Parkinson’s disease and Parkinsonism: Are They the Same?
I want to wish you all a great New Year filled with happiness, peace, and success.

BMS faculty, staff and students continue to make strides in all three missions of our department: teaching, research and service. Our commitment to professional instruction was strong last year, and our faculty members continue to effectively address increasing demands in this area. Significant improvements have been made in course integration and delivery methods in the physiology and anatomy courses. Our faculty have excelled in publishing new books in physiology and neuroanatomy. Most importantly, we have recruited a new faculty member in anatomy and physiology, and we are in the process of recruiting two new faculty members in pharmacology. These new additions to our faculty are expected to synergize our commitments to the BMS teaching and research mission.

Our department has made tremendous growth in graduate education in the biomedical sciences. The BMS graduate program is home to about 75 graduate students out of approximately 140 graduate students in our college. This is a wonderful achievement for our department. As outlined in this newsletter, our graduate students consistently win several competitive awards at national meetings. Recently, our graduate students established a student organization within the graduate college, and some of our graduate students serve in leadership positions as student representatives for national scientific societies.

In addition to our regular PhD and MS programs, we successfully established a unique professional MS program in BMS. We proudly graduated over 40 professional MS students in the last two years, and will be graduating over 25 students this year. The combination of intense course work, hands-on lab experience and the creative component has been serving our graduates well in achieving their career goals. The student outcomes indicate that our MS program meets its primary goal by placing our students in various professional programs including DVM, MD, DO, DDS and PhD programs. Students have also secured private sector jobs in pharmaceutical industries and other health-related companies. Another positive impact of our new MS program is that it provides our PhD students with teaching experience, which broadens their career opportunities in academia. Teaching assistantships to our graduate students in turn reduce research overhead and help PIs somewhat in sustaining a research program. Our department will strive to improve the program and make it a premier professional MS program at Iowa State.

Our department continues to be a leader in NIH-funded biomedical research programs at the University, and our faculty members have published several original research papers in recent years. In terms of professional service, members of our faculty have assumed active roles with national and international scientific societies and are serving on grant review panels and on editorial boards.

I applaud our faculty, staff and students for their commitment to the growth of the BMS department and wish everyone another successful year.

Anumantha G. Kanthasamy, Chair
akanthas@iastate.edu
(515) 294-2516
2008 Vet Med
Ahmed Abdalla
Ahmed Abdalla is a graduate student in Dr. Anumantha Kanthasamy’s lab. He graduated with his undergraduate degree in veterinary medicine from the University of Khartoum in Sudan and obtained his master’s degree in animal health from North Carolina Agricultural and Technical State University (NCA&T). His previous work experiences include working for LabCorp and Zoetis, where he performed mainly lab work. He recently joined Dr. Kanthasamy’s lab and is currently learning techniques and participating in lab tasks. Ahmed was drawn to the PhD program in toxicology at Iowa State because he research that is done here appealed to him. He says that he likes the quality of the academic and research training provided by the staff, as well as the facilities, including the library and labs. “I also admire the beautiful campus that helps make my experience even more enjoyable. Ames is a nice and quiet place to live, making it a good choice for graduate students.” Ahmed plays soccer during his leisure time.

Kristina Feye
Kristina Feye is a graduate student in Dr. Steve Carlson’s laboratory. She graduated from Texas Woman’s University with a BS in biology and a minor in chemistry. She later obtained her MS in biology with a focus on parasitology from Stephen F. Austin State University. This is what Kristina had to say when asked why she chose Iowa State: “I went to a conference in New Orleans for the American Society of Microbiology. I met a student there who seemed happy and loved his program, so I applied.” She says she loves her lab and the research she does. Kristina likes to ride her horse and travel whenever possible.

Nyzil Massey
Nyzil Massey is a graduate student in our department, and has been doing rotations in the labs of Drs. Richard Martin, Anumantha Kanthasamy, and Michael Cho. He graduated from Dr. GC Negi College of Veterinary and Animal Sciences, CSKHPKV in Palampur, India in July 2011. Since then he has worked with government services and non-profit organizations for animals, including Daramshala Animal Rescue (an United States-registered non-governmental organization working for animals in the state of Himachal, India), Baan Unrak Thai Animal Sanctuary (an United Kingdom-registered animal charity working exclusively for the welfare of the animals in Thailand), and Animal SOS Sri Lanka (another UK-registered animal charity). Nyzil joined Iowa State to pursue a PhD in Biomedical Sciences with the hope of taking his education to the next level. “Ultimately, I would like to work with an organization or NGO for the betterment of animal health, and spend a lifetime serving, advocating, and promoting the welfare of animals.”

Shelly Loonan
Shelly Loonan joined the Department of Biomedical Sciences as the program assistant for Iowa Center for Advanced Neurotoxicology (ICAN). She taught computer classes online for the past ten years before joining us. Shelly says, “ISU provides a great working environment. I have enjoyed meeting many new people.” She likes to golf and travel during her free time, and she also enjoys volunteering in her community.

Kelly Pullen
Kelly Pullen, senior in Graphic Design, joined the BMS office staff as a graphic designer. She designs all of the promotional materials for the department specifically for the 1-Year MS program, including brochures, posters, and information cards. One of her weekly duties entails designing and sending out announcements for the weekly BMS seminar. When asked how she likes working here so far Kelly said: “The people I work with are great and it’s great design experience for me.” Kelly enjoys running and is an active runner in her free time. She has run two marathons in the past and is currently training for another half marathon. She also enjoys volunteering in her community.

Emma Wilcockson
Emma Wilcockson, junior in Graphic Design, joined the BMS office staff as a graphic designer and office assistant. She chose this job because it fits with her current major and thought it would be a great way of getting experience in her field. Some of Emma’s duties include designing grant proposals, CyRide advertisements, and posters. She also does a lot of filing, organizing, and other office duties. Emma says, “The thing I like most about this job is definitely the people, and how friendly and caring everyone is. I also like the freedom to try different things in my design work to come up with the best solution for the project that is assigned.” She enjoys spending time with friends and hanging out with her cat during her free time.
AWARDS & HONORS
by Hiruni Harischandra

STUDENTS
AWARDS FOR POSTER PRESENTATIONS AND INVITED TALKS AT CONFERENCES

MELANIE ABONGWA
AWARD: Young Investigator Award - First place
TITLE OF PRESENTATION: In vitro antifilarial activities and metabolic profiling of extracts of Daniellia oliveri and Poospermum febrifugum
NAME OF CONFERENCE: American Society of Tropical Medicine and Hygiene (ASTMH) 64th Annual Meeting, October 23-29, 2015, Philadelphia Marriott Downtown, Philadelphia, Pennsylvania, USA

SHIVANI GHAIAS
AWARD: Best Poster Award
TITLE OF PRESENTATION: Chronic exposure to manganese causes mitochondrial dysfunction in the enteric nervous system leading to altered gastrointestinal motility
NAME OF CONFERENCE: Central States Society of Toxicology (CS-SOT) annual meeting, October 8-9, 2015, University of Kansas Medical Center, Kansas City, Missouri

DILSHAN HARISCHANDRA
AWARD: Invited speaker for an International Neuropsychiatric Association (INA) 2015 meeting and second place in David Ray Student Travel Award
TITLE OF PRESENTATION: Lysosomal dysfunction caused by the environmental neurotoxin manganese increases exosome mediated cell-to-cell transfer of α-synuclein by a prion-like mechanism
NAME OF CONFERENCE: International Neurotoxicology Association 15th Biannual Meeting, June 27 – July 01 2015, Montreal, Canada

MONICA LANGLEY
AWARD: Best Poster Award
TITLE OF PRESENTATION: Preclinical Efficacy Testing of the Mitochondria Targeted Antioxidant Mito-apocynin in the Transgenic MitoPark Mouse Model of Chronic Dopaminergic Neurodegeneration
NAME OF CONFERENCE: Experimental Biology Meeting, March 28 - April 1, 2015, Boston, Massachusetts

PRESTIGIOUS IOWA STATE UNIVERSITY RESEARCH AND TEACHING EXCELLENCE AWARDS
The purpose of these awards is to recognize and encourage outstanding achievement by graduate students in teaching and research. Each Research and Teaching Excellence Award consists of a letter of commendation signed by the ISU President, a certificate of achievement signed by the ISU President and the Graduate Dean, and an honor cord to be worn at graduation.

SOUVARISH SARKAR
AWARD: ISU Teaching Excellence Award
I have been a graduate teaching assistant for the Genetics, Development, and Cell Biology Department since Fall 2014, teaching Human Anatomy in the fall semester and Human Physiology in the spring semester. My duties include preparing lectures, conducting lab sessions, creating mini tests, study guides, and overall assisting students who are keen to enter the field of medicine, kinesiology, physiotherapy, etc. I also mentor undergraduate teaching assistants. I really enjoy teaching, it helps me meet different people, overcome difficulties and achieve confidence for the future.

SAIKAT BANERJEE
AWARD: ISU Research Excellence Award
As part of my PhD under Dr. Michael Cho, I have worked on HIV-1 vaccine development. I have specifically worked on targeting the membrane proximal external region (MPER) present in the gp120 envelope protein. Apart from its role in virus fusion, the MPER domain is considered an attractive candidate for vaccine because it can elicit potent and broad neutralizing antibodies like 4E10 and 10E8 in HIV-1 infected patients. My efforts in the lab have been directed towards designing and assessing MPER-based vaccine antigens for their ability to induce similar broadly neutralizing antibodies through immunization in rabbits. While we haven’t been successful in eliciting similar broadly neutralizing antibodies, we have made significant progress towards targeting some of the 4E10/10E8 epitopes in MPER. We hope that these advances will help design more effective vaccines against HIV-1.

SREEMOYEE ACHARYA
AWARD: ISU Research Excellence Award
I am a fourth year PhD student in the laboratory of Dr. Anumantha Kanthsamy in Biomedical Sciences at Iowa State University. As a graduate assistant in BMS, I work on prions and other protein misfolding syndromes that have zoonotic importance. We have developed novel ex-vivo models and ultrasensitive detection methods for prions. The overarching goal of our group is to address some knowledge gaps in diagnostics, mechanisms and therapeutics by establishing a diverse collaborative efforts within and outside the departments at the College of Veterinary Medicine, United States Department of Agriculture (USDA) and Animal and Plant Health Inspection Service (APHIS). I have also been serving as a teaching assistant in the BMS 502 course for the one-year master's program.

NAVEEN KONDRU
AWARD: ISU Research Excellence Award
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Dilshan Harischandra is a final year graduate student in Dr. Anumantha Kanthasamy’s laboratory. His research focuses on the interactions between divalent manganese and α-synuclein and the effect these interactions have on the progression of neurodegenerative processes in Parkinson’s disease models. Over the years, he has had the opportunity to publish in several journals, including Toxicological Sciences and PLoS, and present his work at several national and international scientific meetings. His recent work received the “FL1000 Prime” recommendation and was featured as the cover art for Toxicological Sciences. Dilshan has also received several graduate student research awards, including the prestigious Syngenta Fellowship in Human Health Applications of New Technologies and the Carl C. Smith Graduate Student Fellowship in Human Health Applications of New Technologies and the Carl C. Smith Graduate Student Award from the Society of Toxicology (SOT). In addition to his scholarly contributions, he has served on many leadership positions representing the Graduate and Professional Student Senate and Graduate Council at ISU and nationally as the student representative for the SOT’s Neurotoxicology Specialty Section and regionally for the SOT’s Central States Chapter. He was selected for this award based on his achievements and contributions to the college as a graduate student.

Nic Wheeler is a third year graduate student in Dr. Tim Day’s Laboratory. Their lab seeks to be the first to develop a CRISPR/Cas9 protocol for the parasitic flatworm Schistosoma mansoni. While his lab has developed many basic materials and methods in the past, Nic hopes to precisely optimize the plasmids and methods currently in use with the monetary support received through this grant. He hopes to provide a robust approach to the greater schistosomiasis research community and foresees applying this method in his own research and acquiring further extramural funding for expanding his research.

Joonbae Seo
AWARD: ISU Research Excellence Award
My research focus during my PhD training in Dr. Ravindra Singh’s laboratory was characterization of Survival Motor Neuron genes: SMN1 and SMN2. SMN2 is known to rescue embryonic lethality due to loss of SMN1, but still cause spinal muscular atrophy (SMA), the most frequent genetic cause of infant mortality.

Shaunik Sharma
AWARD: ISU Teaching Excellence Award
I serve as a teaching assistant for Principles of Morphology I (BMS 330), a graduate level course where I teach first year DVM students. My responsibilities as a TA include tutoring and mentoring students, helping instructors in setting up exams and grading papers, assisting students with dog and cat dissections in the lab and helping them identifying various anatomical structures of the cadaver. These include all the major organs, muscles, ligaments, bones, blood vessels, nerves and other structures in the body. I also conduct review sessions where I go through the week’s syllabus with the students and help those who need assistance at the end of the week. I also provide helpful material from different sources, assisting in any way I can.

Dr. Jesse Goff has secured a new NIH-R15 grant to develop Vitamin D glucuronide prodrugs for colon cancer treatment. A total of $450,000 has been awarded for two years.

Dr. Alan Robertson has received a new NIH-R21 grant award to characterize a novel nicotinic acetylcholine receptor from the nematode pharynx as a potential drug target. The total award is $393,015 for two years.

Dr. Anumantha Kanthasamy was appointed a Fellow of the American Association for the Advancement of Science (AAAS). This prestigious award was presented to Dr. Kanthasamy in recognition of his “outstanding contributions to the fields of neurotoxicology and neurodegeneration, and for the development and translation of new therapeutic strategies to treat neurodegenerative disorders.” The new AAAS Fellows were announced in November 2015, and they will also be honored during the Fellows Forum at the AAAS annual meeting to be held on February 13, 2016 in Washington, D.C. The AAAS is the world’s largest general scientific society and this is quite an honor not only to our department but also to the university. Dr. Kanthasamy was also named a Fellow of the Academy of Toxicological Sciences (ATS) in recognition of his competence, professional experience and contributions to field of Neurotoxicology. The Academy recognizes the accomplishments of senior toxicologists in the areas of education and continuing education, publications and professional development, and demonstration of professional recognition.

Dr. Michael Cho served as Director of the second annual Vaccines Against Antigenically Variable Viruses (VAAVV) Symposium held at Iowa State University on the 5th – 8th of November, 2015. The purpose of this symposium was to explore advancements, ideas, and opportunities for innovative vaccines against antigenically variable viruses. The director of the Oregon National Primate Research Center at Oregon Health & Science University, Dr. Nancy L. Haigwood, addressed the conference attendees as the keynote speaker this year. The symposium was composed of several sessions where topics such as antigenic variation in viruses, immune correlation of protection, insights from bioinformatics/computational/systems biology, and strategies to enhance immune responses and vaccine efficacy were discussed. There were many featured speakers including Dr. Adrian Shepherd from University of London, Dr. Gary McLean from Imperial College of London, Dr. Elizabeth Rieder from USDA Plum Island Animal Disease Center, Dr. Richard Webbly from St. Jude’s Children’s Hospital, Dr. Kyung-Jin Yoon, Dr. David Verhoeven from ISU and many other professors from prominent universities and institutes around the country. There was a good representation of the international scientific community with featured and invited speakers and poster presentations from University of London, Flinders Medical Center Australia, Burnet Institute Australia, Ruhr University-Bochem Germany, Monash University and University of Manitoba Canada. The symposium concluded early Sunday afternoon with the presentation of awards.

Dr. WeiDong Xu has secured a contract from the Department of Homeland Security to develop a T-cell based vaccine against African Swine Fever Virus. The total amount of the contract is $80,000 for one year.
BMS 1-YEAR MS PROGRAM: THE STEPPING STONE TO YOUR PROFESSIONAL DEGREE

by Christie Mitchell

The spring semester is well under way and the BMS one-year MS students are preparing for a great last semester. During the course of the last semester we all got to know each other and faculty members. Although the first semester was a new and exciting experience, this spring semester is just as exciting!

This master's program attracts a lot of different individuals who vary in their science backgrounds. We have students from all over the United States and numerous countries around the world studying within this program. Many of the students are looking to expand their science background and get ready to pursue a degree from a professional school, such as medical or dental schools. Others are looking to deepen their knowledge with the hopes of pursuing more graduate schooling after this, either in a PhD or another master's program. No matter the ambitions of each student, this program is preparing us all very well for our future endeavors.

The all-science curriculum has proven to be as rigorous as many of us had thought coming into this program. This past fall we students took courses in physiology, anatomy, cell biology, and microbiology. This semester the course work sounds just as interesting but we also all get to choose elective classes specific to our own areas of interest. It is exciting to hear about all the different classes people chose and being able to talk about our different experiences and interests.

The fall semester also marked the beginning of our Creative Component, which is usually a literature review that is presented orally and in thesis form in the spring semester. We have all been busy meeting and conversing with faculty members who share similar research interests in hopes of gaining a mentor. By assigning a major professor and a committee, we will all be in great shape to really explore our specific interests and be able to share it with others while creating a great relationship with the faculty in the program. With the spring semester beginning, we are all well underway with our topics and are very excited to see what our classmates research and interests are.

With the winter break behind us, we are ready to hit the ground running and make this semester even better than the last. We are definitely excited to see what our classmates research and interests are.

FACULTY MENTORS

by Luna KC and Sreemoyee Acharya

Dr. Jesse Goff

What are the points you look for, in a prospective graduate student?

Our lab primarily focuses on the interplay of nutrition and immunology for the development of metabolic diseases in transition dairy cattle. Another focus area is human colon cancer or bowel disease using a mouse model. Usually when a student approaches me, the impression is he or she has some background knowledge on the work that our lab does, have read some of my papers and is interested in our research area. So, students who know what they want to work on (dairy/mouse models) and show interest in our research are always easy picks. An advanced degree (preferably master's degree) in biochemistry or molecular biology is a plus because these subjects are the skeleton to what we do in our lab. Grades are important. Not necessarily straight A's, but students should meet our department's minimum requirements before applying.

What expectations do you have of your students?

I expect them to fall in love with their project so that work is not merely work and the number of hours they spend in accomplishing their goal becomes fun; it’s not a job. The worst is when a graduate student considers their work drudgery.

How independent do you want your students to be? At what point do you want your students to come to you to seek for advice/guidance?

For master's degree seeking students, I encourage but don't expect them to be independent. I usually ask them to pick some of the projects that we have already planned to accomplish in our lab. More or less, they get designed projects to work on. For PhD students, I usually give them some prospective areas and ask them to come up with some ideas. If their ideas fall into our lab objectives and do not necessarily cost a fortune, I encourage them to take the initiative. For PhD students, you expect them to fall down once in a while; that's part of the learning process because things don't always work the way you thought they would. I am working side by side with my students in lab. I try to keep tabs on what their next step is and how they want to achieve their goals, so I have fairly regular contact with them. This makes our lives much easier and more efficient. One of my best students – we argued a lot. I want my students to have a fighting spirit while doing science. It's no fun when students agree with you on everything.

How do you help your students achieve their end goals and grow professionally?

Hopefully, our lab can come up with some funding to support students with their stipend and tuition expenses. This way students don't have to worry about making ends meet. It is also important to provide students with good equipment so they can work efficiently.

I believe students can grow both independently and professionally by trying on their own and learning from their experiences, both good and bad. I make sure students participate in lab discussions, listen to other members and give their input when trying to solve problems. You can only learn so much just by soaking it up. Professional growth is a stepwise process; you begin working on it from day one. My role is to guide students and give them full access to what they need to achieve their goals.

Academia or industry?

With the current funding situation, I can see why academia might not be a pick for many students. I have had 20 graduate students over the years and not all of them ended up in academia. I support the students’ choices and facilitate them to achieve their career goals. If a student wants to go into dairy industry, it’s often easy for me to introduce them to the folks there. A lot
of times, it is useful for master's degree students to go out and work in farms. Whatever field students choose, I support them by writing good recommendation letters. If you had to go back and advice your former graduate self, what would it be?

Let me put it this way. When I first started graduate school, things were different; different in the sense that opportunities were much better. Once I had my PhD, the ability to get money to do research was much simpler than it is today. I think the environment for a young PhD graduate at present is much more competitive.

In the years you have taught and guided students, is there any particular incident (both good/bad) that made you rethink about choosing your present career?

One incident I remember is when I was working as a research leader in USDA, which was actually rather frustrating. I found myself in difficult situations several times while I was there. This was mainly because I had to motivate people to do more work but had no carrot or stick, that is. I had no reward or punishment for them so it was very hard to motivate them.

If you had to make changes to the present graduate student scenario in biological sciences, what would they be?

I am very much afraid that students these days narrow down their research goals too much and sometimes do not see the big picture of where the research fits, and how it can be applied. How do you address that? For this department, I think it is important for students to take some of the basic subjects like physiology, molecular biology, and a good course in biochemistry too. That's the core work. Research-wise, I think students should be able to partake things done by their major professor. It is important that the major professor gets to see what/how their students are doing. This helps both parties to be critical yet productive.

Dr. Heather Greenlee

What are the points you look for in a prospective graduate student?

I look for work ethic, the willingness to work hard, initiative - will the student take the initiative to troubleshoot the problem if they are curious about something, would they go out and find more about it? The third is scientific curiosity. This is not to say that they want to come to the lab to cure prion disease, but its good to be motivated by a lofty goal; they should be able to handle criticism. I don't have any secrets from my students. If I am unhappy they know it and if I'm happy they know that as well. They never have to wonder about what I'm thinking. You have to be a little tough early on.

How independent do you want your students to be? At what point do you want your students to come to you for advice/guidance?

We meet weekly and at those weekly meetings, I always expect an update of what they’ve done, and what they plan to do, that needs to come from them. We might talk about the plan and alter it, I might say, “That sounds good, but how about you do this, instead?” but I want them to come to me with a plan. Like I said before, if there’s a problem I want them to come up with potential solutions or at least tell me what they’ve done to address it. Then we will talk about it and decide what the next step should be. My job is to guide, not direct.

Planning projects—do you want students to plan their own experiments? Or do you design the project yourself?

What I always tell students who are rotating or a student who wants to join the lab is that I typically think of a PhD as three sub-projects, which are parts of a bigger project. For the first of those projects, I do most of the planning, maybe 70-80%, and the students do the remaining 30-20%. For the second project, I expect 50-50. Depending on the student, they do most of the planning. But for the third project, they should do most of the planning. It’s a gradual increase. I would not expect a new student to plan his or her own projects. Likewise, I wouldn’t expect a senior student to just wait for me to tell them what to do.

How do you help your students achieve their end goals and grow professionally?

I think the most important thing is to keep them on track, because that’s a skill that you really need to have in science. You can work really hard and you can answer a lot of interesting questions but if you don’t publish as you go, you will not be successful. I have seen many people over the years that didn’t ever really learn that process, they did a lot of work but they didn’t really have anybody to guide them. Whatever you do, always think, “How does that contribute to me moving forward?” I talk to my students a lot. You don’t want to stay in this lateral direction; you want to think about moving forward. When doing an experiment, always think how it is going to relate to a publication. This was a skill that I wasn’t great at when I was a graduate student but had the good fortune to find a mentor who really modeled it. I see a lot of my colleagues struggle with this issue to date.

If you had to go back and advice your former graduate self, what would it be?

I would do the same thing. I just wish I learned the skill of designing experiments to relate to publications sooner and how hard it is to publish. For most manuscripts, there isn’t a deadline and because of that people tend to put it off or try new experiments. This is something I still struggle with sometimes. Even now, I have a manuscript, which I really should have started writing a long time ago, but I keep waiting for a little bit more data; it’s a constant struggle.

Academia or Industry?

If you really like working in the lab, you should try for a senior scientist job in the industry. I myself looked into a job in the industry a few years ago, and was told that 80-90% of my time would be in the lab. Here, in academia, I am 10% in the lab at best. So if you really like experimental science, I think industry is the way to go. To be honest, lab work was never my favorite part. I like thinking about experiments and planning them, but when I worked I just wanted the experiment to work. Academia is more appropriate for me; my students work and I get to talk to them about science. Academia is very tough and very frustrating, and you are always pulled in a bunch of different directions. If you go into industry or even government, although government is not quite the same, you have an objective and you get to focus all your time and energy on it. In academia your science is important but there are all these other responsibilities; so yes, it is tough.

In the years you have taught and guided students, is there any particular incident (both good/bad) that made you rethink about choosing your present career?

There has definitely been no moment as such. When I look back, the thing which has been most unsuspecting to me is how stressful it is to mentor students. Sometimes I wake up at night wondering if they are progressing or what their funding situation will be like. I didn't anticipate being that personally involved. I would never have guessed it and this affects me quite profoundly.

If you had to make changes to the present graduate student scenario in biological sciences, what would they be?

Stability of funding. It would be the biggest change and would take away a lot of stress for the student. If funding isn’t a question when a student comes in, I think that would promote graduate education.
BACK FROM CONFERENCES
by Hiruni Harischandra

PRION 2015 CONFERENCE
FORT COLLINS, COLORADO, USA.
MAY 26-29, 2015
NAVEEN KONDuru
Other participants from BMS department:
Sireesha Mane, Dihan Harischandra,
Dharmin Rokad, Najiba Mammadova.

The central theme of the Prion 2015 conference was human and animal prion diseases. However, it was unique this year since experts from Alzheimer’s and Parkinson’s disorders presented their work on other prion like proteins. The international prion research convened for the first time in the United States, in Fort Collins, Colorado, May 26-29, 2015. It has a traditional structure that constituted keynote presentations from experts in the field and workshops on animal, yeast and human prions. The Symposium also featured three plenary and over fifty invited and selected talks from leading researchers from around the world. It was a good place to meet many who work on prions including some of our collaborators at USDA and APHIS. This meeting provided us with opportunities to collaborate with eminent scientists working at various national institutes. Fort Collins has great places to visit; Rocky Mountain National Park was gorgeous and peaceful.

INTERNATIONAL NEUROTOXICOLOGY ASSOCIATION MEETING.
MONTREAL, CANADA.
JUNE 27 – JULY 1, 2015.
DILSHAN HARISCHANDRA

This year the International Neuotoxicology Association and the Neurobehavioral Teratology Society (NBTS), two international scientific societies dedicated to research in neurotoxicology and neurobehavioral toxicology, had their joint meeting in Montreal, Canada. This joint conference was conducted under the theme, “Neural Mechanisms of Functional Impairment across the Lifespan.” The meeting provided a great opportunity for exposure and participation in a broad range of public health disciplines ranging from study of the adverse effects of chemicals on the nervous system to neurochemistry, physiology, neuropathology, and behavior. Moreover, I had the opportunity to enjoy the rich culture of Montreal which sits on the St. Laurence River in Quebec, Canada with diverse attractions of art, architecture, music, cuisine and nature.

25TH INTERNATIONAL CONFERENCE OF THE WORLD ASSOCIATION FOR THE ADVANCEMENT OF VETERINARY PARASITOLOGY (WAAVP)
THE ARENA AND CONVENTION CENTRE, LIVERPOOL, U.K.
AUGUST 16-20, 2015.
MELANIE ABONGWA
Other participants from the department:
Shivani Choudhary

This was my first time attending the WAAVP conference. This conference provided an opportunity to meet leading parasitologists from around the world, as well as the opportunity to present my research to a large scientific audience. I was also able to learn about recent advances in parasitology research, especially pertaining to veterinary medicine. An additional important component of the WAAVP conference was the Consortium for Anthelmintic Resistance and Susceptibility Meeting (CARS) which I was opportune to attend. Discussions at CARS focused on ways of understanding the mode of action or resistance to antiparasitic drugs, and the strategies for slowing the emergence of resistance to these drugs.

GRAND CHALLENGES IN PARKINSON’S DISEASE
VAN ANDEL RESEARCH INSTITUTE,
GRAND RAPIDS, MICHIGAN.
SEPTEMBER 30TH – OCT. 1ST 2015.
DHARMIN ROKAD
Other participants from the department:
Dilshan Harischandra

This meeting was focused on the role of alpha-synuclein in Parkinson’s Disease — its function, its pathobiology, how it spreads and how it may lead to new biomarkers and therapies. Grand Challenges featured scientific presentations from 20 of the world’s leading experts on alpha-synuclein, along with poster and “DataBlitz” presentations. VARI and The Cure Parkinson’s Trust hosted Rallying to the Challenge, a meeting for people with Parkinson’s, advocates and caregivers that explored how the Parkinson’s community can impact and accelerate research. It was a great experience specially meeting people who are pioneers in this field, and also meeting with patients suffering from Parkinson’s disease.

CENTRAL STATE SOCIETY OF TOXICOLOGY
ANNUAL MEETING, KANSAS CITY,
MISSOURI.
OCTOBER 8-9, 2015.
DHARMIN ROKAD
Others participants from BMS department:
Monica Langley, Dan Luo, Adhithiya Charlie,
Vivek Lawana and Shivani Ghaisas.

This was the MNID’s fifth annual meeting, and the meeting has continued to grow in renown and utility since its inception in 2011. The meeting aims to bring together researchers from the midwest who work on diseases that are increasingly neglected by the broader research community. I joined colleagues and collaborators with our lab to present our research on parasitic flatworms and roundworms. While the meeting was beneficial for learning about other approaches in infectious disease research, networking, and inspiring potential future collaborations, it was dominated by fungal and protozoal research, while only two other presentations dealt with worms. Overall, it was an enjoyable time and a helpful meeting that provided my first opportunity to give an oral presentation outside of the ISU campus.

The annual meeting of CS-SOT was held at University of Kansas Medical Center. There were many interesting talks focusing on liver toxicity and PCBs toxic role, as well as additional presentations on other diverse toxicants. There was wide range of poster presentations, which covered many areas. It was really great experience in sharing our knowledge and receiving crucial ideas with other researchers and pioneers in the field advancing our knowledge in the field of toxicology.
This year the Society of Toxicologic Pathology meeting was combined with The American College of Veterinary Pathologists and American Society for Veterinary Clinical Pathology at the 2015 ACVP/ASVCP/STP Combined Annual Meeting. It was an excellent opportunity to learn about experimental and natural diseases that occur in a variety of animal species and understand the underlying mechanisms. The program included a mix of joint and separate sessions, symposia, and workshops from the respective organizations. For me, the most notable parts were the session on traumatic brain injury, dog fighting, and zoonotic diseases. I also attended a post-meeting workshop on mouse CNS neuropathology that was particularly informative. I won the second place young investigator award, so I was able to present my poster an extra day, which led to even more networking. It was a nice growing experience to go alone to a conference that was new to me and be forced to meet new people.

SfN, with close to 30,000 attendees, is one of the largest annual scientific meetings in the world. Neuroscientists from all around the globe participate and showcase their areas of work in these five days. It is amazing to see the volume and quality of neuroscience research worldwide. Due to its massive size there will be something or the other going on which you will be interested in. This meeting is not only about work but also fun. Various vendors organize symposiums after the meeting in various city landmarks where you can go and meet new people and talk about research, helping to make worldwide connections.

I was a first time attendee of ASTMH, the largest international scientific organization that is dedicated to reducing the burden of tropical infectious diseases worldwide and improving global health. This year’s ASTMH meeting brought together researchers, medical professionals, and policy makers who promote the goals of ASTMH. The ASTMH meeting was an excellent opportunity for me to learn about the advances in tropical disease research, the strategies used by individuals living in tropical countries to control or eliminate diseases, and the role of policy makers in tropical disease intervention. Moreover, as one of this year’s ASTMH Young Investigator Award winners, I had the privilege of delivering an oral presentation which was a great opportunity to improve my public speaking skills.

BMSgo (Biomedical Sciences Graduate Organization) was established in Fall 2015 by the initiative and combined efforts of a few senior graduate students, along with support from the BMS faculty and staff. We aim to serve as the focal point of interaction for graduate students, thereby fostering and strengthening the graduate body of the Biomedical Sciences department at Iowa State University. Being a student represented organization under the guidance of faculty members, the primary goals of BMSgo is to provide opportunities for the BMS students to network, develop leadership skills and enhance participation not only in departmental events but also University-wide. The executive committee of the BMSgo looks forward to working in together with the BMS Department to accomplish our vividly defined goals. Unlike taking on responsibilities from the previous year’s committee and going about achieving the goals of the organization, our tasks as the founding committee are a somewhat different; we hope to set preliminary goals for the organization and gain momentum during this school year, paving the path for growing into a well-established student organization at Iowa State University.
The short answer would be no, they are not the same. Parkinsonism is a generic descriptive term encompassing neurological diseases whose underlying neuropathologies are clinically manifested as Parkinson-like symptoms, including Parkinson’s disease (PD). These symptoms include slowing of movement, tremor, rigidity or stiffness and balance issues. As a clinical syndrome, Parkinsonism also includes many atypical variants, often known as “Parkinson’s Plus Syndromes” and any other brain disease that resemble Parkinson’s, such as manganism, hydrocephalus or drug-induced Parkinsonism. However, despite the clinical diagnosis, all cases of Parkinsonism share a disturbance in the dopamine neurotransmitter system of the basal ganglia - a part of the brain that controls movement.

Classical PD makes up approximately 80% of all cases and arguably is the most studied form of Parkinsonism. PD is mainly characterized by selective neurodegeneration of dopamine-producing cells in the substantia nigral region of the brain, resulting in a deficiency in the key neurotransmitter dopamine. Supplementing patients with L-dopa, a precursor of dopamine, helps alleviate the shortage of dopamine and the resulting symptoms. Also, in a majority of typical PD patients, neurons in the affected regions of the brain contain Lewy bodies, which consist of a misfolded form of the protein α-synuclein. Although the exact function of this protein has yet to be elucidated, α-synuclein has long been implicated in the pathogenesis of PD.

The remaining spectrum of Parkinsonism comprises rare, severe neurodegenerative disorders including progressive supranuclear palsy (PSP), corticobasal degeneration (CBD), Lewy body dementia (LBD) and multiple system atrophy (MSA, also known as Shy-Drager syndrome). Besides sharing similar symptoms with typical PD, these movement disorders are distinguished by their own unique symptomology. For example, in MSA, aggregated α-synuclein depositions are seen in the brain’s glial cells instead of in the neurons; and in PSP and CBD, an abnormal accumulation of “tau” protein, which normally binds and stabilizes microtubules within cells, is observed instead of the accumulation of α-synuclein seen in classical PD. Another classic example is LBD, one of the most common causes of dementia in the elderly population. While LBD patients likewise accumulate an abnormal aggregation of α-synuclein in their brains, they also suffer from visual hallucinations, which is non-existent in typical PD patients. Clearly, even though Parkinsonism comprises disorders having many overlapping symptoms, signifying altered dopamine neurons, the diverse array of distinctive symptoms and underlying neuropathologies makes diagnosis and development of effective therapeutic agents to battle this spectrum of diseases that much more difficult.

Our research in Dr. Kanthasamy’s lab focuses on unraveling the cellular and molecular mechanism of Parkinson’s disease and other protein-misfolding diseases. Our lab uses multidisciplinary approaches to understand cellular signaling mechanisms that regulate the survival of dopamine-producing nerve cells and to try to develop novel translational approaches to slow down the progression of PD. We are also interested in understanding the role of environmental neurotoxic chemicals and other neurotoxic stresses on PD pathogenesis. In recent years, we have made several advancements in understanding how occupational neurotoxicants interact with proteins to mediate neuronal cell death processes. Our lab has also made several fundamentals advancements in elucidating the role of protein kinases such as PKCδ and Fyn kinase in regulating dopaminergic degeneration in animal models of PD. With strong financial support from the National Institutes of Health, Dr. Kanthasamy is able to mentor many graduate students and to adopt many state-of-the-art tools and techniques so vital to overcoming barriers to filling the existing gaps in knowledge.
What advice do you have for the students currently enrolled in this program to help succeed in your field and/or in general?

I can give lots of free advice, where do I start? OK here we go: follow your heart, be bold, speak up, don’t be shy to say no and don’t be afraid to fail; fail often, fail fast and work hard. Work out, eat right, take regular breaks and travel the world as much as you can! Remember you are never too young to do anything amazing!
While the target time for PhD completion is around five to seven years in Biomedical Sciences, the precise time varies depending upon the individual’s research project and his/her performance. Clear and concise goals help not only in successfully completing the program but also in making sure you have publishable results and a strong resume when you graduate. The following timeline has been chalked up based on personal experiences of senior graduate students.

YEARS 3-7

Try and schedule your prelims by the end of the third year.
This is a requirement in order to be considered a Ph.D. candidate. Some of the benefits of completing prelims early are it increases eligibility for travel funding, F31 and Foundational Grants and other sources such as university’s Bridge funding. In an instance where there is a gap between when one grant ends and the next one begins, your PI may be eligible for university bridge funding to support you in the interim; your status as a PhD candidate will help strengthen their case.

Professional development is just as important!
Being involved with activities in the department and university will enrich your graduate experience. As your coursework lessens, focus on developing yourself as a scientist in a professional field. Iowa State provides a number of professional development workshops as well as select courses on thesis and dissertation writing etc. Every month the graduate newsletter lists upcoming academic writing and organization newsletter lists upcoming academic writing and professional workshops being involved in organizations like GPSS will complete your graduate experience.

Publications are key to success beyond graduation
Have at least one first author publication by your goal. Publishing a research paper can be a time consuming process and you don’t want to spend an extra year just trying to get your results published; or worse, have your work languishing among the pile of other unpublished manuscripts because you didn’t push for publication before graduating.

YEAR 2

Finish your core classes and most of the courses your advisor wants you to take.
There are always classes that you will find appealing, however, graduate level courses have a huge time commitment. If it is something that just interests you, you can always read more about it during your leisure time without the added stress of assignments and exams.

Form your POS committee and have a POS meeting by the end of the year.
Your POS committee is crucial for the successful completion of your degree so pick faculty members who you can work well with. Having the POS meeting early on will help streamline your research and coursework, most of the time this ensures that you don’t end up taking courses that aren’t required for the completion of your degree. It also gives the committee the opportunity to critique your research proposal and any preliminary results obtained. This helps in setting the course of your research work.

Try to attend a conference.
No conference is of lesser value. A symposium organized by your department, the Graduate and Professional Student Senate (GPSS) or the university is a good place to start. It will develop your presentation skills at no cost to your supervisor and will be a great way to meet other researchers with similar research interests and could even result in meaningful collaborations! Attend these conferences even if you don’t have anything to present. It will help prepare you for when you present in the future.

YEAR 1

Get off to a strong start with coursework.
It would be wise to start with the core courses because your interests might not remain the same throughout or line up with your Program of Study (POS). Most first year students take the same courses. This will give you an opportunity to get to know your colleagues better and will make your graduate experience more pleasant.

First impressions matter!
Maintain a good work ethic in the labs you rotate. Be in the lab during the hours that are the norm for that lab within reason; the more time you spend there, the more you get accustomed to the work-environment and the senior students. You can always work on your assignments if you have free time. Always be friendly and professional. Talk to students working in these labs as well as those who have previously rotated in them. These candid conversations will help choosing the lab that’s right for you.

Be communicative with your major professor.
As you near the end of your last rotation, you should know which lab you would like to join. Be sure to discuss the project you will be taking on, each other’s expectations on hours put into research, conference attendance, TA/RA requirements and publications with your advisor.

BEFORE YOU ARRIVE

Select and contact the faculty members with whom you would like to rotate.
Select the faculty members whose research interests match yours. Keep in mind though that even though you are interested in a certain faculty member, he/she may not be recruiting students that year, so don’t narrow your choices too much; be flexible. Contact these faulty members and discuss the possibility of rotating in their lab. Set up a time to meet with each of them soon after you arrive and finalize your rotations. The danger of putting this off is that you might get stuck in the lab during the hours that are the norm for that lab within reason; the more time you spend there, the more you get accustomed to the work-environment and the senior students. You can always work on your assignments if you have free time. Always be friendly and professional. Talk to students working in these labs as well as those who have previously rotated in them. These candid conversations will help choosing the lab that’s right for you.

It’s never too early to start building relationships!
If you have been assigned a graduate student mentor, contact him/her. Experiences of your graduate student mentor and senior graduate students in the program will help you direct yourself better and avoid unfavorable situations.

TIMELINE FOR DEGREE COMPLETION FOR GRADUATE STUDENTS

by Shivani Ghaisas

YEAR 1

YEAR 2

YEARS 3-7
What do you consider your biggest accomplishment? What challenges did you face with this?

I am proud to say that I was able to contribute to the field of veterinary pharmacology. In veterinary medicine, we use α2-adrenergic agonists to sedate animals and to induce anesthsia. You might have heard about xylazine. It is the most famous α2-adrenergic agonist among many others in that category. The big problem around 1980 was how to control the duration of xylazine-induced sedation, and mitigate other pharmacological effects of xylazine. I discovered and developed reversal agents to xylazine to solve that problem. I found Yohimbine, an α2-adrenergic antagonist, to be a reversal agent to xylazine. Yohimbine helps veterinary practitioners a great deal. For instance, one can use xylazine to immobilize animals in the wild by the use of a tranquilizer gun. But what would you do after the clinical procedure? You cannot just leave them there in the wild. If you do, they could die of hyperthermia when it is hot or hypothermia when cold. Yohimbine helps in that the animal wakes up minutes within administration. That is my amazing invention! This work was published in the Journal of Pharmacology and Experimental Therapeutics in 1981. This journal publishes mainly on preclinical and analgesic effects and decided to throw it to the veterinary drug market! Unfortunately, the manufacturer of xylazine (Rompun) did not tell veterinarians that it was an α2-agonist. It was when I was at the Experimental Biology Meeting (Federation Meeting in its early days), the largest meeting in Biomedical Sciences, in 1979 that I overheard that Xylazine was an α2-agonist. I thought that an α2-antagonist would control the pharmacological action of xylazine and from there the idea began to flow. Yohimbine at the time was one of the few selective α2-antagonists. I worked on it and there you have it!

Shifting gears, what would you consider your main focus to be as a scientist?

I like novel ideas. I hate following someone else’s footsteps and just testing whether what they found in a different system works in ours. That isn’t me. I like to find novel things. In order to do that, you have to think through a lot of stuff. You have to ask yourself a lot of questions, like why are these things happen? I think if we take this approach science becomes exciting.

What advice do you have for graduate students and postdocs? What characteristics do you gravitate towards when selecting graduate students and postdoctoral researchers?

The three things: curiosity, passion, and persistence. You will succeed if you have these three! Curiosity, you need to be curious about things! This is very important. You need to always be asking why and how things happen. Curiosity itself isn’t enough; you have to have passion to pursue the work, to find your answer. We didn’t have computers when I was studying. It is a great tool if used correctly. The answer to almost any question you may have can be at your fingertips within minutes. Why then is it that people haven’t learned much from the computer? They go online and get distracted. I feel bad because people have this great tool that we didn’t have, yet they aren’t making good use of it. People are curious but have no passion. Passion is what drives us but that isn’t enough, we need to sustain, we need to be persistent. You also need to be persistent and never give up no matter what. In addition, working hard and being a good communicator is key. Graduate students need to be willing to work hard; they don’t get a PhD just by coming here. It is important to ask why you come to graduate school and what you want to learn. No pain, no gain. Communicating well with your mentors is also very important. You need to listen to others including your major professor. If you run into a problem, you need to communicate with your mentor. He/ she can help you solve the problem, big or small. If graduate students do these things, then they should have no problem whatsoever!

Do you have any other words of wisdom for any of our students?

This is tailored to the students of the one-year master’s program. Many of them would like to go to professional schools: medical, dental, or veterinary school. I call our one-year MS program the enrichment program because these students are here to improve themselves, to fulfill the academic requirements needed for professional school. As an instructor, I like to push my students to work hard. I take my responsibilities very seriously. I care about them. I would write recommendation letters for students who work hard to improve their quality. Graduates from this program have managed to get good jobs or get into professional schools and they have come back and thanked me for what I have done for them; I like that. A student who sat for her MCAT examination after finishing the MS program and got 93% percentile. She came back and said, “Dr. Hsu, thank you very much. You challenged me and I accepted the challenge. As a result, I got 93% for critical thinking.” I like to hear these things. I just hope that students strive to improve their quality. Remember, where there is no pain there is no gain. If you don’t put your efforts into it, you aren’t getting anywhere. You work hard, you will achieve.
Since early September, 838 people across 38 states have been reported to have contracted Salmonellosis from contaminated cucumbers. On September 4, 2015, the Centers for Disease Control and Prevention (CDC) together with multiple states and the United States Food and Drug Administration (FDA) initiated an investigation regarding an apparent outbreak of Salmonellosis, a known food borne illness causing severe diarrhea, dehydration, and possible systemic complications. Of those infected, 50% of patients are under 18 years old. Poona. Salmonella spp. is capable of penetrating the external layer of the cucumber known as the epicarp and residing in the space between the epicarp and endocarp of the skin. By not penetrating the vegetable beyond the skin, the Salmonella spp. evades immune like responses of the vegetable which can otherwise cause blemishes, making the vegetable look unappetizing. This is why in this instance and others where this invasive technique is common, like tomatoes infected with Salmonella spp., one cannot identify the infected vegetables upon a simple visual inspection. Cooking these vegetables to reduce transmission is advised, as the heat will kill the bacteria; the problem of course is that cucumbers are typically consumed raw and therefore, it is highly recommended that consumption of cucumbers identified in the recall be avoided. The latest updates can be located at http://www.cdc.gov/salmonella/poona-09-15/.

### AWARDS

**RESEARCH EXCELLENCE AWARD**

Awards are offered each semester and summer session to recognize students for outstanding research or creativity as seen in theses and dissertations. http://www.grad-college.iastate.edu/academics/awards/ex/index.php

**TEACHING EXCELLENCE AWARD**

Awards are offered each semester to recognize outstanding achievement by graduate students in teaching. http://www.grad-college.iastate.edu/academics/awards/ex/index.php

**THE KARAS AWARD FOR OUTSTANDING DISSERTATIONS**

The award is offered each spring semester to recognize a superior mathematical and physical sciences and engineering or social sciences dissertation. http://www.grad-college.iastate.edu/academics/award/karas.php

**THE ZAFFARANO PRIZE FOR GRADUATE STUDENT RESEARCH**

The award is offered each spring semester to recognize superior performance in publishable research by an Iowa State graduate student. http://www.grad-college.iastate.edu/academics/awards/ex/index.php

**GPSS TRAVEL AWARDS**

Iowa State University Graduate and Professional Student Senate Professional Development Grants https://www-gpss.sws.iastate.edu/students/pg/

**GENETIC TRAVEL AWARDS**

Iowa State University Interdepartmental Genetics and Genomics Graduate Programs, Travel to Professional Conferences and Symposia http://www.genetics.iastate.edu/travel.html

**TOXICOLOGY TRAVEL AWARDS**

Iowa State University Interdepartmental Toxicology Graduate Programs, Travel to Professional Conferences and Symposia http://www.toxicology.iastate.edu/travelTOX.html

**SDT TRAVEL AWARDS**

Society of Toxicology Awards and Fellowships For Graduate Students https://www.toxicology.org/awards/sot/awards.asp

### CONFERENCES

**ANTHELMINTICS: RESISTANCE TO DRUGS II**

http://www.extension.iastate.edu/registration/events/conferences/membrane/location.html

**RNA 2016**

June 16-19, 2016: Disneyland Hotel, Southern California

**THE 4TH INTERNATIONAL CONFERENCE ON MOLECULAR NEURODEGENERATION**


**THE SOCIETY OF TOXICOLOGY 55TH ANNUAL MEETING AND TOXEXPO**

March 13-17, 2016: New Orleans, Louisiana

**THE SOCIETY OF TOXICOLOGY 55TH ANNUAL MEETING AND TOXEXPO**

February 9th – 12th 2015: San Diego, California

**SACNAS TRAVEL AWARDS**

Society for Advancement of Hispanics/Chicanos and Native Americans in Science http://sacnas.org/events/national-conf/travel-scholarships

**FASEB TRAVEL AWARDS**


**SFN TRAVEL AWARDS**

Society for Neuroscience Travel Awards http://www.sfn.org/awards-and-funding/individual-prizes-and-fellowships/list-of-all-awards

**CONFERENCES**

**CURE SMA 2016**

http://www.curesma.org/research/for-researchers/research-conference/

**RNA 2016**


**THE SOCIETY OF TOXICOLOGY 55TH ANNUAL MEETING AND TOXEXPO**

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**CONFERENCES**

**THE SOCIETY OF TOXICOLOGY 55TH ANNUAL MEETING AND TOXEXPO**

February 9th – 12th 2015: San Diego, California
I would like to extend my heartfelt gratitude to the faculty editors Drs. Michael Kimber and Tim Day for their time and contributions to the continued success of the BMS Herald. I would also like to note the generous contributions of time and effort of the columnists, without which this edition would not have been a reality. A special thank you to Dr. Anumantha Kanthasamy, Amy Brucker, Emma Willcockson, Kelly Pullen and those featured in these editions for their time and support in helping make the BMS Herald a success!

- Hiruni Harischandra