

Medical Pharmacology Graduate Program Newsletter

MESSAGE FROM DEPARTMENT HEAD, DR. GLENN SIPES

The Department of Pharmacology has had a long history in training graduate students. This history started about 1970 when the newly established Department of Pharmacology in the College of Medicine decided to offer graduate degrees in conjunction with the existing graduate program that was offered by the Department of Pharmacology and Toxicology in the College of Pharmacy. In the early 1980s this joint program became a key graduate program within the Graduate College's Interdisciplinary Graduate Programs. The affiliation continued until 2004, when the current departmentally base Graduate Program in Medical Pharmacology was established. Our history is important to our current success because it instilled in us the importance of the multidisciplinary approach to problem solving. I am happy that this Newsletter was developed as it will provide a way to track our success and record our history.

For this first issue I would like to offer some thank "yous". Many thanks are extended to Dr. Ed French for the excellent stewardship of the Graduate Program during the past 14 years. What a great job he has done. I also thank Dr. Todd Vanderah for accepting a three year term as Director of the Graduate Program. He and Ed will work together to ensure a smooth transition. As expected, Todd is loaded with enthusiasm and ideas, so expect some changes. I also recognize and thank the faculty. It is their willingness to mentor students, to conduct exciting research, and to generate external funds that make the graduate program possible. Special recognition also goes to Vickie Healey, as she completes her first year as Program Coordinator (good job Vickie!!) and to the Hank Yamamura Fellowship Fund

for providing support for student recruitment. As you read through the newsletter it will be clear that the Graduate Program in Medical Pharmacology had an outstanding year. Ten students were awarded graduate degrees and 11 new students were recruited in 2009-2010. Our graduates have found challenging and meaningful employment opportunities. Other important measures of success include our continued publication of innovative research in peer journals (over 50 publications, most of which included students and postdoctoral fellows as coauthors), and importantly, the receipt of several new grants and contracts. Last year the department's total external funding was close to \$7 million. As in past years, the Department of Pharmacology was one of the top earning departments in the COM/AHSC. I expect this new academic year to be just as successful.

Over the year we will continue to modify the curriculum and enhance the seminar program. Dr. Greg Dussor will organize and coordinate the seminar program. He and I ask all faculty, postdoctoral fellows and graduate students to attend the regular seminars as well as student defense seminars. They are an opportunity to bring us together, expand our knowledge base, provide training opportunities and share information. A student defense is the culmination of several years of work. We should all be there to celebrate this important achievement.

As space is limited, I shall close with wishes that we have a productive, successful year. Welcome new students and welcome back everyone else.

I. Glenn Sipes, Ph.D., Fellow ATS
Professor and Head

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**WELCOME FROM DR. TODD VANDERAH,
DIRECTOR OF GRADUATE STUDIES**

I am excited to take the reins as director of the graduate program and hope to fill the “shoes” of our past director, Dr. Edward French. I want to thank Ed for his service and his guidance as I begin directorship of the graduate program and also thank the rest of the faculty for their support through the transition. We have a fantastic group of eleven students starting this Fall. My thanks go out to the current students and faculty for their efforts in recruitment and to Dr. Ted Price and his wife Rubria Marines-Price for hosting the student recruitment reception.

Our newsletter, to be published twice a year, is to inform our students, staff and faculty of the exciting progress and achievements we make as a program and department. Although the various grants, awards and achievements received by students, faculty and staff are reported to the College of Medicine, The University of Arizona, and even the Board of Regents, we in our own department are often not aware of them. Therefore, I ask you to inform Vickie Healey of such achievements so we can report them in this newsletter. It is important that we all realize our many successes. The Department of Pharmacology is one of the leading basic science departments in the entire University and plays an important role in research, teaching, and service, in the College of Medicine. I have high hopes that the newsletter will be successful. You can help if you continually inform Vickie and me of your accomplishments.

One idea I have as the director of the Graduate Program is to reach-out to undergraduates on campus at the U of A. Most of the undergraduates do not know about Pharmacology as a career. We have recently restructured some of our introductory pharmacology courses so that both undergraduate and graduate students may enroll. This year a large number of undergraduate students are enrolled in the Introduction to Pharmacology course. Let's make them feel extra welcome. Perhaps one or two of them will consider applying to our graduate program. The undergraduate research experience is also an effective tool to interest students in a career in pharmacology and in our graduate program.

As in past years, our faculty participated in the UBRP and ASPET undergraduate summer research experience. Faculty, if you have not participated in these programs, see me for information.

I want to ensure that our rich history in graduate education continues. I seek constructive advice on how to improve from all of you – faculty, students, staff and most importantly, our alumni. Thanks for all your past help.

Welcome to the Fall semester

Dr. Todd W. Vanderah

I N C O M I N G C L A S S O F 2 0 1 0

The Department of Pharmacology would like to welcome the following students to the program.

PhD.

Pengfei (Shawn) Gu received his undergraduate degree from Shenyang Pharmaceutical University. Shawn will be working under Dr. Porreca.

Ji-Young Kim received her undergraduate degree from McGill University.

Beenish Majeed received her undergraduate degree from Arizona State University.

Adia Shy received her undergraduate degree from the University of California, Berkeley.

David Skinner received his undergraduate and MBA degree from Arizona State University and will be working under Dr. Vanderah.

Joshua Strom received his undergraduate degree from the University of Arizona. Josh will be working under Dr. Chen.

Ashley Symons received her undergraduate degree from Colgate University.

MS

Diana Meske received her undergraduate degree from University of Arizona.

Perfusion

Laura Hook received her undergraduate degree from the University of Arizona.

Molly Oldeen received her undergraduate and Master degrees from the University of Southern California.

Diane Gansert received her undergraduate degree from the University of Nevada-Reno.

Tiffany Robb received her undergraduate degree from the University of Arizona.

**2 0 1 0 Y A M A M U R A F E L L O W S H I P
R E C I P I E N T S**

Dr. Yamamura, a Regents Professor at the University of Arizona, was a distinguished researcher, teacher and mentor. Fellowships as a tribute to his contributions to pharmacology are awarded to one or two first year students in the Graduate Program in Medical Pharmacology.

This year's recipients are:

Ji-Young Kim - Ms. Kim majored in Biology with a minor in Chemistry and graduated with Distinction from McGill University.

Beenish Majeed - Ms. Majeed graduated from Arizona State University. She majored in Molecular Biosciences and Biotechnology with a Spanish Minor, and graduated Magna Cum Laude.

2010 GRADUATE STUDENT REPS

Each Spring, graduate students nominate and vote for their fellow students to serve as Representatives of the Graduate Program in Medical Pharmacology.

This year Marina Asiedu and Lucy Sanchez-Covarrubias were elected as the Graduate Reps.

We will be calling for nominations in January, so start thinking now for who you would like to nominate.

GRADUATE STUDENT AWARDS

Asiedu, Marina

- 2010 IASP Financial Aid for the 13th World Congress on Pain Meeting

Campbell, Rowena

- 2010 National Black Graduate Student Association Michael Powel Esq. Service Award
- 2009 Experimental Biology BASEB MARSC Program Travel Award
- 2009 The Underrepresented Graduate Student Final Project Fund Award
- 2009 National Institutes of Health National Heart, Lung and Blood Institute Minority Supplement
- 2009 League of United Latin American Citizens (LULAC) Service Award

Hanlon, Katherine

- GPSC Travel Grant Award, August 2009

Highstrom-Millard, Lindsey

- Travel Grant Award from NEI, May 2009
- 2009, Graduate Student of the Year

Knudsen, Gabriel

- 2010 Graduate Training Fellowship and Travel Award under the NIEHS Training Grant in Toxicology and Toxicogenomics
- 2010 Student Travel Award in the Society of Toxicology Mountain-West Regional Chapter

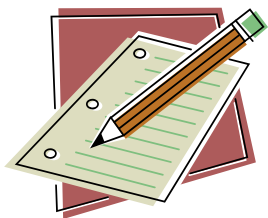
Ondoua, Alysia

- National Science Foundation Honorable Mention

Yan, Jin

- 2010, Travel Award IASP

GRADUATE STUDENT PUBLICATIONS



Asiedu, M., M. Ossipov, K. Kaila, T. Price. "Acetazolamide and Midazolam Act Synergistically to Inhibit Neuropathic Pain," *Pain*, 2010, Volume 148, Issue 2, Pages 302-308.

Campbell, R., S. Boitano, M. Halonen, "PAR-2 Involvement in Activation of Human Airway Epithelial Cells," *The FASEB Journal*, 2010, 24:970.3

Cheng, Y., Wright SH., Hootu, MJ. and Sipes, IG. "Characterization of the Disposition and Toxicokinetics of N-Butylpyridinium Chloride." *Drug Metabolism and Disposition*, 2009, 37(4):909-916.

Hanlon, K., AL Ondoua, TM Largent-Milnes, A. Chandramouli, DD Sukhtankar, MA.. Nelson, T. King, PW. Mantyh, and TW. Vanderah. "Activation of the CB₂ Receptor Attenuates Breast Cancer Induced Bone Pain and Promotes Bone Health in a Murine Model of Breast Cancer Metastases." Society for Neuroscience, Chicago, IL, October 2009.

Knudsen, GA, Kuester, RK, Cunningham, MC and Sipes, IG. "Genetic Variation in Isogenic Strains of Laboratory Mice Alters Disposition in Bone Marrow After Acute Exposure to [¹⁴C] Benzene." *The Toxicologist*, 2010, 114:1, 79.

Kuester, RK., **Knudsen, GA.,** Jacobs, LM., Cunningham, MC., and Sipes, IG. "Genetic Variation in Isogenic Strains of Female Mice Alters Disposition in Bone Marrow After Acute Exposure to [¹⁴C] Benzene." *The Toxicologist*, 2010, 114:1, 78.

Knudsen, GA., Cheng, Y., Kuester, RK., Hootu MJ., and Sipes, IG. "The Effects of Dose and Route on the Disposition and Kinetics of 1-Butyl-1-Methylpyrrolidinium Chloride in Male F-344 Rats." *Drug Metabolism and Disposition*, 2009, 37(11):2171-7.

Lozano-Ondoua, A., C. Wright, A. Vardanyan, T. L. King, TM Largent-Milnes, M. Nelson, J. Miguel Jimenez-Andrade, PW. Mantyh, and T. Vanderah, "A CB₂ Receptor Agonist Attenuates Bone Cancer-Induced Pain and Bone Loss." *Life Sciences*, February 2010.

Willis CL, **Meske DM,** Davis TP. Protein kinase-C activation Modulates Reversible Increase in Cortical Blood-Brain Barrier Permeability and Tight Junction Protein Expression During Hypoxia and Post-Hypoxic Reoxygenation. *JCBFM*. (in press)

Rad, G., Hoehle, SL., Kuester, RK., and Sipes, IG. "In Vitro Glucuronidation of 2,2-Bis (Bromomethyl) -1,3-Propanediol by Microsomes and Hepatocytes from Rats and Humans." *Drug Metabolism Disposition*, 2010, 38(6):957-962

Jimenez-Andrade, JM., Mantyh, WG., Bloom, AP., **Xu, H.,** Gereng, AS., G. Dussor, G., Vanderah, TW, Mantyh, PW. "A Phenotypically Restricted Set of Primary Afferent Nerve Fibers Innervate the Bone Versus Skin: Therapeutic Opportunity for Treating Skeletal Pain." *Bone*, Feb. 2010, 46(2):206-13.

**C O N F E R E N C E S A T T E N D E D B Y
G R A D U A T E S T U D E N T S****Asiedu, M.**

- Society for Neuroscience-Neuroscience Meeting , August 17-21, 2009

Campbell, Rowena

- Experimental Biology Conference, Anaheim, CA, April 2010
- More Graduate Education at Mountain State Alliance Student Research, Tempe, AZ, January 2010
- Proctor and Gamble Research and Technical Careers in Industry Conference, Cincinnati, OH, June 2009

Hanlon, Katherine

- Society for Neuroscience Annual Meeting, Chicago, IL, October 17-21, 2009

Highstrom-Millard, Lindsey

- ARVO, May 2009
- ARVO, May 2010
- ISER, July 2010

Kong, Weixi

- Society of Toxicology 49th Annual Meeting and ToxExPo, Salt Lake City, UT, March 7-11, 2010

Knudsen, Gabriel

- Society of Toxicology Annual Meeting, March 7-11, 2010

Ondoua, Alysia

- The Ninth International Meeting on Cancer Induced Bone Disease, Arlington, VA, October 2009

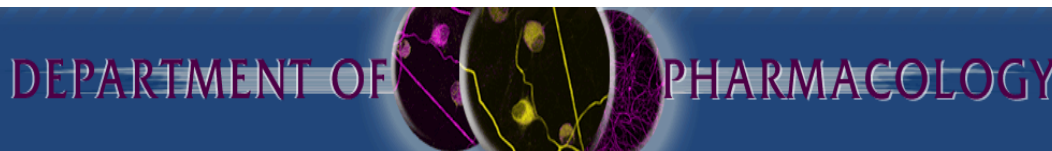
Wei, Xiaomei

- Science Foundation Arizona Grand Challenges Conference, Phoenix, AZ, April 12-13, 2010

Yan, Jin

- Society of Neuroscience, October 17-21, 2009

CONGRATULATIONS TO OUR
FALL 2009 AND SPRING 2010
GRADUATES



Summer 2009

Golriz Rad (MS) "Species Variation in the Glucuronidation of 2,2-bis (bromomethyl)-1,3 propanediol (BMP)"

Fall 2009

Yaofeng Cheng (PHD) "Roles of organic cation transporters on the disposition of N-Butylpyridinium Chloride and Structurally Related Ionic Liquids"

JiYang Ren (MS) "Potential Role of NGF Pathways in Sustained Morphine Induce Hyperalgesia"

Brianna Paisley (MS) "Dynorphin A as a Novel Ligand at Bradykinin Receptors"

Ramon Mercado (MS) "Complete Freund's adjuvant-Induced ongoing and Thermal Evoked Pain are Mediated by TRPV1 Positive Primary Afferent Fibers"

Braxton Norwood (PHD) "Anatomical and Electrophysiological Studies of an Animal Model of Temporal Lobe Epilepsy with Classic Hippocampal Sclerosis"

Spring 2010

Zach Archer (MS-Perfusion) "In Cold Blood: Modeling the Effect of Temperature on Blood Viscosity and Oxygen Dissociation"

Marie Fouts (MS-Perfusion) "The Role of Angiotensin II and Vascular Stiffness"

Lucas Schroedl (MS-Perfusion) "Interleukin-18 and Interleukin-33: A Western Standoff for Lysyl Oxidase Expression In Vitro"

Elise Slack (MS-Perfusion) "Immune Basis of Hypertension"

Tally Largent-Milnes (PHD) "NK1 Receptors and Their Role in Opioid-Induced Hyperalgesia Antinociceptive Tolerance and Reward"

Summer 2010

Rowena Campbell (PHD) "Inflammatory Responses to Alternana in Airway Epithelial Cells: Cytokine Expression Pattern and the Role of Proteases"



C O M P R E H E N S I V E E X A M S

Congratulations to the following students for moving on to the next stage of their academic work and becoming ABD (all but dissertation).

Fall 2010

Marina Asiedu
Weixi Kong
Jin Yan

Spring 2010

Gabriel Knudsen

P O S I T I O N S A C C E P T E D

Zachary Archer has accepted employment at the University of Colorado in Denver.

Rowena Campbell accepted a Post-Doc position at Washington University in St. Louis. Rowena will be working in Dr. Michael Holtzman's Lab beginning October 1st.

Paul Cheng accepted a Post-Doc position with Novartis in New Jersey.

Golriz Rad accepted a position with Beckman Coulter in Los Angeles, California.

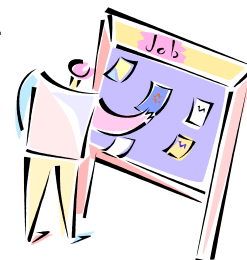
Marie Fouts has accepted employment in Tucson for Palo Verde Perfusion, Tucson Heart Hospital and Northwest Medical Center.

Tally Largent-Milnes accepted a Post-Doc position at Oregon Health Sciences University in Portland, Oregon.

Braxton Norwood accepted a Post-Doc position at Marburg University, Marburg, Germany.

Lucas Schroedl moved to Portland to work at the University of Oregon in Portland.

Elise Slack is employed by Hospital Clinical Services Group, in Portland, Oregon.



P H A R M A C O L O G Y F A C U L T Y
H O N O R S / A W A R D S

Dr. John Bloom

- Deans List for Excellence in Teaching

Dr. Qin Chen

- Colgate Palmolive Award for Alternative Research, Society of Toxicology NIEHS Study Section
- Distinguished visiting professor at Cardiovascular Research Center of UCLA in May.

Dr. Tom Davis

- Invited speaker, "The Blood Brain Barrier in Health and Disease." St Jude's Children's Hospital, Memphis, TN., April, 2010
- Visiting Professor, Department of Neurosurgery, University of Rochester School of Medicine, Frank P. Smith Laboratory for Neuroscience and Neurological Research. July and August 2010
- Invited Plenary Speaker, International Meeting on "Signal Transduction at the Blood Brain Barrier." "Pathology at the Blood Brain Barrier." Univ College, London, England, Sept, 2009
- Invited Session Chair, Spring Brain Conference. "Matrix and Neurovascular Biology of the Stressed Brain." Omni Tucson National, Tucson, AZ. March, 2010
- Invited Session Chair, Gordon Research Conference. "Barriers of the Central Nervous System." Colby-Sawyer College, New Hampshire. June, 2010
- Invited Plenary Speaker and Chair of Session, International Stroke Meeting, American Heart Association. "Physiology and Pathology of the Blood Brain Barrier." San Antonio, TX, 2010

Dr. Greg Dussor

- Associate Editor for the journal *Pain*

Dr. Juan Miguel Jimenez-Andrade

- Invited to speak at XIX Congreso del Dolor, AMETD. Noviembre 2009. Querétaro, México. "Mecanismos del dolor óseo no maligno"
- Invited to speak at XIX Congreso del Dolor, AMETD. Noviembre 2009. Querétaro, México. "Dolor oncológico, causas, consecuencias y oportunidades terapéuticas"
- Invited speaker. 8th Manual Making Strides Against Breast Cancer. American Cancer Pain Society. August 12, 2010. Tucson, Arizona USA. Bone cancer pain and breast cancer.

Dr. Tamara King

- Invited Speaker at the Eighth IASP Research Symposium entitled "Cancer Pain from Bench to Bedside." The presentation title: "Opioid Mediated Effects on Tumor Growth and Disease Progression"

Dr Pat Mantyh

- Plenary Speaker at 1st Annual Pain Research Day at University of Pittsburgh
- Plenary Speaker at Annual Irish Pain Society Meeting
- Invited to speak at the Eighth IASP Research Symposium entitled Cancer Pain from Bench to Bedside. "Cancer pain, causes and therapeutic opportunities"

Dr. Michael Ossipov

- Invited Speaker European Congress of Neuropsychopharmacology in Nice, France, March 2010.
- Invited Speaker Medication Overuse Headache at 12th World Congress on Pain, Montreal, August 2010.

**P H A R M A C O L O G Y F A C U L T Y
H O N O R S / A W A R D S C O N T ' D .**

Dr. Frank Porreca

- Plenary Lecture: Keystone Symposium on Pain: "Modulating Descending Modulation" - February 2009
- Plenary Lecture: Antal'J French Society on Pain: "Transition form Acute to Chronic Pain" -June, 2010
- Plenary Lecture: American Headache Society: "Medication Overuse Headache" - June 2010

Dr. Glenn Sipes

- Completed term as President and Past President of the Academy of Toxicology Sciences of which he is also a Fellow.
- Served as an advisor to the Joint Expert Committee on Food Additives, which evaluates the safety of food additives and contaminants for the World Health Organization/Food and Agriculture Organization of the United Nations

Dr. Robert Sloviter

- Visiting Professor in the Dept of Pharmacology and Toxicology, Otago University School of Medicine, Dunedin, New Zealand, summer 2010

Dr. Dan Stamer

- 2009-10, Research to Prevent Blindness Research Sabbatical Award
- 2010, Association for Research in Vision and Ophthalmology Service Award

Dr. Todd Vanderah

- Outstanding Teacher in the Neuroscience Block Year I Medical School Dean's List for Excellence in Teaching in the Basic Sciences, 2009.
- Appointed Chair for the Dean's Research Council Space Committee, 2010
- Appointed Associate Editor for Brain Research, 2010
- Session Chair and Speaker Bone Cancer Pain at 12th World Congress on Pain, Montreal, 2010

Dr. George Watts

- Recipient of Tucson's 40 under 40 Award

Dr. Jack Zhang

- Recipient of the Marjorie Hornbeck Estate Research Award (Novel Research Project Awards in the Area of CV Disease and Medicine) from the Sarver Heart Center.

P H A R M A C O L O G Y F A C U L T Y G R A N T S**Dr. Tom Davis**

- **R01 NIH/NIDA** "Blood to CNS Drug Uptake in Pain States." 1997-2014, \$4,321,103.

Dr. Greg Dussor

- **UofA Foundation** Faculty Small Grant, "Brain Imaging in a Novel Rat Model of Migraine" 2009-2010.
- **American Pain Society** Future Leaders in Pain Research Grant, "Cutaneous Nociceptors Respond to Mediators Released from Skin Cells" 2009-2010.

Dr. Juan Miguel Jimenez-Andrade

- **AZCC**. Breast Cancer: Progression and Pain. 2009-2010\$ 25,000.00.

Dr. Tamara King

- **Co-PI, R01 NIH/NINDS**, "Mechanisms of Spontaneous Neuropathic Pain" Frank Porreca (PI) 2010-2015.
- **Co-PI, R01 NIH/NCI** "Cannabinoid CB2 Agonist for Treatment of Breast Cancer-Induced Bone Pain" Todd Vanderah (PI) 2010-2015.

Dr. Josephine Lai

- **Co-PI, R01 NIH/NINDS**, "Mechanisms of spontaneous neuropathic pain." Porreca (PI) - 2010-2015
- **Co-PI, P01 NIH/NIDA** "New modalities for treatment of pain and drug abuse: therapeutic profile of opioid delta receptors: new modalities." Hruby (PI) - 2009-2014.

Dr. Patrick Mantyh

- **R01 NIH/NINDS** "Peripheral Nociceptors in Persistent Pain." 04/01/09 - 01/31/13, \$1,311,288
- **VA Grant** "Polytrauma, Fracture Pain and Functional Recovery." 04/01/09-03/31/12 \$1,998,400
- **Co-PI, R01 NIH/NCI** (Vanderah PI) "Cannabinoid CB2 Agonists for Treatment of Breast Cancer-Induced Bone Pain" 2010-2015, \$1,864,000
- **AZCC BTE** "A model for human breast cancer-induced bone pain ." 2009-2011, \$40,000

Dr. Frank Porreca

- **R01 NIH/NINDS** "Mechanisms of Spontaneous Neuropathic Pain." 2010-2015, \$250,000/year,
- **R01 NIH/NINDS** "Mechanism of Medication Overuse Headache and Chronic Migraine Pain." 2011-2015, \$606,655/year,
- **P01 NIH/NIDA**, Project C titled "New Modalities for Treatment of Pain and Drug Abuse", Victor Hruby (PI), 2009-2014, \$6,296,106

Dr. Ted Price

- **R01 NIH/NINDS** "Axonal translation as a novel mechanism of nociceptor plasticity." 2010-2014, \$876,000
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PHARMACOLOGY FACULTY GRANTS CONT'D

Dr. Glenn Sipes

- **N01-ES** "Chemical Disposition in Mammals" \$600,000 supplement 2010

Dr. Dan Stamer

- **Renewal R01 NIH/NEI**: "Molecular Mechanisms of Myocilin Function in the Human Eye" 2001-2011.
- **Co-PI, R01 NIH/NEI** "The Mechanical Basis of Primary Open-Angle Glaucoma" 2009-2014, Bio-engineering Research Program Grant, Mark Johnson(PI).

Dr. Eva Varga

- **R21 NIH/NIDA** "A Novel Pharmacological Target to Prevent Sustained-Morphine-Mediated Pain Sensitization." 2010-2011, \$412,000

Dr. Todd Vanderah

- **R01 NIH/NCI** titled "Cannabinoid CB2 Agonists for Treatment of Breast Cancer-Induced Bone Pain" 2010-2015, \$1,864,000
- **P01 NIH/NIDA**, director of the Biochemical Core titled "New Modalities for Treatment of Pain and Drug Abuse", Victor Hruby (PI), 2009-2014, \$6,296,106
- **AZCC BTE** titled "CB2 Mechanisms of Inhibiting Breast-Induced Bone Cancer Pain", 2009-2011, \$120,000

PHARMACOLOGY FACULTY PUBLICATIONS

We have asked the faculty for a couple of publications in order to highlight current research.

Dr. Qin Chen

- Xie LF, Terrand J, Xu BB, Tsapralis G, Boyer J and **Chen QM** (2010) Cystatin C increases in Cardiac Injury: A Role in Extracellular Matrix Protein Modulation. *Cardiovasc. Res.* (in press).
- Morrissy S, Xu BB, Zhang J, Aguilar D and **Chen QM** (2010) Inhibition of Apoptosis by Progesterone in Cardiomyocytes. *Aging Cell* (in press).

Dr. Greg Dussor

- **Dussor G**, Koerber HR, Oaklander AL, Rice FL, Molliver DC. Nucleotide signaling and cutaneous mechanisms of pain transduction. *Brain Res Rev.* 2009 Apr;60(1):24-35. Review.
- De Felice M, Ossipov MH, Wang R, **Dussor G**, Lai J, Meng ID, Chichorro J, Andrews JS, Rakhit S, Maddaford S, Dodick D, Porreca F. Triptan-induced enhancement of neuronal nitric oxide synthase in trigeminal ganglion dural afferents underlies increased responsiveness to potential migraine triggers. *Brain.* 2010 Jul 13. [Epub ahead of print]

**PHARMACOLOGY FACULTY PUBLICATIONS
CONT'D****Dr. Tom Davis**

- Lochhead JJ, McCaffrey G, Quigley CE, Finch J, Demarco KM, Nametz N, **Davis TP**. Oxidative stress increases blood-brain barrier permeability and induces alterations in occludin during hypoxia-reoxygenation. *J Cereb Blood Flow Metab*. 2010 Mar 17. [Epub ahead of print]
- Ronaldson, P.T., K.M. DeMarco, L. Sanchez-Covarrubias, C.M. Solinsky and **T.P. Davis**. "Transforming Growth Factor Beta Signaling Alters Permeability and Tight Junction Protein Expression at the Blood Brain Barrier During Inflammatory Pain." *J. Cerebral Blood Flow and Metabolism* 29, 6. 1084-1098. 2009.

Dr. Juan Miguel Jimenez-Andrade

- **Jimenez-Andrade JM**, Bloom AP, Mantyh WG, Koewler NJ, Freeman KT, Delong D, Ghilardi JR, Kuskowski MA, Mantyh PW. Capsaicin-sensitive sensory nerve fibers contribute to the generation and maintenance of skeletal fracture pain. *Neuroscience*. 2009, 162(4):1244-54.
- **Jimenez-Andrade JM**, Mantyh WG, Bloom AP, Xu H, Ferng AS, Dussor G, Vanderah TW, Mantyh PW. A phenotypically restricted set of primary afferent nerve fibers innervate the bone versus skin: therapeutic opportunity for treating skeletal pain. *Bone*. 2010, 46(2):306-13.

Dr. Tamara King

- **King, T.**, Vera-Portocarrero, L., Gutierrez, T., Vanderah, T.W., Dussor, G., Lai, J., Fields, H.L., and Porreca, F. Unmasking the tonic-aversive state in neuropathic pain. *Nature Neuroscience*, 12, 1364-1366, 2009.
- Vardanyan, A, Wang, R, Vanderah, TW, Ossipov, MH, Lai, J, Porreca, F, and **King, T.** TRPV1 Receptor in Expression of Opioid-Induced Hyperalgesia. *The Journal of Pain*, 10, 243-52, 2009.

Dr. Josephine Lai

- W. Zhang, S. Gardell, D. Zhang, J.Y. Xie, R.S. Agnes, H. Badghisi, V.J. Hruby, N. Rance, M.H. Ossipov, T.W. Vanderah, F. Porreca, **J. Lai**. Neuropathic pain is maintained by brainstem neurons co-expressing opioid and cholecystokinin receptors. *Brain* 132:778-87, 2009.
- T. King, L. Vera-Portocarrero, T. Gutierrez, T.W. Vanderah, G. Dussor, **J. Lai**, H.L. Fields, F. Porreca. Unmasking spontaneous neuropathic pain. *Nature Neurosci* 12: 1361-3, 2009.

Dr. Patrick Mantyh

- Jimenez-Andrade JM, Mantyh WG, Bloom AP, Xu H, Ferng AS, Dussor G, Vanderah TW, **Mantyh PW**. A phenotypically restricted set of primary afferent nerve fibers innervate the bone versus skin: therapeutic opportunity for treating skeletal pain. *Bone*. 2010, 46(2):306-13.
- Jimenez-Andrade JM, Mantyh WG, Bloom AP, Ferng AS, Geffre CP, **Mantyh PW**. "Bone cancer pain." *Ann N Y Acad Sci*. 2010.
- Jimenez-Andrade JM, Bloom AP, Mantyh WG, Koewler NJ, Freeman KT, Delong D, Ghilardi JR, Kuskowski MA, **Mantyh PW**. Capsaicin-sensitive sensory nerve fibers contribute to the generation and maintenance of skeletal fracture pain. *Neuroscience*. 2009, 162(4):1244-54.

Dr. Michael Ossipov

- **Ossipov, M.H.**, Dussor, G., and Porreca, F. Central Modulation of Pain. *J Clin Investig* in press, 2010.
- Meng, I., **Ossipov, M.H.**, Dodick, D., and Porreca, F. Pathophysiology of Medication Overuse Headache: Insights from Preclinical Studies. *Cephalalgia*, in press, 2010.

**PHARMACOLOGY FACULTY PUBLICATIONS
CONT'D****Dr. Frank Porreca**

- King, T., Vera-Portocarrero, L., Gutierrez, T., Vanderah, T.W., Dussor, G., Lai, J., Fields, H.L., **Porreca, F.**, Unmasking the tonic-aversive state in neuropathic pain, *Nature Neuroscience*, 12: 1361-3, 2009.
- De Felice, M., Ossipov, M.H., Wang, R., Lai, J., Chichorro, J.G., Meng, I., Dodick, D.W., Vanderah, T.W., Dussor, G. & **Porreca, F.** (2010) Triptan-induced latent sensitization: A possible basis for medication overuse headache, *Annals of Neurology*, 67: 325-337, 2010.

Dr. Ted Price

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Dr. Glen Sipes

- Keating, A.F., Mar, C.J., Sen, N., **Sipes, I.G.**, Hoyer, P.B. Effect of phosphatidylinositol-3 kinase inhibition on ovotoxicity caused by 4-vinylcyclohexene diepoxide and 7, 12-dimethylbenz[a]anthracene in neonatal rat ovaries Toxicology and Applied Pharmacology :241(2):127-34, 2009.
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Dr. Dan Stamer

- **WD Stamer**, D Piwnica, T Jolas, RW Carling, CL Cornell, H Fliri, J Martos, SN Pettit, JW Wang and DF Woodward. Cellular basis for bimatoprost effects on human conventional outflow. *Invest.Ophthalmol. Vis. Sci.* in press, 2010.
- GM Sumida and **WD Stamer**. Sphingosine-1-phosphate enhances cortical actomyosin organization in human Schlemm's canal endothelial cells. *Invest. Ophthalmol. Vis. Sci.* in press, 2010.

Dr. Robert Sloviter

- Norwood BA, Bumanglag AV, Osculati F, Sbarbati A, Marzola P, Nicolato E, Fabene PF, **Sloviter RS**. "Classic hippocampal sclerosis and hippocampal-onset epilepsy produced by a single "cryptic" episode of focal hippocampal excitation in awake rats." *J Comp Neurol*. 518(16):3381-407, 2010.

Dr. Todd W. Vanderah

- Lozano-Ondoua AN, Wright C, Vardanyan A, King T, Largent-Milnes TM, Nelson M, Jimenez-Andrade JM, Mantyh PW & **Vanderah TW**, Cannabinoid 2 Receptors Attenuate Pain and Maintain Bone Structure In a Murine Model of Bone Cancer. *Life Sciences*, 86(17-18): 646-653, 2010.
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**PHARMACOLOGY FACULTY PUBLICATIONS
CONT'D.****Dr. Eva Varga**

- Tumati S, Yamamura HI, Vanderah TW, Roeske WR, **Varga EV**: Sustained morphine treatment augments capsaicin evoked CGRP release in a PKA and Raf-1 dependent manner. *J Pharmacol Exp Ther* 330:810-817, 2009.
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Special Highlights:

Dr. Frank Porreca received a “perfect score of a 1” on his recent R01 NIH/NINDS grant titled “Mechanisms of Spontaneous Neuropathic Pain.” A perfect score is extremely rare.....Congrats!

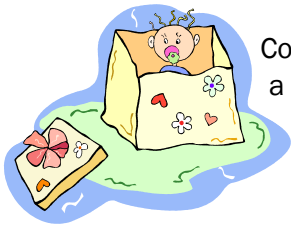
Dr. Tom Davis who received a fantastic score of “1.2” on his recent R01 NIH/NIDA grant titled “Blood to CNS Drug Uptake in Pain States.”

Dr. Patrick Mantyh has received Foundation monies for the Calhoun Bone Pain Project and Fibrous Dysplasia Foundation. You can find more information at <http://www.calhounbonepainproject.org/>

Dr. Ted Price receiving his First R01 NIH/NINDS grant titled “Axonal translation as a novel mechanism of nociceptor plasticity.”

Dr. Tamara King and Frank Porreca on their publication in *Nature Neuroscience* titled: “Unmasking the tonic-aversive state in neuropathic pain.”

ON THE PERSONAL SIDE

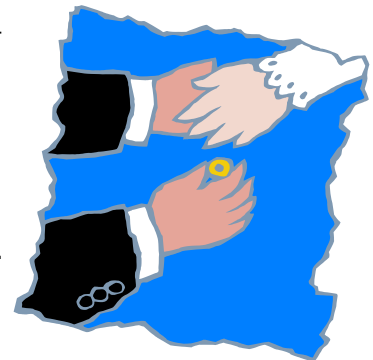


Congratulations to Alysia and Desmond Ondoua. They welcomed their 2nd child, a beautiful baby boy, Sebastian Eli Ondoua, born May 21, 2010. Sebastian weighed in at 7 lbs 8 oz.

Congratulations to Tally Largent-Milnes on her marriage to Philippe Coursodon, Jr. Tally was married in Grand Cayman on April 21, 2010.

Xiaomei Wei said I do Christmas Day, 2009 to Jiamin Xue.
Congratulations Xiaomei!

Dipti Tillu married Sanket Unhale, December 10, 2009 in Mumbai, India. Dipti's husband, Sanket, is pursuing a PhD at the University of Arizona in the Mechanical Engineering Department.



WE'RE ON THE WEB
WWW.PHARMACOLOGY.ARIZONA.EDU

Calendar of Events



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NEXT ISSUE:

Reunion Homecoming

August 2010

23		Fall Session Begins
25	11:00 AHSC 8403	Yamamura Recipient Presentation

September 2010

6	No Classes (Labor Day)
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October 2010

20	11:00 AHSC 8403	Homecoming Seminar Dr. Greg Stevens, Pfizer
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November 2010

11	No Classes (Veterans Day)
13-17	Society for Neuroscience Conference San Diego, CA
25-26	Holiday (Thanksgiving)

December 2010

8	Last Day of Classes
10-17	Finals

January 2011

12	Spring Session Begins
17	No Classes (MLK Day)

March 2011

6-10	Toxicology Conference—Washington, DC
14-18	UA Spring Break

April 2011

9-13	ASPET Conference— Washington, DC
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May 2011

16-20	AMEFAR (Mexican Assn of Pharmacology and Western Pharmacologic Society Mexico City)
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