

## Division Data Summary

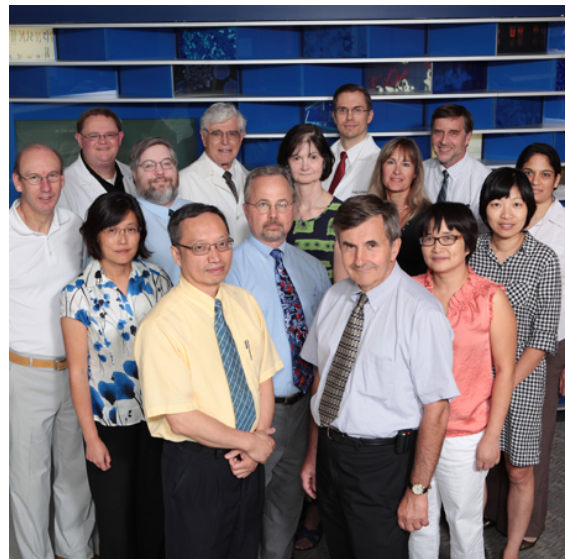
### Research and Training Details

Number of Faculty	19
Direct Annual Grant Support	\$631,591
Direct Annual Industry Support	\$76,283
Peer Reviewed Publications	55

### Clinical Activities and Training

Number of Clinical Fellows	4
Inpatient Encounters	745478
Outpatient Encounters	1.12M

## Division Photo



Row 1: P Tang, J Stanek  
Row 2: L Miles, J Mortensen, J Mo  
Row 3: K Setchell, R McMasters, M Collins, K Wikenheiser-Brokamp, J Yin  
Row 4: T Boyd, K Bove, K Stringer, D Witte, A Gupta

## Significant Publications

### Division Collaboration

#### Human Genetics » Gregory Grabowski MD

Providing technical and professional support for NIH study to characterize a metabolic disease animal model.

#### Gastroenterology, Hepatology and Nutrition » Mitch Cohen MD; Jorge Bezerra MD; Xiaonan Han PhD; Noah Shroyer PhD

Digestive Health Center: Integrated morphology core lab, provides technical and professional support to members of the DHC involved in basic and translational research in gastrointestinal tract.

#### Gastroenterology, Hepatology and Nutrition » James HEubi MD; John Bucuvalas MD; Jorge Bezerra MD; Kathleen Campbell MD

Director of Pathology Core for multicenter BARC and CLIC studies on biliary atresia and other chronic liver disorders in children.

#### Endocrinology » Stuart Handwerker MD

Providing technical and professional support for NIH placental studies.

#### Rheumatology » John Harley MD; Sue Thompson PhD; Hermine Brunner MD

Providing pathology professional and technical support for establishment of Biorepository service and support for Rheumatology core lab for Cincinnati Rheumatic Diseases Center and multicenter study for lupus

nephritis.

**Allergy and Immunology »** Marc Rothenberg MD; Pablo Abonia MD

Providing professional support for the Cincinnati Center for Eosinophilic Disorders program and related research.

**Hematology/Oncology »** Maryam Fouladi MD; Richard Dressi PhD

Providing pathology professional and technical support for multicenter referral service for the High Grade Glioma program and basic research program.

**Hematology/Oncology Research »** Yi Zheng PhD; James Mulloy PhD; Jose Cancelas MD, PhD

Joint development of Leukemia Biology program at CCHMC.

**Department of Surgery and Division of Hematology/Oncology »** Denise Adams MD; Richard Azizkhan MD;

Anusa Dasgupta MD

Hemangioma/vascular malformation clinical program. Providing professional diagnostic and technical pathology support for multidisciplinary patient care program.

## Faculty Members

**David Witte, MD**, Professor

*Division Director*

**Research Interests**

**Mohammad Azam, PhD**, Assistant Professor

**Research Interests**

**Kevin E Bove, MD**, Professor

**Research Interests**

**J. Todd Boyd, DO**, Assistant Professor

**Research Interests**

**Margaret H Collins, MD**, Professor

**Research Interests**

**Anita Gupta, MD**, Assistant Professor

**Research Interests**

**Gang Huang, PhD**, Assistant Professor

**Research Interests**

**Richard L McMasters, MD**, Assistant Professor

**Research Interests**

**Lili Miles, MD**, Associate Professor

*Director, Training Program*

**Research Interests**

**Michael Miles, PharmD**, Professor

**Research Interests**

**Jun Q Mo, MD**, Associate Professor

**Research Interests**

**Joel E Mortensen, PhD**, Associate Professor

*Director, Diagnostic Infectious Disease Lab*

## **Research Interests**

**Kenneth D Setchell, PhD**, Professor

*Director, Mass Spec Lab*

## **Research Interests**

**Jerzy W Stanek, MD, PhD**, Professor

## **Research Interests**

**Paul E Steele, MD**, Associate Professor

*Medical Director, Clinical Lab*

## **Research Interests**

**Keith F Stringer, MD**, Assistant Professor

## **Research Interests**

**Peter Tang, PhD**, Assistant Professor

## **Research Interests**

**Kathryn Wikenheiser-Brokamp, MD, PhD**, Associate Professor

## **Research Interests**

**Hong Yin, MD**, Assistant Professor

## **Research Interests**

## Trainees

- Rachel Sheridan, MD, PGY-VI, University of Cincinnati
- Amy Sheil, MD, PGY-VI, Medical University of South Carolina
- Matthew Bramlage, MD, PGY-8, Memorial Sloan-Kettering Cancer Center
- Guangju Luo, MD, PGY-V, University of Cincinnati

## Significant Accomplishments

### **Molecular Basis for Lung Disease**

Kathryn Wikenheiser-Brokamp, MD, PhD, is a clinical pathologist with research programs in lung development and cancer. Her laboratory studies the genetic and developmental basis of lung disease, with specific interest in identifying the molecular underpinnings of lung cancer and pediatric cystic lung disease. She has identified critical functions for the Rb/p16 and p53 tumor suppressive pathways in pulmonary epithelial cell growth in the context of lung development, injury repair and carcinogenesis. These studies are supported by a National Institutes of Health RO1 grant and funding from the American Cancer Society. Wikenheiser-Brokamp is part of a multi-institutional, interdisciplinary team of physicians and researchers that recently discovered DICER1 mutations in a familial tumor predisposition syndrome that develop pleuropulmonary blastoma (PPB). This work was published in *Science* in 2009 and represents the first human syndrome associated with DICER1 mutations. She leads the consortium toward elucidating how DICER1, and the microRNAs it generates, controls organogenesis and oncogenesis. In addition to the NIH grant (2011-2015), she received three grants from the St. Baldrick's Foundation (2009-2016). The most recent St. Baldrick's Research Consortium Grant supports the basic science studies and development of the International PPB Treatment and Biology Registry.

### **Targeting Genes for Drug-Resistant Tumors**

The introduction of Gleevec (imatinib mesylate) as a targeted therapeutic agent has changed the management of chronic myelogenous leukemia (CML) and played a significant role in developing key concepts for targeting other oncogenic kinases such as EGFR, c-KIT, PDGFRA, PDGFRB and BRAF. Targeted inhibition of these oncogenic kinases by small molecule inhibitors induces hematologic remission in leukemias and tumor regression in solid tumors. Despite this success, most patients retain molecular evidence of residual disease, and emergence of drug resistance limits the prospects for cure. Mohammad Azam, PhD, hypothesizes that a clear understanding of oncogene addiction in imatinib-responsive cells will allow strategies to target the intrinsic resistance of leukemia stem cells (LSCs). Recent work in his lab includes a comparative expression profiling studies of imatinib-responsive and -resistant cells, which suggests c-Fos, Dusp1, Dusp10 and mir-279 are critical mediators of imatinib-mediated therapeutic response. Eradication of these cancer stem cells is probably a critical part of any successful anticancer therapy. This work is aimed to target these identified genes using genetic and pharmacological agents in LSCs of CML. He anticipates engineering the oncogene addiction in LSCs either by genetic or pharmacological means to develop a curative response.

### Cancer Biology Program

Cincinnati Children's is a nationally recognized center for diagnostic evaluation and management of children with malignancies of the hematopoietic system. We are also building a world-class research program in cancer biology to support this clinical program. The focus is to dissect hematopoietic and cancer cell signaling networks at the molecular level. The Division of Pathology has joined with the Hematology /Oncology Research Division under the direction of Yi Zheng, PhD, to build a larger comprehensive joint program of research in leukemia and stem cell biology. An example of this successful joint effort includes the work of Gang Huang, PhD, in the Division of Pathology. He has recently obtained funding from the Ohio Cancer Research Associates to study the "Molecular Mechanisms of Leukemogenesis Mediated by MLL-partial tandem Duplication (MLL-PTD)." MLL-related leukemogenesis has been researched for nearly 20 years. There are still many unknown roles in how MLL causes leukemias. Huang, based on his original study, proposes an elegantly designed step-wise approach to investigate the non-Hoxs MLL downstream targets, the MLL/RUNX1/CBF beta/PU.1 network in leukemogenesis. These focuses will potentially provide a scientific foundation in understanding the heterogeneity of MLL-leukemias that may potentially lead to more precise targeting therapy for leukemia patients.

## Division Publications

1. Abonia JP, Blanchard C, Butz BB, Rainey HF, Collins MH, Stringer K, Putnam PE, Rothenberg ME. **Involvement of mast cells in eosinophilic esophagitis**. *J Allergy Clin Immunol*. 2010; 126:140-9.
2. Bischoff A, Gupta A, D'Mello S, Mezoff A, Podberesky D, Barnett S, Keswani S, Frischer JS. **Crohn's disease limited to the appendix: a case report in a pediatric patient**. *Pediatr Surg Int*. 2010; 26:1125-8.
3. Bissler JJ, Siroky BJ, Yin H. **Glomerulocystic kidney disease**. *Pediatr Nephrol*. 2010; 25:2049-56; quiz 2056-9.
4. Blake C, Fabick KM, Setchell KD, Lund TD, Lephart ED. **Neuromodulation by soy diets or equol: anti-depressive & anti-obesity-like influences, age- & hormone-dependent effects**. *BMC Neurosci*. 2011; 12:28.
5. Bove K, Miles L. **Neuromuscular Disease in Childhood**. *Stocker & Dehner's Pediatric Pathology*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2011.
6. Brown NM, Belles CA, Lindley SL, Zimmer-Nechemias L, Witte DP, Kim MO, Setchell KD. **Mammary gland differentiation by early life exposure to enantiomers of the soy isoflavone metabolite equol**. *Food*

*Chem Toxicol.* 2010; 48:3042-50.

7. Copeland JW, Stanek J. **Dizygotic twin pregnancy with a normal fetus and a nodular embryo associated with a partial hydatidiform mole.** *Pediatr Dev Pathol.* 2010; 13:476-80.
8. Dasgupta S, Wansapura J, Hariharan P, Pratt R, Witte D, Myers MR, Banerjee RK. **HIFU lesion volume as a function of sonication time, as determined by MRI, histology, and computations.** *J Biomech Eng.* 2010; 132:081005.
9. DeBrosse CW, Collins MH, Buckmeier Butz BK, Allen CL, King EC, Assa'ad AH, Abonia JP, Putnam PE, Rothenberg ME, Franciosi JP. **Identification, epidemiology, and chronicity of pediatric esophageal eosinophilia, 1982-1999.** *J Allergy Clin Immunol.* 2010; 126:112-9.
10. Denson LA, Kim MO, Bezold R, Carey R, Osuntokun B, Nylund C, Willson T, Bonkowski E, Li D, Ballard E, Collins M, Moyer MS, Klein DJ. **A randomized controlled trial of growth hormone in active pediatric Crohn disease.** *J Pediatr Gastroenterol Nutr.* 2010; 51:130-9.
11. Eghtesady P, Michelfelder EC, Knilians TK, Witte DP, Manning PB, Crombleholme TM. **Fetal surgical management of congenital heart block in a hydroptic fetus: lessons learned from a clinical experience.** *J Thorac Cardiovasc Surg.* 2011; 141:835-7.
12. Evason K, Bove KE, Finegold MJ, Knisely AS, Rhee S, Rosenthal P, Miethke AG, Karpen SJ, Ferrell LD, Kim GE. **Morphologic findings in progressive familial intrahepatic cholestasis 2 (PFIC2): correlation with genetic and immunohistochemical studies.** *Am J Surg Pathol.* 2011; 35:687-96.
13. Fabian CJ, Kimler BF, Zalles CM, Klemp JR, Petroff BK, Khan QJ, Sharma P, Setchell KD, Zhao X, Phillips TA, Metheny T, Hughes JR, Yeh HW, Johnson KA. **Reduction in Ki-67 in benign breast tissue of high-risk women with the lignan secoisolariciresinol diglycoside.** *Cancer Prev Res (Phila).* 2010; 3:1342-50.
14. Fuller KK, Richie DL, Feng X, Krishnan K, Stephens TJ, Wikenheiser-Brokamp KA, Askew DS, Rhodes JC. **Divergent Protein Kinase A isoforms co-ordinately regulate conidial germination, carbohydrate metabolism and virulence in *Aspergillus fumigatus*.** *Mol Microbiol.* 2011; 79:1045-62.
15. Garrett KM, Kim HK, Stanek J, Emery KH. **MR findings of primary bone lymphoma in a 15-year-old girl: emphasis on diffusion-weighted imaging.** *Pediatr Radiol.* 2011; 41:658-62.
16. Giannini CM, Kim HK, Mortensen J, Marsolo K, Huppert J. **Culture of non-genital sites increases the detection of gonorrhea in women.** *J Pediatr Adolesc Gynecol.* 2010; 23:246-52.
17. Graham DL, Grace CE, Braun AA, Schaefer TL, Skelton MR, Tang PH, Vorhees CV, Williams MT. **Effects of developmental stress and lead (Pb) on corticosterone after chronic and acute stress, brain monoamines, and blood Pb levels in rats.** *Int J Dev Neurosci.* 2011; 29:45-55.
18. Guo F, Zhang S, Tripathi P, Mattner J, Phelan J, Sproles A, Mo J, Wills-Karp M, Grimes HL, Hildeman D, Zheng Y. **Distinct roles of Cdc42 in thymopoiesis and effector and memory T cell differentiation.** *PLoS One.* 2011; 6:e18002.
19. Gupta A, Kozakewich H. **Histopathology of vascular anomalies.** *Clin Plast Surg.* 2011; 38:31-44.
20. Hagaman JT, Panos RJ, McCormack FX, Thakar CV, Wikenheiser-Brokamp KA, Shipley RT, Kinder BW. **Vitamin D deficiency and reduced lung function in connective tissue-associated interstitial lung diseases.** *Chest.* 2011; 139:353-60.
21. Hinton RB, Michelfelder EC, Marino BS, Bove KE, Ware SM. **A fetus with hypertrophic cardiomyopathy, restrictive, and single-ventricle physiology, and a beta-myosin heavy chain mutation.** *J Pediatr.* 2010; 157:164-6.
22. Hinze CH, Lucky AW, Bove KE, Marsh RA, Blessing JH, Passo MH. **Leukocyte adhesion deficiency type 1 presenting with recurrent pyoderma gangrenosum and flaccid scarring.** *Pediatr Dermatol.* 2010; 27:500-3.
23. Hummel T, Anyane-Yeboah A, Mo J, Towbin A, Weiss B. **Response of NF1-related plexiform neurofibroma to high-dose carboplatin.** *Pediatr Blood Cancer.* 2011; 56:488-90.

24. Karakukcu C, Karakukcu M, Tang PH. **Correlation of serum coenzyme Q10 and bilirubin levels of jaundiced newborns in intermediate risk zone: Is it an etiopathogenic factor in neonatal jaundice?**. *Turk J Biochem*. 2011; 36:143-148.
25. Kohli R, Kirby M, Setchell KD, Jha P, Klustaitis K, Woollett LA, Pfluger PT, Balistreri WF, Tso P, Jandacek RJ, Woods SC, Heubi JE, Tschoep MH, D'Alessio DA, Shroyer NF, Seeley RJ. **Intestinal adaptation after ileal interposition surgery increases bile acid recycling and protects against obesity-related comorbidities**. *Am J Physiol Gastrointest Liver Physiol*. 2010; 299:G652-60.
26. Kohli R, Kirby M, Xanthakos SA, Softic S, Feldstein AE, Saxena V, Tang PH, Miles L, Miles MV, Balistreri WF, Woods SC, Seeley RJ. **High-fructose, medium chain trans fat diet induces liver fibrosis and elevates plasma coenzyme Q9 in a novel murine model of obesity and nonalcoholic steatohepatitis**. *Hepatology*. 2010; 52:934-44.
27. Laskin BL, Goebel J, Davies SM, Khoury JC, Bleesing JJ, Mehta PA, Filipovich AH, Paff ZN, Lawrence JM, Yin HJ, Pinkard SL, Jodele S. **Early clinical indicators of transplant-associated thrombotic microangiopathy in pediatric neuroblastoma patients undergoing auto-SCT**. *Bone Marrow Transplant*. 2011; 46:682-9.
28. Lawal TA, Chatoorgoon K, Collins MH, Coe A, Pena A, Levitt MA. **Redo pull-through in Hirschsprung's disease for obstructive symptoms due to residual aganglionosis and transition zone bowel**. *J Pediatr Surg*. 2011; 46:342-7.
29. Major TA, Panmanee W, Mortensen JE, Gray LD, Hoglen N, Hassett DJ. **Sodium nitrite-mediated killing of the major cystic fibrosis pathogens *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Burkholderia cepacia* under anaerobic planktonic and biofilm conditions**. *Antimicrob Agents Chemother*. 2010; 54:4671-7.
30. Mehta PA, Harris RE, Davies SM, Kim MO, Mueller R, Lampkin B, Mo J, Myers K, Smolarek TA. **Numerical chromosomal changes and risk of development of myelodysplastic syndrome--acute myeloid leukemia in patients with Fanconi anemia**. *Cancer Genet Cytogenet*. 2010; 203:180-6.
31. Miles MV, Putnam PE, Miles L, Tang PH, DeGrauw AJ, Wong BL, Horn PS, Foote HL, Rothenberg ME. **Acquired coenzyme Q10 deficiency in children with recurrent food intolerance and allergies**. *Mitochondrion*. 2011; 11:127-35.
32. Motley WW, Melson AT, Mortensen JE. **Pediatric *Metarrhizium anisopliae* keratitis**. *J AAPOS*. 2011; 15:101-3.
33. O'Brien KB, Alberich-Jorda M, Yadav N, Kocher O, Diruscio A, Ebralidze A, Levantini E, Sng NJ, Bhasin M, Caron T, Kim D, Steidl U, Huang G, Halmos B, Rodig SJ, Bedford MT, Tenen DG, Kobayashi S. **CARM1 is required for proper control of proliferation and differentiation of pulmonary epithelial cells**. *Development*. 2010; 137:2147-56.
34. Oestreich AE, Stanek JW. **Preautopsy imaging in cerebro-costo-mandibular syndrome**. *Pediatr Radiol*. 2010; 40 Suppl 1:S50.
35. Patil N, Mortensen JE. **Case nineteen: a fungal infection in a bone marrow transplant patient**. *Journal of Continuing Education Topics & Issues*. 2011; 13:14-17.
36. Privette Vinnedge LM, McClaine R, Wagh PK, Wikenheiser-Brokamp KA, Waltz SE, Wells SI. **The human DEK oncogene stimulates beta-catenin signaling, invasion and mammosphere formation in breast cancer**. *Oncogene*. 2011; 30:2741-52.
37. Probst EJ, Prager JD, Shott SR, Mortensen JE, Greinwald JH. **Resolution of hypoglossal nerve palsy associated with retropharyngeal abscess after prompt medical and surgical treatment**. *International Journal of Pediatric Otorhinolaryngology Extra*. 2011; 6:74-77.
38. Russo P, Magee JC, Boitnott J, Bove KE, Raghunathan T, Finegold M, Haas J, Jaffe R, Kim GE, Magid M,

- Melin-Aldana H, White F, Whittington PF, Sokol RJ. **Design and validation of the biliary atresia research consortium histologic assessment system for cholestasis in infancy.** *Clin Gastroenterol Hepatol.* 2011; 9:357-362 e2.
39. Sanchez-Pinto LN, Laskin BL, Jodele S, Hummel TR, Yin HJ, Goebel J. **BK virus nephropathy in a pediatric autologous stem-cell transplant recipient.** *Pediatr Blood Cancer.* 2011; 56:495-7.
40. Seo JH, Holland K, Rose D, Rozhkov L, Fujiwara H, Byars A, Arthur T, DeGrauw T, Leach JL, Gelfand MJ, Miles L, Mangano FT, Horn P, Lee KH. **Multimodality imaging in the surgical treatment of children with nonlesional epilepsy.** *Neurology.* 2011; 76:41-8.
41. Setchell KD, Clerici C. **Equol: history, chemistry, and formation.** *J Nutr.* 2010; 140:1355S-62S.
42. Setchell KD, Clerici C. **Equol: pharmacokinetics and biological actions.** *J Nutr.* 2010; 140:1363S-8S.
43. Sherrill JD, Gao PS, Stucke EM, Blanchard C, Collins MH, Putnam PE, Franciosi JP, Kushner JP, Abonia JP, Assa'ad AH, Kovacic MB, Biagini Myers JM, Bochner BS, He H, Hershey GK, Martin LJ, Rothenberg ME. **Variants of thymic stromal lymphopoietin and its receptor associate with eosinophilic esophagitis.** *J Allergy Clin Immunol.* 2010; 126:160-5 e3.
44. Shi Z, Dragin N, Miller ML, Stringer KF, Johansson E, Chen J, Uno S, Gonzalez FJ, Rubio CA, Nebert DW. **Oral benzo[a]pyrene-induced cancer: two distinct types in different target organs depend on the mouse Cyp1 genotype.** *Int J Cancer.* 2010; 127:2334-50.
45. Siroky BJ, Yin H, Bissler JJ. **Clinical and molecular insights into tuberous sclerosis complex renal disease.** *Pediatr Nephrol.* 2011; 26:839-52.
46. Sivaprasad U, Askew DJ, Ericksen MB, Gibson AM, Stier MT, Brandt EB, Bass SA, Daines MO, Chakir J, Stringer KF, Wert SE, Whitsett JA, Le Cras TD, Wills-Karp M, Silverman GA, Khurana Hershey GK. **A nonredundant role for mouse Serpinb3a in the induction of mucus production in asthma.** *J Allergy Clin Immunol.* 2011; 127:254-61, 261 e1-6.
47. Stanek J. **Placental membrane and placental disc microscopic chorionic cysts share similar clinicopathologic associations.** *Pediatr Dev Pathol.* 2011; 14:1-9.
48. Stanek J. **Diagnosing placental membrane hypoxic lesions increases the sensitivity of placental examination.** *Arch Pathol Lab Med.* 2010; 134:989-95.
49. Stanek J, Sheridan RM, Le LD, Crombleholme TM. **Placental fetal thrombotic vasculopathy in severe congenital anomalies prompting EXIT procedure.** *Placenta.* 2011; 32:373-9.
50. Sun Y, Ran H, Liou B, Quinn B, Zamzow M, Zhang W, Bielawski J, Kitatani K, Setchell KD, Hannun YA, Grabowski GA. **Isofagomine in vivo effects in a neuronopathic Gaucher disease mouse.** *PLoS One.* 2011; 6:e19037.
51. Towbin AJ, Luo GG, Yin H, Mo JQ. **Focal nodular hyperplasia in children, adolescents, and young adults.** *Pediatr Radiol.* 2011; 41:341-9.
52. Wagner LM, Gelfand MJ, Laor T, Ryckman FC, Al-Ghawi H, Bove KE. **A welcome surprise: nodular fasciitis presenting as soft tissue sarcoma.** *J Pediatr Hematol Oncol.* 2011; 33:316-9.
53. Xiong Y, Li Z, Ji M, Tan AC, Bemis J, Tse JV, Huang G, Park J, Ji C, Chen J, Bemis LT, Bunting KD, Tse W. **MIR29B regulates expression of MLLT11 (AF1Q), an MLL fusion partner, and low MIR29B expression associates with adverse cytogenetics and poor overall survival in AML.** *Br J Haematol.* 2011; 153:753-757.
54. Xu YH, Jia L, Quinn B, Zamzow M, Stringer K, Aronow B, Sun Y, Zhang W, Setchell KD, Grabowski GA. **Global gene expression profile progression in Gaucher disease mouse models.** *BMC Genomics.* 2011; 12:20.
55. Xu YH, Sun Y, Ran H, Quinn B, Witte D, Grabowski GA. **Accumulation and distribution of alpha-synuclein and ubiquitin in the CNS of Gaucher disease mouse models.** *Mol Genet Metab.* 2011; 102:436-47.

# Grants, Contracts, and Industry Agreements

Grant and Contract Awards

Annual Direct / Project Period Direct

<b>AZAM, M</b>			
<b>Molecular and Therapeutic Analysis of Human Leukemia Using Human Induced-Pluripotent Stem Cells</b>			
The V Foundation			
	12/01/09-11/30/11		\$100,000
<b>BOVE, K</b>			
<b>Clinical Center for Cholestatic Liver Disease in Children</b>			
National Institutes of Health			
U01 DK 062497	09/10/09-05/31/14		\$34,201
<b>SIMPSON, D</b>			
<b>Role of Rb/p16 Pathway in Pulmonary Progenitor Cell Regulation</b>			
National Institutes of Health			
F30 HL 097609	08/11/09-08/10/13		\$32,621
<b>WIKENHEISER-BROKAMP, K</b>			
<b>Role of Rb Family in Lung Epithelial Response to Injury</b>			
National Institutes of Health			
R01 HL 079193	04/01/10-03/31/14		\$250,000
<b>Rb-p16 Regulatory Pathway in Lung Carcinogenesis</b>			
American Cancer Society National			
	07/01/10-06/30/14		\$150,000
<b>Mouse Model to Elucidate Mechanisms of Pleuropulmonary Blastoma Initiation</b>			
St. Baldrick's Foundation			
	07/01/10-06/30/11		\$100,000
<b>WITTE, D</b>			
<b>Digestive Health Center: Bench to Bedside Research in Pediatric Digestive Health (Integrative Morphology Core)</b>			
National Institutes of Health			
P30 DK 078392	08/01/07-05/31/12		\$114,769
		<b>Current Year Direct</b>	<b>\$631,591</b>
<b>Industry Contracts</b>			
<b>WIKENHEISER-BROKAMP, K</b>			
Research Triangle Institute			\$17,211
<b>WITTE, D</b>			
Ception Therapeutics Inc			\$59,072
		<b>Current Year Direct Receipts</b>	<b>\$76,283</b>
		<b>Total</b>	<b>\$707,874</b>