

Medical Pharmacology Spring 2012 / Fall 2012 Graduate Program Newsletter

Message from Interim Department Head,
Dr. Todd Vanderah

I hope everyone had some rest and relaxation over the summer and that the fall semester is going well. We have had some recent changes in the Department of Pharmacology starting with Dr. Sloviter accepting a position at Morehouse College in Atlanta, Georgia. Dr. Sloviter resigned to be on the East coast where he could be closer to family and colleagues. He is continuing with research on Epilepsy and teaching in the medical school.

Additional changes include the promotion of Dr. Ted Price from Assistant Professor to Associate Professor with Tenure and Dr. Greg Dussor assuming the role of the Medical Pharmacology Graduate Program Director.

The faculty worked hard over FY 2012 year putting together the 7-year annual progress report (APR). It exceeded expectations at all levels including research and teaching which resulted in the comments of "fantastic job keep up the great work" by Provost Comrie. It also received an overwhelming positive acceptance by the Arizona Board of Regents.

Due to the departure and retirements of faculty members in 2011, the department has started the process of recruiting with hopes of hiring two to three new Assistant Professors in the FY 2013/2014.

Please participate in interviewing and attending seminars presented by the candidates. Your opinion of the faculty candidates is valuable to insure continued success of the Department.

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Welcome From Dr. Greg Dussor Director of Graduate Studies



Dear Colleagues,

It is a great honor to take over as director of the Medical Pharmacology Graduate Program at The University of Arizona. This Program has a long history of success training graduate students with numerous alumni currently holding faculty and administrative positions within academia as well as scientific and leadership positions within industry. Our past achievements are reflected in the recent top 5 ranking by the National

Research Council placing us among the best pharmacology programs in the country. I will work to ensure that this record of success continues not only during my time as director, but well into the future.

Before I discuss current and future changes within the Program, I would like to thank Dr. Todd Vanderah for his service as director for the last several years. Dr. Vanderah was director during a number of significant events, notably the most recent Academic Program Review completed in the Spring of 2012. Dr. Vanderah worked tirelessly to ensure that this review was an overwhelming success and we owe him many thanks for his efforts.

The most prominent change starting with the Fall 2012 semester is the new Medical Pharmacology Facebook page. I would like to personally thank Vickie Healey and Dr. Ted Price for getting this page off the ground. We hope that this will be a place for everyone to stay aware of manuscripts published and awards received by Department members as well as current events within the Department. Additionally, we hope that the Facebook page will help advertise the Department and Graduate Program to future students and colleagues around the world. Those of you who have not visited this page can find it at <https://www.facebook.com/UniversityofArizonaPharmacology>.

There are a number of significant future changes within the Program but I would like to take this opportunity to discuss the proposed changes in the graduate curriculum. We are currently in the process of reorganizing the list and schedule of courses in an effort to allow students to finish classwork by the end of their first year (classroom credits typically take two full years to complete). This will move students full time into laboratories one year earlier than in the past and we anticipate this will shorten graduation times. Reorganizing the curriculum will require larger numbers of credit hours during the first year and will also require combining courses to streamline presentation of material and eliminate overlap. Importantly, this will not have a negative impact on students as they will learn all the basic fundamentals necessary for their success, but this will occur in a shorter period of time. We ask for the help of all faculty and students involved during this process and are confident that these changes will benefit everyone. This new curriculum will take effect in the Fall of 2013.

Finally, I would like to welcome all of the incoming students beginning the program this Fall. Ram Kandasamy and Jamie Moy begin the program as PhD students, Lynn Bui joins the Masters program, and Daniella Boros, Amanda Best, Trevor Swyers, Hiro Landazuri, and Randy Vazquez are entering the Perfusion program. Best of luck to all of you and I hope for continued success to our returning students as well.

Regards,

Greg Dussor

Med Pharm Graduate Reps

Each Spring, graduate students nominate and vote for two fellow 3rd/4th year students to serve as Representatives of the Graduate Program in Medical Pharmacology.

This year Dipti Tillu and Alec Okun were elected as the Graduate Reps.

A call for nominations will be going out in December, so start thinking now for who you would like to nominate.

2012 Graduate Recruitment

Graduate Recruitment was held February 9–12, 2012. A big thank you to all involved and made it another successful recruitment. The Department of Pharmacology would like to welcome the following students to the program new students for 2012-13 (see page 5).

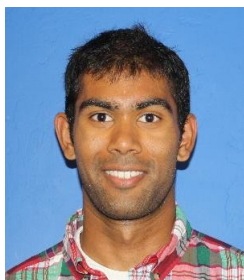
Dates for 2013 will be announced soon.

Graduate Student Reminders

- Please see Vickie Healey, Graduate Coordinator, to reserve a room. Students can either email Vickie at vhealey@email.arizona.edu or call 626-7218.
- Graduate student mailboxes are located in front of the Admin Office located on the 5th Floor. Please check at least once a week.
- If you will be travelling on University Business, you MUST notify the Pharmacology Admin Office in an email, the dates you will leave/return, reason why. Should this not be done, you risk the chance of not having insurance should something happen and / or not getting reimbursed.
- Receipts for reimbursements NEED to be filed with the Pharmacology Admin Office with in 10 days of your return. Should this not be done, you risk the chance of not getting reimbursed.

2012 INCOMING CLASS

PhD.

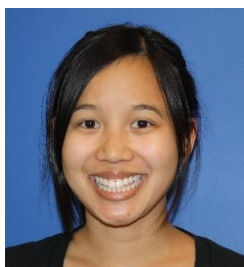


Ram Kandasamy received his undergraduate degree from Washington State University. Ram is also the recipient of the Yamamura Award.



Jamie Moy received her undergraduate degree from the University of Arizona. Jamie is also the recipient of an IMSD award and Yamamura Fellowship Award.

MS



Lynn Bui received her undergraduate degree from the University of Arizona and will be working Dr. Todd Vanderah's Lab.

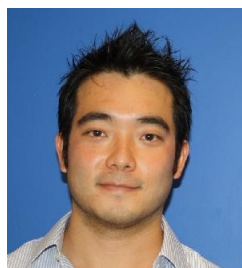
PERFUSION PROGRAM



Amanda Best received her degree from the University of New Mexico-Albuquerque



Daniella Boros received her degree from the University of Arizona



Hiro Landazuri received his degree from California State-Los Angeles



Trevor Swyers received his degree from Southern Utah University.



Randy Vazquez received his degree from the University of Puerto Rico

Graduation Exam Deadlines

Masters

- 2nd Semester in Residence Submit **Masters/Specialist Plan of Study** form
- December 12, 2012 Degree Requirements (All degree requirements must be met by this date (including defense/revision of thesis, coursework and

Doctoral

- 3rd Semester in Residence Submit **Doctoral Plan of Study** form through UAccess
- As soon as course work is completed. Schedule the Oral Comprehensive Examination. The Results of Oral Comprehensive Exam for Doctoral Candidacy form must e returned to the Grad College. There are fees associated with this form
- As soon as Comps Passed Submit **Committee Appointment** Form
- November 19, 2012 Last day to **TAKE** the Final Oral Examination/Defense. The Announcement of Final Oral Defense form, is due at least seven (7) working days prior to the date of the examination.
- December 3, 2012 Deadline to submit dissertation to Degree Certification.

NEW Graduate College - GradPath

Monday, October 1, 2012, GradPath (new online degree certification forms system) went live.

What this means to you, ALL required forms for M.S. and Ph.D students, will be done on-line.

- Students will be submitting forms through UAccess - Student Center - GRADPATH
- Advisors will be approving forms on-line when notified by email, the email will take you directly to the site for approval.
- Students should notify advisors when a particular form has been submitted. This is to prevent your form from possibly being heldup.
- Students "Chair" means "Advisor" not the Chair of your Comp Committee.

Should you have any questions/concerns, please see or call me as we will all have to work through this together.

Congratulations To Our
FALL 2011, Spring 2012 and Summer 2012
Graduates

Fall 2011

Gabriel Knudsen, Ph.D.

“Investigating complex Phenotypes: haplotype association mapping of benzene pharmacokinetics in isogenic mouse strains”

Jin Yan, Ph.D.

“Understanding the pathophysiology of migraine: activation and sensitization of dural afferents”



Spring 2012

Marina Asiedu, PhD.

“Spinal Sensitization mechanisms promoting pain: Gabaergic disinhibition and PKMzeta-mediated plasticity”

Katherine Hanlon, Ph.D.

“Cannabinoid Receptor 2: A Novel Multi-Targeted Approach in the Treatment of Breast Cancer and Related Skeletal Metastasis”

Weixi Kong, Ph.D.

“Oxidative DNA damage and DNA binding induced by 2, 2-bis (bromomethyl)-1, 3-propanediol: Possible modes of Action implicated in its carcinogenicity”

Aaron Bloom, M.S. (Medical Pharmacology)

“Pathological Sprouting of Sensory Nerves and the Development of Cancer-Induced Bone Pain”

Diane Gansert, M.S. (Perfusion)

“In vitro analysis of Renin Angiotensin System on Lymphocytes”

Molly Oldeen, M.S. (Perfusion)

“Optimizing Anticoagulation Therapy of ECMO Patients with Antithrombin III”

Laura Roeder, M.S. (Perfusion)

“The Effect of BAPN on Heart Structure and Function in AngII Hypertensive Mice”

Tiffany Robb, M.S. (Perfusion)

“Immune Mechanisms of Extracellular Matrix Remodeling in the Common Carotid”

Summer 2012

Allec Okun, Ph.D.

“Mechanistic Evaluation of the Affective Dimensions of Pain in Rats”

Spring 2012 Graduates



Pefusion Studednts: Diane Gansert,
Molly Oldeen, Tiffany Robb, Laura Roeder
(L-R)

Weixi Kong with her husband Pengfei Gu
and Weixi's Mom and Dad



Aaron Bloom with Advisor Patrick Manty
and Aarons Mom and Dad

Marina Asiedu with her advisor Ted Price



Graduate Student Publications

Melemedjian OK, **Asiedu MN**, **Tillu DV**, Sanoja R, Yan J, Lark A, Khoutorsky A, Johnson J, Peebles KA, Lepow T, Sonenberg N, Dussor G, Price TJ. [Targeting adenosine monophosphate-activated protein kinase \(AMPK\) in preclinical models reveals a potential mechanism for the treatment of neuropathic pain.](#) Mol Pain. 2011 Sep 21;7:70

Bloom, Aaron. Cover illustration for the International Association for the Study of Pain, November 2011.



Bloom AP, Jimenez-Andrade JM, Taylor RN, Castañeda-Corral G, Kaczmarek MJ, Freeman KT, Coughlin KA, Ghilardi JR, Kuskowski MA, Mantyh PW. [Breast cancer-induced bone remodeling, skeletal pain, and sprouting of sensory nerve fibers.](#) J Pain. 2011 Jun;12(6):698-711. Epub 2011 Apr 15.

Marshall TM, Herman DS, Largent-Milnes TM, **Badghisi H**, Zuber K, Holt SC, Lai J, Porreca F, Vanderah TW. [Activation of descending pain-facilitatory pathways from the rostral ventromedial medulla by cholecystokinin elicits release of prostaglandin-E\(2\) in the spinal cord.](#) Pain. 2011 Oct 24.

Lee YS, Kulkarni V, Cowell SM, Ma SW, Davis P, **Hanlon KE**, Vanderah TW, Lai J, Porreca F, Vardanyan R, Hruby VJ. [Development of potent \$\mu\$ and \$\delta\$ opioid agonists with high lipophilicity.](#) J Med Chem. 2011 Jan 13;54(1):382-6. Epub 2010 Dec 3.

Sukhtankar D, **Okun A**, Chandramouli A, Nelson MA, Vanderah TW, Cress AE, Porreca F, King T. [Inhibition of p38-MAPK signaling pathway attenuates breast cancer induced bone pain and disease progression in a murine model of cancer-induced bone pain.](#) Mol Pain. 2011 Oct 20;7:81.

King T, Qu C, **Okun A**, Mercado R, Ren J, Brion T, Lai J, Porreca F. [Contribution of afferent pathways to nerve injury-induced spontaneous pain and evoked hypersensitivity.](#) Pain. 2011 Sep;152(9):1997-2005. Epub 2011 May 26.

Lozano-Ondoua AN, Hanlon KE, Largent-Milnes TM, Chandramouli A, Owusu-Ankomah M, Bloom AP, Jimenez-Andrade JM, King T, Porreca F, Malan TP Jr., Nelson MA, Mantyh PW, and Vanderah TW. "Disease Modification of Breast Cancer-Induced Bone Remodeling by Cannabinoid 2 Receptor Agonists," *Journal of Bone and Mineral Research*, January 2013.

Lochhead, J., McCaffrey, G., **Sanchez-Covarrubias L.**, Finch, J., DeMarco, K., Quigley, C., Davis, T., and Ronaldson, P. Tempot modulates changes in xenobiotic permeability and occluding oligomeric assemblies at the Blood-Brain Barrier During Inflammatory Pain. Am J Physiol Heart Circ Physiol, 2012, 203:582-593.

McCaffrey, G., Staats, WD., **Sanchez-Covarrubias, L.**, Finch, J., DeMarco, K., Laracuente, Mei-Li., and Ronaldson, P. Davis, T. P-glycoprotein trafficking at the Blood-Brain Barrier altered by peripheral inflammatory hyperalgesia. 2012 Accepted article.

Wei X, Edelmayer RM, Yan J, Dussor G. [Activation of TRPV4 on dural afferents produces headache-related behavior in a preclinical rat model.](#) Cephalalgia. 2011 Nov 2.

Medical Pharmacology Graduate Student Award

Congratulations to Dipti Tillu for receiving the Arizona Board of Regents Graduate Research Grant!! A huge, and well deserved honor for one of our outstanding graduate students

Pharmacology Faculty Awards / Honors

The College of Medicine held the 32st Annual Faculty Teaching Awards November 18, 2011..



Todd Vanderah, PhD received the
Outstanding Teaching in a Block Award - Year I



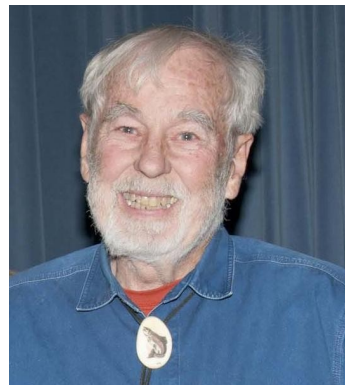
John Bloom, MD received the
Deans List for Excellence in Teaching Award -
Year III/ IV



Greg Dussor received the Vernon and Virginia Furrow Award for Excellence in Graduate Student Education

Pharmacology Faculty
Award/Honors Cont'd

John Palmer for Deans List for Excellence in Teaching - Year I -
Cardiovascular Systems



Congratulations to **Thomas Davis** on being honored with the 2011 Faculty Science Forum Founders Day Award and delivering the Founders Day lecture on his research into the blood-brain barrier. Each year a faculty member is chosen who embodies a model of an investigator whose research work has a continuous thread of significance and who can effectively present that research with enthusiasm, vigor and inspiration.

Dr. Davis' loyal and tenacious commitment to the College of Medicine exemplifies the dedication and excellence of a scientist, educator and mentor.

Congratulations to **Patrick Ronaldson** for receiving the "2011 New Investigator Grant Award" by the American Association of Pharmaceutical Scientists.



Pharmacology Faculty Grants

Dr. Gregory Dussor, Assistant Professor of Pharmacology at the University Of Arizona College Of Medicine has been awarded \$ 1.6 million by the NIH National Institute of Neurological Disorders and Stroke to study the role of ASICs in Migraine Pathophysiology.

Migraine headache is the most common neurological condition but a substantial percentage of migraine sufferers are not adequately treated by currently available therapeutics. Development of new treatments is limited, in part, by a lack of understanding of the mechanisms contributing to this disorder. The goal of this grant is to investigate the role of novel targets in migraine pathophysiology (acid-sensing ion channels) that may provide new therapeutic opportunities for the treatment of migraine headache.

Dr. Patrick Mantyh, Professor of Pharmacology at the University Of Arizona College Of Medicine has been awarded \$ 1.6 million by the NIH National Cancer Institute to study Metastatic Prostate Cancer-induced Bone Pain.

Prostate cancer is unique among cancers as although it spreads to different organs, bone is frequently the only clinically detectable site of metastasis. Fortunately, patients with metastatic prostate cancer usually have a long survival time. Unfortunately, prostate metastasis to bone frequently causes a severe, chronic pain that reduces quality of life, functional status and greatly increases health care utilization. The goals of this application are to understand the mechanisms that drive prostate cancer-induced bone pain and to use this information to develop therapies that can better treat this chronic pain

Dr, Frank Porreca, Professor, was awarded \$2.5 million to investigate mechanisms of migraine pain (Mechanism of Medication Overuse Headache and Chronic Migraine Pain") and \$1.6 million to investigate mechanisms of neuropathic pain ("Mechanisms of Spontaneous Neuropathic Pain")

Dr. Porreca collaborates with Drs. Gregory Dussor, Josephine Lai, Tamara King, Milena DeFelice, Theodore Price, Jennifer Xie, Edita Navratilova, Michael Ossipov and Todd Vanderah in the Department of Pharmacolog

Dr. Ted Price, Associate Professor, was awarded \$1.6 million by NINDS to study PAR2-Targeted Drug Discovery for the Treatment of Pain. Drs. Theodore J. Price, Scott Boitano and Josef Vagner of Bio5 and the University Of Arizona College Of Medicine have been awarded \$1.6 million by the NIH National Institute of Neurological Disorders and Stroke to identify drug targets in treatment of pain.

Chronic pain is a frequent consequence of injury or disease and impacts the lives of millions of Americans. Available treatments for chronic pain have side effects that make them untenable in many, if not most, of these cases. Drs. Boitano, Price and Vagner propose to develop novel analgesics with increased efficacy directed at a key player in pain sensitization, the protease activated receptor-2 (PAR2). Such agents will be useful in elucidating the role of the PAR2 in chronic pain states and may represent a novel therapeutic avenue for the treatment of persistent chronic pain following injury or disease.

Dr. Boitano, Dr. Vagner and Dr. Price are Multi-PIs in this NIH-funded collaboration.

**Pharmacology Faculty
Grants Cont'd**

Dr. Sally Dickinson, Research Assistant Professor, received an award from the American Cancer Society Institutional Research Grant program at the UA Cancer Center for “Chemoprevention of Squamous Cell Carcinoma Using the AP-1 Inhibitor 1-Isothiocyanato-7-(methylsulfinyl)-heptane”

This project tests the ability of 1-Isothiocyanato-7-(methylsulfinyl)-heptane (Iso-7), a compound naturally found in watercress, to block skin cancer caused by solar-simulated light (SSL) exposure. The Dickinson lab will examine whether Iso-7 affects markers of cancer growth in treated skin and determine whether Iso-7 may be a useful compound to explore for development as a topical agent for skin cancer prevention.

Dr. Isis Sroka, Research Assistant Professor, was awarded an R03—2 year grant for “Mechanisms of Pancreatic Tumor Nerve Invasion” in the amount of 151,500

Faculty Announcements

Dr. Davis has been asked by The Natural Sciences and Engineering Research Council of Canada (NSERC) and the Canadian Institutes of Health Research (CIHR), to review applications submitted to its Collaborative Health Research Projects (CHRP) Program.

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Congratulations to **Dr. John Palmer!!**

Dr. Palmer, a member of a group led by Marie Chisholm-Burns, Professor & Head, Department of Pharmacy Practice & Science, to perform a meta-analysis to assess the value of pharmacists in medical practice/patient care. The University of Arizona was the only institution to receive the grant from ASHP to perform the task. The result was 2 papers and the Foundation Literature Awards Program's Pharmacy Practice Research Award for their Medical Care article, “U.S. Pharmacists' Effects as Team Members on Direct Patient Care: Systematic Review and Meta-analyses.”

The award will be presented at the ASHP Midyear Meeting in New Orleans in December.

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Please join me in congratulating **Dr. Ted Price**, who joined the department in 2007, has been promoted from Assistant Professor to Associate Professor with tenure in the Department of Pharmacology. In addition, Ted has received the Louis J Kettel Faculty Mentor Award, Dept of Surgery, UA, as well as the Award where he will be mentoring Kevin Horton a Teach of Cienega High School. Congrats Ted!!

Miscellaneous Department News



Congratulations to Dr. Palmer for being 80 yrs young this past Fall

Tamara King left the nice warm state of Arizona to accept a position as an Assistant Professor at the University of New England, Maine



Remember these two little ones. They came to help with Tamara's send off.



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