

## Section of Neonatology, Perinatal and Pulmonary Biology

### Division Photo



Front row seated: J. Greenberg, J. Whitsett; Back rows, left to right: K. Schibler, T. Le Cras, A. Perl, D. Premer, K. Melton, S. Glasser, L. Bookman, Y. Xu, A. South, B. Kamath, T. Kalin, A. Morrow, W. Rice, S. Kallapur, E. Hall, T. Weaver, H. Falciglia, T. Cahill, K. Wikenheiser-Brokamp, J. Reuter, A. Jobe, M. Ikegami, V. Narendran, V. Kalinichenko, A. Nathan, N. Hillman, S. Wert, K. Wedig, D. Sinner, L. Nommsen-Rivers

### Division Data Summary

#### Research and Training Details

Number of Faculty	51
Number of Joint Appointment Faculty	1
Number of Research Fellows	16
Number of Research Students	9
Number of Support Personnel	86
Direct Annual Grant Support	\$8,208,735
Direct Annual Industry Support	\$49,415
Peer Reviewed Publications	82

#### Clinical Activities and Training

Number of Clinical Staff	24
Number of Clinical Fellows	14
Inpatient Encounters	83,963
Outpatient Encounters	2,350

### Significant Publications

Bridges J P, Ikegami M, Brilli L L, Chen X, Mason R J, Shannon J M. LPCAT1 regulates surfactant phospholipid synthesis and is required for transitioning to air breathing in mice. *J Clin Invest.* 2010;120(5):1736-1748.

This work identifies a key gene regulating the induction of surfactant synthesis prior to birth. Loss of the gene LPCAT blocked the increase of surfactant lipid production that is required for the transition to airbreathing at birth. These studies provide new insight into the causes of respiratory distress syndrome in preterm infants.

Chen G, Korfhagen T R, Xu Y, Kitzmiller J, Wert S E, Maeda Y, Gregorieff A, Clevers H, Whitsett J A. SPDEF

is required for mouse pulmonary goblet cell differentiation and regulates a network of genes associated with mucus production. *J Clin Invest.* 2009;119(10):2914-2924.

This work is the first to demonstrate a master regulatory gene controlling goblet cell and mucus production in the lung. The gene SPDEF is found to control a network of other genes that are critical for mucus hyperproduction associated with common airway diseases, including cystic fibrosis, asthma, and chronic obstructive lung disease that affect countless individuals world wide.

**SUPPORT Study Group of the Eunice Kennedy Shriver NICHD Neonatal Research Network, Carlo W A, Finer N N, Walsh M C, Rich W, Gantz M G, Lupton A R, Yoder B A, Faix R G, Das A, Poole W K, Schibler K, Newman N S, Ambalavanan N, Frantz I D 3rd, Piazza A J, Sánchez P J, Morris B H, Laroia N, Phelps D L, Poindexter B B, Cotten C M, Van Meurs K P, Duara S, Narendran V, Sood B G, O'Shea T M, Bell E F, Ehrenkranz R A, Watterberg K L, Higgins R D.** Target ranges of oxygen saturation in extremely preterm infants. *N Engl J Med.* 2010; 362(21): 1959-1969.

This multicenter collaborative project provides new data used to optimize the use of oxygen for treatment of preterm newborn infants, seeking to minimize oxygen toxicity to the developing lung and minimizing retinopathy of prematurity, a disease causing blindness in preterm infants.

**Donovan E F, Besl J, Paulson J, Rose B, Iams J; Ohio Perinatal Quality Collaborative.** Infant death among Ohio resident infants born at 32 to 41 weeks of gestation. *Am J Obstet Gynecol.* 2010;203(1):58.e1-5.

This work represents a statewide collaborative effort to understand the causes of infant mortality in the State of Ohio. Preterm delivery is an important cause of this morbidity and mortality. Statewide efforts to minimize late preterm birth provides an opportunity to reduce infant death in Ohio and nationally.

**Wang M, Bridges J P, Na C L, Xu Y, Weaver T E.** Meckel-Gruber syndrome protein MKS3 is required for endoplasmic reticulum-associated degradation of surfactant protein C. *J Biol Chem.* 2009;284(48):33377-33383.

This work identifies MKS3 (Meckel-Gruber Syndrome) protein as a key gene influencing the processing and degradation of surfactant protein C. Mutations in SP-C cause misfolding and accumulation of a toxic protein that is chaperoned by MKS3. The mutations of SP-C are the first known cause of familial idiopathic pulmonary fibrosis. Understanding this regulatory pathway will be important for identifying potential new therapies for this severe lung disease affecting children and adults.

## Division Highlights

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### **Beena Kamath, MD: Late Preterm Morbidity**

Dr. Kamath published her work demonstrating the neonatal risks associated with elective preterm delivery. She is currently building on these efforts in collaboration with Dr. Michael Marcotte Maternal Fetal Medicine at Good Samaritan Hospital to study the antenatal steroids on late preterm infants.

### **Andrew South, MD, MPH; Eric Hall, PhD; James Greenberg, MD; Jereen Meizen-Derr, PhD: Regional Epidemiology of Preterm Birth**

This group is developing geographic analysis for preterm birth epidemiology through analysis of neighborhood-specific attributable risk.

### **Laurel Bookman, MD, MPH: International Quality Improvement**

Dr. Bookman led an effort to use quality improvement methods to establish an evidence-based neonatal resuscitation program in Accra Ghana. An article detailing her work is in press in [Resuscitation](#).

### **Heather Kaplan, MD, MSCE: Health Outcomes**

Transferring established evidence-based practice is central to effective, sustainable and consistent high-quality medical care. Dr. Kaplan studies mechanisms of in transfer, and information recently published work on clinical practice variation pertaining to the use of vitamin A to prevent neonatal chronic lung disease.

### **Vivek Narendran, MD, MBA; James Greenberg, MD**

These investigators analyzed changes in referral patterns of mothers presenting in labor at less than 32 wks gestation. They found that a Children's Hospital quality improvement initiative prompted a significant increase in the percentage of regional preterm deliveries at level III specialty centers and a corresponding decline in mortality.

## Division Collaboration

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### **Collaboration with**

#### **Collaborating Faculty:**

Divisional faculty have close collaborations with faculty in multiple divisions within CCHMC, the University of Cincinnati, and with investigators throughout the world

### **Collaboration with**

## Faculty Members

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- Jeffrey A. Whitsett, MD**, Professor ; *Chief, Section of Neonatology, Perinatal and Pulmonary Biology*  
**Research Interests:** Lung Development; Surfactant
- Ann L. Akeson, PhD**, Research Associate Professor  
**Research Interests:** Pulmonary Vascular and Lymphatic Development
- Henry T. Akinbi, MD**, Associate Professor Clinical  
**Research Interests:** Neonatal Infections and Blood Transfusions
- Cindy J. Bachurski, PhD**, Research Associate Professor ; *Director, Research in Pulmonary Biology and Neonatology Elective, University of Cincinnati College of Medicine; Director, Summer Internship Program for High School Students, CCHMC*  
**Research Interests:** Gene Regulation in the Lung
- Thomas Bartman, MD, PhD**, Assistant Professor  
**Research Interests:** Cardiovascular Development
- Tanya E. Cahill, MD**, Assistant Professor Clinical  
**Research Interests:** Neonatal Abstinence Syndrome and High Risk Infant Follow-Up
- Michael W. Crossman, MD, PhD**, Assistant Professor Clinical  
**Research Interests:** Intestinal Function and Host-Microbial Interactions; Bioethics
- Vrushank G. Dave', PhD**, Research Assistant Professor  
**Research Interests:** Transcription, Lung Development and Cancer
- Edward F. Donovan, MD**, Professor Emeritus  
**Research Interests:** Prematurity Prevention; Infant Mortality; Evidence-based Decision Making; and Clinical Research
- Horacio Falciglia, MD**, Professor Clinical ; *Director, Mother/Baby Unit Good Samaritan Hospital*  
**Research Interests:** Seleniun Status and Neonatal Sepsis; Timing of Cord Clamping and Outcome; Vermont Oxford Data Base
- Stephan W. Glasser, PhD**, Associate Professor  
**Research Interests:** Gene Regulation in the Lung
- Lloyd Graf, Jr., PhD**, Research Assistant Professor  
**Research Interests:** Dysregulated Gene Expression in Inflammatory Lung Diseases
- James M. Greenberg, MD**, Associate Professor ; *Director, Division of Neonatology; Medical Director, Regional Newborn Services*  
**Research Interests:** Pulmonary Vascular Development
- Beth E. Haberman, MD**, Assistant Professor Clinical ; *Medical Director, RCNIC & Mercy Anderson Hospital Nurseries; Director, High Risk Infant Follow-Up Clinic*  
**Research Interests:** Infant Follow-up
- Eric Hall, PhD**, Research Instructor  
**Research Interests:** Biomedical Informatics
- Noah H. Hillman, MD**, Assistant Professor
- Steven B. Hoath, MD**, Professor ; *Director, Skin Sciences Institute*  
**Research Interests:** Skin Development
- Machiko Ikegami, MD, PhD**, Professor ; *Director, Surfactant and Metabolic Function Core*  
**Research Interests:** Surfactant Metabolism
- Alan H. Jobe, MD, PhD**, Professor ; *Director, Division of Perinatal Biology*  
**Research Interests:** Surfactant Physiology
- Tanya V. Kalin, MD, PhD**, Research Assistant Professor  
**Research Interests:** Fox Transcription Factors in Lung Cancer and Radiation-Induced Lung Fibrosis
- Vladimir V. Kalinichenko, MD, PhD**, Associate Professor  
**Research Interests:** Fox Proteins in Lung Development
- Suhas G. Kallapur, MD**, Associate Professor Clinical ; *Director, Neonatology CME*  
**Research Interests:** Lung Development/Inflammation, BPD, Developmental Immunology
- Heather Kaplan, MD, MSCE**, Research Assistant Professor

**Research Interests:** Health Services Research; Implementation Science

**Alan P. Kenny, MD, PhD,** Research Instructor

**Research Interests:** Molecular Development of the Foregut Organs

**Paul S. Kingma, MD, PhD,** Assistant Professor Clinical

**Research Interests:** Innate Immune Systems; Surfactant Protein D; Neutrophil function in Cystic Fibrosis

**Madhavi Koneru, MD,** Assistant Professor Clinical

**Research Interests:** Urine biomarkers in prenatal renal anomalies

**Thomas R. Korfhagen, MD, PhD,** Professor

**Research Interests:** Lung Defense

**Timothy Le Cras, PhD,** Associate Professor ; *Director of Graduate Student Recruiting, Molecular & Developmental Biology Graduate Program*

**Research Interests:** Chronic Lung Disease; Lung Development

**Kristin R. Melton, MD,** Associate Professor Clinical

**Research Interests:** Developmental Biology

**Vivek Narendran, MD,** Associate Professor Clinical ; *Director, Univ. Hosp. NICU & Newborn Nursery; Medical Director, The Christ Hospital Nursery*

**Research Interests:** C-PAP; Business Case for Quality Improvements

**Amy T. Nathan, MD,** Research Assistant Professor

**Research Interests:** Immunobiology

**Laurie A. Nommsen-Rivers, PhD, RD, IBCLC,** Research Assistant Professor

**Research Interests:** Human Milk and Lactation; Perinatal Epidemiology

**Anne-Karina Perl, PhD,** Research Assistant Professor

**Research Interests:** FGF/PDGF Signaling in Alveolar Regeneration and EGFR Signaling in Bronchiolar Injury and Repair

**Danna M. Premer, MD,** Assistant Professor Clinical

**John H. Reuter, MD, PhD,** Associate Professor Clinical ; *Chair, Dept. Pediatrics, Bethesda North Hospital Nurseries*

**Ward R. Rice, MD, PhD,** Professor ; *Director, Neonatal Fellowship Training Program; Director, Newborn Services, St. Elizabeth Medical Center*

**Research Interests:** Lung Development

**Laurie Nommsen-Rivers, PhD, RD, IBCLC,** Research Assistant Professor ; *Co-Chair, Interdisciplinary Seminar Series in Human Milk and Lactation*

**Research Interests:** Perinatal and pediatric epidemiology; human lactation with a focus on the term newborn

**Kurt R. Schibler, MD,** Associate Professor ; *Principal Investigator, NICHD Neonatal Research Network*

**Research Interests:** Neonatal Immunology

**John M. Shannon, PhD,** Professor

**Research Interests:** Lung Development

**Andrew P. South, MD, MPH,** Research Assistant Professor

**Research Interests:** Outcomes and Etiology of Gastroschisis, Epidemiology of Late-Preterm Birth

**Jean J. Steichen, MD,** Professor ; *Chair, Department of Pediatrics, The Christ Hospital*

**Research Interests:** Infant Follow-up

**Bruce C. Trapnell, MD, MS,** Professor ; *Director, Rare Lung Diseases Clinical Research Consortium; Scientific Director, PAP Foundation; Director, Translational Pulmonary Research; Co-Director, Cystic Fibrosis TDN Center*

**Research Interests:** Pulmonary Gene Delivery

**Laura Ward, MD,** Adjunct Assistant Professor

**Research Interests:** Use of Human Milk in the NICU

**Timothy E. Weaver, PhD,** Professor ; *Co-Director, Division of Pulmonary Biology*

**Research Interests:** Protein Processing in the Lung

**Kathryn E. Wedig, MD,** Associate Professor Clinical ; *Director, High Risk Clinic @ GSH; Medical Director, Mercy Hospital Fairfield*

**Research Interests:** Infant Follow-up

**Susan E. Wert, PhD,** Research Associate Professor ; *Director, Molecular Morphology Core, Division of Pulmonary Biology*

**Research Interests:** Lung Development, Molecular Morphology of the Lung, Ultrastructural Analysis of the Lung, Genetic Surfactant Disorders

**Scott Wexelblatt, MD,** Assistant Professor Clinical ; *Associate Medical Director Regional Newborn Services; Co-medical*

*Director Bethesda North Hospital*

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

**Research Interests:** Pulmonary Pathology; Pediatric and Adult Lung Diseases

**Yan Xu, PhD**, Research Associate Professor ; *Director, Microarray-Bioinformatics Core, Division of Pulmonary Biology*

**Research Interests:** Bioinformatics, Systems Biology, Transcriptional Network

## Clinical Staff Members

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- **Samina Ahmed, MD**
- **Shana Alexander, MD**
- **Stephen Bird, MD**
- **Mary Burwinkel, MD**
- **Thomas Catalanotto, MD**
- **Diane Donley, MD**
- **Michelle French, MD**
- **Lisa Green, MD**
- **Jennifer Hardie, MD**
- **Evelyn Jones, MD**
- **Jillian Klein, MD**
- **Carrie Kluger, MD**
- **Katie Loudermilk, MD**
- **Alisa McGill, MD**
- **Kenton Pate, MD**
- **Miriam Peri, MD**
- **Ajay Ponkshe, MD**
- **John Robinson, MD**
- **Deborah Rufner, MD**
- **Kathy Sorger, MD**
- **Kara Tencza, MD**
- **Kira Zimmerly, MD**

## Trainees

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- **Valerie Besnard, PhD**, Universite Rene Descartes - Paris V
- **Stephanie Binder, MD**, PL6, John H. Stronger Hospital Cook County, Chicago, IL
- **Jim Bridges, PhD**, University of Cincinnati
- **Brenna Carey, PhD**, University of Cincinnati
- **Gang Chen, MS**, Yangzhou University, China
- **Fusheng Chou, MD**, National Taiwan University
- **Nikki Glenn, BS**, Miami University
- **David Hahn, BS**, Northern Kentucky University
- **Prakruti Jambula, MD**, PL4, Univ. of Oklahoma HSC, Oklahoma City, OK
- **Amer Jameel, BS**, Ohio State University
- **Brooke King, MD**, PL5, Cincinnati Children's Hospital Medical Center - UCMC, Cincinnati, OH
- **Elizabeth Kramer, BA, BS**, Miami University
- **Rishikesh Kulkarni, BPharmSc**, University of Mumbai, India
- **Venkata Kuppala, MD**, PL5, The Cleveland Clinic, Cleveland, OH
- **Tara Lang, MD**, PL5, Mayo School GME, Rochester, MN
- **Alexander Lange, PhD**, University of Cincinnati
- **Yutaka Maeda, PhD**, University of California
- **Karunyakanth Mandapaka, MS**, University of Cincinnati

- **Rafael Mena, MD, PL4**, Cincinnati Children's Hospital Medical Center - UCMC, Cincinnati, OH
- **Stephanie Merhar, MD, PL4**, Cincinnati Children's Hospital Medical Center - UCMC, Cincinnati, OH
- **Bhuvana Murali, BTech**, Vellore Institute of Technology, India
- **Elizabeth Mushaben, BS**, College of Mount St. Joseph
- **Ross Ridsdale, PhD**, University of Toronto
- **Chika Saegusa, PhD**, RIKEN, Japan
- **Takuro Sakagami, MD, PhD**, Niigata University, Japan
- **Christine Sarlone, MD, PL4**, Univ. of Tennessee HSC, Memphis, TN
- **Tushar Shah, MD, MPH, PL5**, Case Western Reserve Univ., Cleveland, OH
- **Jonathan Slaughter, MD, MSc., PL5**, Medical Univ. of South Carolina, Charleston, SC
- **Gareth Stewart, MB BCH BAO, MRCP, PhD**, Royal Infirmary of Edinburgh
- **Holly Strike, MD, PL6**, Indiana Univ SOM, Indianapolis, IN
- **Takuji Suzuki, MD, PhD**, Tohoku University, Japan
- **David Tompkins, MS**, University of Texas
- **Huajing Wan, PhD**, University of Cincinnati
- **Elizabeth Wetzel, MD, MSc, PL4**, Indiana Univ. SOM, Indianapolis, IN

## Significant Accomplishments

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### Center for bronchopulmonary dysplasia

We have worked collaboratively with Pulmonary Medicine and Immunobiology to develop a center for the study of bronchopulmonary dysplasia, a common lung disease affecting preterm infants.

The group received an NIH grant to participate in a network with five other centers to study the causes, consequences, and treatments for bronchopulmonary dysplasia. The awardees include Alan Jobe, MD, James Greenberg, MD, Suhas Kallapur, MD, Lisa Young, MD and Claire Chougnnet, PhD. They are working to understand the immunological infectious disease antecedents of preterm delivery and accompanying chronic lung disease. Biomarkers and genetic data will be linked to outcomes in infants' pulmonary functions after discharge.

### Neonatal network

Another NIH award supports research into the causes of morbidity and mortality in preterm infants. Through a network of 16 participating academic centers, the work focuses on studies related to the common causes of death and illness in preterm infants weighing under 1000 grams. This year, the group participated in studies that included optimizing ventilation, safely using oxygen to treat lung disease and minimize retinopathy, managing neonatal jaundice and assessing risks for prematurity. The data have led to collaborative publications to define best practices in neonatology.

Participating faculty include Kurt Schibler, MD, Vivek Narendran, MD, Jean Steichen, MD, Alan Jobe, MD, and Edward Donovan, MD. Network data have led to collaborative publications that define best practices in neonatology.

### Genetic research in lung disease

We made significant progress this year in clarifying genes and processes in the pathogenesis of chronic pulmonary diseases, including cystic fibrosis, COPD, asthma, and idiopathic pulmonary fibrosis.

Our investigators have collaborated on a series of publications defining the roles of a number of stem/progenitor cell genes involved in both forming and maintaining normal lung structure. Contributors include Richard Lang, PhD; James Wells, PhD; Thomas Korfhagen, MD, PhD; and Jeffrey Whitsett, MD, in Developmental Biology; Marsha Wills-Karp, PhD, and H. Leighton Grimes, PhD, in Immunobiology.

Their NIH-funded studies help identify the master regulators of mucus metaplasia that complicates cystic fibrosis, COPD and other lung diseases. They provide new mechanisms and potential therapeutic targets to influence the way respiratory cells respond to environmental challenges and infection. The work is directly related to the pathogenesis of common lung diseases affecting children and adults.

## Division Publications

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## Grants, Contracts, and Industry Agreements

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### Grant and Contract Awards

### Annual Direct / Project Period Direct

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**Akinbi, H****Cystic Fibrosis Foundation Research Development Program**

Cystic Fibrosis Foundation

R457CR07

07/01/08 - 06/30/10

\$40,000 / \$80,000

**Bachurski, C****Novel Model of Adult Epithelial Stem Cell Expansion**

National Institutes of Health

R21 HL 093706

04/01/09 - 03/31/11

\$150,000 / \$275,000

**Bridges, J****Characterization of LPCAT, a Lung LysoPC Acyltransferase: Identification of Catalytic Domains and Transcription**

Parker B. Francis Fellowship Program

07/01/07 - 06/30/10

\$50,000 / \$144,000

**Dave', V****Effectors of Calcineurin in Pulmonary Homeostasis**

American Heart Association - National

01/01/08 - 09/30/10

\$70,000 / \$280,000

**Glasser, S****Role of Surfactant Protein-C and Innate Lung Defense**

National Institutes of Health

R01 HL 050046

08/01/09 - 07/31/13

\$250,000 / \$1,000,000

**Hill, K****Regional Outreach Education Program**

Ohio Department of Health

10/01/09 - 09/30/10

\$80,000 / \$80,000

**Hillman, N****Lung Injury with Resuscitation of the Preterm**

National Institutes of Health

K08 HL 097085

08/01/09 - 07/31/14

\$120,250 / \$608,750

**Ikegami, M****Role of C/EBPalpha in Cytoprotection and Recovery from Lung Injury**

National Institutes of Health

R01 HL 095464

04/01/09 - 03/31/13

\$250,000 / \$1,000,000

**Efficacy of sp-d Containing Surfactant for Treatment of Premature Newborns**

March of Dimes - National

06/01/09 - 05/31/12

\$90,605 / \$271,996

**Jobe, A****Neonatal Resuscitation and Preterm Lung Injury**

National Institutes of Health

R01 HD 012714

05/01/06 - 03/31/11

\$183,330 / \$927,121

**Late Preterm Birth, Ureaplasma Species and Childhood Lung Disease (Jobe/Kallapur)**

National Institutes of Health

R01 HL 097064

09/24/09 - 07/31/13

\$355,573 / \$1,418,186

**Biomarkers of Immunologic Function and Preterm Respiratory Outcomes (Jobe/Chougnnet)**

National Institutes of Health

U01 HL 101800

05/01/10 - 04/30/15

\$149,203 / \$149,203

Jobe, A

Core

103,074

Chougnnet, C

Project

23,441

Young, L

Project

10,119

**Kalin, T****Role of Foxm1 Protein in Macrophages During Lung Tumor Formation**

Concern Foundation

07/01/08 - 06/30/10

\$50,000 / \$100,000

**Role of Foxm1 in the Pathogenesis of Prostate Cancer**

Department of Defense Army

W81XWH0910389

07/01/09 - 06/30/12

\$70,719 / \$221,145

**Kalinichenko, V****Fox Transcription Factors in Development of Pulmonary Capillaries**

National Institutes of Health

R01 HL 084151

05/01/08 - 04/30/11

\$242,750 / \$728,250

**Foxm1 Transcription Factor in Development of Non-Small Lung Cancer**

American Cancer Society - National

07/01/07 - 06/30/10

\$173,917 / \$498,525

**Kallapur, S****Mechanisms of Fetal Inflammatory Response Syndrome Induced by Chorioamnionitis**

National Institutes of Health

R01 HD 057869

02/03/09 - 01/31/14

\$240,679 / \$1,246,972

**Kaplan, H****Impact of Context on QI Success-A Novel Framework**

Robert Wood Johnson Foundation

10/01/08 - 09/30/10

\$80,418 / \$155,251

**Kingma, P****Surfactant Protein D in Pulmonary and Systemic Host Defense**

National Institutes of Health

K08 HL 089505

07/01/08 - 06/30/13

\$120,100 / \$604,250

**Cystic Fibrosis Foundation Research Development Program**

Cystic Fibrosis Foundation

R457CR07

07/01/08 - 06/30/10

\$50,000 / \$100,000

**Korfhagen, T****RELM Peptides Alter Lung Defense**

National Institutes of Health

R21 HI 083599

09/01/09 - 08/31/11

\$125,000 / \$275,000

**LeCras, T****Impact of Early Life Diesel Exposure on Immune Patterning and Lung Structure/Function (LeCras/Hershey)**

National Institutes of Health

R01 HL 097135

09/01/09 - 07/31/14

\$356,772 / \$703,977

**Pathogenesis of Neonatal Lung Disease**

American Heart Association - National

01/01/07 - 12/31/11

\$90,909 / \$454,545

**Maeda, Y****The Role of TTF-1 in Lung Cancer**

University of Cincinnati

01/01/10 - 12/31/10

\$5,000 / \$5,000

**Morrow, A****The Role of Human Milk in Infant Nutrition and Health**

National Institutes of Health

P01 HD 013021

08/01/09 - 07/31/14

\$960,101 / \$960,101

<b>Novel Genetic and Salivary Glycan Biomarkers for Risk of NEC in ELBW Infants.</b>		
National Institutes of Health		
R01 HD 059140	01/15/09 - 12/31/13	\$515,827 / \$2,888,593
<b>Novel Genetic and Salivary Glycan Biomarkers for Risk of NEC in ELBW Infants</b>		
National Institutes of Health		
R01 HD 059140	09/30/09 - 09/29/11	\$44,335 / \$44,335
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<b>Perl, A</b>		
<b>Role of EGF Receptor Regenerating Airway Epithelium and Air</b>		
American Lung Association		
	07/01/09 - 06/30/11	\$40,000 / \$80,000
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<b>Sarlone, C</b>		
<b>Role of the EGF Receptor in Compensatory Lung Growth</b>		
Ikaria		
	12/01/09 - 05/31/11	\$10,000 / \$10,000
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<b>Schibler, K</b>		
<b>NICHD Cooperative Multi-Center Neonatal Research Network</b>		
National Institutes of Health		
U10 HD 027853	04/01/06 - 03/31/11	\$148,616 / \$1,175,792
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<b>Shannon, J</b>		
<b>Role of HIF-1alpha in Fetal Lung Epithelial Differentiation</b>		
National Institutes of Health		
R01 HL 084376	02/01/07 - 01/31/12	\$361,656 / \$1,795,771
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<b>Trapnell, B</b>		
<b>Role of Anti-GM-CSF Antibodies in Myeloid Cell Function</b>		
National Institutes of Health		
R01 HL 085453	04/01/07 - 03/31/11	\$250,000 / \$1,000,000
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<b>Wang, I-C</b>		
<b>Role of FoxN1 in K-Ras Induced Lung Tomorigenesis</b>		
National Lung Cancer Partnership		
	01/01/09 - 12/31/10	\$50,000 / \$100,000
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<b>Weaver, T</b>		
<b>Structure/ Function Analyses of SP-B in Transgenic Mice</b>		
National Institutes of Health		
R37 HL 056285	05/01/06 - 04/30/11	\$380,299 / \$1,845,106
<b>Role of SFTPC in Pathogenesis of Interstitial Lung Disease</b>		
National Institutes of Health		
R01 HL 086492	12/01/08 - 11/30/13	\$298,833 / \$1,516,407
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<b>Whitsett, J</b>		
<b>Transcriptional Control of Respiratory Epithelial Progenitor Cells</b>		
National Institutes of Health		
R01 HL 090156	09/28/07 - 06/30/11	\$360,735 / \$1,344,309
<b>Pulmonary and Cardiovascular Development Training Grant</b>		
National Institutes of Health		
T32 HL 007752	07/01/09 - 06/30/14	\$249,079 / \$1,241,867
<b>Transcriptional Programming of Asthma Related Pathology in Respiratory Epithelial Cells</b>		
National Institutes of Health		
R01 HL 095580	04/01/09 - 03/31/13	\$343,951 / \$1,410,756
<b>Genetic Control of Gestation and Lung Maturation in the Mouse</b>		
March of Dimes		
	03/01/10 - 02/28/11	\$49,280 / \$49,280

**Pulmonary Progenitor Cells**

Oregon Health Sciences University (National Institutes of Health)

RC1 HL 100371

09/30/09 - 08/31/11

\$103,010 / \$210,239

**Unbiased Genome-Wide Screen to Identify Genes Regulating Mucous Cell Hyperplasia**

National Institutes of Health

RC1 HL 100315

09/01/09 - 08/31/11

\$287,000 / \$557,508

**ABCA3 and Alveolar Homeostasis**

National Institutes of Health

R01 HL 085610

07/10/06 - 06/30/11

\$310,788 / \$1,513,864

**Cystic Fibrosis Foundation Research Development Program**

Cystic Fibrosis Foundation

R457CR07

07/01/08 - 06/30/10

\$50,000 / \$100,000

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**Current Year Direct****\$8,208,735****Industry Contracts****Merhar, S**

Medimmune, Inc.

\$ 35,000

**Steichen, J**

PPD Development

\$ 14,415

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**Current Year Direct Receipts****\$49,415**

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**Total \$8,258,150**

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