

Division Data Summary

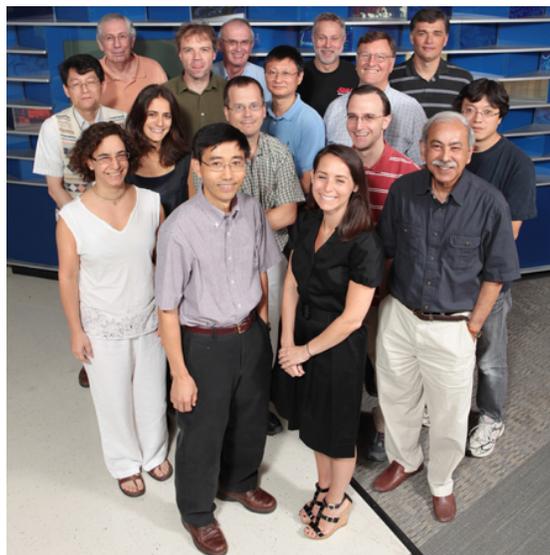
Research and Training Details

Number of Faculty	24
Number of Joint Appointment Faculty	10
Number of Research Fellows	52
Number of Research Students	32
Number of Support Personnel	42
Direct Annual Grant Support	\$7,568,608
Direct Annual Industry Support	\$62,761
Peer Reviewed Publications	100

Clinical Activities and Training

Number of Clinical Fellows	3
Number of Other Students	22

Division Photo



Row 1: R Jiang, S Brugmann, SK Dey
Row 2: T Cook, G Guasch, J Wells, R Waclaw, Y Yoshida
Row 3: M Nakafuku, B Gebelein, J Ma, C Wylie
Row 4: D Wiginton, J Lessard, S Potter, V Kalinichenko

Significant Publications

Katayama K, Melendez J, Baumann JM, Leslie JR, Chauhan BK, Nemkul N, Lang RA, Kuan CY, Zheng Y, Yoshida Y. **Loss of RhoA in neural progenitor cells causes the disruption of adherens junctions and hyperproliferation.** *Proc Natl Acad Sci U S A*. [Research Support, Non-U.S. Gov't]. 108(18):7607-12. May 3, 2011.

Pei Z, Wang B, Chen G, Nagao M, Nakafuku M, Campbell K. **Homeobox genes Gsx1 and Gsx2 differentially regulate telencephalic progenitor maturation.** *Proc Natl Acad Sci U S A*. [Research Support, N.I.H., Extramural]. 108(4):1675-80. Jan 25, 2011.

Spence JR, Mayhew CN, Rankin SA, Kuhar MF, Vallance JE, Tolle K, Hoskins EE, Kalinichenko VV, Wells SI, Zorn AM, Shroyer NF, Wells JM. **Directed differentiation of human pluripotent stem cells into intestinal tissue in vitro.** *Nature*. [Research Support, N.I.H., Extramural; Research Support, Non-U.S. Gov't]. 470(7332):105-9. Feb 3, 2011.

Lin SC, Wani MA, Whitsett JA, Wells JM. **Klf5 regulates lineage formation in the pre-implantation mouse embryo.** *Development*. [Research Support, N.I.H., Extramural; Research Support, Non-U.S. Gov't]. 137(23):3953-63. Dec 2010.

Runck LA, Kramer M, Ciruolo G, Lewis AG, Guasch G. **Identification of epithelial label-retaining cells at the transition between the anal canal and the rectum in mice.** *Cell Cycle*. [Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.]. 9(15):3039-45. Aug 1, 2010.

Division Highlights

Developmental Biology and Plastic Surgery

The divisions of Plastic Surgery and Developmental Biology have established a new interdivisional Center for Cranio-Facial Development. Drs. Rulang Jiang (Professor) and Samantha Brugmann (Assistant Professor) have been recruited from the University of Rochester Medical Center and Stanford University, respectively, to establish this research group.

Developmental Biology and Urology

The divisions of Pediatric Urology and Developmental Biology have jointly recruited Dr. Joo-Seop Park, from Harvard University. Dr. Park will work on the development of the urinary tract.

Christopher Wylie

Chris Wylie was awarded the Waddington Medal by the British Society for Developmental Biology. The medal is awarded for *“outstanding research performance as well as services to the research community”*.

Midwest Society for Developmental Biology Meeting

The Midwest regional meeting of the Society for Developmental Biology was hosted by CCHMC in May 2010. The local committee; Vladimir Kalinichenko (Neonatology/Pulmonary Biology), Vaughn Cleghon (Developmental Biology), Deborah Sinner (Neonatology/Pulmonary Biology), and Nadean Brown (Chair, Developmental Biology), did an outstanding job. The meeting was a great success, and attracted the largest audience ever for this regional meeting.

Trainee accomplishments

Trainees in the division gained some significant awards this year. Jason Spence (postdoctoral fellow, Wells lab) gained an NIH career transition award. Ying Gu (graduate student, Wylie/Heasman lab) gained a Ryan Fellowship, the most prestigious University award for graduate students. Jennifer Tucker (postdoctoral fellow, Chuang lab) gained an American Cancer Society Postdoctoral Fellowship. Kate Maurer (graduate student, Brown lab) gained a Young Investigator Student Fellowship Award for Female Scholars in Vision Research, from Prevent Blindness Ohio. Xiaofei Sun (postdoctoral fellow, Dey lab) was awarded a Lalor Foundation Postdoctoral Fellowship. Alejandro Lopez Juarez (postdoctoral fellow, Nakafuku lab) gained a postdoctoral fellowship from the National Science and Technology Board of Mexico. Andrea Pardo (neurology resident trainee, Nakafuku lab) gained an Outstanding Junior Member Award from the Child Neurology Society. We are very proud of our trainees, whose awards indicate the increasing strength in depth of the developmental biology matrix.

Geraldine Guasch

Geraldine Guasch, a young faculty member in the division, gained a prestigious Sydney Kimmel Scholar's award, one of only fifteen awarded in the USA for her work in cancer research. Geraldine is the first Kimmel awardee at CCHMC. Geraldine also gained a Basil O'Connor Starter Scholar Award from the March of Dimes.

Samantha Brugmann

Samantha Brugmann, a new faculty member Plastic Surgery/Developmental Biology, gained an NIH Pathway to Independence (PI) award (K99/R00).

Tiffany Cook

Tiffany Cook (Ophthalmology/Developmental Biology) gained an Outstanding Achievement Award from the Schmidlapp Women Scholars Program at CCHMC.

Division Collaboration

Pediatric Ophthalmology » Tiffany Cook

Conserved and divergent mechanisms of lens development with Nadean Brown

Molecular Cardiovascular Biology » Katherine Yutzey

Notch mutations that cause congenital eye, heart and liver defects with Nadean Brown

Experimental Hematology » Ronald Waclaw

Molecular mechanisms of amygdalar development with Kenneth Campbell

Colorectal Center » Alberto Pena; Marc Levitt

Defining the nature of the epithelium of persistent cloacas in human with Geraldine Guasch

Pathology and Laboratory Medicine » Keith Stringer

Defining the nature of the epithelium of persistent cloacas in human. Characterizing the role of stem cells in a mouse model of transitional epithelia tumor with Geraldine Guasch

Urology » Shumyle Alam

Defining the nature of the epithelium of persistent cloacas in human with Geraldine Guasch

Anesthesiology » Steve Danzer

Roles of postnatal neural stem cells and epilepsy with Alex Kuan

Experimental Hematology » Yi Zheng

Roles of small GTPases in mammalian brain development with Alex Kuan

Neurology » Mark Schapiro

Roles of S1P receptor signaling in perinatal brain injury with Alex Kuan

Pulmonary Biology » John Shannon and James Bridges

Roles of HIF1 signaling in oligodendrocytes and perinatal white-matter injury with Alex Kuan

Radiology » Diana Lindquist

Diffusion tensor imaging and white-matter protection in stroke with Alex Kuan

Pediatric Bioinformatics » Bruce Aronow

Gene expression and function in the developing mouse lower urinary tract with James Lessard

Pulmonary Biology » John Shannon

Smooth muscle formation in the developing mouse lung with James Lessard

Pulmonary Biology » Jeffrey Whitsett

Role of Klf5 in bladder urothelial development and repair with James Lessard

Experimental Hematology » Nancy Ratner

Molecular mechanism for myelin formation in the postnatal brain with Masato Nakafuku

Experimental Hematology » Ronald Waclaw

Molecular mechanism underlying white matter injury in premature brains with Masato Nakafuku

Biomedical Informatics » Bruce Aronow

GUDMAP and FACEBASE projects with Steve Potter

Nephrology » Prasad Devarajan

Role of Hox genes in uterine biology with Steve Potter

Biomedical Informatics; Plastic Surgery » Bruce Aronow; Christopher Gordon

Micro RNA role in craniofacial development with Saulius Sumanas

Hematology/Oncology » Denise Adams

Investigating genetic mechanisms of vascular disorders in children with Saulius Sumanas

Oncology » Timothy Cripe

Inhibiting tumor growth in a zebrafish model with Saulius Sumanas

Endocrinology » Stuart Handwerker

Wnt pathway function in placental development with James Wells

Gastroenterology » Noah Shroyer

Function of human intestinal tissue from Pluripotent Stem Cells with James Wells

Hematology/Oncology » Susanne Wells

Reprogramming pathways mediated by HPV oncogenes with James Wells

Infectious Diseases » Jason Jiang

Norovirus growth in human intestinal tissue from Pluripotent Stem Cells with James Wells

Ophthalmology » Richard Lang

Role of macrophage-derived Wnt ligands in beta cell regeneration with James Wells

Pediatric Surgery » Michael Helmraath

Function of human intestinal tissue from Pluripotent Stem Cells in vivo with James Wells

Pulmonary Biology » Jeffrey Whitsett

Directed differentiation of Pluripotent Stem Cells into respiratory lineages with James Wells

Orthopedics » Roger Cornwall

Intercellular signaling pathways active during and after growth and differentiation of lumbar vertebral growth plate with Christopher Wylie

Experimental Hematology » Nancy Ratner

EM analysis of sensory-motor connections with Yutaka Yoshida

Experimental Hematology » Yi Zheng

Roles of Rho GTPases in nervous system with Yutaka Yoshida

Pediatric Ophthalmology » Richard Lang

Roles of wntless in sensory-motor connections with Yutaka Yoshida

Gastroenterology » Noah Shroyer

Digestive system development with Aaron Zorn

Pulmonary Biology » Jeffrey Whitsett

Lung development and repair with Aaron Zorn

Faculty Members

Christopher C. Wylie, PhD, Professor

Director; Associate Chair for Basic Science

Research Interests Early Vertebrate Development, Xenopus, Mammal

Nadean Brown, PhD, Associate Professor

Research Interests Eye Development, Mouse And Drosophila

Kenneth Campbell, PhD, Professor

Director, Molecular and Developmental Biology Graduate Program; Associate Director

Research Interests CNS Patterning, Mammal

Chieh Chang, PhD, Assistant Professor

Research Interests Nervous System, C. Elegans

Chiou-Fen Chuang, PhD, Assistant Professor

Research Interests Nervous System, C. Elegans, Laterality

Vaughn Cleghon, PhD, Associate Professor

Research Interests Kinase Function In Development, Signaling

Brian Gebelein, PhD, Assistant Professor

Research Interests Transcriptional Regulation, Drosophila, Body Patterning, Nervous System

Geraldine Guasch, PhD, Assistant Professor

Research Interests Stem Cells in Epithelial Tissues and Their Role in Tumorigenesis, Transitional Epithelium and Anorectal Malformations

Janet Heasman, PhD, Professor

Research Interests Early Vertebrate Development, Xenopus

Rashmi S. Hegde, PhD, Professor

Research Interests Protein Structure/Function

J. Matthew Kofron, PhD, Assistant Professor

Research Interests Imaging Manager, Ectodermal Organ Development In Vertebrates, Xenopus

Chia-Yi Kuan, MD, PhD, Associate Professor

Research Interests Nervous System Patterning, Stroke, Cell Death, Mammal

James L. Lessard, PhD, Professor

Research Interests Muscle Development, Mammal

Hung-Chi Liang, PhD, Instructor

Research Interests Affymetrix Core Manager

Xinhua Lin, PhD, Professor

Research Interests Cell Signaling, Drosophila

Christopher Mayhew, PhD, Assistant Professor

Co-Director, Stem Cell Core

Research Interests Human ES Biology and Differentiation

Masato Nakafuku, MD, PhD, Professor

Research Interests Nervous System Patterning And Stem Cells, Mammal

S. Steven Potter, PhD, Professor

Director, Affymetrix Core

Research Interests Transcription Regulation And Kidney Development, Mammal

Jason Spence, PhD, Assistant Professor

Research Interests Vertebrate Gut Development, Stem Cells

Saulius Sumanas, PhD, Assistant Professor

Research Interests Vascular Development, Zebrafish

James M. Wells, PhD, Associate Professor

Co-Director, Stem Cell Core

Research Interests Vertebrate Gut Development, Stem Cells, Mammal

Dan A. Wiginton, PhD, Associate Professor

Research Interests Gut Differentiation, Mammal

Yutaka Yoshida, PhD, Assistant Professor

Research Interests Nervous System, Cell Migration, Mammal, Chicken

Aaron Zorn, PhD, Associate Professor

Research Interests Vertebrate Gut Development, Xenopus, Mammal

Joint Appointment Faculty Members

Bruce Aronow, PhD, Professor

Pediatric Bioinformatics

Research Interests Bioinformatics

Samantha Brugmann, PhD, Assistant Professor

Plastic Surgery

Research Interests Molecular Basis for Craniofacial Development and Disease

Tiffany Cook, PhD, Assistant Professor

Pediatric Ophthalmology

Research Interests Eye Development, Drosophila

Sudhansu Dey, PhD, Professor

Director, Reproductive Sciences

Research Interests Reproductive Biology

Prasad Devarajan, MD, Professor

Director, Nephrology and Hypertension

Research Interests Urinary Tract Differentiation, Mammal

Vladimir Kalinichenko, MD PhD, Associate Professor

Pulmonary Biology and Neonatology

Research Interests Transcriptional Regulation of Lung Embryonic Development

Richard A. Lang, PhD, Professor

Director, Transgenic Core Facility, Pediatric Ophthalmology

Research Interests Visual System Development, Mammal

Jun Ma, PhD, Professor

Pediatric Bioinformatics

Research Interests Transcriptional Regulation, Drosophila

Noah F. Shroyer, PhD, Assistant Professor

Gastroenterology, Hepatology, and Nutrition

Research Interests Vertebrate Gut Development, Mammal

Jeffrey A. Whitsett, MD, Professor

Chief, Section of Neonatology, Perinatal, and Pulmonary Biology

Research Interests Respiratory System, Mammal

Trainees

- Chitra Dahia*, PhD, Facult, Indian Institute of Science
- Larry Patterson, MD, Facult, College of Medicine of Pennsylvania State University, Assoc. Prof., Nephrology (end 6/30/11)
- Pramod Reddy, MBBS, Facult, Guntur Medical College and Siddhartha, Assoc. Prof., Urology
- Kei-Ichi Katayama, PhD, DVM, Vis Re, University of Tokyo
- Tatyana Belenkaya, PhD, Res. A, Russian Academy of Science
- Eric Brunskill, PhD, Res. A, University of Maryland
- Sang-Wook Cha, PhD, Res. A, Kyungpook National University, Korea
- Bharesh Chauhan*, PhD, Res. A, Oxford University, United Kingdom
- Lisa Ehrman, PhD, Res. A, University of Cincinnati (end 2/25/11)
- Christina James-Zorn, PhD, Res. A, University of Queensland, Australia
- Guoqing Lin, PhD, Res. A, University of Luebeck, Germany (end 2/25/11)
- Junbo Lui*, PhD, Res. A, Fudan University
- Adrian McNairn, PhD, Res. A, SUNY Upstate Medical University (end 6/3/11)
- Motoshi Nagao, PhD, Res. A, Tokyo Institute of Technology (end 9/9/10)
- Virgilio Ponferrada, PhD, Res. A, Wright State University
- Sujata Rao*, PhD, Res. A, Cornell University
- Emmanuel Tadjuidje, PhD, Res. A, University of Goettengen, Germany
- Huirong Xie*, PhD, Res. A, Vanderbilt University
- Dianer Yang, PhD, Res. A, Chinese Academy of Sciences
- Sivan Bezalel*, PhD, Res. F, University Medical School, Isreal
- Kevin Burns, PhD, Res. F, University of Cincinnati
- Yuqi Cai, PhD, Res. F, Zhejiang University School of Medicine, Taiwan
- Zheng Chen, PhD, Res. F, University of Groningen, Germany
- Jun-Huei Fan, PhD, Res. F, University of Texas, Dallas (end 1/14/11)
- Amy Gresser, PhD, Res. F, Harvard University
- Jing-Fen Han, PhD, Res. F, University of Medicine and Dentistry of New Jersey (end 1/14/11)
- Yi-Wen Hsieh, PhD, Res. F, University of California, Los Angeles
- Fumiyasu Imai, PhD, Res. F, Yokohama City University of Medicine, Japan
- Maximiliano Jimenez-Dalmaroni, PhD, Res. F, University of Oxford, UK
- Avedis Kazanjian*, PhD, Res. F, University of Louisville
- Vikram Kohli, PhD, Res. F, University of Alberta, Canada
- Suh-Chin Lin, PhD, Res. F, University of Texas Health Sciences, San Antonio (end 12/30/10)
- Chia-Feng Liu, PhD, Res. F, University of Chicago at Urbana
- Alejandro Lopez Juarez, PhD, Res. F, University of Mexico
- Mayur Madhavan, PhD, Res. F, Miami University
- Sumathra Manokaran, PhD, Res. F, North Dakota State University
- Paloma Merchan Sala, PhD, Res. F, University of Murcia, Spain
- Myung-Soon Moon, PhD, Res. F, University of Wisconsin-Madison
- Sumeda Nandadasa, PhD, Res. F, University of Cincinnati
- Athanasia Nikolaou, PhD, Res. F, University of Melbourne, Australia

- Taeko Noah*, PhD, Res. F, University of Nevada
- Timothy Plageman*, PhD, Res. F, University of Cincinnati
- Anna Raines, PhD, Res. F, University of Wisconsin
- Latasha Redmond, PhD, Res. F, Virginia Commonwealth University
- Emily Shifley, PhD, Res. F, Ohio State University
- Jason Spence, PhD, Res. F, Miami University, Ohio (end 3/31/11)
- Xiaofei Sun*, PhD, Res. F, Vanderbilt University
- Yu-Yo Sun, PhD, Res. F, Taipei Medical University, Taiwan
- Kaori Takeshima, PhD, Res. F, Miyazaki University, Japan (end 5/11/11)
- Jun Tang, PhD, Res. F, Third Military Medical University, China
- Jennifer Tucker, PhD, Res. F, University of Pennsylvania
- Ronald Waclaw, PhD, Res. F, University of Cincinnati (end 8/31/11)
- Baotang Xie*, PhD, Res. F, Chinese Academy of Sciences
- Ying Ye, PhD, Res. F, University of Pennsylvania (end 1/16/11)
- Eun-Jin Yeo*, PhD, Res. F, Seoul National University, South Korea
- Yan Zou, PhD, Res. F, Chinese Academy of Sciences
- Jonathan Howell, MD PhD, Clin. , Indiana University
- Alan Kenny, MD PhD, Clin. , University of Rochester, School of Medicine and Dentistry
- Andrea Pardo, MD, Clin. , Johns Hopkins University
- Sarah Ehrman, , Med. S, University of Cincinnati
- Douglas Brown*, , Grad., University of Cincinnati - College of Medicine
- Hui Chiu, , Grad., National Taiwan University, Taiwan (end 3/11/11)
- Xiaolan Fan, , Grad., Wenzhou Medical College, China (11/30/10)
- Jonathan Fletcher, , Grad., University of Cincinnati
- Qinzhu Huang, , Grad., Wenzhou Medical College, China (end 1/14/11)
- Robert Hufnagel, , Grad. , University of Cincinnati - PSTP and Neuroscience (end 7/13/10)
- Hyon Kim, , Grad., University of Cincinnati
- Rohit Rao, , Grad., University of Cincinnati Medical School
- Brittany Bayne, , Underg, University of Cincinnati
- Kalyn Campbell, , Underg, Xavier University
- Matthew Carter, , Underg, Miami University, Oxford, OH
- Felicia Ciamacco, , Underg, University of Cincinnati (end 8/27/10)
- Karmela Dalisay, , Underg, University of Notre Dame
- Yanne Doucet, , Underg, University of Mediterranee, France
- Elizabeth Eichhold, , Underg, Xavier University (end 4/15/11)
- Abigail Evans, , Underg, Ohio State University
- Alyssa Gallas, , Underg, Xavier University (end 4/29/11)
- M. Victoria Gomez, , Underg, Xavier University
- Matthew Grazyk, , Underg, Xavier University
- Amaleah Hartman, , Underg, University of Cincinnati
- Lauren Head, , Underg, Xavier University (end 7/30/10)
- Rachel Helping, , Underg, University of Cincinnati
- Tiffany Hoang, , Underg, California State University - Fullerton (PSTP Summer Student)
- Sarah Kastner, , Underg, Cincinnati State (end 6/17/11)
- Ryan Lauf, , Underg, Xavier University
- Marianna Luga, , Underg, University of Cincinnati

- Doug Meyer, , Underg, College of Mount St. Joseph
- Ashley Riesenberg, , Underg, University of Cincinnati (end 8/27/10)
- Alex Roth, , Underg, Miami University, Oxford, OH
- Blair Wissel, , Underg, Xavier University

Significant Accomplishments

Growing intestinal tissue

A recent paper in *Nature* documented the first example of organogenesis into intestinal tissue from human pluripotent stem cell cultures. The team of principal investigators, including Chris Mayhew, PhD, and Aaron Zorn, PhD (Developmental biology), Vladimir Kalinichenko, MD, PhD (Neonatology/Pulmonary Biology), Susanne Wells, PhD (Hematology/Oncology), and Noah Shroyer, PhD (Gastroenterology), was headed up by James Wells, PhD (Developmental biology). The paper was first-authored by postdoctoral fellow Jason Spence, PhD.

Studying neuron development

A team including including Richard Lang, PhD (Ophthalmology), Alex Kuan, MD, PhD (Developmental Biology), Yi Zheng, PhD (Experimental Hematology), and headed by Yutaka Yoshida, PhD, (Developmental Biology), published a paper in *Proceedings of the National Academy of Sciences* showing that disruption of the intracellular signal RhoA altered the balance between differentiation and proliferation in the progenitor cells of neurons in the central nervous system. The paper is first-authored by Kei-ichi Katayama, PhD, DVM, a trainee in the Yoshida laboratory.

Understanding abnormal hematopoiesis

In a recent issue of *Current Opinion in Hematology*, Noah Shroyer, PhD (Gastroenterology), Tiffany Cook, PhD (Ophthalmology), Brian Gebelein, PhD (Developmental Biology), and H. Leighton Grimes, PhD (Immunobiology), discuss the roles of a specific transcription factor (Gfi1) whose actions are conserved in evolution from fruit fly development to human hematopoiesis. In humans, Gfi1 is a component of transcriptional regulatory pathways whose dysregulation leads to abnormal hematopoiesis and malignancy. Such pathways represent key targets for clinical intervention. The article is first-authored by James Phelan, a graduate student in the immunology graduate program.

Neonatal trauma and muscle growth

In a paper in the *Journal of Bone and Joint Surgery*, Chris Wylie, PhD (Developmental Biology), and Roger Cornwall, MD (Orthopaedic Surgery) identify a failure of normal satellite cell function and muscle growth as the primary defect in the contractures caused by neonatal trauma to the brachial plexus. The paper is first-authored by Sia Nikolaou, PhD, a postdoctoral fellow in Orthopaedic Surgery.

Division Publications

1. Balli D, Zhang Y, Snyder J, Kalinichenko VV, Kalin TV. **Endothelial cell-specific deletion of transcription factor FoxM1 increases urethane-induced lung carcinogenesis**. *Cancer research*. 2011; 71:40-50.
2. Basu RK, Devarajan P, Wong H, Wheeler DS. **An update and review of acute kidney injury in pediatrics**. *Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies*. 2011; 12:339-47.

3. Bennett MR, Devarajan P. **Proteomic analysis of acute kidney injury: biomarkers to mechanisms.** *Proteomics. Clinical applications.* 2011; 5:67-77.
4. Blythe SA, Cha SW, Tadjuidje E, Heasman J, Klein PS. **beta-Catenin primes organizer gene expression by recruiting a histone H3 arginine 8 methyltransferase, Prmt2.** *Developmental cell.* 2010; 19:220-31.
5. Borok Z, Whitsett JA, Bitterman PB, Thannickal VJ, Kotton DN, Reynolds SD, Krasnow MA, Bianchi DW, Morrissey EE, Hogan BL, Kurie JM, Walker DC, Radisky DC, Nishimura SL, Violette SM, Noble PW, Shapiro SD, Blaisdell CJ, Chapman HA. **Cell Plasticity in Lung Injury and Repair: Report from an NHLBI Workshop, April 19-20, 2010.** *Proceedings of the American Thoracic Society.* 2011; 8:215-22.
6. Brunskill EW, Lai HL, Jamison DC, Potter SS, Patterson LT. **Microarrays and RNA-Seq identify molecular mechanisms driving the end of nephron production.** *BMC developmental biology.* 2011; 11:15.
7. Brunskill EW, Potter SS. **Gene expression programs of mouse endothelial cells in kidney development and disease.** *PLoS one.* 2010; 5:e12034.
8. Carpenter AC, Rao S, Wells JM, Campbell K, Lang RA. **Generation of mice with a conditional null allele for Wntless.** *Genesis.* 2010; 48:554-8.
9. Charlton-Perkins M, Cook TA. **Building a fly eye: terminal differentiation events of the retina, corneal lens, and pigmented epithelia.** *Current topics in developmental biology.* 2010; 93:129-73.
10. Charlton-Perkins M, Whitaker SL, Fei Y, Xie B, Li-Kroeger D, Gebelein B, Cook TA. **Prospero and Pax2 combinatorially control neural cell fate decisions by modulating Ras- and Notch-dependent signaling.** *Neural development.* 2011; 6:20.
11. Chen S, Rong M, Platteau A, Hehre D, Smith H, Ruiz P, Whitsett J, Bancalari E, Wu S. **CTGF disrupts alveolarization and induces pulmonary hypertension in neonatal mice: implication in the pathogenesis of severe bronchopulmonary dysplasia.** *American journal of physiology. Lung cellular and molecular physiology.* 2011; 300:L330-40.
12. Chiu HS, Szucsik JC, Georgas KM, Jones JL, Rumballe BA, Tang D, Grimmond SM, Lewis AG, Aronow BJ, Lessard JL, Little MH. **Comparative gene expression analysis of genital tubercle development reveals a putative appendicular Wnt7 network for the epidermal differentiation.** *Developmental biology.* 2010; 344:1071-87.
13. Comstock CE, Augello MA, Schiewer MJ, Karch J, Burd CJ, Ertel A, Knudsen ES, Jessen WJ, Aronow BJ, Knudsen KE. **Cyclin D1 is a selective modifier of androgen-dependent signaling and androgen receptor function.** *The Journal of biological chemistry.* 2011; 286:8117-27.
14. Cook T, Zelhof A, Mishra M, Nie J. **800 facets of retinal degeneration.** *Progress in molecular biology and translational science.* 2011; 100:331-68.
15. Dahia CL, Mahoney EJ, Durrani AA, Wylie C. **Intercellular signaling pathways active during and after growth and differentiation of the lumbar vertebral growth plate.** *Spine.* 2011; 36:1071-80.
16. Devarajan P. **Biomarkers for the early detection of acute kidney injury.** *Current opinion in pediatrics.* 2011; 23:194-200.
17. Devarajan P. **The use of targeted biomarkers for chronic kidney disease.** *Advances in chronic kidney disease.* 2010; 17:469-79.
18. Devarajan P, Krawczeski CD, Nguyen MT, Kathman T, Wang Z, Parikh CR. **Proteomic identification of early biomarkers of acute kidney injury after cardiac surgery in children.** *American journal of kidney diseases : the official journal of the National Kidney Foundation.* 2010; 56:632-42.
19. Flick MJ, Chauhan AK, Frederick M, Talmage KE, Kombrinck KW, Miller W, Mullins ES, Palumbo JS, Zheng X, Esmon NL, Esmon CT, Thornton S, Becker A, Pelc LA, Di Cera E, Wagner DD, Degen JL. **The development of inflammatory joint disease is attenuated in mice expressing the anticoagulant prothrombin mutant W215A/E217A.** *Blood.* 2011; 117:6326-37.
20. Fukushima Y, Okada M, Kataoka H, Hirashima M, Yoshida Y, Mann F, Gomi F, Nishida K, Nishikawa S,

- Uemura A. **Sema3E-PlexinD1 signaling selectively suppresses disoriented angiogenesis in ischemic retinopathy in mice**. *The Journal of clinical investigation*. 2011; 121:1974-85.
21. Galambos C, Levy H, Cannon CL, Vargas SO, Reid LM, Cleveland R, Lindeman R, deMello DE, Wert SE, Whitsett JA, Perez-Atayde AR, Kozakewich H. **Pulmonary pathology in thyroid transcription factor-1 deficiency syndrome**. *American journal of respiratory and critical care medicine*. 2010; 182:549-54.
 22. Goldstein SL, Devarajan P. **Acute kidney injury in childhood: should we be worried about progression to CKD?**. *Pediatric nephrology*. 2011; 26:509-22.
 23. Gordon EJ, Rao S, Pollard JW, Nutt SL, Lang RA, Harvey NL. **Macrophages define dermal lymphatic vessel calibre during development by regulating lymphatic endothelial cell proliferation**. *Development*. 2010; 137:3899-910.
 24. Gower WA, Wert SE, Ginsberg JS, Golan A, Whitsett JA, Noguee LM. **Fatal familial lung disease caused by ABCA3 deficiency without identified ABCA3 mutations**. *The Journal of pediatrics*. 2010; 157:62-8.
 25. Gutzwiller LM, Witt LM, Gresser AL, Burns KA, Cook TA, Gebelein B. **Proneural and abdominal Hox inputs synergize to promote sensory organ formation in the Drosophila abdomen**. *Developmental biology*. 2010; 348:231-43.
 26. Hamada N, Miyata M, Eto H, Ikeda Y, Shirasawa T, Akasaki Y, Miyauchi T, Furusho Y, Nagaki A, Aronow BJ, Tei C. **Loss of clusterin limits atherosclerosis in apolipoprotein E-deficient mice via reduced expression of Egr-1 and TNF-alpha**. *Journal of atherosclerosis and thrombosis*. 2011; 18:209-16.
 27. Hardie WD, Hagood JS, Dave V, Perl AK, Whitsett JA, Korfhagen TR, Glasser S. **Signaling pathways in the epithelial origins of pulmonary fibrosis**. *Cell cycle*. 2010; 9:2769-76.
 28. He F, Ren J, Wang W, Ma J. **A multiscale investigation of bicoid-dependent transcriptional events in Drosophila embryos**. *PloS one*. 2011; 6:e19122.
 29. He F, Saunders TE, Wen Y, Cheung D, Jiao R, ten Wolde PR, Howard M, Ma J. **Shaping a morphogen gradient for positional precision**. *Biophysical journal*. 2010; 99:697-707.
 30. He F, Wen Y, Cheung D, Deng J, Lu LJ, Jiao R, Ma J. **Distance measurements via the morphogen gradient of Bicoid in Drosophila embryos**. *BMC developmental biology*. 2010; 10:80.
 31. Hirota Y, Acar N, Tranguch S, Burnum KE, Xie H, Kodama A, Osuga Y, Ustunel I, Friedman DB, Caprioli RM, Daikoku T, Dey SK. **Uterine FK506-binding protein 52 (FKBP52)-peroxiredoxin-6 (PRDX6) signaling protects pregnancy from overt oxidative stress**. *Proceedings of the National Academy of Sciences of the United States of America*. 2010; 107:15577-82.
 32. Huang H, Du G, Chen H, Liang X, Li C, Zhu N, Xue L, Ma J, Jiao R. **Drosophila Smt3 negatively regulates JNK signaling through sequestering Hipk in the nucleus**. *Development*. 2011; 138:2477-85.
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Grants, Contracts, and Industry Agreements

Grant and Contract Awards	Annual Direct / Project Period	Direct
BROWN, N		
Cell-Cell Signaling During Mammalian Early Eye Formation		
National Institutes of Health		
R01 EY 018097	04/01/08-03/31/12	\$247,500
Investigation of Mammalian Retinal Neuron Development		
National Institutes of Health		
R01 EY 013612	08/01/09-07/31/13	\$222,750
CAMPBELL, K		
Roles of Gsh1 & Gsh2 in Telencephalic Neurogenesis		
National Institutes of Health		
R01 NS 044080	07/01/08-06/30/13	\$216,563
Molecular Mechanisms Controlling Formation of Basal Ganglia Circuitry		
National Institutes of Health		
R01 MH 090740	04/01/10-01/31/15	\$247,500
CHANG, C		
Understanding MicroRNA Mechanisms for Age-Related Decline in Neuronal Regeneration		
Whitehall Foundation, Inc.		
	10/01/09-09/30/12	\$69,653
Understanding MicroRNA Mechanisms for Developmental Decline in Axon Growth Ability		
March of Dimes		
	06/01/10-05/31/13	\$58,993
CHUANG, C		
Molecular Mechanisms of Gap Junction-Mediated Olfactory Signaling		
Whitehall Foundation, Inc.		
	07/01/08-06/15/12	\$71,363
Developmental Control of Olfactory Signaling in C. Elegance		
Alfred P. Sloan Foundation(University of Cincinnati)		
	09/16/10-09/15/12	\$25,000
CLEGHON, V		
Fundamental Mechanisms of Protein Kinase Activation Loop Autophosphorylation		
National Institutes of Health		
R01 GM 0873474	04/15/10-02/28/14	\$193,050
GEBELEIN, B		
Hox Regulation of Sensory Organ Development in Drosophila		
National Institutes of Health		
R01 GM 079428	04/01/08-02/28/13	\$186,219

GUASCH GRANGEON, G**Defining Transitional Zones Associated with Squamous Cell Carcinoma Development**

Concern Foundation

07/01/10-06/30/12

\$50,000

Defining the Role of Sox2 in Vaginal Atresia Disorder

March of Dimes

02/01/11-01/31/13

\$68,182

HEGDE, R**Eyes Absent Phosphatase Inhibitors In Eye Disease**

National Institutes of Health

R21 EY 019125

08/01/09-07/31/11

\$123,750

Molecular Mechanisms of Retinal Determination Proteins

National Institutes of Health

R01 EY 014648

04/01/10-03/31/13

\$240,000

KUAN, C**Rac GTPases in the Mammalian Brain Development**

National Institutes of Health

R01 NS 056435

07/01/08-06/30/12

\$198,000

LIN, X**Regulation of Wingless (Wg) Signaling and Morphogen Gradient Formation**

National Institutes of Health

R01 GM 063891

07/01/07-06/30/11

\$188,100

Roles of Retromer Complex in Development

National Institutes of Health

R01 GM 087517

03/01/10-02/28/14

\$188,100

NAKAFUKU, M / CAMPBELL, K**Molecular Control of Neurogenesis in the Adult Subventricular Zone**

National Institutes of Health

R01 NS 069893

04/01/10-03/31/15

\$290,274

Endogenous CNTF Receptors and Adult, In Vivo Neurogenesis

National Institutes of Health

R01 NS066051

07/01/09-06/30/13

\$11,370

NAKAFUKU, M**Endogenous CNTF Receptors and Adult, In Vivo Neurogenesis**

National Institutes of Health(University of Cincinnati)

R01 NS066051

07/01/09-06/30/13

\$11,825

POTTER, S**Glomerulosclerosis in Human FSGS and Animal Models**

National Institutes of Health

R01 DK 081489

09/14/09-09/13/11

\$231,506

Nextgen Dissection of the Genomic Basis of Kidney Development

National Institutes of Health

RC4 DK 090891

09/30/10-09/29/13

\$1,186,072

Global Gene Expression Atlas of Craniofacial Development

National Institutes of Health

U01 DE 020049

09/21/09-04/30/14

\$184,987

SPENCE, J**Developmental Paradigms to Direct Human Endoderm into Foregut**

National Institutes of Health

F32 DK 083202	09/01/09-08/31/11	\$52,154
Mechanisms of Intestine Development		
National Institutes of Health		
K01 DK091415	06/28/11-03/31/16	\$128,000
Digestive Health Center: Bench to Bedside in Pediatric Digestive Disease (Pilot & Feasibility Study)		
National Institutes of Health		
P30 DK 078392	08/01/07-05/31/12	\$50,000

SUMANAS, S

Molecular Mechanisms of Arterial-Venous Differentiation in Zebrafish

National Institutes of Health

R01 HL 107369 04/01/11-03/31/16 \$250,000

Role of Hedgehog Signaling in Endocardium Formation

American Heart Association

07/01/09-06/30/11 \$60,000

TUCKER, J

Molecular Mechanisms of Gap Junctional Intercellular Communication

American Cancer Society National

01/01/11-12/31/12 \$50,000

WYLIE, C

The Roles of Steel Factor in Germ Cell Behavior in the Mouse

National Institutes of Health

R01 HD 060578 07/27/09-06/30/11 \$248,698

Cadherin-based Actin Assembly in the Xenopus Embryo

National Institutes of Health

R01 HD 044764 03/12/09-01/31/14 \$197,208

Ectoderm Formation in the Early Xenopus Embryo

National Institutes of Health

R01 HD 045737 04/01/10-03/31/15 \$199,200

A Developmentally-Based Tissue Engineering Approach to Improve Tendon Repair

University of Cincinnati (National Institutes of Health)

R01 AR 056943 07/10/09-06/30/14 \$181,255

WYLIE, J

Wnts Interacting With Wnts: Mechanism and Biological Significance

National Institutes of Health

R01 GM 084951 03/15/10-02/28/13 \$193,050

YANG, D

Effects of PAI1 on the tPA-JNK-Bim Pathway in Neonatal Cerebral Hypoxia-Ischemia

American Heart Association

07/01/10-06/30/12 \$43,000

YOSHIDA, Y

Regulation of Sensory-Motor Connectivity by Semaphorin-Plexin Signaling

National Institutes of Health

R01 NS 065048 04/01/09-03/31/14 \$216,563

ZORN, A / WELLS, J

Mammalian Foregut and Liver Development

National Institutes of Health

R01 DK 080823 01/01/09-12/31/12 \$240,572

Mammalian Foregut and Liver Development

National Institute of Health

R01 DK 080823 08/20/09-07/31/11 \$33,333

ZORN, A		
Molecular Basis of Liver Development		
National Institutes of Health		
R01 DK 070858	04/01/07-03/31/12	\$179,002
Xenbase: a Xenopus Model Organism Database		
National Institutes of Health		
P41 HD064556	06/01/10-05/31/15	\$735,816
	Current Year Direct	\$7,568,608
Industry Contracts		
GUASCH GRANGEON		
International Company		\$62,761
	Current Year Direct Receipts	\$62,761
	Total	\$7,631,369

Molecular and Developmental Biology Graduate Program

The Graduate Program in Molecular and Developmental Biology is an interdepartmental program within the University of Cincinnati that offers the Ph.D. degree. It has been based in the Department of Pediatrics for over 35 years. Drs. Kenneth Campbell and Timothy Weaver served as Directors of the Program with co-directors Drs. Jeffrey Whitsett - finance, Richard Lang- curriculum, Tim LeCras - admissions, Edith Markoff – recruitment, Jeff Robbins – faculty membership, and John Shannon– graduate studies.

There are 85 faculty members in the program. During the past year, there were 65 pre-doctoral students in the program, 8 of whom are pursuing M.D./Ph.D. degrees. Students and faculty continue to be productive as measured by their numbers of publications, presentations at meetings, honors and awards received. Grant support to faculty remains high.

During the past year, the University of Cincinnati continued to support the program by providing University Graduate Assistantships and funds appropriated from the Dean's office to support 6 first year students. The remaining students are supported through a variety of sources including Ryan Fellowships (3), American Heart Fellowships (2), NIH training grants (14), external grants to their advisors (28), CHRF Special Purpose Funds to their advisors (19) and funds from the Children's Hospital Research Foundation to the Graduate Program (7).

The MDB Program provides an excellent research educational experience for students and has an excellent record in the placement of its graduates in scientific careers.

Molecular and Developmental Biology Graduate Program Students, 2009-2010

Student	Faculty Mentor	Admission
Thomas Acciani	Timothy LeCras	2009
Shailaja Akunuru	Yi Zheng	2006
Amel Alqadah	Rotating	2010

Robyn Amos-Kroohs	Michael Williams	2009
Aria Attia	Rotating	2010
William Baird**	Timothy Cripe	2006
David Balli	Vladimir Kalinichenko	2008
Kristin Bell	Rotating	2010
Gregory Bick	Paul Andreassen	2010
Abigail Bower	Steve Potter	2008
Caitlin (Maynard) Braitsch	Katherine Yutzey	2006
Adam Burr**	Jeff Molkentin	2009
Ashley Cast	Stephanie Ware	2007
Jeeyeon Cha**	Sudhansu K. Dey	2009
Heather Chapman	Kenneth Campbell	2007
Mark Charlton-Perkins	Rotating	2010
Mikah Coffindaffer-Wilson	Jaye Hove	2007
Michelle Combs	Katherine Yutzey	2004
Jason Cowan	Stephanie Ware	2009
Sharina Desai	Saulius Sumanas	2008
Tracy Dohn	Joshua Waxman	2009
Jieqing Fan	Richard Lang	2007
Ming Fang	Rotating	2010
Chen Gao	Rotating	2010
Margaret Gardner	Rotating	2010
Nicole Glenn	Saulius Sumanas	2006
Ying Gu	Christopher Wylie	2006
Zirong Gu	Yutaka Yoshida	2008
David Hahn	Timothy Weaver	2006
Jamie Havrilak	John Shannon	2008
Michael Hester	Steve Danzer	2009
Mary Horn	Katherine Yutzey	2007
Diva Jonatan	James Wells	2006
David Li-Kroeger	Brian Gebelein	2008
Shan Lin	James Mulloy	2009
Wei Liu	Yi Zheng	2005
Mariana Louza	Rotating	2010
Thomas Lu**	Marc Rothenberg	2007
Arturo Maldonado	Timothy Crombleholme	2004
Karunyakanth Mandapaka	Timothy Weaver	2005
Kate Maurer	Nadean Brown	2009
Heather McCauley	Geraldine Guasch	2009
Kyle McCracken**	James Wells	2010
Elizabeth McDonald	Tiffany Cook	2004
Timothy Mead	Katherine Yutzey	2006
Anna (Hake) Method	James Wells	2007
Monique Morrison	Susanne Wells	2005
Elizabeth Mushaben	Timothy LeCras	2007
Diana Nardini	Katherine Yutzey	2009
Zhenglei Pei	Kenneth Campbell	2004
Megan Rost	Saulius Sumanas	2008
Shatrunjai Singh	Rotating	2010
Tony Stefater**	Richard Lang	2008
Mardi Sutherland	Stephanie Ware	2008
Xiaofang Tang	Xinhua Lin	2006
David Terrell**	Jeffrey Robbins/Tiffany Cook	2008
Chelsea Tolentino	Rotating	2010
Juli Uhl	Brian Gebelein	2008
Sha Wang	Christopher Wylie	2009
Jiadi Xu	Rotating	2010
Jia You	Xinhua Lin	2007
Inuk Zandvakili**	Yi Zheng	2009
Zheng Zhang	Aaron Zorn	2008
Bo Zhou	Xinhua Lin	2006
Xuan Zhou	Yi Zheng	2007
Hongyan Zhu	Marc Rothenberg	2004

**MD/PhD Students

Students completing their Masters work

- Elizabeth McDonald – “A study of Drosophila Orthodenticle: Mapping the functional domains and proposing a post-developmental role in the Drosophila eye,” April 29, 2010.
- Diana Nardini – “The impact of conditional MMP-13 overexpression on mouse cardiac valve development and disease,” September 7, 2010.
- Ashley Cast – “An essential and highly conserved role for Zic3 in left-right patterning, gastrulation and convergent extension morphogenesis,” October 19, 2010.
- William Baird – “Development of a Novel Model for Exploring the Role of Regulatory T-cells in Oncolytic HSV Cancer Therapy,” May 2, 2011.

Students completing their PhD work

- Hongyan Zhu – “Deep breath and relax: a study of NPS/NPSR1,” August 20, 2010.
- Michelle Combs – “NFATc1 in cardiac valve development and EPDC invasion,” November 30, 2010.
- Zhenglei Pei – “The role of Gsx homeobox genes in the specification and differentiation of mouse lateral ganglionic eminence progenitors,” December 17, 2010.
- Arturo Maldonado – “Molecular Targeting and Enhancing Anticancer Efficacy of Oncolytic HSV-1 to Midkine Expressing Tumors,” December 20, 2010.
- Timothy Mead – “Notch pathway regulation of skeletal development and neural crest cell lineages in vivo,” February 3, 2011.

Student Publications

During the past year, students from the Program authored or co-authored 22 articles.

Akunuru S, Palumbo J, Zhai QJ, Zheng Y. Rac1 targeting suppresses human non-small cell lung adenocarcinoma cancer stem cell activity. *PLoS One*.6(2):e16951. PMID: 3036726. 2011.

Balli D, Zhang Y, Snyder J, Kalinichenko VV, Kalin TV. Endothelial cell-specific deletion of transcription factor FoxM1 increases urethane-induced lung carcinogenesis. *Cancer Res*.71(1):40-50. PMID: 3075588. 2011.

Charlton-Perkins M, Cook TA. Building a fly eye: terminal differentiation events of the retina, corneal lens, and pigmented epithelia. *Curr Top Dev Biol*.93:129-73. 2010.

Charlton-Perkins M, Whitaker SL, Fei Y, Xie B, **Li-Kroeger D**, Gebelein B, Cook T. Prospero and Pax2 combinatorially control neural cell fate decisions by modulating Ras- and Notch-dependent signaling. *Neural Dev*.6:20. PMID: 3123624. 2011.

Coffindaffer-Wilson M, Craig MP, Hove JR. Determination of lymphatic vascular identity and developmental timecourse in zebrafish (*Danio rerio*). *Lymphology*.44(1):1-1. 2011.

Combs MD, **Braitsch CM**, Lange AW, James JF, Yutzey KE. NFATC1 promotes epicardium-derived cell invasion into myocardium. *Development*.138(9):1747-57. PMID: 3074451. 2011.

Kavanaugh GM, Wise-Draper TM, Morreale RJ, **Morrison MA**, Gole B, Schwemberger S, Tichy ED, Lu L, Babcock GF, Wells JM, Drissi R, Bissler JJ, Stambrook PJ, Andreassen PR, Wiesmuller L, Wells SI. The human DEK oncogene regulates DNA damage response signaling and repair. *Nucleic Acids Res*. 2011.

Le Cras TD, **Acciani TH**, **Mushaben EM**, Kramer EL, Pastura PA, Hardie WD, Korfhagen TR, Sivaprasad U, Ericksen M, Gibson AM, Holtzman MJ, Whitsett JA, Hershey GK. Epithelial EGF receptor signaling mediates airway hyperreactivity and remodeling in a mouse model of chronic asthma. *Am J Physiol Lung Cell Mol Physiol*.300(3):L414-21. PMID: 3064289. 2010.

Lim EJ, **Lu TX**, Blanchard C, Rothenberg ME. Epigenetic regulation of the IL-13-induced human eotaxin-3 gene by CREB-binding protein-mediated histone 3 acetylation. *J Biol Chem*.286(15):13193-204. PMID: 3075666. 2011.

Liu W, Feng Y, Shang X, Zheng Y. Rho GTPases in hematopoietic stem/progenitor cell migration. *Methods Mol Biol.*750:307-19. 2011.

McAuliffe JJ, Bronson SL, **Hester MS**, Murphy BL, Dahlquist-Topala R, Richards DA, Danzer SC. Altered patterning of dentate granule cell mossy fiber inputs onto CA3 pyramidal cells in limbic epilepsy. *Hippocampus.*21(1):93-107. PMID: 2888689. 2011.

McDonald EC, Xie B, Workman M, **Charlton-Perkins M**, **Terrell DA**, Reischl J, Wimmer EA, Gebelein BA, Cook TA. Separable transcriptional regulatory domains within Otd control photoreceptor terminal differentiation events. *Dev Biol.*347(1):122-32. PMID: 2969183. 2010.

Melendez J, Stengel K, **Zhou X**, Chauhan BK, Debidda M, Andreassen P, Lang RA, Zheng Y. RhoA GTPase is dispensable for actomyosin regulation but is essential for mitosis in primary mouse embryonic fibroblasts. *J Biol Chem.*286(17):15132-7. PMID: 3083211. 2011.

Pei Z, Wang B, Chen G, Nagao M, Nakafuku M, Campbell K. Homeobox genes Gsx1 and Gsx2 differentially regulate telencephalic progenitor maturation. *Proc Natl Acad Sci U S A.*108(4):1675-80. PMID: 3029701. 2011.

Ryan MA, Nattamai KJ, Xing E, Schleimer D, Daria D, Sengupta A, Kohler A, **Liu W**, Gunzer M, Jansen M, Ratner N, Le Cras TD, Waterstrat A, Van Zant G, Cancelas JA, Zheng Y, Geiger H. Pharmacological inhibition of EGFR signaling enhances G-CSF-induced hematopoietic stem cell mobilization. *Nat Med.*16(10):1141-6. 2010.

Shang X, Cancelas JA, Li L, Guo F, **Liu W**, Johnson JF, Ficker A, Daria D, Geiger H, Ratner N, Zheng Y. R-Ras and Rac GTPase Cross-talk Regulates Hematopoietic Progenitor Cell Migration, Homing, and Mobilization. *J Biol Chem.*286(27):24068-78. PMID: 3129188. 2011.

Skelton MR, Graham DL, Schaefer TL, Grace CE, Braun AA, Burns LN, **Amos-Kroohs RM**, Williams MT, Vorhees CV. Distinct periods of developmental sensitivity to the effects of 3,4-(+/-)-methylenedioxymethamphetamine (MDMA) on behaviour and monoamines in rats. *Int J Neuropsychopharmacol.*1-14. 2011.

Stefater JA, 3rd, Lewkowich I, Rao S, Mariggi G, Carpenter AC, **Burr AR**, **Fan J**, Ajima R, Molkentin JD, Williams BO, Wills-Karp M, Pollard JW, Yamaguchi T, Ferrara N, Gerhardt H, Lang RA. Regulation of angiogenesis by a non-canonical Wnt-Fli1 pathway in myeloid cells. *Nature.*474(7352):511-5. 2011.

Tadjuidje E, Cha SW, **Louza M**, Wylie C, Heasman J. The functions of maternal Dishevelled 2 and 3 in the Early Xenopus embryo. *Dev Dyn.*240(7):1727-36. 2011.

Vorhees CV, He E, Skelton MR, Graham DL, Schaefer TL, Grace CE, Braun AA, **Amos-Kroohs R**, Williams MT. Comparison of (+)-methamphetamine, +/-methylenedioxymethamphetamine, (+)-amphetamine and +/-fenfluramine in rats on egocentric learning in the Cincinnati water maze. *Synapse.*65(5):368-78. PMID: 2994999. 2011.

Wang IC, Zhang Y, Snyder J, **Sutherland MJ**, Burhans MS, Shannon JM, Park HJ, Whitsett JA, Kalinichenko VV. Increased expression of FoxM1 transcription factor in respiratory epithelium inhibits lung sacculatation and causes Clara cell hyperplasia. *Dev Biol.*347(2):301-14. PMID: 2957513. 2010.

Zhu H, Perkins C, Mingler MK, Finkelman FD, Rothenberg ME. The role of neuropeptide S and neuropeptide S receptor 1 in regulation of respiratory function in mice. *Peptides.*32(4):818-25. PMID: 3073698. 2011.

Student Honors

- Acciani, T. – Supported by Choose Ohio First Scholarship
- Akunuru, S. – Supported by NIH Training Grant (Hematologic and Oncologic Diseases)
- Alqadah, A. – Supported by Choose Ohio First Scholarship
- Amos-Kroohs, R. –Supported by NIH Training Grant (Teratology)
- Baird, W. – Supported by NIH Training Grant (UC Cancer Therapeutics)

- Bick, G. – Supported by Choose Ohio First Scholarship
- Bower, A. – Supported by NIH Training Grant (Teratology)
- Braitsch, C. – Supported by AHA Fellowship
- Burr, A. – Supported by NIH Training Grant (Organogenesis)
- Cha, J. – Supported by NIH Training Grant (Perinatal Endocrinology)
- Chapman, H. – Supported by NIH Training Grant (Teratology)
- Dohn, T. – Supported by Choose Ohio First Scholarship
- Gu, Y. – Supported by Ryan Fellowship
- Li-Kroeger, D. – Supported by Ryan Fellowship; Supported by NIH Training Grant (Organogenesis)
- Lu, T. – Supported by Ryan Fellowship; NHLBI Ruth L. Kirchenstein National Research Service Award for Individual Pre-doctoral MD/PhD Fellows
- McCracken, K. – Supported by NIH Training Grant (Organogenesis)
- Mead, T. – Supported by AHA Fellowship
- Method, A. – Supported by NIH Training Grant (Perinatal & Developmental Biology)
- Mushaben, E. – Supported by NIH Training Grant (Pulmonary & Cardiovascular Biology)
- Nardini, D. – Supported by Choose Ohio First Scholarship
- Stefater, T. – Supported by NIH Training Grant (UC MSTP)
- Sutherland, M. – Supported by NIH Training Grant (Pulmonary & Cardiovascular Biology)

Richard A. Akeson Fellowship Fund

The Richard A. Akeson Fellowship and Memorial Lectureship Fund continues to support the Annual Richard Akeson Memorial Lectureship and travel by students in our graduate program to relevant courses and meetings in which they are presenting results of their research. Dr. Takashi Mikawa presented the Sixteenth Annual Richard Akeson Memorial Lectureship in conjunction with the annual Molecular and Developmental Biology Graduate Student Symposium in 2010.

The following students received funding from the Richard A. Akeson Fellowship and Memorial Fund for travel in 2010 - 2011:

Student	Meeting	Presentation	Date
Zheng Zhang	13 th International Xenopus Conference <i>Lake Louise, Alberta, Canada</i>	Poster	9/12/10-9/17/10
Robyn Amos-Kroohs	Society for Neuroscience <i>San Diego, California</i>	Poster	11/13/10-11/17/10
Heather Chapman	Society for Neuroscience <i>San Diego, California</i>	Poster	11/12/10-11/18/10
Michael Hester	Society for Neuroscience <i>San Diego, California</i>	Poster	11/13/10-11/17/10
Wei Liu	52 nd ASH Annual Meeting <i>Orlando, Florida</i>	Poster	12/4/10-12/7/10
Xuan Zhou	52 nd ASH Annual Meeting <i>Orlando, Florida</i>	Poster	12/4/10-12/7/10
Kyle McCracken	Keystone Symposium: Stem Cells <i>Santa Fe, New Mexico</i>	Poster	1/30/11-2/4/11
Jamie Havrilak	Keystone Symposium: Lung Development and Repair <i>Santa Fe, New Mexico</i>	Poster	2/6/11-2/11/11
Thomas Acciani	Keystone Symposium: Immunity in the Respiratory Tract <i>Vancouver, British Columbia, Canada</i>	Poster	2/26/11-3/3/11
Elizabeth Mushaben	Keystone Symposium: Immunity in the Respiratory Tract <i>Vancouver, British Columbia, Canada</i>	Poster	2/26/11-3/3/11
Bo Zhou	52 nd Drosophila Conference <i>San Diego, California</i>	Poster	3/30/11-4/4/11
David Li-Kroeger	52 nd Drosophila Conference <i>San Diego, California</i>	Poster	3/30/11-4/4/11
Xiaofang Tang	52 nd Drosophila Conference <i>San Diego, California</i>	Poster	3/30/11-4/4/11
David Terrell	ARVO 2011 Annual Meeting <i>Ft. Lauderdale, Florida</i>	Poster	4/29/11-5/4/11