Developmental Biology

Division Photo

First row: Jun Ma, Tiffany Cook, Janet Heasman, Kenny Campbell, Chris Wylie, Nadean Brown

Second row: Alex Kuan, Masato Nakafuku, Yutaka Yoshida, Geraldine Guasch, Vaughn Cleghon,

Noah Shroyer, Jeff Whitsett

Third row: Brian Gebelein, Vladimir Kalinichenko, Saulius Sumanas, Matt Kofron, Dan Wiginton, Bruce Aronow, Jim Lessard

Not pictured: Tom Bartman, Chieh Chang, Chiou-Fen Chuang, Jay Degen, Sandra Degen, Prasad Devarajan, SK Dey, Rashmi Hegde, Richard Lang, Hung-Chi Liang, Xinhua Lin, Chris Mayhew, Steve Potter, Jim Wells, Aaron Zorn

Division Data Summary

Research and Training Details	
Number of Faculty	24
Number of Joint Appointment Faculty	11
Number of Research Fellows	34
Number of Research Students	24
Number of Support Personnel	35
Direct Annual Grant Support	$6,929,069
Direct Annual Industry Support	$61,781
Peer Reviewed Publications	100
Clinical Activities and Training	
Number of Clinical Fellows	5

Significant Publications

Waclaw RR, Wang B, Pei Z, Ehrman LA, Campbell K. Distinct temporal requirements for the homeobox gene Gsx2 in specifying striatal and olfactory bulb neuronal fates. Neuron. 2009 Aug 27;63(4):451-65.

Kinstrie R, Luebbering N, Miranda-Saavedra D, Sibbet G, Han J, Lochhead PA, Cleghon V. Characterization of a domain that transiently converts class 2 DYRKs into intramolecular tyrosine kinases. Sci Signal. 2010;3(111):ra16.

Cha SW, Tadjuidje E, White J, Wells J, Mayhew C, Wylie C, Heasman J. Wnt11/5a complex formation caused by tyrosine sulfation increases canonical signaling activity. Curr Biol. 2009 Sep 29;19(18):1573-80

Yan D, Wu Y, Feng Y, Lin SC, Lin X. The core protein of glypican Dally-like determines its biphasic activity in wingless morphogen signaling. Dev Cell. 2009 Oct;17(4):470-81.

Spence JR, Lange AW, Lin SC, Kaestner KH, Lowy AM, Kim I, Whitsett JA, Wells JM. Sox17 regulates organ lineage segregation of ventral foregut progenitor cells. Dev Cell. 2009 Jul;17(1):62-74.

Division Collaboration

Collaboration with Pediatric Ophthalmology

Collaborating Faculty: Tiffany Cook
Understanding Sens/Gfi-1 function in Drosophila with Brian Gebelein.
Collaboration with Immunobiology

Collaborating Faculty: Lee Grimes
Integration of Hox and Sens inputs in blood cells and new tumor suppression pathways in leukemia with Brian Gebelein.
Collaboration with Pathology

Collaborating Faculty: Margaret Collins; Keith Stringer
Interpretation of histology of common channel epithelium with Geraldine Guasch.
Collaboration with Pediatric and Thoracic Surgery

Collaborating Faculty: Alberto Pena; Marc Levitt
Provides persistent cloaca common channel samples with Geraldine Guasch.
Collaboration with Experimental Hematology

Collaborating Faculty: Susanne Wells
EYA in the DNA damage response with Rashmi Hegde.
Collaboration with Infectious Disease

Collaborating Faculty: Jason Jiang
Structure-function of Norwalk virus capsid proteins with Rashmi Hegde.
Collaboration with Experimental Hematology

Collaborating Faculty: Nancy Ratner
EYA in MPNST with Rashmi Hegde.
Collaboration with Molecular Immunology

Collaborating Faculty: Chris Karp
Functional mimicry of a TLRlike receptor complex with Rashmi Hegde.
Collaboration with Pediatric Ophthalmology

Collaborating Faculty: Zubair Ahmed
Molecular basis of deafness associated mutations with Rashmi Hegde.
Collaboration with Pediatric Ophthalmology

Collaborating Faculty: Richard Lang
Role of EYA in neural crest migration and EYA inhibitors in angiogenesis with Rashmi Hegde.
Collaboration with Pediatric Bioinformatics

Collaborating Faculty: Bruce Aronow
Gene expression in the mouse genitourinary tract with Jim Lessard.
Collaboration with Pulmonary Biology and Neonatology

Collaborating Faculty: John Shannon
Smooth muscle development in the lung with Jim Lessard.
Collaboration with Pulmonary Biology and Neonatology

Collaborating Faculty: Jeffrey Whitsett
Role of Klf5 in the development of the bladder urothelium with Jim Lessard.

Collaboration with Pediatric Bioinformatics

Collaborating Faculty: Bruce Aronow

GUDMAP, genito-urinary development microanatomy project, studying kidney development with laser capture microdissection, FACS and microarrays. Also, FACEBASE project, using similar strategy, studying face development with Steve Potter.

Collaboration with Pediatric Nephrology and Hypertension

Collaborating Faculty: Prasad Devarajan

Study of glomerulosclerosis in animal models and human FSGS samples, using a combination of laser capture micro dissection and microarrays with Steve Potter.

Collaboration with Pediatric Bioinformatics; Plastic Surgery

Collaborating Faculty: Bruce Aronow; Christopher Gordon

Investigating the role of microRNAs in craniofacial development in the zebrafish model system with Saulius Sumanas.

Collaboration with Pediatric Otolaryngology; Pediatric Ophthalmology

Collaborating Faculty: Saima Riazuddin; Zubair Ahmed

Utilizing zebrafish to investigate the molecular mechanism of gene function associated with human hearing disorders with Saulius Sumanas.

Collaboration with Hematology/Oncology

Collaborating Faculty: Timothy Cripe

Investigating the role of Etv2 transcription factor in the pediatric and newborn tumors with Saulius Sumanas.

Collaboration with Hematology/Oncology

Collaborating Faculty: Denise Adams

Investigating the molecular basis of human vascular disorders with Saulius Sumanas.

Collaboration with Pulmonary Biology and Neonatology

Collaborating Faculty: Jeff Whitsett

Role of Sox17 in lung development and directed differentiation of pluripotent stem cells into lung cells with Jim Wells.

Collaboration with Gastroenterology, Hepatology, and Nutrition

Collaborating Faculty: Noah Shroyer

Directed differentiation of pluripotent stem cells into intestinal cells with Jim Wells.

Collaboration with Pediatric Ophthalmology

Collaborating Faculty: Richard Lang

Role of macrophages in pancreatic injury and regeneration with Jim Wells.

Collaboration with Endocrinology

Collaborating Faculty: Stuart Handwerger

Wnt signaling in placental development with Jim Wells.

Collaboration with Pediatric Bioinformatics

Collaborating Faculty: Bruce Aronow

Microarray studies related to the role of Onecut transcription factors in small intestinal development, including temporal gene regulation with Dan Wiginton.

Collaboration with Orthopedic Surgery

Collaborating Faculty: Roger Cornwall

This work seeks to understand the basis of contractures caused by neo-natal brachial plexus injuries, and is based upon the hypothesis that temporary denervation caused by these injuries causes loss of muscle growth due to altered stem cell behavior with Chris Wylie.

Collaboration with Orthopedic Surgery

Collaborating Faculty: Eric Wall

This project aims to understand the signals that control normal growth and differentiation of the intervertebral disc, with the long term aim of applying this knowledge to disc degenerative diseases with Chris Wylie.

Collaboration with Urology

Collaborating Faculty: Pramod Reddy

This work studies the normal differentiation of the bladder with Chris Wylie.

Collaboration with Pulmonary Biology; Pediatric Ophthalmology

Collaborating Faculty: Jeffrey Whitsett; Richard Lang

Role of the transcription factor Sox2 in stratified squamous epithelium of the anorectal and genital regions of the mouse.

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, Associate Professor ; *Director, Molecular and Developmental Biology Graduate Program*
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

Jay L. Degen, PhD, Professor
Research Interests: Hemostatic Factor Function, Mammal

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, Research 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 ; *Associate Director*
Research Interests: Muscle Development, Mammal

Hung-Chi Liang, PhD, Research Instructor
Research Interests: Affymetrix Core Manager

Xinhua Lin, PhD, Professor
Research Interests: Cell Signaling, Drosophila

Christopher Mayhew, PhD, Research 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

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
Bioinformatics

Thomas Bartman, MD PhD, Assistant Professor
Pulmonary Biology and Neonatology
Cardiovascular Development, Zebrafish

Tiffany Cook, PhD, Assistant Professor
Pediatric Ophthalmology
Eye Development, Drosophila

Sandra Degen, PhD, Professor
Research Administration
Director, Career Development

Sudhansu Dey, PhD, Professor
Director, Reproductive Sciences
Reproductive Biology

Prasad Devarajan, MD, Professor
Director, Nephrology and Hypertension
Urinary Tract Differentiation, Mammal

Vladimir Kalinichenko, MD PhD, Associate Professor
Pulmonary Biology and Neonatology
Transcriptional Regulation of Lung Embryonic Development

Richard A. Lang, PhD, Professor
Director, Transgenic Core Facility, Pedatric Opthalmology
Visual System Development, Mammal

Jun Ma, PhD, Professor
Pediatric Bioinformatics
Transcriptional Regulation, Drosophila

Noah F. Shroyer, PhD, Assistant Professor
Gastroenterology, Hepatology, and Nutrition
Vertebrate Gut Development, Mammal

Jeffrey A. Whitsett, MD, Professor
Chief, Section of Neonatology, Perinatal, and Pulmonary Biology
Respiratory System, Mammal

Trainees

- **Chitra Dahia*, PhD,** Facult, Indian Institute of Science
- **Matthew Flick, PhD,** Facult, Purdue University, Instructor, Rheumatology
- **Larry Patterson, MD,** Facult, College of Medicine of Pennsylvania State University, Assoc. Prof., Nephrology
- **Joseph Palumbo, MD,** Facult, Penn State University College of Medicine, Asst. Prof., Hematology
- **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
- **Weiming Bu, PhD,** Res. A, Jilin University, China (end 6/22/10)
- **April Carpenter-Elrod, PhD,** Res. F, Hospital for Special Surgery, New York, NY
- **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
- **Tomoko Fujita*, PhD,** Res. A, University of Tsukuba, Japan
- **Alfor Lewis, PhD,** Res. A, University of Manchester, UK (end 5/30/10)

- **Guoqing Lin, PhD,** Res. A, University of Luebeck, Germany
- **Adrian McNairn, PhD,** Res. A, SUNY Upstate Medical University
- **Motoshi Nagao, PhD,** Res. A, Tokyo Institute of Technology
- **Virgilio Ponferrada*, PhD,** Res. A, Wright State University
- **Reena Rani, PhD,** Res. A, Chatrapati Shahu Ji University, India (end 11/13/09)
- **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
- **Jun-Huei Fan, PhD,** Res. F, University of Texas, Dallas
- **Hidetoshi Fujita*, PhD,** Res. F, University of Tsukuba, Japan (end 9/30/09)
- **Amy Gresser, PhD,** Res. F, Harvard University
- **Jing-Fen Han, PhD,** Res. F, University of Medicine and Dentistry of New Jersey
- **Yasushi Hirota*, MD PhD,** Res. F, University of Tokyo, Japan (end 3/29/10)
- **Yi-Wen Hsieh, PhD,** Res. F, University of California, Los Angeles
- **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
- **Jay Kormish, PhD,** Res. F, University of Calgary (end 7/31/10)
- **Suh-Chin Lin, PhD,** Res. F, University of Texas Health Sciences, San Antonio
- **Yi-Ling Lin, PhD,** Res. F, National Yang-Ming University, Taiwan (end 8/14/09)
- **Junbo Liu*, PhD,** Res. F, Fudan University
- **Mayur Madhavan, PhD,** Res. F, Miami University
- **Myung-Soon Moon, PhD,** Res. F, University of Wisconsin-Madison
- **Taeko Noah*, PhD,** Res. F, University of Nevada
- **Jennifer Ondr*, PhD,** Res. F, Washington University
- **Timothy Plageman*, PhD,** Res. F, University of Cincinnati
- **Latasha Redmond, PhD,** Res. F, Virginia Commonwealth University
- **Emily Shifley, PhD,** Res. F, Ohio State University
- **Jason Spence, PhD,** Res. F, Miami University, Ohio
- **Yalikun Suofu, PhD,** Res. F, University of Greifswald, Germany (end 8/14/09)
- **Kaori Takeshima, PhD,** Res. F, Miyazaki University, Japan
- **Jennifer Tucker, PhD,** Res. F, University of Pennsylvania
- **Ronald Waclaw, PhD,** Res. F, University of Cincinnati
- **Baotang Xie*, PhD,** Res. F, Chinese Academy of Sciences
- **Dong Yan, PhD,** Res. F, University of Cincinnati (end 5/28/10)
- **Ying Ye, PhD,** Res. F, University of Pennsylvania
- **Eun-Jin Yeo*, PhD,** Res. F, Seoul National University, South Korea
- **Yan Zou, PhD,** Res. F, Chinese Academy of Sciences
- **Andrew Grande, MD,** Clin. , University of Cincinnati
- **Jonathan Howell, MD PhD,** Clin. , Indiana University
- **Alan Kenny, MD PhD,** Clin. , University of Rochester, School of Medicine and Dentistry
- **Eric Mullins, MD,** Clin. , University of Missouri - Columbia
- **Bella Zeisler*, MD,** Clin. , New York University
- **Nuray Acar*, ,** Grad., Akdeniz University, Antalya, Turkey (end 4/11/10)

- **Douglas Brown*, ,** Grad., University of Cincinnati - College of Medicine
- **Peng Cheng, ,** Grad., Xiamen University School of Life Sciences, China (end 11/20/09)
- **Hui Chiu, ,** Grad., National Taiwan University, Taiwan
- **Xiaolan Fan, ,** Grad., Wenzhou Medical College, China
- **Ying Feng, ,** Grad. , Xiamen University, China (end 6/30/10)
- **Qinzhu Huang, ,** Grad., Wenzhou Medical College, China
- **Robert Hufnagel, ,** Grad. , University of Cincinnati - PSTP and Neuroscience (end 7/13/10)
- **Xiaofei Sun*, ,** Grad., Vanderbilt University
- **Yongfei Yang, ,** Grad. , Peking University, China (end 4/10/10)
- **Brittany Bayne, ,** Underg, University of Cincinnati
- **Kristin Bell, ,** Underg, University of Cincinnati
- **Julie Bonn, ,** Underg, University of Cincinnati (end 3/18/10)
- **Kalyn Campbell, ,** Underg, Xavier University
- **Matthew Carter, ,** Underg, Miami University, Oxford, OH
- **Felicia Ciamacco, ,** Underg, University of Cincinnati
- **Yanne Doucet, ,** Underg, University of Mediterranee, France
- **Elizabeth Eichhold, ,** Underg, Xavier University
- **Abigail Evans, ,** Underg, Ohio State University
- **Alyssa Gallas, ,** Underg, Xavier University
- **M. Victoria Gomez, ,** Underg, Xavier University
- **Lauren Head, ,** Underg, Xavier University
- **Tiffany Hoang, ,** Underg, California State University - Fullerton (PSTP Summer Student)
- **Wynn Hunter, ,** Underg, Duke University
- **Ryan Lauf, ,** Underg, Xavier University
- **Marianna Luga, ,** Underg, University of Cincinnati
- **Veronica Massey, ,** Underg, Xavier University (end 4/29/10)
- **Lana Milbern, ,** Underg, Ohio State University
- **Susan Mittenzwei, ,** Underg, Xavier University (end 5/28/10)
- **Karan Munshani, ,** Underg, Case Western University (end 1/8/10)
- **Nicholas Ray, ,** Underg, University of Cincinnati (end 4/16/10)
- **Ashley Riesenberg, ,** Underg, University of Cincinnati
- **Felicia Rinaldi, ,** Underg, Archbishop McNicholas High School, Cincinnati, OH
- **Alex Roth, ,** Underg, Miami University, Oxford, OH
- **Ashley Schumate, ,** Underg, Purdue University
- **Daniel Tang, ,** Underg, Northwestern University
- **Kathleen Wilkin, ,** Underg, Miami University, Oxford, OH
- **Blair Wissel, ,** Underg, Xavier University
- **Chris Wolfe, ,** Underg, Xavier University (end 5/5/10)

Significant Accomplishments

Signaling pathways in development

Cell signaling underlies all developmental decisions, and when abnormal leads to many developmental disorders, including cancer. The Heasman lab reported in *Current Biology* the major finding that Wnt proteins, known to be important in both normal development and tumorigenesis, functionally interact with each other to enhance signaling levels, and this interaction is controlled by sulfation of specific tyrosine residues. The Lin lab reported in *Developmental Cell* that the range of Wnt signaling is controlled by the core proteins of specific proteoglycans on the cell surface. The Wylie lab reported in *Development* that expression of survival signals follows the migration of early embryonic migrating stem cells, forming a travelling niche surrounding them as they go. Nadean Brown, PhD, has established a successful institute-wide monthly meeting on Notch signaling, which has led to several major interdivisional collaborative projects.

Organogenesis and stem cells

This is a major part of the division's research, and has been highly successful recently. A collaboration between the Wells and Whitsett labs, published in *Developmental Cell*, identified Sox17 as a major regulator of foregut cell differentiation. Aaron Zorn, PhD, was part of a consortium that published in *Science* the genome of a new model organism; Xenopus tropicalis. This will dramatically improve the usefulness of this vertebrate model organism for studies of organogenesis. The Hegde lab reported in *Oncogene* that the multifunctional protein Eyes Absent promotes the invasiveness and motility of tumor cells. The Gebelein lab reported in *Developmental Biology* a transcriptional network that controls sensory neuron patterning. The Campbell lab reported in a series of high profile papers in *Neuron* and *Nature Neuroscience* the roles of several transcription factors and signaling proteins that control mammalian forebrain patterning. The Guasch lab reported in *Cell Cycle* the discovery of potential stem cells in the ano-rectal canal, a region with high levels of tumorigenesis in humans. The Brown lab reported in *J. Neurosci* that the transcription factor Rbpj plays a major role in the formation of the mammalian retina.

Success of research trainees

One of the most satisfying aspects of a research division is to see its trainees win external recognition. Last year was a highly successful one for our trainees. Sumeda Nandadasa, an MDB student in the Wylie/Heasman lab, was a finalist in the postdoc/PhD poster competition at the national meeting of the Society for Developmental Biology. He was beaten by the winner, Chia-Feng Liu, who subsequently joined the lab as a postdoc, indicating the importance of such external recognition. Ying Gu, an MDB student in the Wylie/Heasman lab, was selected for a platform presentation at the national society meeting in 2009, and Sang-Wook Cha, a postdoc in the Wylie/Heasman lab, has been selected to make a platform presentation in 2010. Ying Gu also gained a prestigious Ryan Fellowship for her work on stem cell survival. Amy Gresser, a postdoc in the Gebelein lab, gained the highly prestigious University Research Council Fellowship for her work on organism growth control. Dianer Yang, a postdoc in the Kuan lab, gained an American Heart Association grant for his work on neonatal cerebral hypoxia-ischemia. David Li-Kroeger, an MDB student in the Gebelein lab, gained a Ryan Fellowship, and won the poster prize at the Mid-West meeting of the Society for Developmental Biology. Kei-ichi Katayama, a postdoc in the Yoshida lab, gained a prestigious Postdoctoral Fellowship from the Japan Society for Promotion of Science, for his work on sensory-motor connections in the nervous system. Anna Method, an MDB student in the Wells lab, gained the Best Platform Presentation Award at the Annual Graduate Symposium. Diva Jonatan, an MDB student in the Wells lab, won the best poster prize at the Diabetes and Obesity Symposium in Cincinnati. These are outstanding achievements from an outstanding cadre of trainees in the division.

Division Publications

1. Aziz RK, Kansal R, Aronow BJ, Taylor WL, Rowe SL, Kubal M, Chhatwal GS, Walker MJ, Kotb M. Microevolution of group A streptococci in vivo: capturing regulatory networks engaged in sociomicrobiology, niche adaptation, and hypervirulence. *PLoS One.* 2010; 5: e9798.
2. Deng J, Wang W, Lu LJ, Ma J. A two-dimensional simulation model of the bicoid gradient in Drosophila. *PLoS One.* 2010; 5: e10275.
3. Devarajan P. Neutrophil gelatinase-associated lipocalin: a promising biomarker for human acute kidney injury. *Biomark Med.* 2010; 4: 265-80.
4. Palumbo JS, Degen JL. Mechanisms coupling the hemostatic system to colitis-associated cancer. *Thromb Res.* 2010; 125 Suppl 2: S39-43.
5. Dey SK. How we are born. *J Clin Invest.* 2010; 120: 952-5.
6. Hufnagel RB, Le TT, Riesenberg AL, Brown NL. Neurog2 controls the leading edge of neurogenesis in the mammalian retina. *Dev Biol.* 2010; 340: 490-503.
7. Schachtrup C, Ryu JK, Helmrick MJ, Vagena E, Galanakis DK, Degen JL, Margolis RU, Akassoglou K. Fibrinogen triggers astrocyte scar formation by promoting the availability of active TGF-beta after vascular damage. *J Neurosci.* 2010; 30: 5843-54.
8. Hellsten U, Harland RM, Gilchrist MJ, Hendrix D, Jurka J, Kapitonov V, Ovcharenko I, Putnam NH, Shu S, Taher L, Blitz IL, Blumberg B, Dichmann DS, Dubchak I, Amaya E, Detter JC, Fletcher R, Gerhard DS, Goodstein D, Graves T, Grigoriev IV, Grimwood J, Kawashima T, Lindquist E, Lucas SM, Mead PE, Mitros T, Ogino H, Ohta Y, Poliakov AV, Pollet N, Robert J, Salamov A, Sater AK, Schmutz J, Terry A, Vize PD, Warren WC, Wells D, Wills A, Wilson RK, Zimmerman LB, Zorn AM, Grainger R, Grammer T, Khokha MK, Richardson PM, Rokhsar DS. The genome of the Western clawed frog Xenopus tropicalis. *Science.* 2010; 328: 633-6.
9. Klingenberg JM, McFarland KL, Friedman AJ, Boyce ST, Aronow BJ, Supp DM. Engineered human skin substitutes undergo large-scale genomic reprogramming and normal skin-like maturation after transplantation to athymic

mice. *J Invest Dermatol.* 2010; 130: 587-601.

10. Kothiyal P, Cox S, Ebert J, Husami A, Kenna MA, Greinwald JH, Aronow BJ, Rehm HL. High-throughput detection of mutations responsible for childhood hearing loss using resequencing microarrays. *BMC Biotechnol.* 2010; 10: 10.
11. Le Cras TD, Korfhagen TR, Davidson C, Schmidt S, Fenchel M, Ikegami M, Whitsett JA, Hardie WD. Inhibition of PI3K by PX-866 prevents transforming growth factor-alpha-induced pulmonary fibrosis. *Am J Pathol.* 2010; 176: 679-86.
12. Mayhew CN, Wells JM. Converting human pluripotent stem cells into beta-cells: recent advances and future challenges. *Curr Opin Organ Transplant.* 2010; 15: 54-60.
13. Plageman TF, Jr., Chung MI, Lou M, Smith AN, Hildebrand JD, Wallingford JB, Lang RA. Pax6-dependent Shroom3 expression regulates apical constriction during lens placode invagination. *Development.* 2010; 137: 405-15.
14. Logan-Collins J, Thomas RM, Yu P, Jaquish D, Mose E, French R, Stuart W, McClaine R, Aronow B, Hoffman RM, Waltz SE, Lowy AM. Silencing of RON receptor signaling promotes apoptosis and gemcitabine sensitivity in pancreatic cancers. *Cancer Res.* 2010; 70: 1130-40.
15. Noah TK, Kazanjian A, Whitsett J, Shroyer NF. SAM pointed domain ETS factor (SPDEF) regulates terminal differentiation and maturation of intestinal goblet cells. *Exp Cell Res.* 2010; 316: 452-65.
16. Xu Q, Guo L, Moore H, Waclaw RR, Campbell K, Anderson SA. Sonic hedgehog signaling confers ventral telencephalic progenitors with distinct cortical interneuron fates. *Neuron.* 2010; 65: 328-40.
17. Nawabi H, Briancon-Marjollet A, Clark C, Sanyas I, Takamatsu H, Okuno T, Kumanogoh A, Bozon M, Takeshima K, Yoshida Y, Moret F, Abouzid K, Castellani V. A midline switch of receptor processing regulates commissural axon guidance in vertebrates. *Genes Dev.* 2010; 24: 396-410.
18. Besnard V, Matsuzaki Y, Clark JC, Xu Y, Wert SE, Ikegami M, Stahlman MT, Weaver TE, Hunt AN, Postle AD, Whitsett JA. Conditional Deletion of Abca3 in Alveolar Type II Cells Alters Surfactant Homeostasis in Newborn and Adult Mice. *Am J Physiol Lung Cell Mol Physiol.* 2010; 298: L646-L659.
19. Bowes JB, Snyder KA, Segerdell E, Jarabek CJ, Azam K, Zorn AM, Vize PD. Xenbase: gene expression and improved integration. *Nucleic Acids Res.* 2010; 38: D607-12.
20. Hall IE, Yarlagadda SG, Coca SG, Wang Z, Doshi M, Devarajan P, Han WK, Marcus RJ, Parikh CR. IL-18 and urinary NGAL predict dialysis and graft recovery after kidney transplantation. *J Am Soc Nephrol.* 2010; 21: 189-97.
21. Kennedy MW, Cha SW, Tadjuidje E, Andrews PG, Heasman J, Kao KR. A co-dependent requirement of xBcl9 and Pygopus for embryonic body axis development in Xenopus. *Dev Dyn.* 2010; 239: 271-83.
22. Kormish JD, Sinner D, Zorn AM. Interactions between SOX factors and Wnt/beta-catenin signaling in development and disease. *Dev Dyn.* 2010; 239: 56-68.
23. Reed CA, Mayhew CN, McClendon AK, Knudsen ES. Unique impact of RB loss on hepatic proliferation: tumorigenic stresses uncover distinct pathways of cell cycle control. *J Biol Chem.* 2010; 285: 1089-96.
24. Smith AN, Radice G, Lang RA. Which FGF ligands are involved in lens induction? *Dev Biol.* 2010; 337: 195-8.
25. Miller SJ, Lan ZD, Hardiman A, Wu J, Kordich JJ, Patmore DM, Hegde RS, Cripe TP, Cancelas JA, Collins MH, Ratner N. Inhibition of Eyes Absent Homolog 4 expression induces malignant peripheral nerve sheath tumor necrosis. *Oncogene.* 2010; 29: 368-79.
26. Baeten KM, Richard MC, Kanse SM, Mutch NJ, Degen JL, Booth NA. Activation of single-chain urokinase by platelet-associated plasminogen: a mechanism for stimulation of fibrinolysis by platelets. *J Thromb Haemost.* 2010; 8: 1313-22.
27. Dusing MR, Maier EA, Aronow BJ, Wiginton DA. Onecut-2 knockout mice fail to thrive during early postnatal period and have altered patterns of gene expression in small intestine. *Physiol Genomics.* 2010; 42: 115-25.
28. Yan D, Wu Y, Yang Y, Belenkaya TY, Tang X, Lin X. The cell-surface proteins Dally-like and Ihog differentially regulate Hedgehog signaling strength and range during development. *Development.* 2010; 137: 2033-44.
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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 / $997,500

Investigation of Mammalian Retinal Neuron Development
National Institutes of Health
R01 EY 013612 — 08/01/09 - 07/31/13 — $225,000 / $900,000

Campbell, K

Roles of Gsh1 & Gsh2 in Telencephalic Neurogenesis
National Institutes of Health
R01 NS 044080 — 07/01/08 - 06/30/13 — $218,750 / $1,093,750

Molecular Mechanisms Controlling Formation of Basal Ganglia Circuitry
National Institutes of Health
R01 MH 090740 — 04/01/10 - 01/31/15 — $250,000 / $1,250,000

Chang, C

Understanding MicroRNA Mechanisms for Age-Related Decline in Neuronal Regeneration
Whitehall Foundation, Inc.
10/01/09 - 09/30/12 — $69,653 / $210,133

Understanding MicroRNA Mechanisms for Developmental Decline in Axon Growth Ability
March of Dimes
06/01/10 - 05/31/13 — $58,993 / $176,979

Chuang,C-F

Molecular Mechanisms of Gap Junction-Mediated Olfactory Signaling
Whitehall Foundation, Inc.
05/21/08 07/01/08 - 06/30/11 $71,363 / $207,851

Cleghon, V

Fundamental Mechanisms of Protein Kinase Activation Loop Autophosphorylation
National Institutes of Health
R01 GM 087374 04/15/10 - 02/28/14 $195,000 / $780,000

Degen, J

Hemostatic Factors as Determinants of Bacterial Virulence and Host Defense
National Institutes of Health
R01 HL 085357 07/01/06 - 06/30/11 $242,750 / $1,221,000

Cincinnati Rheumatic Diseases Core Center - Core 2
National Institutes of Health
P30 AR 047363 07/01/09 - 06/30/10 $65,815 / $65,815

Thrombin-Mediated Proteolysis in Neuroinflammatory Disease
National Institutes of Health
R01 HL 096126 08/01/09 - 04/30/13 $250,000 / $1,000,000

Gebelein, B

Hox Regulation of Sensory Organ Development in Drosophila
National Institutes of Health
R01 GM 079428 04/01/08 - 02/28/13 $188,100 / $948,100

A New Tumor Suppression Pathway in Leukemia
Ohio Cancer Research Associates
07/01/08 - 06/30/10 $22,727 / $45,454

Gresser, A

Characterization of a Drosophila Sensory Organ as a Regulator of Growth and Viability
University of Cincinnati
01/01/10 - 12/31/10 $5,000 / $5,000

Hegde, R

Eyes Absent Phosphatase Inhibitors In Eye Disease
National Institutes of Health
R21 EY 019125 08/01/09 - 07/31/11 $150,000 / $275,000

Molecular Mechanisms of Retinal Determination Proteins
National Institutes of Health
R01 EY 014648 04/01/10 - 03/31/13 $250,000 / $750,000

CRIM1-b-Catenin-Cadherin Interactions in Eye Development
National Institutes of Health
R01 EY019377 06/01/09 - 05/31/11 $250,000 / $498,963

Kuan, C

Apoptosis and Renewal of Neural Progenitor Cells
Yale University School of Medicine (National Institutes of Health)
R01 NS 038296 02/01/06 - 01/31/11 $41,199 / $207,226

Rac GTPases in the Mammalian Brain Development
National Institutes of Health
R01 NS 056435 07/01/08 - 06/30/12 $200,000 / $800,000

Kavil Institute Equipment Grant

Yale University School of Medicine
01/01/10 - 12/31/10 $11,000 / $11,000

Lin, X

Regulation of Hedgehog Distribution and Signaling
American Cancer Society - National
01/01/07 - 12/31/10 $150,000 / $600,000

Regulation of Wingless (Wg) Signaling and Morphogen Gradient Formation
National Institutes of Health
R01 GM 063891 07/01/07 - 06/30/11 $190,000 / $758,100

Roles of Retromer Complex in Development
National Institutes of Health
R01 GM 087517 03/01/10 - 02/28/14 $190,000 / $950,000

Nakafuku, M

Molecular Control of Neurogenesis in the Adult Subventricular Zone
National Institutes of Health
R01 NS 069893 04/01/10 - 03/31/15 $293,194 / $1,556,611

Endogenous CNTF Receptors and Adult, In Vivo Neurogenesis
University of Cincinnati (National Institutes of Health)
R01 NS 066051 07/01/09 - 06/30/13 $12,148 / $48,592

Potter, S

Global Gene Expression Atlas of Craniofacial Development
National Institutes of Health
U01 DE 020049 09/21/09 - 04/30/14 $186,082 / $972,654

Glomerulosclerosis in Human FSGS and Animal Models
National Institutes of Health
R01 DK 081489 09/14/09 - 09/13/11 $228,633 / $460,139

Spence, J

Developmental Paradigms to Direct Human Endoderm into Foregut Lineages
National Institutes of Health
F32 DK 083202 09/01/09 - 08/31/11 $49,646 / $101,356

Sumanas, S

Etsrp Role in the Zebrafish Heart Formation
March of Dimes
02/01/09 - 01/31/11 $68,182 / $136,364

Role of Hedgehog Signaling in Endocardium Formation
American Heart Association
07/01/09 - 06/30/11 $60,000 / $120,000

Wells, J

Mechanisms of Endoderm Specification Along the A-P Axis
National Institutes of Health
R01 GM 072915 05/01/06 - 04/30/11 $182,645 / $926,119

Microfabrication of Tissue-Engineered Islets
Ohio State University
09/01/09 - 08/31/10 $28,167 / $28,167

Wylie, C

Training Program in Organogenesis
National Institutes of Health

T32 HD 046387	05/01/06 - 04/30/11	$220,973 / $1,015,072

Ectoderm Formation in the Early Xenopus Embryo
National Institutes of Health

R01 HD 045737	04/01/10 - 03/31/15	$207,500 / $1,037,500

Cadherin-based Actin Assembly in the Xenopus Embryo
National Institutes of Health

R01 HD 044764	03/12/09 - 01/31/14	$205,425 / $1,029,200

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	$175,976 / $942,743

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	$250,000 / $498,698

Wylie, J

Wnts Interacting with Wnts: Mechanism and Biological Significance
National Institutes of Health

R01 GM 084951	03/15/10 - 02/28/13	$195,000 / $585,000

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 / $1,091,563

Role of Sema3E-PlexinD1 Signaling in Synaptic Specificity of Sensory-Motor Connections in the Developing Mouse Spinal Cord
March of Dimes

	02/01/09 - 01/31/11	$68,182 / $136,364

Zorn, A

Molecular Basis of Liver Development
National Institutes of Health

R01 DK 070858	04/01/07 - 03/31/12	$198,891 / $1,006,591

Mammalian Foregut and Liver Development
National Institutes of Health

R01 DK 080823	01/01/09 - 12/31/12	$269,863 / $1,046,047

Mammalian Foregut and Liver Development
National Institutes of Health

R01 DK 080823	08/20/09 - 07/31/11	$33,333 / $66,666

Xenbase: a Xenopus Model Organism Database
National Institutes of Health

P41 HD 064556	06/01/10 - 05/31/15	$735,816 / $3,658,969

Current Year Direct **$6,929,069**

Industry Contracts

Guasch Grangeon, G.

L'Oreal International	$ 61,781

Current Year Direct Receipts **$61,781**

Total $6,990,850

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- academics, Tim Le Cras - admissions, Edith Markoff – recruitment, Jeff Robbins – faculty membership, and John Shannon– graduate studies.

There are 83 faculty members in the program. During the past year, there were 60 pre-doctoral students in the program, 7 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 (11), external grants to their advisors (22), CHRF Special Purpose Funds to their advisors (21) and funds from the Children's Hospital Research Foundation to the Graduate Program (6).

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
Shailaja Akunuru	Yi Zheng	2006
Zegary Allen**	Kenneth Campbell	2004
David Balli	Rotation	2008
William Baird**	Timothy Cripe	2006
Abigail Bower	Rotation	2008
Seth Brown*	Rotation	2008
Ashley Cast	Stephanie Ware	2007
Heather Chapman	Kenneth Campbell	2007
Gang Chen	Jeffrey Whitsett	2004
Michelle Combs	Katherine Yutzey	2004
Sharina Desai	Rotation	2008
Jieqing Fan	Richard Lang	2007
Derek Garrison	Jeffrey Whitsett	2006
Nicole Glenn	Thomas Bartman	2006
Curtis Grace	Charles Vorhees	2003
Ying Gu	Christopher Wylie	2006
Yuanyuan Gu	Christopher Karp	2005
Zirong Gu	Rotation	2008
David Hahn	Timothy Weaver	2006
Anna Hake	James Wells	2007
Jamie Havrilak	Rotation	2008
Mary Horn	Katherine Yutzey	2007
Shawna (Blaney) Hottinger	Jeffrey Robbins	2004
Amer Jameel	Timothy Weaver	2006
Diva Jonatan	James Wells	2006
Elizabeth (Haque) Kramer**	Timothy Le Cras	2005
David Li-Kroeger	Rotation	2008
Kristen Lipscomb	Woodrow Benson	2004
Wei Liu	Yi Zheng	2005
Thomas Lu**	Marc Rothenberg	2007

Rajat Madan	Christopher Karp	2001
Arturo Maldonado	Timothy Crombleholme	2004
Karunyakanth Mandapaka	Timothy Weaver	2005
Caitlin Maynard	Katherine Yutzey	2006
Elizabeth McDonald	Tiffany Cook	2004
Timothy Mead	Katherine Yutzey	2006
Monique Morrison	Susanne Wells	2005
Elizabeth Mushaben	Tim LeCras	2007
Sumeda Nandadasa	Christopher Wylie	2005
Zhenglei Pei	Kenneth Campbell	2004
Jennifer Peters	Randy Sallee	2002
Megan Rost	Rotation	2008
Tori Schaefer	Michael Williams	2004
Kathy (Shair) Schroer	Gurjit Hershey	2004
Emily Sites	Nancy Ratner	2005
Tony Stefater**	Richard Lang	2008
Mardi Sutherland	Rotation	2008
Xiaofang Tang	Xinhua Lin	2006
David Terrell**	Jeffrey Robbins	2008
Julie Uhl	Rotation	2008
Shiv Kumar Viswanathan	Woodrow Benson	2003
Mikah Wilson	Jaye Hove	2007
Dong Yan	Xinhua Lin	2002
Jia You	Xinhua Lin	2007
Zhang Zheng	Rotation	2008
Bo Zhou	Xinhua Lin	2006
Xuan Zhou	Yi Zheng	2007
Hongyan Zhu	Marc Rothenberg	2004
*On Leave from Program **MD/PhD Students		

Students completing their Masters work

Derek Garrison – “Role of Lung Lipofibroblasts in Surfactant Synthesis”, September 23, 2008
Shawna Hottinger – “MimickingαB Crystallin Phosphorylation at Serine 45 and 59 in Vivo”, June 19, 2009.
Emily Sites – “ProposedRoles for Sox Transcription Factors and Growth Factor Receptors in NF1”, August20, 2008.

Students completing their PhD work

Zegary Allen – “TranscriptionFactor Regulation of Olfactory Bulb Interneuron Heterogeneity,” June 24, 2009.
Yuanyuan Gu –“Immunobiology of IFRD1, a Novel Genetic Modifier of Cystic Fibrosis LungDisease,” June 17, 2009.
Elizabeth Kramer – “Role ofthe EGFR Pathway in Lung Remodeling and Disease,” June 3, 2009.
Rajat Madan – “Into theVortex: The In Vivo Biology of Interleukin-10 Production,” February 24, 2009.
Tori Schaefer – “The Roleof Serotonin in Brain Development and 3,4-methylenedioxymethamphetamine-inducedCognitive Deficits,” May 22, 2009.
Shiv Kumar Viswanathan –“Developmental and Genetic Origins of the Sinoatrial Node,” October 1, 2008.
Dong Yan – “Functions ofGlypicans in Cell Signaling during Drosophila Development,” March 24, 2009.

Student Publications

During the past year, students from the Program authored or co-authored 17 articles.
Wang B, WaclawRR, **Allen ZJ** 2nd, GuillemotF, Campbell K. Ascl1 is a required downstream effector of Gsx gene function inthe embryonic mouse telencephalon. Neural Dev. 2009 Feb 10;4:5.
Mahller YY,Sakthivel B, **Baird WH**, Aronow BJ, Hsu YH, Cripe TP, Mehrian-Shai R. Molecular analysis ofhuman cancer cells infected by an oncolytic HSV-1 reveals multiple upregulatedcellular genes and a role for SOCS1 in virus replication. Cancer

Gene Ther.2008 Nov;15(11):733-41.
Mahller YY,Williams JP, **Baird WH**, Mitton B, Grossheim J, Saeki Y, Cancelas JA, Ratner N, Cripe TP. Neuroblastomacell lines contain pluripotent tumor initiating cells that are susceptible to atargeted oncolytic virus. PLoS One. 2009;4(1):e4235.
Vorhees CV,Herring NR, Schaefer TL, **Grace CE, Skelton MR**, Johnson HL, Williams MT. Effects ofneonatal (+)-methamphetamine on path integration and spatial learning in rats:effects of dose and rearing conditions. Int J Dev Neurosci. 2008Oct;26(6):599-610.
Skelton MR,Able JA, **Grace CE**, Herring NR, **SchaeferTL**, Gudelsky GA,Vorhees CV, Williams MT. (+/-)-3,4-Methylenedioxymethamphetamine treatment inadult rats impairs path integration learning: a comparison of single vs onceper week treatment for 5 weeks. Neuropharmacology. 2008 Dec;55(7):1121-30.
Vorhees CV,Skelton MR, **Grace CE**, **Schaefer TL**, Graham DL, Braun AA, Williams MT. Effects of (+)-methamphetamine onpath integration and spatial learning, but not locomotor activity or acousticstartle, align with the stress hyporesponsive period in rats. Int J DevNeurosci. 2009 May;27(3):289-98.
Skelton MR, **SchaeferTL**, Herring NR**,Grace CE**, Vorhees CV,Williams MT. Comparison of the developmental effects of 5-methoxy-N,N-diisopropyltryptamine(Foxy) to (+/-)-3,4-methylenedioxymethamphetamine (ecstasy) in rats. Psychopharmacology(Berl). 2009 Jun;204(2):287-97.
Vorhees CV, **SchaeferTL**, Skelton MR, **GraceCE**, Herring NR,Williams MT. (+/-)3,4-Methylenedioxymethamphetamine (MDMA) dose-dependentlyimpairs spatial learning in the morris water maze after exposure of rats todifferent five-day intervals from birth to postnatal day twenty. Dev Neurosci.2009;31(1-2):107-20.
Gu Y, Runyan C, Shoemaker A, Surani A, Wylie C. Steelfactor controls primordial germ cell survival and motility from the time oftheir specification in the allantois, and provides a continuous nichethroughout their migration. Development. 2009 Apr;136(8):1295-303.
Gu Y, Harley IT, Henderson LB, Aronow BJ, VietorI, Huber LA, Harley JB, Kilpatrick JR, Langefeld CD, Williams AH, Jegga AG,Chen J, Wills-Karp M, Arshad SH, Ewart SL, Thio CL, Flick LM, Filippi MD,Grimes HL, Drumm ML, Cutting GR, Knowles MR, Karp CL. Identification of IFRD1as a modifier gene for cystic fibrosis lung disease. Nature. 2009 Apr23;458(7241):1039-42.
Kramer EL, **Mushaben EM**, Pastura PA, Acciani TH, Deutsch GH, KhuranaHershey GK, Korfhagen TR, Hardie WD, Whitsett JA, Le Cras TD. Egr-1 SuppressesEGFR-Mediated Airway Hyperresponsiveness and Lung Remodeling in Mice. Am JRespir Cell Mol Biol. 2009 Feb 2.
Li-Kroeger D, Witt LM, Grimes HL, Cook TA, Gebelein B. . Hox and senseless antagonism functions as a molecular switch toregulate EGF secretion in the Drosophila. PNS. Dev Cell 2008 Aug;15(2):298-308.

Sund KL, Roelker S, Ramachandran V, Durbin L, Benson DW. Analysis of Ellis van Creveld syndrome gene products: implications forcardiovascular development and disease. HumMol Genet. 2009 May15;18(10):1813-24.
Lu TX, Munitz A, Rothenberg ME. MicroRNA-21 isup-regulated in allergic airway inflammation and regulates IL-12p35 expression.J Immunol. 2009 Apr 15;182(8):4994-5002.
Trompette A,Divanovic S, Visintin A, Blanchard C, Hegde RS, **Madan R**, Thorne PS, Wills-Karp M, Gioannini TL,Weiss JP, Karp CL. Allergenicity resulting from functional mimicry of aToll-like receptor complex protein. Nature. 2009 Jan 29;457(7229):585-8.
Nandadasa S, Tao Q, Menon NR, Heasman J, Wylie C. N- andE-cadherins in Xenopus are specifically required in the neural and non-neuralectoderm, respectively, for F-actin assembly and morphogenetic movements. Development.2009 Apr;136(8):1327-38.
Yan D, Lin X. Opposing roles for glypicans inHedgehog signalling. Nat Cell Biol. 2008 Jul;10(7):761-3.

Student Honors

Acciani, T. – Supported by Choose Ohio First Scholarship
Akunuru, S. – Supported by NIH Training Grant (Hematologic and Oncologic Diseases)
Amos-Kroohs, R. – Supported by NIH Training Grant (Teratology)
Baird, W. – Supported by NIH Training Grant (UC Cancer Therapeutics)
Bower, A. – Supported by NIH Training Grant (Teratology)
Braitsch, C. – Supported by AHA Fellowship
Chapman, H. – Supported by NIH Training Grant (Organogenesis)
Dohn, T. – Supported by Choose Ohio First Scholarship
Grace, C. – Supported by NIH Training Grant (Teratology)
Gu, Y. – Supported by Ryan Fellowship
Jonatan, D. – First place for her poster at the Diabetes and Obesity Center Research Symposium
Li-Kroeger, D. – First prize in Graduate Student Presentations at the 2010 Midwest Society for Developmental Biology Meeting; Supported by NIH Training Grant (Organogenesis)
Lu, T. – Supported by Ryan Fellowship; Supported by NIH Training Grant (Organogenesis)
Mead, T. – Awarded the David and Lindsay Morgenthaler Endowed Fellowship at the Cleveland Clinic Lerner Research Institute; Supported by AHA Fellowship
Mushaben, E. – Supported by NIH Training Grant (Pulmonary & Cardiovascular Biology)
Nandadasa, S. – Supported by Ryan Fellowship; Supported by Dissertation Completion Fellowship
Nardini, D. – Supported by Choose Ohio First Scholarship
Stefater, T. – Supported by NIH Training Grant (UC MSTP)
Terrell, D. – 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. Barry Gumbiner presented the Fourteenth Annual Richard Akeson Memorial Lectureship in conjunction with the annual Molecular and Developmental Biology Graduate Student Symposium in 2009. The following students received funding from the Richard A. Akeson Fellowship and Memorial Fund for travel in 2009 - 2010:

Student	Meeting	Presentation	Date
Jennifer McGuire	Society for Neuroscience, Chicago, Illinois	Poster	10/17/09-10/21/09
Wei Liu	American Society of Hematology Conference, New Orleans, Louisiana	Oral	12/5/09-12/08/09
Zhenglei Pei	Keystone Symposium, Keystone, Colorado	Poster	2/15/10-2/20/10
Bo Zhou	51st Annual Drosophila Research Conference, Washington, D.C.	Poster	4/7/10-4/11/10
Jia You	51st Annual Drosophila Research Conference, Washington, D.C.	Poster	4/7/10-4/11/10
Juli Uhl	51st Annual Drosophila Research Conference, Washington, D.C.	Poster	4/7/10-4/11/10
Diva Jonatan	Keystone Symposia on Molecular & Cellular Biology, Whistler, British Columbia, Canada	Poster	4/12/10-4/17/10
Caitlin Braitsch	Weinstein Cardiovascular Development Conference, Amsterdam, Netherlands	Poster	5/20/10-5/22/10
Tim Mead	Weinstein Cardiovascular Development Conference, Amsterdam, Netherlands	Poster	5/20/10-5/22/10
Mary Horn	Weinstein Cardiovascular Development Conference, Amsterdam, Netherlands	Poster	5/20/10-5/22/10
Michelle Combs	Weinstein Cardiovascular Development Conference, Amsterdam, Netherlands	Poster & Oral	5/20/10-5/22/10
Nikki Glenn	9th Meeting of Zebrafish Genetics & Development, Madison, Wisconsin	Poster	6/16/10-6/20/10
Sharina Desai	9th Meeting of Zebrafish Genetics & Development, Madison, Wisconsin	Poster	6/16/10-6/20/10