Executive Summary for 2009-2010

I took on the responsibility as Chair of the Physiology and Pharmacology Department in 2009 and this is my first annual report of the Department. In the first month after my arrival, I met with every member of the faculty, student body and staff. The teaching core, headed by Drs. Rosenberg and Beavis, meets with me once every three months. I have individual meetings with the teaching core to keep me current with both medical and graduate student education.

My primary goal upon arrival was to improve the department so that it would be rated among the top 20 medical schools in the nation in terms of publications and faculty funding. Dr Askari's PPG is an encouragement for others to apply for additional PPGs. To succeed in this goal, the department will have to obtain funding for two program projects grants (2-PPG). One PPG will focus on diabetes and obesity under the leadership of Dr. Najjar. Dr. Sonia Najjar is Professor and Director of the Center for Diabetes and Endocrine Research (CeDER). CeDER continues to grow, advance and more funding is needed to achieve its goals. The second PPG will focus on kidney disease and will be headed by either Dr. Shapiro or Dr. Abraham.

In the initial meeting with the students I stressed that they were the future of the department and the departmental progress will be measured by their publications and successful completion of their pre-doctoral fellowships. The enthusiasm of the students was reflected in the improvements that were seen in the research programs of many faculty members which flourished with great productivity. I am very optimistic about the faculty's continuation to attract NIH and extramural funding.

2) Chair's self assessment

My Goals in the 2009-2010 academic year were: A) I will strengthen the departmental program of mentoring and I will insure that I am available to meet with both students and faculty as often as necessary; B) to reinforce my focus on graduate and medical students (MD/PhD program), I established the Student Research Forum and C) to insure that funding of the department including Cedar increases.

My Goals for 2010-2011, 1) to continue the second Student Research Forum, the tentative date is June 17, 2011 and 2) Establish a translational research program with Drs. Ebraheim, Shapiro and Cooper using stem cells for regenerative medicine.

3) Departmental Highlights and Notable Events.

A) Education, Drs. Rosenberg, Beavis and teaching Professors continue to do an outstanding job and, will add more clinicians to the curriculum.

B) The department's lack of modern, state of the art, equipment is a serious problem; UT and NIH support are needed.

C) Student Research forums. I am presently raising funds for the Second Student Research Forum 2011.

D) Awards and nomination, additional awards and achievements are listed in individual faculty descriptions below

1) Dr. Bina Joe won the young investigator award (2010) from the American Society of Hypertension and became a permanent member of a NIH study section (2011-2014).

2) Dr. Vazquez is the Managing Editor of Frontier in Bioscience.

3) Dr. Sandrine Pierre won a new investigator award and received a $100,000 grant for an updated ECHO instrument.

4) The department is well represented in two AHA meetings

5) Dr. John Turner received notice of his award of $2,900,000.00 from Green and Wild Life Conservation to support his research.

6) Drs. Mensah-Osman and Abraham received a pre-doctoral Award from AHA for Dr. Mensah-Osman's graduate student Ms. Kristine Rose Angevine.

I would like to express my sincere appreciation to the Faculty, Office Staff, and Students for making this an excellent department. I have had the opportunity to work with you for over a year now. This Department has the talent, the drive and the intellect to eventually place it in the top tenth percentile of Medical Schools as well as the Club 100.

Department Highlights as submitted by each Faculty Member

Dr. Nader G. Abraham

A. Research Interest

Research programs in Dr. Abraham's laboratory are focused on vascular dysfunction which are a prelude to cardiovascular and metabolic diseases including hypertension, stroke, diabetes and obesity, the role of oxidative stress, inflammatory cytokines, hypoadiponectinemia and lipid-derived from arachidonic acid in the initiation of vascular dysfunction. *The central hypothesis focuses on heme oxygenase (the most potent anti-oxidant gene in human body)-adiponectin-EET plays an essential role in vascular function. We believe that heme oxygenase acts as a molecular "switch" to genetically reprogram the vascular endothelium through activation of a unique signaling cascade with amplification of protective circuits to provide resistance to vascular dysfunction. Heme oxygenase also serves as the mediator of cross-talk between adipose tissue and the vasculature. Studies in his lab focus on the impact of adipocyte stem cell dysfunction on vascular endothelial integrity through the prism of heme oxygenase.*

Human biological materials and experimental animal models of diabetes and obesity are used to examine the use of molecular, gene therapy and stem cell interventions that amplify the heme oxygenase system. Additionally, one of our research approaches represents a powerful tool to identify therapeutic strategies and novel biomarkers for cardiovascular and metabolic diseases (e.g. Circulating endothelial cells and progenitor stem cells [EPCs] for better prognosis). We believe that the effect of anti-diabetic drugs alone or in combination with the antioxidant genes, have a differential impact on stem cell function and vascular diseases as well as on stem cells differentiation into adipocytes and osteoblasts. The genomic approach and gene array analysis described in these studies represents a powerful tool to systematically investigate therapeutic approaches, and hence, facilitate translational research in hypertension, diabetes and the metabolic syndrome. Additionally, this lab is developing genetic testing for several human genetic diseases to predict future pathphysiological conditions using cell therapy for disease prevention.

B. Special/Invited Presentations at National and International Meetings:

- Invited Speaker; "Role of heme oxygenase in regulation of heme degradation and Heme biosynthesis in normal and disease states" The Swedish Society of Medicine, Stockholm, Sweden June 14-18, 2009.

- Invited Speaker;"The role of gender in obesity Apo A1 Mimetic Peptide L-4F Regulates nitric Oxide, Sex Hormone and Weight gains in Female Mice" Kansai Medical University, Moriguchi, Osaka, Japan, March 19, 2009.

- 34th FEBS Congress Lifes Molecular Interactions - Prague Czech Republic, July 4-9, 2009

- Invited Speaker;" Distinct regulation of inflammatory cytokines and adiponectin by HO-1 induction leads to amelioration of diabetes and adiposity" International Society for Heart Research – Israel Subsection Conference Felsenstein Medical Research Center, Beilinson Campus, Tel Aviv, Israel, February 23, 2009.

- Chairman of Cardiovascular session in Italian Society of Physiological Science 2009, Sicily, Italy, January 30, 2009

- Invited Speaker; "Nitric oxide-Carbon monoxide interaction and Oxidative stress in obesity and diabetes" International Society for Heart Research – Israel Subsection Conference Felsenstein Medical Research Center, Beilinson Campus. Tel Aviv, Israel, December 2009

- Invited Speakers, The University of Toledo, Medicinal & Biological Chemistry, "Oxidative Stress in Obesity and Diabetes" February 4, 2010.

- Chair of Ageing and Stem Cells, The Multidisciplinary Conferences, University of Pisa, Pisa, Italy, October 4-5, 2010

- Invited Speaker: Epicardial visceral fat regulates EPC in diabetic Patients with Coronary artery bypass. October 5, University of Pisa, Italy, 2010

C. Publications

1- Petrini N, Pacini S, Trombi , Fazzi R, Montali M, Ikehara S, Abraham NG. (2009) Identification and purification of mesodermal progenitor cells from human adult bone marrow. Stem Cells Dev, Jul-Aug, 2009 18(6): 857-866.

2- Peterson SJ, Drummond G, Kim DH, Li M, Positano V, Vanella L, Piccolomini F, Rodella LF, Gastaldelli A, Kusmic C, L'Abbate A, Kappas A, Abraham NG. The L-4F mimetic peptide

3- prevents insulin resistance through increased levels of HO-1, pAMPK and pAKT in obese mice Lipid Res. 2009 Jul;50(7):1293-304. Epub 2009 Feb 17.

4- Sodhi K, Inoue K, Gotlinger K, Canestraro M, Vanella L, Kim DH, Manthati VL, Koduru SR, Falck JR, Schwartzman ML, Abraham NG. EET Agonist Rescues the Metabolic Syndrome Phenotype of HO-2 Null Mice. J Pharmacol Exp Ther. 2009 Aug 28. [Epub ahead of print]

5- Li M, Inaba M, Guo K, Abraham NG, Ikehara S. Amelioration of cognitive ability in senescence-accelerated mouse prone 8 (SAMP8) by intra-bone marrow-bone marrow transplantation Neurosci Lett. 2009 Nov 6;465(1):36-40. Epub 2009. Sep 5

6- Inoue K, Sodhi K, Puri N, Gotlinger KH, Cao J, Rezzani R, Falck JR, Abraham NG, Laniado-Schwartzman M. Endothelial-specific CYP4A2 overexpression leads to renal injury and hypertension via increased production of 20-HETE. Am J Physiol Renal Physiol. 2009 Oct; 297(4):F875-84. Epub 2009 Aug 12.

7- Ahmad M, Zhao X, Kelly MR, Kandhi S, Perez O, Abraham NG, Wolin MS. Heme oxygenase-1 induction modulates hypoxic pulmonary vasoconstriction through upregulation of ecSOD. Am J Physiol Heart Circ Physiol. 2009 Oct;297(4):H1453-61. Epub 2009 Aug 7

8- Vanella L, Kim DH, Asprinio D, Peterson SJ, Barbagallo I, Vanella A, Goldstein D, Ikehara S, Abraham NG. HO-1 expression increases mesenchymal stem cell-derived osteoblast but decreases adipocyte lineage. Bone. 2009 Oct 21. [Epub ahead of print]

9- Abraham NG, Cao J, Sacerdoti D, Li X, Drummond G. Heme oxygenase: the key to renal function regulation. Am J Physiol Renal Physiol. 2009 Nov; 297(5):F1137-52. Epub 2009 Jul 1.

10- Li M, Abraham NG, Vanella L, Zhang Y, Inaba M, Hosaka N, Hoshino SI, Shi M, Ambrosini YM, Gershwin ME, Ikehara S. Successful modulation of type 2 diabetes in db/db

mice with intra-bone marrow-bone marrow transplantation plus concurrent thymic transplantation.J Autoimmun. 2010 Sep 28. [Epub ahead of print]

11- Sodhi K, Wu CC, Cheng J, Gotlinger K, Inoue K, Goli M, Falck JR, Abraham NG, Schwartzman ML. CYP4A2-Induced Hypertension Is 20-Hydroxyeicosatetraenoic Acid- and Angiotensin II-Dependent. Hypertension. 2010 Sep 13. [Epub ahead of print]

12- Feng W, Cui Y, Zhan H, Shi M, Cui W, Guo K, Li Q, Song C, Zhang Y, Mori T, Gershwin ME, Abraham NG, Ikehara S. Prevention of premature ovarian failure and osteoporosis induced by irradiation using allogeneic ovarian/bone marrow transplantation. Transplantation. 2010 Feb27;89(4):395-401.

13- Kusmic C, L'abbate A, Sambuceti G, Drummond G, Barsanti C, Matteucci M, Cao J, Piccolomini F, Cheng J, Abraham NGImproved myocardial perfusion in chronic diabetic mice by the up-regulation of pLKB1 and AMPK signaling. J Cell Biochem. 2010 Apr 1;109(5):1033-44.

14- McClung JA, Kruger AL, Ferraris A, Vanella L, Tsenovoy P, Weiss MB, Abraham NG. Usefulness of clopidogrel to protect against diabetes-induced vascular damage. Am J Cardiol. 2010 Apr 1;105(7):1014-8.

D. Funding

PPG Hormonal Regulation of Blood Pressure Stem cell and viral vector core “Core C:
NIH/NHLBI
July 2006-December 2010
$ 1,950,000/ 5 years
UT-HSC Department of Pharmacology
Principal Investigator

Oxidative Stress and HO in Diabetes
NIH/NIDDKRO R01 DK068134-01-
July 2006 to July 2011,
$1,950,000/ 5 years
UT-HSC Department of Pharmacology
Principal Investigator

Oxidative Stress and HO in Diabetes
NIH/NIDDKRO R01 DK068134-01-
Equipment grant; $52,000 November 2011,
UT-HSC Department of Pharmacology
Principal Investigator

Heme Oxygenase Regulation of Eicosanoids Biosynthesis
NIH/NIDDK Type: RO1 DK56601
July 2010 to January 2015
$ 1,950,000/ 5years
UT-HSC Department of Pharmacology
Principal Investigator

Dr. Amir Askari

A. Research Interest

Structure and function of the digitalis receptor. The laboratory has had a long-standing interest in the mechanism of ion transport across biological membranes, with a major emphasis on the properties and functions of (Na+,K+)-ATPase (the sodium pump) of the eucaryotic plasma membrane. Current work of the laboratory is primarily on the interactions of (Na+,K+)-ATPase with non-ATPase proteins, leading to the newly discovered functions of (Na+,K+)-ATPase as a signal transducer that regulates growth of the cardiac myocyte.

B. Publications

"Progesterone modulation of transmembrane helix-helix interactions between the alpha-subunit of Na/K-ATPase and phospholipids N-methyltransferase in the oocyte plasma membrane", Morrill GA, Kostellow, AB, and Askari, A., BCM Structural Biology, 2010, 25;10:12.

C. Notable accomplishment

Have managed to advance my research program in a dysfunctional department created by the abusive attitude of the leadership toward the capable office staff, and in spite of the apparent institutional hostility toward this research program.

D. Funding Sources

NIH, 5P01HL036573-22, $1,046,027 (Direct costs) for 4/1/10-3/31/11.

Dr. Andrew Beavis

A. Research Interest

Mitochondrial bioenergetics and transport processes. Dr. Beavis Mitochondria are cellular organelles responsible for the synthesis of ATP. The coupling mechanism of oxidative phosphorylation involves the generation of a large protonmotive force across the inner membrane by the H+ pumps of the respiratory chain. In addition to being the immediate source of energy for ATP synthesis, the protonmotive force has a great influence on the transport of anions and cations across the inner membrane, and in a number of cases the membrane potential itself is used to drive transport. Most of my research is devoted to the study of these electrophoretic transport processes. I have studied two transport pathways, an anion uniporter which is also called the inner membrane anion channel (IMAC) and a cation uniporter which transports K+ and other cations. The anion uniporter enables mitochondria to pump out salts and the K+ uniporter allows salts to be pumped in. Controlling the balance between these processes

is the essence of mitochondrial volume homeostasis. I have carried out studies with intact mitochondria investigating the effects of physiological and pharmacological regulators and chemical modification on the properties of IMAC. We have used electrophysiological methods to examine the properties of channels extracted from mitochondria and reconstituted into planar lipid bilayers.

B. Department Presentations which include Faculty Meetings and Lectures

Date	Time	Title	Course #	
July 13	1:00-2:50	Drugs for Acne, Psoriasis and other Skin Disorders (I)	PHYA552	PA Pharm
July 16	1:00-2:50	Drugs for Acne, Psoriasis and other Skin Disorders (II)	PHYA552	PA Pharm
July 30	1:00-2:50	Introduction to drug update folder/Review	PHYA552	PA Pharm
Aug 28	10:00-11:50	Drugs affecting uterine smooth muscle	PHYA553	PA Pharm
Sept 11	10:00-11:50	Prescription writing I	PHYA553	PA Pharm
Sept 18	10:00-11:50	Prescription writing II	PHYA553	PA Pharm
Sept 25	10:00-11:50	Toxicology I	PHYA553	PA Pharm
Oct 2	10:00-11:50	Prescription writing III	PHYA553	PA Pharm
Oct 9	10:00-11:50	Prescription writing IV	PHYA553	PA Pharm
Jan 11	10:00-11:50	Introduction to Pharmacology, Pharmacodynamic Principles	PHYA551	PA Pharm
Jan 14	10:00-11:50	Pharmacodynamic Principles	PHYA551	PA Pharm
Jan 15	1:00-2:50	Physical and Chemical Properties of Drugs: Transport and Absorption of Drugs	PHYA551	PA Pharm
Jan 22	1:00-2:50	Distribution and Elimination of Drugs	PHYA551	PA Pharm
Jan 25	10:00-11:50	Pharmacokinetics of Drug Administration	PHYA551	PA Pharm
Jan 28	8:00-9:50	Variations in Response to Drugs Introduction to Autonomic Pharmacology	PHYA551	PA Pharm
Jan 29	1:00-2:50	Autonomic Nervous System Function	PHYA551	PA Pharm
Feb 1	10:00-11:50	Nicotinic Receptor Agonists and Antagonists Muscarinic Receptor Agonists	PHYA551	PA Pharm
Feb 4	10:00-11:50	Muscarinic Receptor Antagonists Introduction to Cardiovascular Drugs	PHYA551	PA Pharm
Feb 5	1:00-2:50	Adrenergic Agonists and Sympathomimetics	PHYA551	PA Pharm
Feb 8	10:00-11:50	Adrenergic Antagonists	PHYA551	PA Pharm
Feb 15	10:00-11:50	Introduction to Autacoids: Eicosanoids, NSAIDs and Nitric Oxide	PHYA551	PA Pharm
Feb 18	11:00-11:50	Exam I Review	PHYA551	PA Pharm
Feb 19	1:00-2:50	Eicosanoids, NSAIDs and Nitric Oxide	PHYA551	PA Pharm
Feb 22	10:00-11:50	Diuretics	PHYA551	PA Pharm
Feb 25	10:00-11:50	Diuretics	PHYA551	PA Pharm
Feb 26	1:00-2:50	Osmotic Diuretics and Vasopressin/ Glaucoma	PHYA551	PA Pharm
Mar 29	10:00-11:50	Respiratory System Pharmacology I	PHYA551	PA Pharm
Aug 26	3:00-5:00	IACUC Training	Student training	
Sept 1	1:00-3:00	Physical and Chem Props of Drugs	INDI780	Systems
Sept 3	1:00-2:00	Absorption and Distribution	INDI780	Systems
Sept 9	2:00-3:00	Excretion	INDI780	Systems
Sept 22	1:00-3:00	Toxicology I	INDI780	Systems
Sept 24/30	10:00-11:50	Autacoids/NSAIDs	INDI783	Immunity
Sept 30	11:00-11:50	Histamine	INDI783	Immunity
Oct 19	9:00-10:50	Biomembranes	BMSP636	Biomembranes
Oct 21	9:00-10:50	Protein Sorting 1	BMSP636	Biomembranes
Oct 23	9:00-10:50	Protein Sorting 2	BMSP636	Biomembranes
Nov 19	10:00-11:50	Hemostasis and Antiplatelets	INDI780	Systems
Nov 23	1:00-2:50	Anticoagulants and Fibrinolytics	INDI780	Systems

Jan 21	10:00-11:50	Diuretics, Vasopressin	INDI780	Systems
Jan 22	10:00-11:50	Diuretics, Vasopressin	INDI780	Systems
Feb 3	1:00-3:00	Bioenergetics	BMSP635	Signaling
Feb 9	8:00-9:50	Respiratory System Pharmacology I	INDI780	Systems
Feb 10	8:00-9:50	Respiratory System Pharmacology II	INDI780	Systems
Mar 17	8:00-9:50	GI Drugs I	INDI780	Systems
Mar 18	8:00-9:50	GI Drugs II	INDI780	Systems
Mar 31	11:00-11:50	Diabetes I	INDI780	Systems
April 1	10:00-11:50	Diabetes II	INDI780	Systems

C. Achievements and Honors

Awarded the "Outstanding Faculty Award" by Physician Assistant Program.

Dr. Paul Brand

A. Research Interest

Mechanisms of regulation of arterial pressure in the conscious animal; etiology of hypertension, mechanisms of pressure diuresis, effects of stress on regulation of arterial pressure.

B. Department Presentations which include Faculty Meetings and Lectures

Fall 2009

PT 511 Clinical Pathophysiology:
Cardiovascular and Respiratory physiology lectures 8 hours.
INDI #525 MSBS Physiology
Cardiovascular, Respiratory, Renal, Gastrointestinal Physiology lectures 18 hours
Organ Systems College of Medicine
Cardiovascular Physiology lectures 11 hours
Physicians Assistant Program PHSL505 Physiology
Cardiovascular, Respiratory, Renal, Gastrointestinal Physiology lectures 18 hours
Year 2 CDM 4 hours

Spring 2010

Organ Systems College of Medicine
Cardiovascular Physiology 3 hours
Body Fluids, Renal Physiology and Acid Base Balance 11 hours
Gastrointestinal Physiology 4 hours
Graduate School
BMSP Systems Pathophysiology Review of Renal Physiology 2 hours
CDM Year 1 20 hours
CDM Year 2 19 hours

SUMMARY

Fall 2009
Lecture hours, 55
Facilitate small group (CDM), 4

Spring 2010

Lecture hours, 20
Facilitate small group (CDM), 39

Dr. Tamara R. Castaneda

A. Research Interest

My current research interest is focused on the study of the potential role of liver CEACAM1 in the pathogenesis of obesity within the context of leptin resistance and decreased energy expenditure (R03 proposal, February 2010). To that end, different mouse models for Ceacam1 and indirect calorimetric measurements will be used. This proposal originates from our previous findings showing that Cc1 knockout mice exhibit hyperinsulinemia and increased adiposity compared to wild-type animals, despite the fact that they show no difference in food intake. My second research project aims to study the role of CEACAM1 in insulin transport in the central nervous system. Using an *in vitro* approach with siRNA, we are analyzing insulin transport in the choroids plexus cell line Z310 as a preliminary step prior to further investigation in the Cc1 knockout mice. My extensive experience working on energy balance, as assessed by several peer-reviewed publications, prepares me for a rigorous independent career in the obesity/diabetes field. I joined CeDER at the University of Toledo, Ohio, with the goal to contribute my expertise in obesity to a group with a solid history in insulin action and homeostasis. Completion of the studies will make a great contribution towards that goal, as it would help to better understand the relevance of the role of CEACAM1 in insulin transport and clearance also in CNS centers, and its implications not only in diabetes, but also in the pathogenesis of obesity.

B. Publications

Castañeda T.R., Tong J., Datta R., Culler M., Tschöp M.H. Ghrelin in the regulation of body weight and metabolism. Front Neuroendocrinol 31:44-60 (2010).
Tschöp J., Nogueiras R., Lockie S., Kasten K., Castañeda T.R., Huber N., Guanciale K., Perez-Tilve D., Woods S.C., Oldfield B., Clarke I., Chua S. jr, Farooqi I.S., O'Rahilly S., Caldwell C.C., Tschöp M.H. CNS leptin action modulates immune response and survival in sepsis. J Neurosci (accepted).

Heinrich G., Ghosh S., DeAngelis A.M., Schroeder-Gloeckler J.M., Patel P.R., Castañeda T.R., Jeffers S., Lee A.D., Jung D.Y., Zhang Z., Opland D.M., Myers, Jr M.G., Kim J.K., Najjar S.M. A role for CEACAM2 in the central control of energy balance and peripheral insulin action. Gastroenterology (accepted).

Castañeda T.R., Nogueiras R., Grant E., Chaudhary N., Solomon M.B., Woods S.C., Herman J.P., Tschöp M.H. Decreased glucose tolerance and plasma adiponectin/resistin ratio in a mouse model of post-traumatic stress disorder (PTSD) (Diabetologia – under review).

C. Department Presentations which include Faculty Meetings and Lectures

- CeDER workshop, February 25th, 2010.
- UT COM Research Day, March 27th, 2010. Poster presentation: "Regulation of energy balance by insulin metabolism".

D. Any other notable accomplishments

R03 proposal submission, February 16th, 2010.

Dr. Joana Chakraborty

A. Research Interest

HIV is a deadly sexually transmitted disease. The development of an animal model to study the transmission of the virus would be a significant research tool. We have successfully cultured a strain of murine retrovirus called MoMuLV-ts-1 (temperature sensitive). The ts-1 virus is a viable candidate for potential development as a small animal model of HIV transmission for the following reasons: 1) like HIV, ts-1 is a neurotropic retrovirus which infects CD4 T-cells; 2) like HIV, disease progression in ts-1 infected mice is related to the amount of viral inoculum, ability of CD8 cells to mount a suppressive response and continuous viral replication; and 3) severe immunodeficiency with subsequent death is the end result of infection with both HIV and ts-1. The goals of the current research is to: i) establish an assay system to quantitate the viral replications; ii) infect female mice with the virus and obtain infection to the offspring; iii) study the rate of transmission of the virus via breast milk; iv) test the long term effect of breast milk transmission of ts-1 on the pups; and v) reduction of viral transmission among pups by probiotics.

B. Publications

Duggan JM, Locher A, Fink B, Okonta C, Chakraborty J. Adherence to antiretroviral therapy; a survey of factors associated with medication usage. AIDS Care 2009 Sep;21(9);1141-7.

Dr. George T. Cicila

A. Research Interest

The molecular genetics and biology of quantitative traits relevant to human disease. Interested in linkage of genetic loci to disease traits using animal models, particularly for high blood pressure

and other quantitative traits relevant to cardiovascular disease. We use these models to identify and validate candidate genes and molecular mechanisms regulating these complex traits.

B. Publications

NESTOR KALINOSKI, A.L., R.S. RAMDATH, K.M. LANGENDERFER, S. SIKANDERKHEL, S. DeRAEDT, M. WELCH, J. PARK, T. PRINGLE, B. JOE, G.T. CICILA, and D.C. ALLISON – 2010 – Neointimal hyperplasia and vasoreactivity are controlled by genetic elements on rat chromosome 3. *Hypertension* 55(2):555-561.

C. Department Presentations, which include Faculty Meetings and Lectures

Poster: College of Medicine Research Day, March 27, 2010. "Genetics of Longevity and Cardiovascular Disease: Identifying Genes Responsible for Differences in Lifespan and Disease Susceptibility"

D. Achievements and Honors:

Named as a member to the Physician Assistant Program Advisory Committee

E. Any other notable accomplishments:

1) Grant reviewer for the Wellcome Trust

2) Became course director for Basic Genetics (PHYA 601, in the Physician's Assistant Program, College of Medicine}.

3) Reviewed two manuscripts for *Hypertension*

F. Funding Sources

Applied for new NSF grant (Jan. 2010) "Identification of Gene-Expression Markers Associated with Environmental Stress in Wild and Captive Parrotfish", John Turner, P.I. (Role on Project: Co-P.I.)
Applied for new RO1 (Feb.5, 2010) "*Rtel1* and Combinatorial Effects of QTLs on Blood Pressure and Longevity", Multi-P.I. (Role on Project: P.I.)

Dr. Debra Gmerek

A. Achievements and Honors
Achievements are detailed in J-CCTR Annual Report

Dr. Jennifer Hill

A. Research Interest

My laboratory's interests lie in understanding hypothalamic homeostatic mechanisms controlling body weight and fertility and the interactions between these two systems. The brain blocks reproduction in animals under metabolic stress. Within the hypothalamus, energy deficits suppress gonadotropin-releasing hormone (GnRH) release from a sub-population of neurons that maintain fertility. Anorexia, cachexia, and excessive exercise suppress reproductive cyclicity in humans and with it the estrogen release essential for bone health. Fully 5% of women of reproductive age suffer from infertility related to eating disorders. Furthermore, the incidence of exercise-related anovulation may reach as high as 61% in gymnasts and 78% in runners. On the opposite end of the spectrum, obesity and diabetes also negatively affect fertility. As rates of these diseases rise, it is urgent that we unravel the hypothalamic homeostatic mechanisms controlling body weight and fertility and the interactions between these two systems. The hypothesis underlying my research is that circulating metabolic factors (such as leptin, insulin, ghrelin, glucose, LC-FAs or PYY_{3-36}) are perceived directly or indirectly by GnRH neurons of the hypothalamus and convey information that prevents GnRH release during a state of negative energy balance. Determining the mechanisms behind this metabolic-reproductive connection will provide much needed targets for medical treatment. The cornerstone of my laboratory's efforts is timed, targeted genetic manipulation using the power of tissue-specific gene deletion. Combined with anatomical, electrophysiological, and physiological techniques this approach offers a powerful tool for investigating the hypothalamic control of metabolism and fertility.

B. Publications

Hill JW, Yong X, Preitner F, Fukuda M, Cho Y, Luo J, Balthasar N, Coppari R, Cantley LC, Kahn B, Zhao JJ, Elmquist JK. Phosphatidyl Inositol 3-Kinase Signaling in Hypothalamic Proopiomelanocortin Neurons Contributes to the Regulation of Glucose Homeostasis. Endocrinology. 2009 Nov;150(11):4874-82. PMID: 19819947

Hill JW. Gene Expression and the Control of Food Intake by Hypothalamic POMC/CART Neurons. The Open Neuroendocrinology Journal, (Invited Review) January 2010 *3;21-27.*

Hill JW, Elias CF, Fukuda M, Williams KW, Berglund ED, Holland WL, Cho YR, Chuang JC, Xu Y, Choi M, Lauzon D, Lee CE, Coppari R, Richardson JA, Zigman JM, Chua S, Scherer PE, Lowell BB, Bruning JC, Elmquist JK, Direct Insulin and leptin action on pro-opiomelanocortin neurons is required for normal glucose homeostasis and fertility. Cell Metab, 2010 Apr 7:11(4);286-97.

C. Department Presentations which include Faculty Meetings and Lectures

Invited Speaker. *The Role of Insulin and Leptin Signaling in Hypothalamic POMC Neurons.* University of Toledo, Department of Chemistry, October 2009

Invited Speaker. *The Role of Insulin and Leptin Signaling in Hypothalamic POMC Neurons.* UT Medical College, Department of Neuroscience, October 2009

Invited Speaker. *A Short Introduction to Obesity and Diabetes Research.* Regional conference: University of Toledo/Ohio State University/University of Michigan Diabetes Update. Toledo OH, November 2009

Presenter. *The reproductive effect of simultaneous deletion of insulin and leptin receptors in POMC neurons. Poster*, Society for Neuroscience Meeting, Chicago November 2009

Invited Speaker. *Kisspeptin in reproduction and metabolism.* Faculty Forum: UT Center for Diabetes and Endocrine Research, January 2010.

Presenter. *Reproductive Complications of Obesity and Insulin Resistance: Mechanisms of Ovarian Dysfunction. Poster*, UT College of Medicine Research Day, March 2010

D. Achievements and Honors

NIH LRP AWARD FOR FERTILITY AND CONTRACEPTION RESEARCH, renewal

To support promising careers in fertility-related academic research. July 2009-2010.

Granted joint appointment in Department of Obstetrics and Gynecology, College of Medicine,

University of Toledo. Dec 2009

E. Any other notable accomplishments

Established a new, productive laboratory.

F. Funding Sources

NICHD R00HD056491 PATHWAY TO INDEPENDENCE AWARD, Principal investigator.
"Hypothalamic leptin and insulin signals aligning metabolic state and fertility."
R00 status began July 1, 2009

Dr. Bina Joe

A. Research Interest

Genetics and genomics of hypertension and related complex traits Dr. Joe's laboratory, the Physiological Genomics Laboratory, is focused on understanding the genetic component of blood pressure regulation using hypertensive rat models. Rat models serve as valuable alternatives to human studies for the identification and characterization of genetic factors/genes. The main strategy is to identify the disease causative genetic factor/gene based on its location on the rat genome by linkage analysis and substitution mapping and/or gene expression and protein expression profiling using custom oligonucleotide arrays, rat genome microarrays and rat proteomics. To this end, we have identified at least 16 different genomic regions that harbor quantitative trait loci (QTLs) for hypertension in rats. All but one of these QTLs remain unidentified. Fine-mapping of several regions to less than 1Mb segments of the rat genome has been achieved. Current efforts are underway to positionally clone the underlying QTL effectors. The expectation is to be able to translate our observations in rat models to disease causative mechanisms in humans.

B. Publications

1. Tietjen, G.E., Herial, N.A., Utley, C., White, L., Yerga-Woolwine, S., Joe, B. Association of von Willebrand factor activity with ACE I/D and MTHFR C677T polymorphisms in migraine. Cephalalgia 29 (9): 960-968, 2009.
2. Cicila, G.T., Morgan, E.E., Lee, S.J.,Farms, P., Yerga-Woolwine, S., Toland, E.J.,Ramdath, R. S., Gopalakrishnan, K., Bohman, K., Nestor-Kalinoski, A.L., Khuder, S.A., Joe, B. Epistatic Genetic Determinants of Blood Pressure and Mortality in a Salt-sensitive Hypertension Model. Hypertension 53: 725-732, 2009.
3. Joe B, Saad Y, Lee N, Frank B, Achinike O, Luu T, Gopalakrishnan K, Toland E, Farms P, Yerga-Woolwine S, Manickavasagam E, Rapp J, Garrett M, Coe D, Apte S, Rankinen T, Pérusse L, Ehret G, Ganesh S, Cooper R, O'Connor A, Rice T, Weder A, Chakravarti A, Rao D, Bouchard C. Positional identification of variants of Adamts16 linked to inherited hypertension. Hum. Mol. Genet. 18(15): 2825-2838, 2009.
4. Nestor-Kalinoski AL, Ramdath RS, Langenderfer KM, Sikanderkhel S, DeRaedt S, Welch M, Park JL, Pringle T, Joe B, Cicila GT, Allison DC. Neointimal Hyperplasia and Vasoreactivity are Controlled by Genetic Elements on Rat Chromosome Hypertension 55(2):555-561, 2010.
5. Kumarasamy S, Gopalakrishnan K, Shafton A, Nixon J, Thangavel J, Farms P, Joe B. Mitochondrial polymorphisms in rat genetic models of hypertension. Mamm Genome 21 (5-6)l299-306, 2010.

C. Department Presentations which include Faculty Meetings and Lectures

College of Medicine Research Day, University of Toledo Health Science Campus (March 2010)

D. Achievements and Honors

1. Chaired Session on Genetics of Hypertension, Council for High Blood Pressure Research, International meeting of the American Heart Association. Chicago, USA
2. Appointed to the Editorial Board of the Journal 'Hypertension'
3. Received notification of being the Young Scholar Awardee from the American Society of Hypertension.

E. Any other notable accomplishments

1. Appointed as an Adhoc Member of the Hypertension and Microcirculation study section of NIH (6/2009)
2. Appointed as an Adhoc Member of the Hypertension and Microcirculation study section of NIH (9/2009)
3. Appointed to review grant proposal submitted to the Medical Research Council, UK.
4. Appointed as a Regular Member of the Hypertension ad Microcirculation study sectin of NIH (7/2010-6/2013)

F. Funding Sources

RO1-HL076709, NIH/NHLBI Principal Investigator-Joe B ($2,612,957)
Genetics of Hypertension
July 2008-June 2012

RO1- HL020176-32, NIH/NHLBI Principal Investigator-Joe B ($ 2,171,690)
Genetic Element s Controlling Blood Pressure
April 2009-March 2013

PO1- HL036573, NIH/NHLBI Principal Investigator-Askari A
Role: Co-investigator (5% effort)
Digitalis-Induced Signaling by Cardiac Na+/K+-ATPase
April 2009-March 2014

Dr. Dong Hyun Kim

A. Research Interest

Adult Stem Cells from Human Bone Marrow, Cord Blood, Fat tissues and other tissues.

Mesenchymal Stem Cells (MSCs) and Hematopoietic Stem Cells (HSCs) for therapeutic resources.

Adipogenesis of MSCs from human bone marrow.

The laboratory is focused on vascular dysfunction which is a prelude to cardiovascular and metabolic diseases including hypertension, stroke, diabetes and obesity, the role of oxidative stress, inflammatory cytokines, hypoadiponectinemia and lipid-derived from arachidonic acid in the initiation of vascular dysfunction. The central hypothesis focuses on heme oxygenase (the most potent anti-oxidant gene in human body)-adiponectin-EET plays an essential role in vascular function. We believe that heme oxygenase acts as a molecular "switch" to genetically reprogram the vascular endothelium through activation of a unique signaling cascade with amplification of protective circuits to provide resistance to vascular dysfunction. Heme oxygenase also serves as the mediator of cross-talk between adipose tissue and the vasculature. Studies in this lab focuses on the impact of adipocyte dysfunction on vascular endothelial integrity through the prism of heme oxygenase and stem cell applications.

B. Publications

Vanella L, Kim DH**,** Asprinio D, Peterson SJ, Barbagallo I, Vanella A, Goldstein DS, Ikehara S, Abraham NG. (2009) HO-1 expression increases mesenchymal stem cell-derived osteoblast and decrease adipocyte lineages. Bone Novenber 2009.

Sodhi K, Inoue K, Gotlinger GH, Canestraro M, Vanella L, Kim DH**,** Manthati VL, Koduru SR, Falck JR, Schwartzman ML, Abraham NG. Epoxyeiocsatrienoic acid agonist rescues the metabolic syndrome phenotype of HO-2-null mice. J Pharmacol Exp Ther Dec;331(3);906-916, 2009.

Peterson SJ**,** Kim DH**,** Li M, Positano V, Vanella L, Rodella LF, Piccolomini F, Puri N, Gastaldelli A, Kusmic C, L'Abbate A, Abraham NG. (2009) The L-4F mimetic peptide prevents insulin resistance through increased levels of HO-1, pAMPK, and pAKT in obese mice. J Lipid Res. Jul;50 (7): 1293-1304. Epub Feb 17.

Barbagallo I, Vanella A, Peterson SJ, Kim DH**,** Tibullo D, Giallongo C, Vanella L, Parrinello N, Palumbo GA, Raimondo FD, Abraham NG, Asprinio D. (2009) Overexpression of heme oxygenase-1 increases human oseteoblast stem cell differentiation. Bone Miner Metab [Epub ahead of print].

Kim DH, Vanella L, Inoue K, Burgess A, Gotlinger K, Manthati VL, Koduru SR, Zeldin DC, Falck JR, Schwartzman ML, Abraham NG. EET-Agonist Regulates Human Mesenchymal Stem Cells-Derived Adipocytes Through Activation of HO-1-pAKT Signaling and a decrease in PPARgamma. Stem Cells Dev. 2010 Apr 22. [Epub ahead of print]

Dr. Lijun Liu

A. Research Interest

My research interest is cardiac cell signaling pathways related to cardiac hypertrophy and heart failure, especially digitalis-induced cardiac hypertrophy and its mechanism. The long term goal is the clarification of the appropriate use of digitalis drugs in the treatment of heart failure, through the study of the mechanisms of the signaling effects of these drugs. Another research interest is the role of caveolae and caveolins in cell functions including cardiac cells and cancer cells. We have found the linkage of caveolin-1and sodium pump. Sodium pump signaling complex locates in caveolae. Sodium pump signaling in normal cells induces cell growth; however, it induces cell arrest in cancer cells. I would like to investigate the role of caveolins and sodium pump in the regulation of the cell growth.

B. Publications

NaKtide, a Na/K-ATPase-derived peptide Src inhibitor, antagonizes ouabain-activated signal transduction in cultured cells.
Li Z, Cai T, Tian J, Xie JX, Zhao X, Liu L, Shapiro JI, Xie Z.
J Biol Chem. 2009 Jul 31; 284 (31): 21066-76

C. Department Presentations which include Faculty Meetings and Lectures

UT COM Research day, March 27, 2010
Poster: "Digitalis-induced cardiac Na^+/K^+-ATPase signaling in vivo"

D. Funding Sources

PO1 HL36573-21 Amir Askari (PI) 04/01/09-03/31/14
NHLBI

Digitalis-Induced Signaling by Cardiac Na^+/K^+-ATPase

Role: Core director

This core provides the program investigators and their trainees with an integrated core laboratory evaluating the physiologic and genetic profiles of transgenic animals and related cutting-edge translational research, including maintenance of genetically modified mice colonies; pharmacological treatment, generation of cardiac disease models, and assessment of cardiac and vascular phenotype; and cardiac cell preparation. I am also PI of all the animal protocols(6) related to PPG.

PO1 HL36573-21 Amir Askari (PI) 04/01/09-03/31/14
NHLBI
Cardiac Na^+/K^+-ATPase: Digitalis-Induced Signaling Through PI3K/Akt Pathway
Role: Co-investigator
This is one of the component projects of P01 HL36573-21. It emphasizes studies on the evaluate the recently found role of the digitalis-induced activation of PI3K/Akt pathway in the regulation of cardiac myocytes hypertrophy.

Dr. Ronald Mellgren

A. Research Interest

The Mellgren laboratory has been interested in regulation of cell function by regulated proteolysis; especially the role of calpains in repairing mechanical damage to plasma membrane (PM). More recently we have focused on repair in general, by using proteomic techniques to identify intracellular proteins that are expressed at injury sites on cells that subsequently survive mechanical penetration of the PM.

B. Publication

Mellgren, RL, Miyake, K, Kramerova, I, Spencer, MJ, Bourg, N, Bartoli, M, Richard, I, Greer, PA, and McNeil, PL (2009) Calcium-dependent plasma membrane repair requires m- or mu-calpain, but not calpain-3, the proteasome, or caspases, *Biochim Biophys Acta* 1793, 1886-1893.

C. Department Presentations

Lectures to medical students on drug biotransformation, drug interactions, antimicrobials, and antineoplastics. Lectures to physician assistants on antimicrobials, antifungals, antivirals, antiparasitics, antineoplastics. Faculty facilitator for graduate students in Grants Workshop course.

D. Achievements and Honors

Invited to speak at a memorial symposium at the University of Arizona honoring Darrel Goll for his research accomplishments in the area of muscle function and muscle protein turnover.

Selected to chair the Murachi/Goll student award judging at the upcoming FASEB Summer Research Conference on calpains.

E. Funding Source

NIH R21AR0054427, Role of calpains in plasma membrane repair, Total direct cost for 8-15-09 to 7-31-10: $268,883.

Dr. Edith Mensah-Osman

A. Research Interest

Investigating the perturbations in the signaling pathways, which are involved in the mechanisms of obesity, fatty liver disease and diabetes. The laboratory is also investigating the pathways linking metabolic disorders with osteosarcoma, an aggressive malignancy of the bone, to determine its role in tumor progression and drug resistance.

B. Department Presentations which include Faculty Meetings and Lectures

TEACHING

2008-present Graduate Students-CVMD #650/850 (Gut hormones and Insulin action)
University of Toledo Medical School

MENTORING

2008-present Kellie Andrews Senior year Pre-medical Student University of Toledo
2008-present David Wang 2nd year Medical Student University of Toledo
2008-present Dr. Nadir Osman University of Michigan, Department of Neurology
2008-present Leah Palladino University of Toledo, CVMD
2008-present Kristine Angevine University of Toledo, CVMD

C. Achievements and Honors

2009 Ross Business School Scholarship
2009 Foy & Phyllis Penn Kohler Grant

D. Any other notable accomplishments

Award of the American Heart Association Great Rivers Affiliate Pre-doctoral fellowship to my Ph.D. Student, Kristine Angevine.

E. Funding Sources

Department of Phys & Pharm- University of Toledo-HSC START-UP FUND

Dr. Patricia Metting

A. Research Interests

1. Medical Education Research: Predictors of Success on Medical Licensure Exams
2. Scientific Areas of Interest: Cardiovascular Physiology and Disease

B. Publications

Metting, P.J. and J.F. Kleshinski, eds., Physiology: PreTest™ Self-Assessment and Review, 13th Edition, The McGraw-Hill Companies, Inc.: New York, NY, 2010.

C. Department Presentations, including faculty meetings and lectures (20 contact hours; 200 hours in lecture and examination preparation)

1. Lectures in Organ Systems Block for Second-Year Medical Students
   a. Pulmonary Gas Exchange: Ventilation and Diffusion, 2/1/10, 9-11:50 am
   b. Mechanics of Breathing, 2/2/10, 9-11:50 am
   c. Pulmonary Blood Flow; Ventilation/Perfusion Balance, 2/4/10, 10-11:50 am
   d. O_2 & CO_2 Transport in the Blood; Hypoxia and Hypoxemia, 2/5/10, 10-11:50 am
   e. Pathophysiology of Acid-Base Disorders, 2/9/10, 10-11:50 am
   f. Control of Breathing, 2/10/10, 10-11:50 am
   g. Pathophysiology of Pulmonary Edema; Pulmonary Hemodynamic Monitoring, 2/11/10, 10-11:50 am
   h. Clinical Evaluation of Pulmonary Function, 2/12/10, 10-11:50 am (with Dr. Dan Olson)
2. Large Group Formative Problem Solving Sessions
   a. Respiratory Physiology Integration & Problem Solving I, 2/8/10, 10-11:50 am
   b. Respiratory Physiology Integration & Problem Solving II, 2/16/10, 10-11:50 am

D. Achievements and Honors

a. NIH Study Section: NIH CSR Special Emphasis Panel, Fellowships: Physiology and Pathobiology of Cardiovascular and Respiratory Systems, March and June 2010

b. Invited Moderator, "National Board of Medical Examiners Professionalism Assessment Project", Association of American Medical Colleges Group on Student Affairs National Meeting, Austin, TX, April 2010

Dr. Nikolai Modyanov

A. Research Interest

The overall goal of my current research is to understand the physiological role of the unique BetaM proteins encoded by ATP1B4 genes, which were discovered in my laboratory. We determined that ATP1B4 genes represent a rare instance of vertebrate gene co-option that radically changed functions of BetaM during the evolutuion. In lower vertebrates BetaM is a subunit of Na,K-ATPase. In placental mammals BetaM-proteins lost their ancestral functions and acquired entirely new functions of regulators of gene expression and signal transduction, which act specifically during atrial chamber of heart and skeletal muscle development, growth and regeneration. During the report period we have developed knock-out mouse model and currently are analyzing the consequences of gene Atp1b4 ablation. For example, we have determined that BetaM deficiency sharply decreased level of expression of a major myogenic regulatory factor MyoD in skeletal muscles and slow down mouse general body development and growth.

B. Publications

Nisar Ahmad , Ivana L. de la Serna, Nikolai N. Modyanov"Eutherian BetaM, a muscle-specific integral protein of inner nuclear membrane, is implicated in regulation of MyoD gene expression" This manuscript is prepared for submission to PNAS.

C. Department Presentations which include Faculty Meetings and Lectures

Graduate core curriculum course "Current Problems and Research Approaches in Protein Structure & Catalysis", (14 hours lectures and two exams).

Facilitator of Clinical Reasoning Small Group Case Discussion 22hr/year

D. Achievements and Honors

Member of editorial board of ” Biochemistry Research International”

E. Any other notable accomplishments

Director of Graduate school course "Current Problems and Research Approaches in Protein Structure & Catalysis"
Member of 2 Graduate student advisory committees
Member of Institutional Animal Care and Use Committee

Most importantly, during the report period we have developed BetaM knock-out mouse model and began analysis of the consequences of gene Atp1b4 ablation. We anticipate that these studies will allow to define physiological role of BetaM in heart and skeletal muscle development and regeneration that might be particularly essential for better understanding

mechanisms underlying muscular disorders. I participated as an invited speaker in the International Conference on Biomolecular Science and gave a lecture entitled "BetaM - an enigmatic member of Na,K-ATPase beta-subunit family: puzzles of one molecule evolution" Moscow, Russia, September 28 – October 1, 2009.

F. Funding Sources
Bridge Funding provided by UT College of Medicine (May, 2008).

Dr. Sonia Najjar

A. Research Interest

The Najjar laboratory investigates the role of hepatic insulin clearance in the regulation of insulin action. Using several genetically engineered mice, we have identified a new paradigm involving CEACAM1, a protein that regulates insulin clearance by promoting receptor-mediated insulin uptake and degradation. Moreover, we have established a CEACAM1-dependent molecular link between the regulation of lipid and insulin metabolism in liver and its effect on overall insulin sensitivity, visceral obesity and endothelial function. In this respect, Ceacam1 mutant mice have demonstrated a link between metabolic disorders, non-alcoholic steatohepatitis, atherosclerosis, and cancer. Moreover, we have shown that reduction of insulin clearance is an early event in the pathogenesis of diet-induced insulin resistance.

B. Publications

1. Haram, P.M., Kemi, O.J., Lee, S.J., Bendheim, M.Ø., Al-Share, Q.Y., Waldum, H.L., Gillian, L.J., Koch, L.G., Britton, S.L., Najjar, S.M.* and Wisløff. U.* (2009) Aerobic interval training vs. continuous moderate exercise in the metabolic syndrome of rats artificially selected for low aerobic capacity. Cardiovascular Res. 81:723-32. *Shared senior authorship.
2. Gayen, J.R., Saberi, M., Schenk, S., Biswas, N., Vaingankar, S.M., Cheung, W.W., Najjar, S.M., O'Connor, D.T., Bandyopadhyay, G., and Mahata, S.K. (2009) A Novel Pathway of Insulin Sensitivity in Chromogranin A Null Mice: A Crucial Role for Pancreastatin in Glucose Homeostasis. J. Biol. Chem. 284:28498-28509.
3. Huang, S., Kaw, M., Harris, M.T., Ebraheim, N., McInerney, M.F., Najjar, S.M**.** and Lecka-Czernik, B. (2010) Decreased osteoclastogenesis and high bone mass in mice with impaired insulin clearance due to liver-specific inactivation of CEACAM1. Bone 46: 1138-1145.

C. Department Presentations, including Faculty Meetings and Lectures
-Teaching in the grant writing workshop
-Teaching in the Pathophysiology of Diseases (second year graduate students).

INVITED TALKS AT MEETINGS/CONFERENCES/WORKSHOPS (selected):

2009 20th International CEA/PSG Workshop, Essen. Germany

CHAIRPERSON and KEYNOTE LECTURES at INTERNATIONAL MEETINGS

2009 20th International CEA/PSG Workshop, Essen. Germany

INVITED INSTITUTIONAL SEMINARS (selected):

2009	National Institutes of Health-NIDDK
2010	Tulane University Cancer Center
2010	Temple University school of Medicine-Cardiovascular Research Cente

D. Achievements and Honors

2010	Sponsor a travel award to the Endocrine Society Meetings; Sumona Ghosh
2010	Sponsor a travel award to the endocrine Society meetings; Thomas A. Bowman
2010	Sponsor a travel award to the endocrine society meetings; Sadeesh K. Ramakrishnan
2010	Receive the Outstanding University Research Award

Other Notable Accomplishments

2009-2010	Mentor 4 PhD students to defend thesis/graduate: Garrett Heinrich; Kelly Ledford; Thomas Bowman; Jehnan-Liu
2009/2010	Serving as reviewer at IPOD study section-NIH
2010-	Serving as reviewer for Hong Kong research funding
2009-	Beginning term as Honorary Editorial Board member for Hepatic Medicine: Research and Evidence.
2010	Complete term on the editorial board of Molecular Endocrinology

E. Funding Source

<u>RESEARCH FUNDING</u>

Pending Support

Succeeded to renew the NIH R01 grant:
NIH/NIDDK-2R01DK54254-09 (Najjar) SCORE 1%
03/01/2000-02/28/2015
"CEACAM and Insulin Action"
The proposal investigates the role of CEACAM proteins in insulin metabolism (secretion and clearance).

Active Support

1) NIH/NIDDK-R01 DK083850-01 (Najjar) 09/30/2009-08/31/2011

"Insulin resistance in the pathogenesis of NASH"
The proposal investigates the role of CEACAM1 in the pathogenesis of non-alcoholic steatohepatitis.

2) US. Dept. of Agriculture (Najjar and McInerney Co-PIs) 09/01/2005-07/31/2011

"Genetic and Dietary Risk factors in Obesity and Diabetes"
The proposal examines the dietary and genetic factors underlying the spread of obesity in Northwest Ohio.

3) Novartis (Khouri/Najjar PIs) 04/01/2009-02/28/2011

"Cardiac and Vascular protection by Aliskiren and Losartan in Murine Models of Metabolic Syndrome"
The proposal seeks to compare the efficacy of several anti-hypertension drugs using Cc1 null mice.

4) NIH/NIDDK-2R01DK54254-8 Supplement (Najjar)

09/25/2009-02/28/2010
"CEACAM and Insulin Action"

Dr. Sandrine Pierre

A. Research Interest

Na,K-ATPase in ischemia-reperfusion injury and in cardioprotection.
Safety and efficacy evaluation of a novel dietary supplement on the cardiovascular system.
To date, studies on the molecular basis of the physiological effects of digitalis such as the increase in cardiac contractility have focused on its ability to specifically inhibit the ion pumping function of Na+/K+-ATPase. However, it has become apparent that, in addition to pumping ions, Na+/K+-ATPase interacts with neighbor membrane proteins and takes part in signaling complexes to send messages to various intracellular organelles. Therefore, the mechanism of action of digitalis may go beyond the modulation of ionic homeostasis. Accordingly, ongoing studies in the laboratory aim to identify specific intracellular pathways involved in the integrated response of the cell following exposure to digitalis.

B. Publications

Sottejeau Y, Belliard A, Duran MJ, Pressley TA, Pierre SV. Critical role of the Isoform-Specific Region in alpha1-Na, K-ATPase trafficking and Protein Kinase C-dependent regulation. *Biochemistry*. 2010 Mar 21. [Epub ahead of print] PMID: 20302352

Morgan EE, Li Z, Stebal C, Belliard A, Tennyson G, Salari B, Garlid KD, Pierre SV. Preconditioning by Sub-inotropic Doses of Ouabain in the Langendorff-Perfused Rabbit Heart. J Cardiovasc Pharmacol. 2010 Mar;55(3):234-9. . [Epub ahead of print] PMID: 20010435

C. Department Presentations which include Faculty Meetings and Lectures

CVMD advanced topics: 2h
CVMD pathophys I: 2h (Pathophysiology of endocrine system: February 2010)

D. Any other notable accomplishments

CVMD Advisory Committee work:

- Kathryn Smedlund (PhD candidate): Guillermo Vazquez (meeting 10/28/2009)
- Rudel Saunders (PhD): major advisor KV Chin (Thesis Defense October 2009)
- Kelly Ledford (PhD): major advisor S. Najjar (Thesis defense 03/26/2010)
- Maria Szludarek (PhD): major advisor KV. Chin (meeting 02/10/2010. Thesis defense 03/29/2010)
- Thomas Bowman (PhD): major advisor S. Najjar (Thesis defense 03/30/2010)
- Tanoya Harris (PhD candidate): major advisor Zijian Xie (qualifying exam 03/25/2010)

Funding Sources

- NIH Heart, Lung, and Blood Institute Grant HL-36573 (Core B Leader, Project III Co-Leader)

- French National National Agency for Technological Research (ANRT) CIFRE N° 924/2008 (Yoann's Sottejeau's fellowship)

Dr. Phillip Robinson

A. Research Interest

Biomedical research management and technology
Current IACUC research protocol (intramurally funded)

Disease Survey of Feral Rodents Proximate to Animal Facilities

B. Department Presentations which include Faculty Meetings and Lectures

No department presentations. Faculty and staff interactions are based on individual and small group interactions, including training in anesthesia, surgery, post-op care and animal research regulatory standards.

C. Any other notable accomplishments

Two grants were prepared and are pending with the NIH under the American Recovery and Reinvestment Act.

GRR029764A - $500,000 (G-20)

Enhancing Rodent Micro-Environments and Husbandry Efficiencies

CRRO30333 - $9,995,000 (C06)

Modernizing UT Animal Resources for Contemporary Research

D. Funding Sources

Department funding is derived from per diem and technical services recharges and from operating subsidies provided by the University.

Dr. Howard Rosenberg

A. Research Interest

Medical education

B. Publications

Greenfield LJ, Jr, Rosenberg HC, Tietz EI. "Benzodiazepines" in Wyllie E., ed., The Treatment of Epilepsy: Principles and Practice, 5th Ed. Philadelphia: Lippincott, Williams and Wilkins, *in press*.

C. Department Presentations which include Faculty Meetings and Lectures

Pharmacology for PA students:
Introduction to CNS Drugs; Non-selective CNS Depressants - 2hr
Inhalational Anesthetics and Local Anesthetics - 2 hr
Ethanol, Benzodiazepines - 2 hr
Antiepileptic Drugs - 2 hr
Opioid Analgesics - 2hr
Drugs of Abuse - 1 hr
Drugs for Parkinson's Disease - 1hr
Drugs for Psychiatric Disorders - 2hr
2nd year MD students:
Intro to Organ Systems - 30 min
Intro to Pharmacology and Dose-Response Relationships - 2 hr
Cholinergic Pharmacology 1 - 2 hr
Cholinergic Pharmacology 2 - 2 hr
Antiarrythymic Drugs
CNS Pharmacology Overview AND Non-selective CNS Depressants - 2 hr
Local and General Anesthetics - 2 hr
Drugs for Parkinson's Disease - 1 hr
CNS Stimulants - 1 hr
Opioid agonists and antagonists - 3 hr
Antidepressant and Anti-manis Drugs - 2 hr
Pharmacologic Aspects of Drug Abuse - 2 hr
Regulation, Discovery and Selling of Drugs - 1 hr
Exam reviews and "pep-talks" for whole class - two sessions, one hour total
Small group presentations for students needing extra help - 4 hour total

D. Any other notable accomplishments

Directed Organ Systems course for 2nd year medical students

Dr. Edwin Sanchez

A. Research Interest

My laboratory investigates the mechanism of steroid hormone action, with an emphasis on the roles played by molecular chaperones (Hsp90, FKBP52, FKBP51, protein phosphatase 5 and Cyp40) in control of steroid receptor function. We study these events at the molecular, cellular and physiological levels. Our most important recent observations are as follows: 1) FKBP52 is required for female fertility in the mouse by controlling progesterone receptor activity and receptivity of the uterus to implantation. 2) FKBP52 controls androgen receptor activity and mouse penile development, and identified FKBP52 mutant mice as the first *bone-fide* mouse model of hypospadias. 3) FKBP52 actions on androgen receptor is required for prostate gland development. 4) Important roles for both FKBP51 and Cyp40 in androgen-mediated prostate cancer cell growth. 5) A differential role for FKBP52 and FKBP51 in the control of glucocorticoid receptor intracellular location and transcriptional enhancement activities. 6) FKBP52 controls the ability of glucocorticoid receptor to regulate glucose metabolism in the liver and the response of mice to high-fat diets. Our current efforts focus on the *in vivo* contributions of steroid receptor associated co-chaperones to metabolic processes. To this end, we have entered into several collaborative projects with CeDER faculty (Najjar, Lecka Czernik and Hill), as well as members of the Urology department (Selman, Elkhairi).

B. Publications

Periyasamy, S., Hinds, T. J., Shemshedini, L., Shou, W., and Sanchez, E. R. (2010) FKBP51 and Cyp40 are positive regulators of androgen-dependent prostate cancer cell growth and the targets of FK506 and cyclosporin A, *Oncogene 29*, 1691-1701.

C. Department Presentation and lectures

Medical School:

1) Year 1: Signal Transduction (2 h)
2) Year 2: Signal Transduction & Drug Discovery (2h)
Adrenal Steroid Pharmacology (1 h)
Thyroid Pharmacology (1 h)
Pharmacology of Reproductive Hormones (2 h)

Physician Assistant Program:

Adrenal Steroid Pharmacology (1 h)
Thyroid Pharmacology (1 h)

Pharmacology of Reproductive Hormones (2 h)

Graduate Program:

Cell Biology & Signaling (Course Director)

Cell Biology & Signaling (5 lectures - 10 h)

Grant Writing Workshop (3 sessions - 6 h)

D. Notable accomplishments

Award of F31 NIH Pre-doctoral fellowship to my Ph.D. student, Terry Hinds, Jr.

E. Funding Sources

1) NIH R01 DK070127-01 Sanchez (PI)
8-1-05 to 6-30-10
40% Effort
TPR Proteins in Steroid Receptor Signaling & Physiology
The major goal of this project is to study the role of FKBP52 in glucocorticoid and progesterone receptor signaling mechanisms and reproductive physiology.

2) NIH 2 R01 DK054254-09 Najjar (PI), Sanchez (Co-I)
Priority Score 1.00
Year 9 to start in late 2010
10% Effort
CEACAM and Insulin Action
Responsible for Aim 2 to study mechanism of CEACAM1 gene regulation by PPARα

Dr. Elizabeth Tietz

A. Research Interests

Drug tolerance and dependence mechanisms; inhibitory and excitatory neuronal receptor regulation.

B. Publications

Shen, G., Mohamed, M.S., Das, P., Xiang, K. and Tietz, E.I. Positive allosteric activation of GABAA receptors bi-directionally modulates hippocampal glutamate plasticity and behavior. *Biochem Soc Trans*, 37:1394-1398, 2009.

Book Chapter:

Greenfield L.J., Jr, Rosenberg H.C., Tietz E.I. "Benzodiazepines" in Wyllie E., ed., The Treatment of Epilepsy: Principles and Practice, 5th Ed. Philadelphia: Lippincott, Williams and Wilkins, *in press*.

C. Department Presentations which include Faculty Meetings and Lectures

Medical School Organ Systems Year 02; 3 lectures (EtOH, benzodiazepines, antipsychotics)

D. Achievements and Honors

Ad Hoc Reviewer, National Institute on Drug Abuse, Special Emphasis Panel/Scientific Review Group 2010/08 ZDA1 LXF-L (01) meeting, 03/22/2010

***Member* Program Committee**, National Society for Neuroscience, Washington, D.C. 11/06 – 6/0

Member Audit Committee, National Society for Neuroscience, Washington, D.C. 11/09 – 6/12

E. Any other notable accomplishments

Invited oral presentation, Neuronal glutamate and GABA-A receptor function in health and disease, Biochemical Society, St. Andrews University, St. Andrews UK, July 21-24, 2009.

F. Funding Sources

Current Grants:
As Principal Investigator:

RO1-DA018341:01-05, NIDA Benzodiazepine-Indiuced Glutamate Receptor Plasticity, (b) PI, Elizabeth I Tietz, Ph.D. 30% Effort, NIDA, (c) 4/05 to 3/11; Year 01, Direct Costs ($226,906), $1,502,812 (total costs); No cost extension through 3/31/11.

As Sponsor:
F30 DA026675-01-05, NIDA, Regulation of voltage-gated calcium channels during chronic BZ treatment in rats. Awardee: Damien Earl; MD/PhD Pre-Doctoral National Research Service Award (NRSA), Sponsor: Elizabeth I. Tietz, Ph.D., co-Sponsor, D.R. Giovannucci, 5% Effort, Pre-doctoral NRSA, 4/09 to 6/12

As Director:
American Society Pharmacology and Experimental Therapeuitcs (ASPET) Institutional Grant Zannoni Summer Undergraduate Research Fellowships $9000/yr 3 (c) 02/01/10-08/31/12; (d) direct $9,000 Entire project total (02/01/10-08/30/12): $27,000

Pending Grant Applications:
As Principal Investigator:

ASPET Zannoni SURF Non-competitive renewal

Grants Submitted, but not funded:

As Principal Investigator:

DM102073, DoD, Therapeutic potential of calcium channel blockers for generalized and withdrawal-anxiety in PTSD (b) PI, Elizabeth I Tietz, Ph.D. 30% Effort and co-PI, David R. Giovannucci, 25% Effort; co-I, L. J. Greenfield, 5% Effort Dept. of Defense (DoD), (c) 10/10 to 9/13; Year 01,

direct costs $323,530, total direct costs, $999,999

RO1-DA018341:06-10, NIDA Ca2+ channel modulation of benzodiazepine-induced glutamatergic plasticity, (b) PI, Elizabeth I Tietz, Ph.D. 45% Effort and co-PI, David R. Giovannucci, 20% Effort, NIDA, (c) 4/10 to 3/15; Year 01, direct costs $355,576, total direct costs, $1,930,707; Not funded.
Five year revision pending Mar 05, 2010; Yr 01, direct costs $307,151, Yr 01-05; total direct costs $1,658,414

As Director:
American Society Pharmacology and Experimental Therapeuitcs (ASPET) Institutional Grant Zannoni Summer Undergraduate Research Fellowships $9000/yr 3 (c) 02/01/10-08/31/12; (d) direct $9,000
Entire project total (02/01/10-08/30/12): $27,000

As Consultant:
NS 049389-01A 1, NINDS, Post-Hypoxic Regulation of GABA-A Receptor Function, (b) P.I., John Greenfield, M.D. Ph.D., E.I. Tietz, 0% Effort; (c) 12/01/05-11/30/6; (d) direct $180,609
Entire project (1/01/04-12/31/10): direct $1,334,700.

Dr. John Turner

A. Research Interests

Research focuses in 2 areas: 1) development of biomarkers for environmental stress
2) development of long-term, controlled-release contraceptive vaccines

Regarding biomarker studies, the effort is directed at the use of the stress hormone cortisol as a reference base for assessing effects of environmental stressors on gene expression, with emphasis on stress-related and reproduction-related genes. The experimental model is stress in fish associated with environmental compromises in coral reef ecosystems. These studies advance knowledge regarding stress and gene expression while addressing a critical problem of environmental stressors causing worldwide declines in coral reef ecosystems. Regarding contraception studies, the effort is directed at multi-year contraception achieved with a single immunization and employs a polymer-based, controlled-release component in the vaccine to provide boostering. The controlled-release aspect allows for multiple boostering across a 3-20 month period and yields vaccines enduring for up to 3 years. The experimental model for these studies is the horse, with application to limit free-roaming wildlife populations to match their habitat capacity. Controlled-release boostering has potential for use with a number of animal and human vaccines.

B. Publications

Lupica, S.J. and Turner, J.W, Jr. (2009), Validation of enzyme-linked immunosorbent assay for measurement of faecal cortisol in fish. Aquaculture Research 40: 437-441.

C. Teaching and Other Presentations

UT College of Medicine instructor : 26 classroom hours in Year 2 Organ Systems Curriculum, Endocrine and Reproductive Systems (March/April, 2010)

Director/Instructor for 2-dayUSDI Bureau of Land Management Workshop on Wild Horse Fertility Control (Sept. 17-18, 2009)

Director/Instructor for 5-day Field Research Education Program in Coral Reef Ecology, Abaco, Bahamas (July 16-22, 2009)

Paper Presentation: 'Recent Progress in PZP Immunocontraception in White-tailed Deer' (authors Rutberg, A.T., R.E. Naugle and J.W. Turner,Jr.), presented at International Conference in Urban Ecology and Management, Amherst,MA. , July 24, 2009.

Paper/Poster Presentation: 'Stress Monitor of Parrotfish Inhabiting Selected Coral Reef Areas That Fringe Abaco Island, Bahamas' (author J.W. Turner,Jr.), presented at Bahamian Science Alliance Conference, Abaco, Bahamas, January 7-10, 2-10.

Poster Presentation: 'Research Program of J.W. Turner, Jr.: ' Project 1 -- ' Monitoring of Coral Reef Parrotfish, US Virgin Islands' ; Project 2 --'Controlled-Release Contraceptive Vaccine of 2-year Duration in Wildlife', presented atUniv. of Toledo College of Medicine Research Day, March 27, 2010.

D. Other Accomplishments

Preparation and submission to US. Patent office thru UT a patent application for fecal cortisol ELISA as a new stress biomarker technology .

Contribution of a chapter on immunocontraceptive chemistry to a 7-chapter document submitted by the Humane Society of the United States to the Environmental Protection Agency for commercial preparation/use permit for PZP contraceptive vaccine (Zonastat H) for use in wildlife. Submitted to EPA on Sept. 17, 2009.

Continued development and expansion of the *reefmonitor.org* website (launched by J.Turner and S. Sloan in April 2008) which we established for dissemination of knowledge regarding environmental issues facing coral reef ecosystems.

Expansion of a video miniseries on coral reef biology launched by J.Turner and S. Sloan in February 2009 through iTunes U Ohio. In 2010 we have added 4 new segments to the existing 6 in the series. The iTunes U site offers >200,000 programs, and our series has been as high as #11 in viewed programs in this list.

Initiation of the development of an on-line 200-level course in coral reef ecology in collaboration with T. Bridgeman, PhD in the UT Dept. of Environmental Science. Course completion is expected in Fall 2011.

E. Funding

Funded as PI

1) USDI Bureau of Land Management, $ 425,000 , "Controlled-release components of PZP contraceptive vaccine (wild horse fertility control project)" , 8/1/09 to 9/30/10
2) USDI-Bureau of Land Management . $ 204,543, "Development of a 3-year duration PZP contraceptive vaccine for wild horses" 10/1/04 to 12/31/09.
3) HSUS/Annenberg Foundation (private nonprofit) , $64,000 , "Wild horse fertility control vaccine in vivo testing", 12/1/06 to 12/31/10.
4) Trustus, Inc. (private nonprofit), $ 32,000 "Environmental stress in coral reef fish", 4/1/07 to 12/31/11.
Funded as CoI
1) UT Interdisciplinary Research Award, $39,667, "Lake Erie dead zone impact on sport fish", 4/1/07-12/31/09.

Submitted as PI

1) National Science Foundation, $661,575, submitted Jan.12, 2010, "Effects of chronic environmental stress on cortisol and expression of reproduction –related genes in parrotfish" 7/1/10 to 6/30/13.
2) USDI Bureau of Land Management, $ 143, 552, "PZP immunocontraception in free-reoaming wild horses (wild horse fertility control project)", 4/1/10 to 3/31/11.

Dr. Guillermo Vazquez

A. Research Interest

My lab is interested in understanding the role of calcium signaling, particularly calcium influx, in endothelial dysfunction and inflammation associated to cardiovascular, metabolic and endocrine-related diseases. One of the main subjects is the role of Transient Receptor Potential Canonical (TRPC, TRPC1-7) channels in molecular/cellular aspects of atherosclerosis. My lab has identified TRPC3 as a novel signaling player in atherogenesis showing that in coronary and aortic artery endothelium expression of TRPC3 channels is upregulated in response to pro-atherogenic stimuli and the consequent gain in TRPC3 function enhances inflammatory signaling, modulates expression of cell adhesion molecules and increases monocyte recruitment. We are also studying the role of TRPC channels in macrophage survival in the subintima, a critical event in progression of atherosclerotic lesions. The role of TRPC3/6/7 channels in oxidative stress within the context of endothelial inflammatory signaling and macrophage survival/apoptosis is also within our research interests. We use a multifaceted approach that includes biochemical and biophysical techniques applied to cultured primary endothelial cells and macrophages, and in vivo studies using mouse models of atherosclerosis to examine the in vivo relevance of TRPC channels in initiation, progression and fate of the atherosclerotic lesion.

B. Publications

- Tano JY, Smedlund K, Vazquez G. 2010. Endothelial TRPC3/6/7 Proteins at the Edge of Cardiovascular Disease. *Cardiovasc. Hematol. Agents Med. Chem.* 8, 76-86.

C. Department Presentations which include Faculty Meetings and Lectures

"Role of Endothelial Dysfunction and Inflammation in Atherosclerosis", September 2009, lecture at Dept. Physiol. And Pharmacol.

D. Achievements and Honors

- Managing Editor, Frontiers in Biosciences
- Permanent Member, Editorial Board, Frontiers in Biosciences
- Member of the Council on Atherosclerosis, Thrombosis and Vascular Diseases, American Heart Association
- Member, Network of Minority Research Investigators, NIDDK
- Invited Speaker, Southern University of the South, Bahia Blanca Argentina, February 18th 2010.

E. Funding Sources

UT-COM (Start up funds)
Scientist Development Grant, American Heart Association

Dr. Xiadong Wang

A. Research Interest

Endoplasmic reticulum (ER) is the portal for proteins entering the secretory pathway. It is estimated that roughly one third of the eukaryotic genome encodes proteins that are associated with the secretory pathway. Strict quality control mechanisms exist to ensure that cargo proteins have attained appropriate conformation for their physiological functions before reaching the cell surface. Problems arising from such quality control or the failure thereof are the bases of increasing number of human diseases including diabetes, cardiovascular diseases and cancer. Molecular chaperones play significant roles in protein quality control. The long-term objective of our research group is to elucidate the organization and regulation of the cellular machineries involved in protein quality control in the context of pathogenesis and treatment of relevant cardiovascular and metabolic diseases.

B. Publications

Roy, G., Chalfin, E.M., Saxena, A. and Wang, X. (2010) Interplay between ER exit code and domain conformation in CFTR misprocessing and rescue. Mol. Biol. Cell 21, 597-609.

C. Department Presentations which include Faculty Meetings and Lectures

Committees:
College of Medicine Graduate School Admissions Committee

Dissertation committees:
Gargi Roy (major advisor)
Anita Saxena (major advisor)

Yeshavanth Kumar Banasavadi-Siddegowda (major advisor)
Kristen Koterba (Biochemistry and Cancer Biology)
Terry Hinds (CVMD)
Kun Liu (Biochemistry and Cancer Biology)
Edward Toland (CVMD)

Teaching:
Organ Systems: 2 hrs
Grant Writing Workshop: 4 hrs
Journal Paper Review in CVMD: 10 hrs
Seminar in Cardiovascular and Metabolic Diseases (Course Director): 20 hrs
Advanced Topics in Cardiovascular and Metabolic Diseases: 2 hrs
Current Problems and Research Approaches in Cell Biology and Signaling: 2 hrs

Presentations:

1. X Wang. Membrane protein biogenesis and related human diseases. University of Toledo College of Medicine Research Day, March 27, 2010 (poster).
2. A Saxena, YK Banasavadi-Siddegowda, G Roy and X Wang. Hsp105 promotes the rescue of CFTR misprocessing by ER-associated folding and post-ER escorting. The University of Toledo Health Science Campus Graduate Research Forum, Toledo, OH, March 30, 2010 (poster).
3. A Saxena. Role of Hsp105 in CFTR biogenesis. The Inaugural Student Research Forum, Department of Physiology and Pharmacology, University of Toledo College of Medicine, June 17, 2010 (oral presentation).
4. YK Banasavadi-Siddegowda. Functional relationship between FKBP38 and Hsp90 in CFTR biogenesis. The Inaugural Student Research Forum, Department of Physiology and Pharmacology, University of Toledo College of Medicine, June 17, 2010 (poster).
5. YK Banasavadi-Siddegowda. Functional relationship between FKBP38 and Hsp90 in CFTR biogenesis. The 37th Annual Pharmacology Colloquium, East Lancing, MI, June 25, 2010 (oral presentation).

D. Achievements and Honors

1. Ph.D. student Gargi Roy passed her defense in December 2009 and moved on to her post-doctoral position in University of Michigan School of Medicine.
2. I was invited to review manuscripts for *Biochemical Journal* and *Cellular and Molecular Life Sciences*.
3. I was invited to review manuscripts for *Biochemical Journal* and *Cellular and Molecular Life Sciences*.
4. I was invited to serve on the Cystic Fibrosis Foundation's 2010 Research Development Program Review Committee.
5. Merrisa Chiu, a local high school student, conducted a research project in my laboratory and received a second-place award in a state-wide competition.
6. Hosted SURF student Tasha Johnson for summer research 2010.
7.

E. Any other notable accomplishments

Merrisa Chiu, a local high school student, conducted a research project in my laboratory and received a second-place award in a state-wide competition.

F. Funding Sources

Cystic Fibrosis Foundation (- 9/30/2009)
American Heart Association

Dr. Zi-Jian Xie

A. Research Interest

J Skou discovered Na/K-ATPase as an energy-transducing ion pump in 1957. The enzyme transports three Na^+ out and two K^+ into the cells, thus converting ATP into trans-membrane electric and chemical gradients. The enzyme also serves as a receptor for cardiotonic steroids (CTS) such as ouabain. During the last 15 years, my laboratory has demonstrated that the Na/K-ATPase has an ion-pumping independent receptor function that relays CTS binding to activation of protein kinase cascades in both renal and cardiac cells. These findings prompted us to propose that Na/K-ATPase and other membrane transporters may constitute another group of important signal transducers, working in concert with receptor tyrosine kinases and G protein-coupled receptors to regulate various cellular functions. Currently, my lab focuses on the following three basic and translational research topics. First, how do Na/K-ATPase and other transporters work as a signal transducer? Second, how do the signals generated from the receptor Na/K-ATPase integrate into the signaling network of receptor tyrosine kinases and G protein-coupled receptors, and then regulate physiological processes? Finally, can the newly discovered receptor Na/K-ATPase/Src complex be used as a new drug target?

B. Publications

1. Li, Z., Cai, T., Tian, J., Xie, J.X., Zhao, X., Liu, L., Shapiro, J.I., and Xie, Z. (2009) NaKtide, a Na/K-ATPase-derived peptide Src inhibitor, antagonizes ouabain-activated signal transduction in cultured cells. J. Biol. Chem., Epub ahead of print. PMID: 19506077

2. Wang Z, Zheng M, Li Z, Li R, Jia L, Xiong X, Southall N, Wang S, Xia M, Austin CP, Zheng W, Xie Z, Sun Y. (2009) Cardiac glycosides inhibit p53 synthesis by a mechanism relieved by Src and MAPK inhibition. Cancer Res., 69(16):6556-64

3. Li, Z., T. Cai, J. Tian, J.X. Xie, X. Zhao, L. Liu, J.I. Shapiro, and Z. Xie, NaKtide, a Na/K-ATPase-derived peptide Src inhibitor, antagonizes ouabain-activated signal transduction in cultured cells. J Biol Chem, 2009. 284(31): p. 21066-76.

C. Department Presentations which include Faculty Meetings and Lectures

1. I have presented 7 hour, 10 hour and 6 hour lectures to MS2, PA and graduate students, respectively.
2. Department of Physiology, Wayne State University “Physiological Relevance of the Receptor Na/K-ATPase and Endogenous Cardiotonic Steroids"

3. Department of Physiology, Emory University Medical School "Na/K-ATPase and the formation of signalosomes"

D. Achievements and Honors

The 8th National Conference of pediatric oncology, Wuhan, P.R. China " Old Drug as Potential Cancer Therapeutics"
Zhejiang Academy of Medical Sciences, Hanzhou, P.R.China "Targeting Na/K-ATPase signalosomes for New drug development".

E. Any other notable accomplishments

2009	MIST study section (NIH). Ad Hoc member
2005-2009	CMBK Study Section (NIH), Regular Member
2009-2010	Scientific advisor, International Workshop "Na/K-ATPase and cardiotonic steroids" Israel.
2010-1011	Member, organizing committee of 14th International Conference on p-type ATPases.

F. Funding Sources

2P01HL036573-21A1 04/01/09-03/31/14
NHLBI
Interaction of Na^+/K^+-ATPase With Its Signaling Partners – Project II (Project Leader)
This application is built upon these new discoveries and preliminary findings, and is aimed to further delineate the molecular interactions that constitute the formation of the Na/K-ATPase/Src receptor complex, and to evaluate the functionality of this receptor in digitalis-activated signal transduction.
1R01GM078565-01A1 (Xie, PI) 07/01/07-06/30/11
NIGMS
Na,K-ATPase as an Integrator of the Calcium-signaling Machinery
The major goals of this grant are to define the molecular mechanism by which the Na/K-ATPase integrates Src, PLC-γ/PKC and IP3R into a functional Ca^{2+} signaling module; to reveal the significance of protein/protein interactions in the targeting of IP3 receptors and in the ouabain-induced Ca^{2+} signaling, and to identify the plasma membrane channel(s) that interacts with the Na/K-ATPase and is responsible for ouabain-induced Ca^{2+} influx.
膜转运蛋白作为细胞信号转运功能分子和新药靶点研究 (Membrane Transporter as signal transducer and new drug target)
Ministry of Science and Technology, PR China
International Collaboration Grant
01/01/08-12/31/11
International Project Leader
"Na/K-ATPase as an Integrator of the calcium-signaling machinery"
NIH RO1 (GM 78565)
10/1/07-6/30/10

Minority Fellowship,
Sponsor

Dr. Beata Lecka-Czernik

Joint Appointment in the Department of Physiology and Pharmacology

A. Research Interest

I am investigating the effects of energy metabolism diseases on bone loss and bone fracture healing. This research, which consists of basic and pre-clinical components, will allow to develop means for prevention of bone loss and to improve fracture healing in diabetic individuals.

Current and future goals of my research:

- Testing new and established anti-diabetic therapies for their effects on skeleton;
- Testing different methods for therapeutic interventions to prevent bone loss associated with an anti-diabetic TZD therapy;
- Investigating molecular mechanisms which are responsible for age- and diabetes-related loss of marrow stem cell potential to form new bone;
- Development of methods to improve bone fracture healing in diabetic patients by means of stem cell-based and nanotechnology-based therapies;
- Comparing biomarkers signature of human bone marrow stem cells derived from diabetic and healthy individuals.

B. Publications

1. Ackert-Bicknell, C.L., Skockley, K.R., Horton, L.G., Lecka-Czernik, B., Churchill, G.A., Rosen, C.J. Strain specific effects of Rosiglitazone on bone mass, body composition and serum IGF-I. Endocrinology 150:1330-1340, 2009.
2. Shockley, K.R., Lazarenko, O.P., Czernik, P.J., Rosen, C.J., Churchill, G.A., Lecka-Czernik, B. PPARγ2 nuclear receptor controls multiple regulatory pathways of osteoblast differentiation from marrow mesenchymal stem cells. J Cell Biochem 106:232-46, 2009.
3. Huang, S., Kaw, M., Harris, M.T., Ebraheim, N., McInerney, M.F., Najjar, S.M., Lecka-Czernik, B. Decreased Osteoclastogenesis and High Bone Mass in Mice with Impaired Insulin Clearance Due to Liver-Specific Inactivation to CEACAM1. Bone 46:1138-1145, 2010. PMID: 20044046
4. Lecka-Czernik, B. PPARs in Bone: The Role in Bone Cell Differentiation and Regulation of Energy Metabolism. Curr Osteoporos Rep. 8(2):84-90, 2010. PMID: 20425615
5. Kawai M, Green CB, Horowitz M, Ackert-Bicknell C, Lecka-Czernik B, Rosen CJ. Nocturnin: a circadian target of Pparg-induced adipogenesis. Ann N Y Acad Sci. 1192(1):131-8, 2010. PMID: 20392228
6. Kawai M, Green CB, Lecka-Czernik B, Douris N, Gilbert MR, Kojima S, Ackert-Bicknell C, Garg N, Horowitz MC, Adamo ML, Clemmons DR, Rosen CJ. A circadian-regulated gene, Nocturnin, promotes adipogenesis by stimulating PPAR-gamma nuclear translocation. Proc Natl Acad Sci U S A 8;107(23):10508-13, 2010. PMID: 20498072

7. Lecka-Czernik, B. PPARγ, an essential regulator of bone mass; Metabolic and molecular cues. IBMS BoneKEy 7:187-189, 2010. http://www.bonekey-ibms.org

C. Department Presentations which include Faculty Meetings and Lectures

Pathophysiology of Skeletal System
BMSP 631/831 System Pathophysiology I
02/19/2010

D. Achievements and Honors

Awarded Order of Amaranth Award from the American Diabetes Association for her project on the effects of anti-diabetic therapies on bone

E. Any other notable accomplishments

Postdoctoral fellows presentations

Shilong Huang, MD, PhD

CONFERENCE POSTER PRESENTATIONS

Huang, S., Farhan, S., Suva, L.J., Lecka-Czernik, B. Estrogen deficiency augments TZD-induced bone loss and fat accumulation in bone in vivo. 31th Annual Meeting of the American Society for Bone and Mineral Research, Denver, CO. Published in *J Bone Miner Res* 24, 2009. Awarded Plenary Poster presentation.

Graduate students

Sima Rahman

CONFERENCE ORAL PRESENTATION

S. Rahman, P. Czernik, B. Lecka-Czernik. B-catenin sequesters PPARg2 proadipocytic activity & supports bone formation through Wnt10b & inhibition of osteoclastogenesis. *31st ASBMR Annual Meeting*, Colorado Convention Center, Denver, CO (September 2009), published in *J Bone Miner Res* 24, 2009

S. Rahman, P.Czernik, B-Lecka-Czernik. B-catenin sequesters PPARg2 proadipocytic activity. *Ohio Physiological Society 2009 Meeting*, Columbus, Ohio (October 2009)

CONFERENCE POSTER PRESENTATIONS

S. Rahman, P. Czernik, B. Lecka-Czernik. B-catenin sequesters PPARg2 proadipocytic activity & supports bone formation through Wnt10b & inhibition of osteoclastogenesis. *36th Annual Pharmacology Research Colloqium*, Wayne State University, Detroit, MI (June 2009)

Awarded First Place for her poster at the Graduate Student Forum, UTHSC March 2010

Vipula Petluru

V. Petluru, B. Lecka-Czernik. The pivotal role of Tob1 in thiazolidinedione induced bone loss. *Graduate Student Forum*, University of Toledo, Health Science Campus, Toledo OH (March 2009)

F. Funding Sources

CURRENT SUPPORT

Title of grant: R01 AG028935 "Bone loss with aging occurs due to increased PPARγγ activity in marrow stem cells"
Funding agency: NIH/NIA/NIAMS
Period of support: 08/15/06 – 07/31/11

Current year direct cost:$200,151
Principal investigator: B. Lecka-Czernik, PhD, Department of Orthopaedic Surgery, University of Toledo College of Medicine

Title of grant: N-120614 "Prevention of TZD-induced bone loss and improvement of TZD-affected bone fracture healing"
Funding agency: American Diabetes Association (Order of Amaranth Award)
Period of support: 01/01/2009 – 12/31/2012
Current year direct cost: $89,739

Principal investigator: B. Lecka-Czernik, PhD, Department of Orthopaedic Surgery, University of Toledo College of Medicine

Title of grant: "Evaluation of rabbit calvarial bone defects fillers on new bone formation by micro-computed tomography (mCT)
Funding agency: North American Science Associates, Inc.
Period of support: 06/02/2009 – 06/01/2010
Current year direct cost: $25,500

Principal investigator: B. Lecka-Czernik, PhD, Department of Orthopaedic Surgery, University of Toledo College of Medicine

Title of grant: TECH 024 "Research Cluster for Development and Evaluation of Spinal Implants"
Funding agency: Ohio Board of Regents
Period of support: 08/18/2008 - 08/17/2013

Current year direct cost: $1,907,052
Principal investigator: Vijay Goel, PhD, Department of Bioengineering, University of Toledo College of Engineering
Lecka-Czernik's Role: Co-Investigator
Title of grant: Genetics of IGF-I and Bone Density: The Role of Nocturnin
Funding agency: National Institute of Health
Period of support: 06/01/2009 – 05/31/2014

Principal investigator: Clifford Rosen, MD, Maine Research Institute, Portland, ME
Lecka-Czernik's Role: Collaborator

Title of grant: R03 DE019508 Dual release of osteogenic factors to enhance bone regeneration
Funding agency: National Institute of Health
Period of support: 09/17/2009 – 08/31/2010

Current year direct cost: $75,000
Principal investigator: Ambalangodage Jayasuriya, PhD, Department of Orthopaedic Surgery, University of Toledo, College of Medicine
Lecka-Czernik's Role: Consultant

Title of grant: Center of Excellence in Translational Health and Bioscence: Biomarker Research and Individualized Medicine (BRIM) Center
Funding agency: State of Ohio
Period of support: N/A

Current year direct cost:N/A
Principal investigator: Debra Gmerek, PhD, Associate Dean for Research, College of Medicine
Director, Jacobson Center for Clinical & Translational Research
Lecka-Czernik's Role: Co-Investigator

PENDING RESEARCH SUPPORT

Title of grant: Investigator-Initiated Research Award "Safety for bone of new and established anti-diabetic drugs"
Funding agency: Department of Defense Congressionally Directed Medical Research Programs
Period of support: 01/01/2011 - 12/31/2014

First year direct cost: $241,666
Principal investigator: B. Lecka-Czernik, PhD, Department of Orthopaedic Surgery, University of Toledo College of Medicine

Title of grant: Major Research Instrumentation: Acquisition of X-ray Microtomography and Nanotomography Scanners for Orthopedic Biomaterials Research
Funding agency: NSF
Period of support:
First year direct cost: $600,000
Principal Investigator: S. Bhaduri, PhD, Department of Bioengineering, University of Toledo College of Engineering
Lecka-Czernik"s role: Co-Investigator

Dr. Jian Tian

Joint Appointment in the Department of Physiology and Pharmacology

A. Research Interest

The major goal of my research is to study the role of Na/K-ATPase and its specific ligands in renal impairment-induced adverse cardiac outcomes. It involves the following three projects:

1) To identify the endogenous cardiotonic steroids as a risk factor for adverse cardiovascular outcomes in patients with renal artery stenosis (funded by AHA national clinical research program).
2) To study whether decrease of Na/K-ATPase potentiates the damage of cardiac and renal functions in renal ischemia animal models.
3) To study the role of signaling function of Na/K-ATPase in the above animal models.

B. Publications from July 1, 2009- April 1, 2010 only

1. Zhang, Z., Z. Li, J. Tian, W. Jiang, Y. Wang, X. Zhang, Q. You, J.I. Shapiro, S. Si, and Z. Xie, *Identification of Hydroxyxanthones as Na/K-ATPase Ligands.* Mol Pharmacol, 2010. 2010. Mar 25. [Epub ahead of print]
2. Tian, J., A. Shidyak, S.M. Periyasamy, S. Haller, M. Taleb, N. El-Okdi, J. Elkareh, S. Gupta, S. Gohara, O.V. Fedorova, C.J. Cooper, Z. Xie, D. Malhotra, A.Y. Bagrov, and J.I. Shapiro, *Spironolactone attenuates experimental uremic cardiomyopathy by antagonizing marinobufagenin.* Hypertension, 2009. 54(6): p. 1313-20.
3. Li, Z., T. Cai, J. Tian, J.X. Xie, X. Zhao, L. Liu, J.I. Shapiro, and Z. Xie, *NaKtide, a Na/K-ATPase-derived peptide Src inhibitor, antagonizes ouabain-activated signal transduction in cultured cells.* J Biol Chem, 2009. 284(31): p. 21066-76.

C. Funding Sources

Endogenous Cardiotonic Steroids, A New Risk Factor of Adverse Cardiac Events in Patients With Renal Artery Stenosis.
Funded by America Heart Association (0980027N).

College of Medicine
Faculty Effort Summary

Department: Physiology & Pharmacology
Academic Year: 2009-2010

THE UNIVERSITY OF TOLEDO
EST. 1872

Faculty	Rank	FTE	% Effort Education	Education FTE	% Effort Research	Research FTE	% Effort Clinical Service	Clinical Service FTE	% Effort Admin / UT Service	Admin / UT Service FTE
Nader G. Abraham, Ph.D., DR.H.C.	Professor & Chair	1.00	5%	0.05	25%	0.25	0%	0	70%	0.7
Amir Askari, Ph.D.	Professor	1.00	0	0.00	75%	0.75	0%	0	25%	0.25
Andrew Beavis, Ph.D.	Associate Professor	1.00	33%	0.33	0%	0.00	0%	0	67%	0.67
Paul Brand, Ph.D.	Associate Professor	0.50	86%	0.86	0%	0.00	0%	0	14%	0.14
Tamara Castaneda, Ph.D.	Assistant Professor	1.00	0%	0.00	100%	100.00	0%	0	0%	0
Joana Chakraborty, Ph.D.	Professor	1.00	60%	0.60	30%	0.30	0%	0	10%	0.1
George T. Cicila, Ph.D.	Associate Professor	1.00	30%	0.30	65%	0.65	0%	0	5%	0.05
Debra Gmerek, Ph.D.	Associate Professor	1.00	0%	0.00	0%	0.00	0%	0	100%	1
Jennifer Hill, Ph.D.	Assistant Professor	1.00	5%	0.05	80%	0.80	0%	0	15%	0.15
Bina Joe, Ph.D.	Associate Professor	1.00	10%	0.10	85%	0.85	0%	0	5%	0.05
Dong Hyun Kim, Ph.D.	Assistant Professor	1.00	0%	0.00	100%	1.00	0%	0	0%	0
Lijun Liu, M.D., M.D., M.S.	Assistant Professor	1.00	0%	0.00	90%	0.90	0%	0	10%	0.1
Ronald Mellgren, Ph.D.	Professor	1.00	35%	0.35	45%	0.45	0%	0	20%	0.2
Edith Mensah-Osman, M.D.Ph.D.	Assistant Professor	1.00	25%	0.25	65%	0.65	0%	0	10%	0.1
Patricia Metting, Ph.D.	Professor	1.00	10%	0.10	0%	0.00	0%	0	90%	0.9
Nilolai Modyanov, Ph.D.	Professor	1.00	25%	0.25	55%	0.55	0%	0	20%	0.2
Sonia Najjar, Ph.D.	Professor	1.00	15%	0.15	60%	0.60	0%	0	25%	0.25
Sandrine Pierre, Ph.D.	Assistant Professor	1.00	10%	0.10	86%	0.86	0%	0	4%	0.04
Phillip Robinson, D.V.M., M.S.	Assistant Professor	1.00	0%	0.00	0%	0.00	0%	0	100%	1
Howard Rosenberg, M.D., Ph.D.	Professor	0.70	20%	0.20	0%	0.00	0%	0	80%	0.8
Edwin Sanchez, Ph.D.	Professor	1.00	40%	0.40	55%	0.55	0%	0	5%	0.05
Elizabeth Tietz, Ph.D.	Professor	1.00	10%	0.10	65%	0.65	0%	0	25%	0.25
John Turner, Ph.D.	Professor	1.00	30%	0.30	60%	0.60	0%	0	10%	0.1
Guillermo Vazquez, Ph.D.	Assistant Professor	1.00	18%	0.18	79%	0.79	0%	0	3%	0.03
Xiaodong Wang, Ph.D.	Assistant Professor	1.00	30%	0.30	60%	0.60	0%	0	10%	0.1
Zi-Jian Xie, Ph.D.	Professor	1.00	45%	0.45	45%	0.45	0%	0	10%	0.1

The University of Toledo

Research Awards by Department and Date Range

Phys Pharm Met/Cardio Science, Department of

Title: TPR Proteins in Steroid Receptor Signaling and Physiology

Proposal #: C-100995-05
Status: Funded-X
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 7/1/2009
Budget End Date: 6/30/2011
Due Date: 5/15/2009
Award Date: 7/1/2009
Cash Report? N

Total Awarded: $235,902
Awarded Direct Cost: $176,551
Awarded Indirect Cost: $59,351

Name	College	Department	% Credit
Sanchez, Edwin	COM	Phys-Pharm	100%

Title: Post-Hypoxic Regulation of GABA-A Receptor Function

Proposal #: C-100898-05
Status: Funded-XR
Agency: National Institute of Neurological Disorders and Stroke

Budget Begin Date: 1/1/2010
Budget End Date: 12/31/2010
Due Date: 11/1/2009
Award Date: 1/1/2010
Cash Report? N

Total Awarded: $256,606
Awarded Direct Cost: $180,609
Awarded Indirect Cost: $75,997

Name	College	Department	% Credit
Greenfield, Lazar John	COM	Neurology	
Howard, Marthe	COM	Neurosci	100%

Title: Immunophillins Regulate the Export of Ion Channels from the Endoplasmic Reticulum

Proposal #: C-101479-04
Status: Funded
Agency: American Heart Association - National

Budget Begin Date: 1/1/2010
Budget End Date: 12/31/2010
Due Date: 11/1/2009
Award Date: 3/1/2010
Cash Report? N

Total Awarded: $65,000
Awarded Direct Cost: $59,091
Awarded Indirect Cost: $5,909

Name	College	Department	% Credit
Wang, Xiaodong	COM	Phys-Pharm	100%

Title: Receptor Dependent Regulation of Calcium Permeable TRPC1 and TRPC3 Cation Channels in Human Coronary Artery Endothelium

Proposal #: C-101555-04
Status: Funded
Agency: American Heart Association - National

Budget Begin Date: 4/1/2010
Budget End Date: 3/31/2011
Due Date: 3/1/2010
Award Date: 4/1/2010
Cash Report? N

Total Awarded: $65,000
Awarded Direct Cost: $59,091
Awarded Indirect Cost: $5,909

Name	College	Department	% Credit
Vazquez, Guillermo	COM	Phys-Pharm	100%

The University of Toledo

Research Awards by Department and Date Range

Phys Pharm Met/Cardio Science, Department of

Title: Na,K-ATPase as an Integrator of the Calcium Signaling Machinery

Proposal #: C-101353-03
Status: Expired
Agency: National Institute of General Medical Sciences

Budget Begin Date: 7/1/2009
Budget End Date: 6/30/2010
Due Date: 6/30/2009
Award Date: 7/1/2009
Cash Report? N

Total Awarded: $295,008
Awarded Direct Cost: $200,236
Awarded Indirect Cost: $94,772

Name	College	Department	% Credit
Giovannucci, David	COM	Neurosci	
Liu, Jiang	COM	Medicine	
Xie, Zi-Jian	COM	Phys-Pharm	100%

Title: CEACAM2: A Novel Mechanism of Diabetes and Complications

Proposal #: C-101576-03
Status: Expired
Agency: American Diabetes Association-National

Budget Begin Date: 7/1/2009
Budget End Date: 6/30/2010
Due Date: 4/30/2009
Award Date: 9/2/2009
Cash Report? N

Total Awarded: $25,800
Awarded Direct Cost: $25,800
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Liu, Jehnan	COM	Phys-Pharm	100%

Title: PZP Contraceptive Vaccine Pellet-related Studies

Proposal #: N-120280-01
Status: Funded
Agency: Annenberg Foundation through Humane Society of U.S.

Budget Begin Date: 12/21/2007
Budget End Date: 12/20/2010
Due Date: 12/20/2007
Award Date: 2/1/2008
Cash Report? Y

Total Awarded: $20,000
Awarded Direct Cost: $20,000
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Turner, John	COM	Phys-Pharm	100%

Title: Genetics of Hypertension

Proposal #: C-100836-02
Status: Expired
Agency: National Heart, Lung & Blood Institute

Budget Begin Date: 8/1/2009
Budget End Date: 7/31/2010
Due Date: 4/28/2009
Award Date: 8/3/2009
Cash Report? N

Total Awarded: $468,353
Awarded Direct Cost: $315,815
Awarded Indirect Cost: $152,538

Name	College	Department	% Credit
Joe, Bina	COM	Phys-Pharm	100%

The University of Toledo

Research Awards by Department and Date Range

Phys Pharm Met/Cardio Science, Department of

Title: Dysregulation of Innate Immune Responses by Borrelia burgdorferi: A Role for IL-10

Proposal #: C-101467-03
Status: Funded
Agency: National Institute of Allergy & Infectious Diseases

Budget Begin Date: 6/1/2010
Budget End Date: 5/31/2011
Due Date: 3/1/2010
Award Date: 6/30/2010
Cash Report? N

Total Awarded: $367,043
Awarded Direct Cost: $247,500
Awarded Indirect Cost: $119,543

Name	College	Department	% Credit
Weaver, David	COM	Phys-Pharm	
Wooten, Ronald Mark	COM	Med Micro & Imm	100%
Worth, Randall G.	COM	Med Micro & Imm	

Title: Role of Calpains in Plasma Membrane Repair

Proposal #: C-101406-02
Status: Funded-X
Agency: National Institute of Arthritis & Musculoskeletal & Skin Diseases

Budget Begin Date: 8/1/2009
Budget End Date: 7/31/2011
Due Date: 4/30/2009
Award Date: 8/1/2009
Cash Report? N

Total Awarded: $162,810
Awarded Direct Cost: $112,845
Awarded Indirect Cost: $49,965

Name	College	Department	% Credit
McNeil, Anna			
McNeil, Paul L.			
Mellgren, Ronald	COM	Phys-Pharm	100%

Title: Insulin Resistance in the Pathogenesis of NASH

Proposal #: N-120642-01-A1
Status: Expired
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 9/30/2009
Budget End Date: 8/31/2010
Due Date: 12/19/2008
Award Date: 9/29/2009
Cash Report? N

Total Awarded: $374,500
Awarded Direct Cost: $250,000
Awarded Indirect Cost: $124,500

Name	College	Department	% Credit
Najjar, Sonia	COM	Phys-Pharm	100%

Title: The Role of CEACAM1 in the Regulation of Cardiac Fatty Acid Metabolism

Proposal #: N-121012-01
Status: Expired
Agency: American Heart Association - Great Rivers Affiliate

Budget Begin Date: 7/1/2009
Budget End Date: 6/30/2010
Due Date: 2/4/2009
Award Date: 7/1/2009
Cash Report? N

Total Awarded: $43,000
Awarded Direct Cost: $43,000
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Morgan, Eric E.	COM	Phys-Pharm	100%

Title: Hypothalamic Leptin and Insulin Signals Aligning Metabolic State and Fertility

Proposal #: T-121161-02
Status: Expired
Agency: National Institute of Child Health & Human Development

Budget Begin Date: 7/20/2009
Budget End Date: 5/31/2010
Due Date: 4/1/2009
Award Date: 7/1/2009
Cash Report? N

Total Awarded: $248,999
Awarded Direct Cost: $166,221
Awarded Indirect Cost: $82,778

Name	College	Department	% Credit
Hill, Jennifer E.W.	COM	Phys-Pharm	100%

Title: Genetic Elements Controlling Blood Pressure

Proposal #: C-010310-33
Status: Funded
Agency: National Heart, Lung & Blood Institute

Budget Begin Date: 4/1/2010
Budget End Date: 3/31/2011
Due Date: 3/5/2009
Award Date: 4/12/2010
Cash Report? N

Total Awarded: $564,433
Awarded Direct Cost: $376,791
Awarded Indirect Cost: $187,642

Name	College	Department	% Credit
Joe, Bina	COM	Phys-Pharm	100%

Title: TPR Proteins in Steroid Receptor Signaling and Physiology

Proposal #: S-100995-05-S1
Status: Expired
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 9/19/2009
Budget End Date: 6/30/2010
Due Date: 4/17/2009
Award Date: 9/19/2009
Cash Report? N

Total Awarded: $58,425
Awarded Direct Cost: $58,425
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Sanchez, Edwin	COM	Phys-Pharm	100%

Title: CEACAM and Insulin Action

Proposal #: S-010991-08-S1
Status: Expired
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 9/25/2009
Budget End Date: 2/28/2010
Due Date: 4/17/2009
Award Date: 9/21/2009
Cash Report? N

Total Awarded: $50,000
Awarded Direct Cost: $33,378
Awarded Indirect Cost: $16,622

Name	College	Department	% Credit
Castaneda, Tamara R.	COM	Phys-Pharm	
Najjar, Sonia	COM	Phys-Pharm	100%

Title: Digitalis-Induced Signaling by Cardiac Na+/K+-ATPase

Proposal #: C-010087-22
Status: Funded
Agency: National Heart, Lung & Blood Institute

Budget Begin Date: 4/1/2010
Budget End Date: 3/31/2011
Due Date: 5/25/2009
Award Date: 4/16/2010
Cash Report? N

Total Awarded: $1,411,019
Awarded Direct Cost: $1,046,027
Awarded Indirect Cost: $364,992

Name	College	Department	% Credit
Askari, Amir	COM	Phys-Pharm	100%
Garlid, Keith			
Liu, Lijun	COM	Phys-Pharm	
Pierre, Sandrine V.	COM	Phys-Pharm	
Xie, Zi-Jian	COM	Phys-Pharm	

Title: Dietary and Genetic Risk Factors in Obesity and Diabetes

Proposal #: C-120474-02
Status: Expired
Agency: U.S. Department of Agriculture

Budget Begin Date: 8/1/2009
Budget End Date: 7/31/2010
Due Date: 6/1/2009
Award Date: 7/24/2009
Cash Report? N

Total Awarded: $324,231
Awarded Direct Cost: $252,900
Awarded Indirect Cost: $71,331

Name	College	Department	% Credit
McInerney, Marcia	PHM	MCHE	50%
Najjar, Sonia	COM	Phys-Pharm	50%

Title: PZP Immunocontraception in Free-roaming Feral Horses

Proposal #: S-100902-01-S6
Status: Expired
Agency: Bureau of Land Management

Budget Begin Date: 8/1/2009
Budget End Date: 9/30/2010
Due Date: 8/21/2009
Award Date: 9/1/2009
Cash Report? N

Total Awarded: $425,000
Awarded Direct Cost: $337,302
Awarded Indirect Cost: $87,698

Name	College	Department	% Credit
Turner, John	COM	Phys-Pharm	100%

Title: ASPET Surf Fellowship

Proposal #: N-120742-01-A1
Status: Funded
Agency: American Society for Pharmacology and Experimental Therapeutics

Budget Begin Date: 5/15/2010
Budget End Date: 5/14/2011
Due Date: 10/1/2009
Award Date: 5/15/2010
Cash Report? N

Total Awarded: $9,000
Awarded Direct Cost: $9,000
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Askari, Amir	COM	Phys-Pharm	
Gartland, Kelly Catherine			
Joe, Bina	COM	Phys-Pharm	
Liu, Lijun	COM	Phys-Pharm	
Lombardo, Steven A.			
Miller, Cassie L.			
Patel, Amit			
Pierre, Sandrine V.	COM	Phys-Pharm	
Tietz, Elizabeth	COM	Phys-Pharm	100%
Yamamoto, Bryan K.	COM	Neurosci	

Title: Oxidative Stress and Vascular HO in Diabetes

Proposal #: T-121624-05
Status: Expired
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 10/16/2009
Budget End Date: 7/31/2010
Due Date: 11/1/2009
Award Date: 2/11/2010
Cash Report? N

Total Awarded: $241,803
Awarded Direct Cost: $161,417
Awarded Indirect Cost: $80,386

Name	College	Department	% Credit
Abraham, Nader G.	COM	Phys-Pharm	100%

Title: Novel Method Protecting Infants From HIV in Breast Milk

Proposal #: N-121635-01
Status: Expired
Agency: Bill and Melinda Gates Foundation through Lavax

Budget Begin Date: 11/1/2009
Budget End Date: 10/31/2010
Due Date: 10/31/2009
Award Date: 1/4/2010
Cash Report? N

Total Awarded: $33,000
Awarded Direct Cost: $33,000
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Chakraborty, Joana	COM	Phys-Pharm	100%
Duggan, Joan	COM	Medicine	

Research Awards by Department and Date Range

Phys Pharm Met/Cardio Science, Department of

Title: An Approach to Reduce the Mother to Offspring Retroviral Transmission

Proposal #: N-121708-01
Status: Funded-XR
Agency: F.M. Douglass Foundation

Budget Begin Date: 1/1/2010
Budget End Date: 12/31/2010
Due Date: 12/1/2009
Award Date: 1/5/2010
Cash Report? N

Total Awarded: $9,000
Awarded Direct Cost: $9,000
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Chakraborty, Joana	COM	Phys-Pharm	100%

Title: Hormonal Regulation of Blood Pressure

Proposal #: T-121714-01
Status: Expired
Agency: National Heart, Lung & Blood Institute through New York Medical College

Budget Begin Date: 10/15/2009
Budget End Date: 8/31/2010
Due Date: 10/14/2009
Award Date: 3/2/2010
Cash Report? N

Total Awarded: $159,138
Awarded Direct Cost: $106,234
Awarded Indirect Cost: $52,904

Name	College	Department	% Credit
Abraham, Nader G.	COM	Phys-Pharm	100%
Kim, Dong Hyun			

Title: Oxidative Stress and Vascular HO in Diabetes

Proposal #: S-121624-05-S1
Status: Expired
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 3/15/2010
Budget End Date: 7/31/2010
Due Date: 10/14/2009
Award Date: 3/15/2010
Cash Report? N

Total Awarded: $52,645
Awarded Direct Cost: $52,645
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Abraham, Nader G.	COM	Phys-Pharm	100%

Title: Heme Oxygenase Regulation of Eicosanoid Biosynthesis

Proposal #: T-121732-10-A1
Status: Funded
Agency: National Institutes of Health

Budget Begin Date: 6/1/2010
Budget End Date: 5/31/2011
Due Date: 3/1/2010
Award Date: 6/1/2010
Cash Report? N

Total Awarded: $374,500
Awarded Direct Cost: $250,000
Awarded Indirect Cost: $124,500

Name	College	Department	% Credit
Abraham, Nader G.	COM	Phys-Pharm	100%

Title: Regulation of Voltage-gated Calcium Channels During Chronic BZ Treatment in Rats

Proposal #: C-120629-02
Status: Funded
Agency: National Institute on Drug Abuse

Budget Begin Date: 4/1/2010
Budget End Date: 3/31/2011
Due Date: 2/1/2010
Award Date: 4/1/2010
Cash Report? N

Total Awarded: $35,586
Awarded Direct Cost: $35,586
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Earl, Damien E.	COM	Phys-Pharm	100%

Title: Dietary and Ginetic Risk Factors in Obesity and Diabetes

Proposal #: C-120474-03
Status: Funded
Agency: U.S. Department of Agriculture

Budget Begin Date: 5/1/2010
Budget End Date: 4/30/2011
Due Date: 1/19/2010
Award Date: 4/12/2010
Cash Report? N

Total Awarded: $324,230
Awarded Direct Cost: $254,659
Awarded Indirect Cost: $69,571

Name	College	Department	% Credit
McInerney, Marcia	PHM	MCHE	51%
Najjar, Sonia	COM	Phys-Pharm	49%
Pinto, Sharrel Lilly	PHM	PRAC	0%

Title: Fatty Acids Control Obesity and the Metabolic Syndrome via TPR Proteins

Proposal #: C-120462-02
Status: Funded
Agency: National Institute of Diabetes, Digestive & Kidney Diseases

Budget Begin Date: 4/13/2010
Budget End Date: 4/12/2011
Due Date: 2/1/2010
Award Date: 4/13/2010
Cash Report? N

Total Awarded: $34,380
Awarded Direct Cost: $34,380
Awarded Indirect Cost: $0

Name	College	Department	% Credit
Hinds, Terry D.	OTH	Col Grad Stds	100%

Title: Hypothalamic Leptin and Insulin Signals Aligning Metabolic State and Fertility

Proposal #: C-121161-03
Status: Funded
Agency: National Institute of Child Health & Human Development

Budget Begin Date: 6/1/2010
Budget End Date: 5/31/2011
Due Date: 4/1/2010
Award Date: 6/1/2010
Cash Report? N

Total Awarded: $246,509
Awarded Direct Cost: $164,559
Awarded Indirect Cost: $81,950

Name	College	Department	% Credit
Hill, Jennifer E.W.	COM	Phys-Pharm	100%

The University of Toledo

Research Awards by Department and Date Range

Phys Pharm Met/Cardio Science, Department of

Report Selection Parameters
Department Code: 01398
Starting Date: 7/1/2009
Ending Date: 6/30/2010

Report Description: This report displays research awards by department between start and end dates selected by the user.

Developer: Dan Kall

Total Awarded: $6,357,271

College of Medicine
Educational Value Units

THE UNIVERSITY OF TOLEDO
EST. 1872

Department: Physiology & Pharmacology

Academic Year: 2009-2010

	Reported		Value Units	Total
1. Classroom lecture hours - M.D. Program Years 1 & 2	206	X	10.0	2,055.0
2. Small group instruction/facilitiation - M.D. Program Years 1 & 2	70	X	3.0	210.0
3. Other small group instruction/facilitation hours - M.D. Program Years 1 & 2	-	X	10.0	-
4. Classroom lecture hours - M.D. Program Year 3	-	X	5.0	-
5. Number of M.D. student clerkship (required) weeks at UTMC sites	-	X	5.0	-
6. Number of M.D. student clerkship (elective) weeks at UTMC sites	-	X	5.0	-
7. Block and Clerkship Directors				
(a) Number of faculty that are block directors	2	X	200.0	400.0
(b) Number of contact hours scheduled in block of director(s)	576	X	1.0	576.0
(c) Number of faculty that are required clerkship directors	-	X	900.0	-
8. Curriculum and Admission Committee participation				
(a) Number of faculty on the Executive, Clinical & Preclinical Curriculum Committees (attendance >75%)	4	X	30.0	120.0
(b) Number of faculty on the Admission Committee (attendance >75%)	2	X	125.0	250.0
(c) Number of medical student candidate interviews conducted by department faculty	132	X	3.0	396.0
9. Educational scholarship and publications				
(a) Number of peer-reviewed articles published	71	X	50.0	3,550.0
(b) Books published (edited)	-	X	75.0	-
(c) Books published (authored)	1	X	150.0	150.0
(d) Number of education presentations (keynote, plenary, abstract-based) - regional & national meeting	97	X	15.0	1,455.0
10. Classroon instructional hours - non-M.D. programs	326	X	10.0	3,260.0
11. Number of Student Mentorships - PhD and MSBS	30	X	250.0	7,500.0
12. Number of resident FTEs in department program(s)	-	X	25.0	-
Total Educational Value Units				**19,922.0**