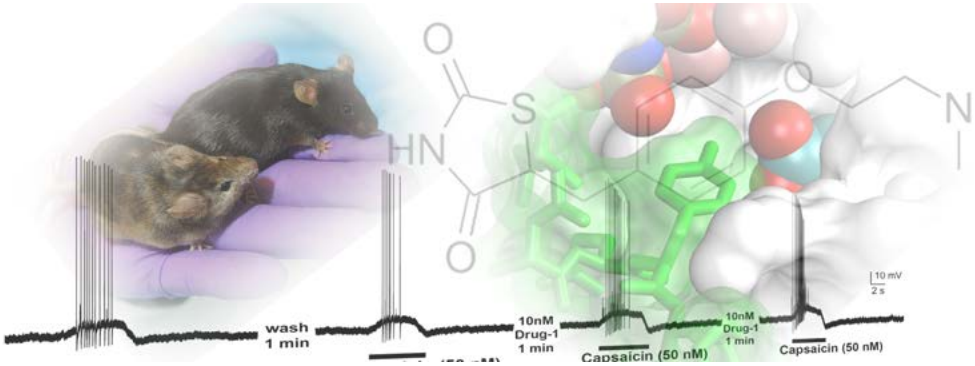
# Iowa Pharmacology NEWS

FOR ALUMNI AND FRIENDS OF THE UNIVERSITY OF IOWA DEPARTMENT OF PHARMACOLOGY

VOLUME 4 ISSUE 1

SPRING 2016




## Greetings from the Chair!

The beautiful spring weather of recent, with an explosion of green around us, reminds us why Iowa City is such a great place to live and work! Since our last newsletter, there have again been a number of noteworthy events in Pharmacology. As detailed herein, we welcomed in April the latest addition to our faculty, Dr. Huxing Cui, who as a new Assistant Professor brings with him an impressive resume and an active research program. Our existing faculty and trainees continue to achieve recognition at the collegiate and international level, and we have several successes to report about their ongoing quest for research funding. We make note here how our faculty have been especially innovative in identifying new, less traditional sources of funding, in some cases seed funding for exciting new research initiatives.

In this issue, we include another close-up look into the ongoings of the research laboratory of one of our faculty, this time that of a well-established investigator, Dr. Stefan Strack. Stefan exemplifies how our faculty achieve success in both their scientific endeavors and in the training of budding young scientists. In regard to the latter, we lastly applaud three of our Pharmacology trainees for successfully defending their PhDs this year! We hope you enjoy this latest addition of *Iowa Pharmacology News*!

IN THIS ISSUE



UNIVERSITY OF IOWA CARVER COLLEGE OF MEDICINE
University of Iowa Health Care
Department of Pharmacology

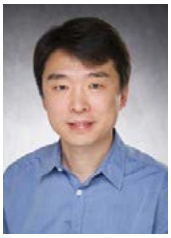
***Contact Information:***

*Phone: (319) 335-7965*
*FAX: (319) 335-8930*
*E-mail: pharmacology@uiowa.edu*

*http://www.medicine.uiowa.edu/pharmacology/*

*Department of Pharmacology*
*University of Iowa*
*Roy J. and Lucille A.*
*Carver College of Medicine*
*51 Newton Road, 2-471 BSB*
*Iowa City , IA 52242-1109*

## Huxing Cui joins Pharmacology



The UIHC *Center for Hypertension Research* and the Department of Pharmacology are pleased to announce that **Huxing Cui**, Ph.D. joined the faculty as an Assistant Professor on April 1, 2016. His recruitment was a collaboration with the *Fraternal Order of the Eagle's Diabetes Research Center* and the *Obesity Research and Education Initiative*. His research interests center on the signaling pathways and neural circuits that regulate metabolism and feeding behavior relating to obesity and eating disorders, and the role of distinct hypothalamic circuits in sympathetic nerve activity and blood pressure regulation. Dr. Cui received his B.A. degree in Medicine from Yanbian University College of Medicine in China and his Ph.D. from Kobe University Graduate School of Medicine in Japan. He performed postdoctoral studies in the Department of Neuroscience at the Osaka Bioscience Institute in Japan before joining the Departments of Psychiatry and Internal Medicine at UT Southwestern Medical Center in Dallas, Texas. In 2012 he joined the Lutter laboratory at the University of Iowa, Department of Psychiatry, and was promoted to Associate in 2014. His research findings have been published in *Cell Reports*, *Diabetes*, and *Journal of Clinical Investigation*, among other journals. Dr. Cui has just received a 5-year R01 grant from the NHLBI to study "Lateral Hypothalamic Regulation of Sympathetic Nerve Activity and Blood Pressure", and a 2-year R21 grant from the NIMH to study "Behavioral Characterization of Humanized Mouse Model of Eating Disorder." Please join us in welcoming Huxing to Pharmacology!

## UI team receives grant from Children's Tumor Foundation

Associate Professor **Dawn Quelle** of Pharmacology and Pathology is part of a UI research team developing an innovative pig model of the rare genetic disorder neurofibromatosis, thanks to a grant from the *Children's Tumor Foundation* (CTF). Neurofibromatosis 1 (NF1) is caused by a mutation in the NF1 gene. The condition can cause nerve tumors and can lead to blindness, bone abnormalities, cancer, deafness, disfigurement, learning challenges, and disabling pain. While traditional mouse models of NF1 have had limited success in advancing NF1 research because mice develop only a few aspects of the disease, pigs models often more closely mimic human diseases. UI researchers led by Dr. David Meyerholz, Associate Professor of Pathology, will use genetic engineering to create pigs that carry a common human NF1 gene mutation. "Studying a more authentic animal model of NF1, and doing comparative analyses in NF1 patients, will directly benefit people with NF1 mutations," said Meyerholz, who is a co-Principal Investigator of the grant project.

The grant is part of CTF's *Synodos for NF1* program, a unique partnership of world-class scientists and clinicians from diverse areas of expertise who work together with patients and share information in real time. In addition to Meyerholz and Quelle, the UI research team includes Drs. Ben Darbro, Assistant Professor of Pediatrics, Jessica Sieren, Assistant Professor of Radiology, and Adam Dupuy, Associate Professor of Anatomy and Cell Biology.

See the full UI press release at *http://www.medicine.uiowa.edu/Newsarticle.aspx?id=35186*; see also *http://www.ctf.org/images_12/CTF_Newsletter-Vol1_2016.pdf*.

## Fisher receives Michael J. Fox and Broad Institute awards

**Dr. Rory A. Fisher**, Professor in the Departments of Pharmacology and Internal Medicine, and his collaborator Dr. Nandakumar S. Narayanan, Assistant Professor of Neurology, have received a *Michael J. Fox Foundation for Parkinson's Research Target Advancement Award* entitled "Regulator of G protein Signaling 6 (RGS6) Protection of Dopamine Neurons in Parkinson's Disease." The project seeks to define the molecular basis for loss of RGS6 in human Parkinson's disease, with the ultimate goal of identifying new RGS6-based Parkinson's disease therapies. Our previous issue noted Dr. Fisher's recent receipt of a *Broad Institute Award* from the *Stanley Center for Psychiatric Research* entitled "RGS6 and Schizophrenia." This project seeks to elucidate the influence of RGS6, a schizophrenia-associated genetic locus, on behavioral measures of schizophrenia in mice, with the aim of identifying novel therapeutic strategies for schizophrenia.

## 2015 Amanda Hope Skolnick Undergraduate Award

The *Amanda Hope Skolnick Undergraduate Award* is given annually to honor the memory of Amanda Skolnick, who worked as a Laboratory Assistant in the Department of Pharmacology while an undergraduate at The University of Iowa. In her junior year of study, Amanda's life tragically ended after being struck by a motor vehicle in Iowa City. The Skolnick family made a generous donation to the Department of Pharmacology to establish an award in memory of Amanda. Our 2015 award recipient was Clayton Rosinski. Clay has been a Laboratory Assistant in Dr. Kamal Rahmouni's laboratory since the fall of 2014. He is a junior working towards a B.S. in biology and a B.S. in biochemistry. Clay's enthusiasm and eagerness to help with the many tasks and studies performed in the laboratory sets him apart. His willingness to take on sophisticated experiments demonstrates his confidence and patience for research. ***Our congratulations and best wishes to Clay!***

*The Skolnick Award is presented annually to a Department of Pharmacology undergraduate employee who best exemplifies the dedication and spirit that Amanda demonstrated daily in her work as a Laboratory Assistant.*

## Meet Our New Grads!

In the past year four students performing their thesis studies in the Department of Pharmacology successfully defended their MS and PhD degrees! Congratulations to:

**Raeesa Gupte, PhD** - Mohapatra lab

"Phosphoregulation of Somatodendritic Voltage-Gated Potassium Channels by Pituitary Adenylate Cyclase-activating Polypeptide"

**Nicole Littlejohn, PhD** - Grobe lab

"Tissue-specific Roles for the Renin-Angiotensin System in Cardiovascular and Metabolic Regulation"

**Madeliene Stump, PhD*** - Sigmund/Rahmouni labs

"The Role of Brain PPARγ in Regulation of Energy Balance and Glucose Homeostasis"

**Hannah Van Beek, MS** - Cullen lab

"Inhibition of Peroxide Removal Systems and Ascorbate-induced Cytotoxicity in Pancreatic Cancer"

*MSTP/Neuroscience Graduate Program student; degree to be awarded at completion of MSTP.

## GIVING OPPORTUNITIES

The research and teaching missions of Iowa Pharmacology receive critical support in the form of generous gifts from friends and alumni. Contributions to Iowa Pharmacology can be made to:

**Department of Pharmacology Development Fund:**

www.givetoiowa.org/pharmacology

**John Paul Long Chair in Pharmacology Fund:**

www.givetoiowa.org/jplong

## CONTACT US

To mail in a gift or to receive more information about giving please contact:

Madelynn Krall
University of Iowa Foundation
P.O. Box 4550
Iowa City, Iowa 52244-4550
(800) 648-6973 | (319) 335-3305
madelynn-krall@uiowa.edu

## OUR APPRECIATION

We thank those of you who have already made generous contributions to Iowa Pharmacology!

# Iowa Pharmacology LAB IN FOCUS...


Born in Mönchengladbach, Germany, Stefan Strack began his education at the University of Würzburg as a student of computer science and artificial intelligence. He then enrolled at the State University of New York, Albany, where after receiving an MS degree in computer science, he changed directions and completed a PhD in neuroscience. In his doctoral studies of Aplysia pacemaker neurons, he learned electrophysiology and biochemical methods, with his expertise in the latter to become a foundation of his research as an independent scientist. Also during this period, his affinity for academic science and the mentoring of scientific trainees was kindled by witnessing the one-on-one approach of his PhD advisor, Jon Jacklet. During his very productive postdoctoral studies with Ford Ebner and Roger Colbran at Vanderbilt University, he was finally indoctrinated in the science of protein phospho-regulation. Stefan Strack's success to date derives from his ingenuity in applying the variety of his accumulated skills to diverse biological problems. Thus, while his research interests are now largely focused on neurobiological questions, he yet finds applications in his work for his early-developed computing skills.

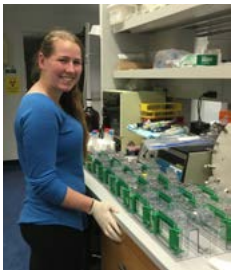
## Lab vitals

**Principal Investigator:** Dr. Stefan Strack (Undergraduate, University of Würzburg, Germany; MS '89 and PhD '91, State University of New York at Albany), Professor, Departments of Pharmacology and Pathology.

**Full-time Staff:** Dr. Ron Merrill, Assistant Research Scientist, Yufang Kong, Research Assistant, Kyle Flippo, Graduate Student, Yujia (Jennie) Liu, Graduate Student, and Jianing Song, Graduate Student.

**Research Focus:** The Strack lab has a long-time interest in protein phosphatase 2 A (PP2A) enzymes, specifically those PP2A species that are expressed in neuronal cells and modulate their behavior in both normal and pathological states. The lab has recently focused upon the regulation of mitochondrial dynamics and function by neuronal PP2A isoforms, which might underlie the involvement of these enzymes in various neurologic disorders. Dr. Strack's research has been continuously funded by the NIH since 2002.

## Their contribution

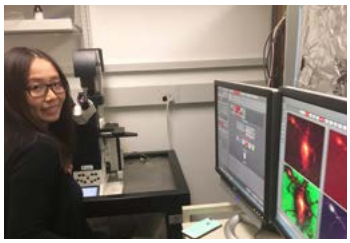


Of many contributions of the Strack lab are the discovery of a conserved phosphorylation site in the mitochondrial fission enzyme dynamin-related protein 1 (Drp1) that is critical for cell survival, the identification of mitochondria-anchored protein kinase A as a regulator of mitochondrial function and neuronal survival, and the identification of a neuron-specific protein phosphatase that is a target for neuroprotective drugs. These discoveries in turn have implications with regard to a variety of neurologic diseases, and the lab is pursuing therapeutic approaches for these maladies. Specific initiatives ongoing include: the development of a chemo-genetic technique for manipulating mitochondrial fission dynamics in specific neuronal cell types in vivo; developing a cultured neuron model of spinocerebellar ataxia SCA12 by introduction of a mutant SCA12 gene into inducible pluripotent stem cells (IPSCs); and initiating a high-throughput screen for pharmacologic inhibitors of brain-specific PP2A isoforms.

# Iowa Pharmacology LAB IN FOCUS...

## The training environment

In a time when the grant writing and administrative tasks of many senior faculty persons make it difficult or impossible for them to work directly at the bench, Stefan Strack yet works regularly at the bench on his personal lab project and in collaboration with his trainees. This greatly enhances the training environment of the laboratory, and Strack's enthusiasm for science clearly rubs off on all his staff and trainees.



Second year graduate student Jennie Liu is a relative newcomer to the Strack lab, currently applying her expertise in the microscopic imaging of mitochondrial form and function in collaborative studies with her fellow lab members. She finds the Strack lab an excellent match for her interests in that she can do microscopy work (She enjoys being able to literally "see" her experimental results!) and also work in the neuroscience area. She is gratified to be able to learn multiple experimental approaches in the Strack lab, ranging from microscopy, to animal behavioral methods, and eventually to biochemical methods. Jennie related that Dr. Strack "is passionate about science, and cannot stay away from the bench." She feels that he and she are working as a team on their research, and that their work together solving problems moves her research forward more rapidly. Assistant Research Scientist Ron Merrill, who has worked with Stefan Strack for eleven years, has a unique perspective on the team approach of the Strack lab. He expressed particular enthusiasm about being able to work one-on-one with students in the lab and being a participant in their training. He was also grateful that in the Strack lab he has the freedom to test his own ideas. He made note of Strack's enthusiasm for training the next generation of scientists, and how every summer multiple undergraduates and even high school students are invited to get their first research experiences in the lab. As the senior lab person, Merrill invests much of his own time in directing these younger trainees, but he finds it quite rewarding. He expressed admiration for the scientific talents of his mentor, remarking about Stefan Strack's impressive facility with recombinant DNA manipulations, the engineering of unique expression constructs, mutagenesis, and the like.

## In Stefan Strack's words

Stefan traces the origins of his mentoring approach back to that of his first scientific mentors. He intimated that he "absolutely loves training students." He gave as an example how he relishes sharing with students the "joy of creating a beautiful microscopic image." He finds working at the bench the best part of his job, and regrets that he cannot do more of it. When asked why he chose to work in a pharmacology department, Strack said it was the "ultimate interdisciplinary discipline, in which one applies basic science in addressing health problems." Aside from the lab, he enjoys walking to work, road and mountain biking, running (and exercise in general), and lastly board games of various kinds.

"Work hard. Play hard."

"As long as you make an enthusiastic effort, you will succeed. Enjoy the small successes, a pretty blot, a pretty image.""

*- Stefan Strack on his philosophy and his advice to students*

You can support the groundbreaking research of the Stefan Strack Lab or other UI Pharmacology laboratories by contributing to the **Department of Pharmacology Development Fund** at the University of Iowa Foundation: www.givetoiowa.org/pharmacology

# THE FUNDING STREAM

## Pharmacology faculty tap novel funding sources

While Pharmacology faculty aggressively pursue funding from traditional sources such as the NIH, AHA, ADA and DOD, they are also successfully competing for awards from organizations that support more specialized research. Examples of new funding sources of which our faculty have recently taken advantage include the *Stanley Center for Psychiatric Research* at the *Broad Institute*, the *Michael J. Fox Foundation for Parkinson's Research*, the *Children's Tumor Foundation*, the *Fondation de l'Ataxie Charlevoix Saguenay* (a Canadian organization funding research on the ARSACS ataxia disorder), the *Edward Mallinckrodt Jr. Foundation*, and *GlaxoSmithKline*. This good-sized collection of awards from diverse agencies reflects the innovation and motivation of our faculty, and the exciting new research initiatives being undertaken in Pharmacology. We thank all of these agencies for their generous support of Pharmacology research!

## New NIH funding

**Huxing Cui**, Ph.D., an Assistant Professor recently joining Pharmacology, has just been awarded a 2-year R21 grant from the NIMH entitled "Behavioral Characterization of Humanized Mouse Model of Eating Disorder," and a 5-year R01 grant from the NHLBI to study "Lateral Hypothalamic Regulation of Sympathetic Nerve Activity and Blood Pressure," (see *Huxing Cui Joins Pharmacology*, Page 2).
**Curt D. Sigmund**, PhD, Professor and Chair of the Department of Pharmacology was awarded a 4-year NIH R01 Research Grant entitled "Role of PPARγ and the PPARγ Target Gene RBP7 in the Endothelium." The goal of the research is to determine how RBP7 (retinol binding protein 7) acts as a specific co-factor for PPARγ in the endothelium, the inner most lining of the blood vessel, to protect the vessel from oxidative stress that can occur in response to cardiovascular stressors such as high fat diets and aging. The grant includes a subcontract to collaborate with Dr. Jorge Plutzky at Harvard Medical School in Boston.

## Graduate College Research Award

**Magdalene Ameka**, a Molecular and Cellular Biology Graduate Program student in the laboratory of Assistant Professor **Matthew Potthoff** in Pharmacology, received a UI *Graduate College Post-Comprehensive Research Award* based on her strong academic record. Magdalene received a generous stipend from the Graduate College during the Spring 2016 semester.

We commend our faculty and trainees for their vigorous efforts towards procuring funding for their science!

### Undergraduate Student Award

**Danny Linggonegoro (Laboratory Assistant, Grobe lab)**
American Diabetes Association (ADA) 2016 Minority Undergraduate Internship

### Predoctoral Fellowship Award

**Magdalene Ameka (Graduate Student, Potthoff lab)**
UI Graduate College Post-Comprehensive Research Award

### New Extramural Grant Awards to Pharmacology Faculty

*(Oct 2015 - May 2016)*

**Huxing Cui (Assistant Professor)**
NIH R21 (Cui PI) - Behavioral Characterization of Humanized Mouse Model of Eating Disorder, $419,000
NIH R01 (Cui PI) - Lateral Hypothalamic Regulation of Sympathetic Nerve Activity and Blood Pressure, $1,905,313

**Rory Fisher (Professor)**
Michael J. Fox Foundation for Parkinson's Research Target Advancement Award (Fisher PI) - Regulator of G Protein Signaling 6 (RGS6) Protection of Dopamine Neurons in Parkinson's Disease, $100,000

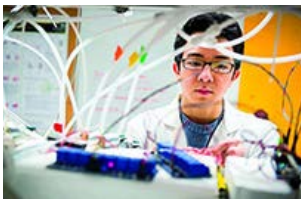
**Dawn Quelle (Associate Professor)**
Children's Tumor Foundation (Quelle Co-I) - Synodos for NF1 Preclinical Acceleration Project 1, $931,395

**Curt Sigmund (Professor and Chair)**
NIH R01 (Sigmund PI) - Role of PPARγ and the PPARγ Target Gene RBP7 in the Endothelium, $2,477,477

## Pharmacology trainees win EB and AHA conference awards

**Dr. Katelin Ahlers**, Pharmacology Lecturer and Postdoctoral Research Scholar in the laboratory of Professor **Rory Fisher**, and **Dr. Nijotu (Larry) Agbor**, Postdoctoral Research Scholar in the laboratory of Professor **Curt Sigmund**, received travel awards to present their work at the April 2016 *Experimental Biology* meeting in San Diego, CA. At the meeting, Dr. Ahlers presented a poster entitled "Novel Brain-specific Isoforms of Regulator of G Protein Signaling 6 (RGS6)." Dr. Agbor, who was selected by the Porter Physiology Development and Minority Affairs Committee as a recipient of an *EB American Physiological Society Minority Travel Fellowship* award, gave an oral presentation of his paper "Smooth Muscle Specific Expression of a Dominant Negative Cullin 3 Mutant (Cul3Δ9) Causes Vascular Dysfunction in Mice Mediated by RhoA/Rho-kinase." In late 2015, Pharmacology graduate student **Balyssa Bell** in the laboratory of Associate Professor **Kamal Rahmouni** received a Top Trainee Award at the 2015 *Council on Hypertension of the American Heart Association* meeting held in Washington DC. At the meeting, Balyssa was also selected as a finalist for the new *Hypertension Early Career Award* and gave an oral presentation entitled "Uncoupling the Metabolic and Cardiovascular Actions of Leptin through mTORC1 Signaling."

## Linggonegoro receives EURA and ADA Internship



**Danny Linggonegoro**, an undergraduate researcher in the laboratory of Assistant Professor **Justin Grobe** of Pharmacology, was selected to receive one of the 2016 *University of Iowa Center for Research by Undergraduates* (ICRU) *Excellence in Undergraduate Research Awards* (EURA). Danny was selected for this honor based on his exceptional track record of accomplishments at the UI, including extensive volunteer service to the University of Iowa Hospitals and Clinics, UI Student Body Government, UI Student Disabilities Organization, and the At-Risk Guided Studies Peer Tutor program for high school students; his work as a peer tutor for the UI Department of Chemistry; substantial outreach and community engagement; and his many accomplishments, awards, and fellowships received as a researcher in Pharmacology. The award consists of an ICRU *Research Fellowship* to be used in summer or fall of 2016 and a travel award to attend a professional scientific conference. Danny was also recently awarded a 2016 *Minority Undergraduate Internship* from the *American Diabetes Association*. This award supports Danny's ongoing work in the Grobe laboratory investigating neural mechanisms of metabolic and cardiovascular control.

## Sigmund delivers inaugural Vancouver 2010 Lecture

Dr. **Curt D. Sigmund**, Professor and Chair of Pharmacology, delivered the inaugural *Vancouver 2010 Plenary Lecture* on October 24, 2015 at the *Canadian Hypertension Congress* in Toronto, Ontario. His lecture entitled "Role of Novel PPARγ Pathways in the Control of Vascular Function and Arterial Pressure" is the first in a new annual series recognizing excellence in hypertension research. The named lecture commemorates the 2010 International Society of Hypertension Congress, which was sponsored by Hypertension Canada in Vancouver in 2010. Dr. Sigmund was also recently selected by the *Physiological Genomics Group* of the *American Physiological Society* as their 2016 Distinguished Lectureship Awardee. He delivered a lecture on physiological genomics to the group in April 2016.

## SPRING EVENTS

**Visiting Speaker Seminar** **Apr 19**
Donald Kohan, M.D., Ph.D.
Professor, Internal Medicine
Division of Nephrology
University of Utah Health Care

**Graduate Student Workshop** **Apr 21**
Brittany Ripley
Biochemistry

**Postdoctoral Workshop** **Apr 26**
Yuanchao Ye, Ph.D.
Pharmacology

**Graduate Student Workshop** **Apr 28**
Julio Sanchez
Biochemistry

**Visiting Speaker Seminar** **May 3**
Glenn M. Toney, Ph.D., F.A.H.A.
Ashbel Smith Professor
Physiology, University of Texas Health Science Center

**Graduate Student Workshop** **May 5**
Christy Heidema
Molecular and Cellular Biology

**Visiting Speaker Seminar** **May 10**
Leah Solberg Woods, Ph.D.
Associate Professor
Pediatrics, Human and Molecular Genetics Center
Medical College of Wisconsin

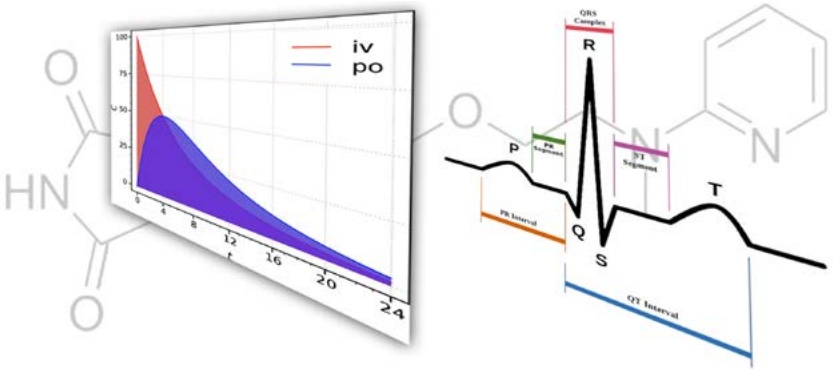
**Visiting Speaker Seminar** **May 17**
Ruth G. Perez, Ph.D.
Associate Professor
Biomedical Sciences
Texas Tech University Health Sciences Center - El Paso

**Center for Hypertension Research Seminar** **May 20**
Pedro Jose, M.D., Ph.D.
Professor, Medicine and Physiology, University of Maryland School of Medicine

**Research Retreat 2016** **June 1**
**Pharmacological Sciences Training Program and Departments of Anatomy & Cell Biology and Pharmacology**
Kirkwood Regional Center
University of Iowa
Oakdale Blvd, Coralville, IA


University of Iowa Carver College of Medicine
University of Iowa Health Care

Department of Pharmacology
2-471 Bowen Science Building
51 Newton Road
Iowa City , IA 52242-1109


### *Contact us:*


*Department of Pharmacology*
*University of Iowa*
*Roy J. and Lucille A. Carver College of Medicine*
*51 Newton Road, 2-471 BSB*
*Iowa City , IA 52242-1109*

*Phone: (319) 335-7965*
*FAX: (319) 335-8930*
*E-mail: pharmacology@uiowa.edu*

*http://www.medicine.uiowa.edu/pharmacology/*

*Please direct comments and inquires to:*
*John Koland, Editor*
*Iowa Pharmacology News*
*319-335-6508*
*john-koland@uiowa.edu*


*To receive this or future editions of Iowa Pharmacology News electronically or to be removed from the mailing list, please express your desire to pharmacology@uiowa.edu*