy of Sciences. For his profession, Professor Mourad previously served for 4 consecutive years, as peer-review panelist for the U.S. Environmental Protection Agency national competitive research grants program. In addition, for many years he served as peer-reviewer for the National Research Initiative Competitive Grants programs for the USDA and for several different genetics and molecular biology journals. At the state level, he served as Chair of the Research Grants Committee of Indiana Academy of Sciences for 5 consecutive years. For his research accomplishments he recently received the Pippert Science Research Scholar Award in 2013. In his spare time, Dr. Mourad likes to fish and enjoys spending time with his family.



Professor George Mourad
(feature.ipfw.edu)

As for his current research program, Dr. Mourad's lab is using genetics, molecular, and biochemical approaches to study membrane transport central to nucleobase biochemistry. Focus is on the evolution of the structure (genome organization) and function (solute/substrate specificity) relationships of membrane transporters involved in the intra- and inter-cellular movement of nucleobases in photosynthetic organisms across the phylogenetic tree starting from single cell algae up to higher plants. If you are interested in Dr. Mourad's research contact him at 481-5704 or mourad@ipfw.edu



DEPARTMENT OF BIOLOGY

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BIOLOGY FACULTY RECOGNITION (continued)

ASSOCIATE PROFESSOR AHMED MUSTAFA

Associate Professor Ahmed Mustafa has always been passionate about research and teaching. At IPFW, he teaches physiology and pharmacology and takes an active role in the service of his students. His research concerns stress and immunity of aquatic life and how to prevent diseases with alternatives to drug therapy. Dr. Mustafa is known for actively involving his students in his research. Under his tutelage, many IPFW students have successfully received grants to support their own research, presented findings at regional, national, and international scientific meetings, and received co-authorships in peer-reviewed publications. Many of those students went on to pursue graduate work in doctoral, medical, and pharmacy degrees. Dr. Mustafa has published more than 35 research articles that have resulted in more than 400 citations globally. He has been the associate editor for *The Journal of Applied Aquaculture* and a reviewer for several other journals.



Associate Professor Ahmed Mustafa
(feature.ipfw.edu/)

As part of his commitment to his students and campus life, Dr. Mustafa has served as the faculty advisor to the Bangladesh Students' Association since 2001 and Tri-Beta since 2003, in addition to his role as Vice President of Phi Kappa Phi since 2009. During his tenure at IPFW, Dr. Mustafa has received numerous awards in recognition of his outstanding contributions to the campus community, including the Teacher of the Year, Advisor of the Year, Student's Choice Award for Teaching Excellence, the Pippert Science Research Scholar Award, and the Community Advisory Council Service to Students Award.

Dr. Mustafa is currently investigating the roles of nutraceuticals in modulating stress and immune response in aquatic organisms. If you are interested in Professor Mustafa's research, you may contact him at 481-6328 or mustafaa@ipfw.edu.

