Neonatology, Perinatal and Pulmonary Biology

Division Data Summary

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<th>Research and Training Details</th>
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<td>Number of Faculty</td>
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<td>Number of Research Students</td>
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<td>Number of Support Personnel</td>
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<td>Peer Reviewed Publications</td>
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Faculty Members

Jeffrey A. Whitsett, MD, Professor; Chief, Section of Neonatology, Perinatal and Pulmonary Biology
Research Interests: Lung Development; Surfactant

Ann Akeson, PhD, Research Associate Professor
Research Interests: Pulmonary Vascular and Lymphatic Development

Henry Akinbi, MD, Associate Professor Clinical

Cindy 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, Assistant Professor
Research Interests: Cardiovascular Development

Tanya E. Cahill, MD, Assistant Professor Clinical

Michael 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

Horacio Falciglia, MD, Professor Clinical; Medical Director, Bethesda North Hospital Normal Newborn Nursery
Research Interests: Selenium Status and Neonatal Sepsis; Timing of Cord Clamping and Outcome; Vermont Oxford Data Base

Derek Fletcher, MD, Assistant Professor Clinical

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 Greenberg, MD, Associate Professor; Director, Division of Neonatology; Medical Director, Regional Newborn Services
Research Interests: Pulmonary Vascular Development

Beth 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: Biostatistics

Noah Hillman, MD, Research Instructor

Steven B. Hoath, MD, Professor; Director, Skin Sciences Institute
Research Interests: Skin Development

Machiko Ikegami, MD, Professor; Director, Surfactant and Metabolic Function Core
Research Interests: Surfactant Metabolism

Alan Jobe, MD, PhD, Professor; Director, Division of Perinatal Biology
Research Interests: Surfactant Physiology

Tanya Kalin, MD, PhD, Research Assistant Professor

Vladimir Kalinichenko, MD, PhD, Associate Professor
Research Interests: Fox Proteins in Lung Development

Suhas Kallapur, MD, Associate Professor Clinical; Director, Neonatology CME
Research Interests: Lung Development: BPD

Heather Kaplan, MD, Research Assistant Professor
Research Interests: Epidemiology and Biostatistics

Alan Kenny, MD, Research Instructor
Research Interests: Molecular Development of the Foregut Organs

Paul S. Kingma, MD, PhD, Research Assistant Professor
Research Interests: Lung Defense; Surfactant

Madhavi Koneru, MD, Assistant Professor Clinical

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

Ron Levin, MD, Associate Professor Clinical

Kristin 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

Amy Nathan, MD, Research Assistant Professor
Research Interests: Immunobiology

Anne-Karina Perl, PhD, Research Assistant Professor
Research Interests: FGF/PGF Signaling in Alveolar Regeneration and EGFR Signaling in Bronchiolar Injury and Repair
John H. Reuter, MD, Associate Professor Clinical

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

Kurt Schibler, MD, Associate Professor; Medical Director, Good Samaritan Hospital NICU; Director, Clinical Research Program

John Shannon, PhD, Professor

Jean J. Steichen, MD, Professor

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

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

Laura Ward, MD, Adjunct Assistant Professor

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

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

Scott Wexelblatt, MD, Assistant Professor Clinical

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

Clinical Staff Members

- Shana Alexander, MD
- Stephen Bird, 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
- Ajay Ponkshe, MD
- John Robinson, MD
- Deborah Rufner, MD
- Kathy Sorgé, MD
- Kara Tencza, MD
- Kira Zimmerly, MD

Trainees

- Valerie Besnard, PhD, Université Rene Descartes - Paris V
- Stephanie Binder, MD, PL6, John H. Stroger Hospital Cook County, Chicago, IL
Significant Accomplishments in FY08

We wish to highlight the considerable progress we have made related to rare lung diseases and the effects of perinatal infection on prematurity.

The Rare Lung Disease Consortium, based at Cincinnati Children's and funded by the NIH, links the basic science underlying the pathogenesis of several rare pulmonary diseases: pulmonary alveolar proteinosis (PAP), interstitial lung diseases (ILD) in children, lymphangioleiomyomatosis (LAM) and alpha-1 antitrypsin. Bringing together investigators and patients affected by rare lung diseases from the US, Japan and Europe, the group has made major advances in diagnosis and treatment.

Recently, researchers demonstrated that adult patients with PAP have high levels of autoimmune antibodies that cause the disease by blocking the protein GM-CSF and, therefore, macrophage function in the lung. Because early trials with GM-CSF inhalation have been effective, larger trials are under study.

Perinatal Infection and Prematurity

In an NIH-funded collaborative with Australian colleagues, our researchers have shown that prenatal exposure of the fetus to bacterial endotoxin or ureaplasma, both commonly associated with preterm labor and perinatal infection, creates a fetal inflammatory syndrome. In the setting of perinatal infection and lung injury, the gentler methods of resuscitation and ventilation in the premature newborn are effective and cause less injury to the lungs. Their research studies are leading to improvements in the use of prenatal steroids, timing of delivery, resuscitation, ventilation methods and the use...
of pulmonary surfactant, all of which contribute to better care for preterm infants.

**Significant Publications in FY08**


Intrauterine infection contributes to prematurity and to the many complications related to preterm birth. In this publication, a model of intrauterine infection was developed to determine how the fetus is able to survive and adapt to bacterial infection prior to birth. The work demonstrates remarkable differences in fetal as compared to adult immune responses that, in turn, have important consequences related to the postnatal problems associated with prematurity.


Congenital malformations account for nearly half of neonatal death. This paper demonstrates a new mechanism that causes malformations of the trachea, lung, and limbs, and identifies a critical role of a secreted molecule (R-spondin 2) in the process of lung formation. R-Spondin was found to regulate the Wnt pathway to influence organogenesis, being required for normal formation of the larynx, trachea, and lung.


Since the lung is repeatedly exposed to infectious agents and toxicants, the cells lining the airways have a robust ability to repair, a process that must be terminated to avoid alterations in lung structure or cancer. This work demonstrates a previously unknown role for Rb (Retinoblastoma associated factor) in termination of the repair process in cells lining the respiratory tract that is relevant to lung repair and cancer prevention.


Misfolded proteins accumulate in cells causing injury or cellular dysfunction, a process related to a number of disorders, including Alzheimer’s disease, cystic fibrosis, and lung fibrosis, to name a few. This work identifies the novel role of ERdj4 and ERdj5 in chaperoning the surfactant protein C precursor through the cell. Mutations in surfactant protein C cause severe respiratory disease in infants and children. Understanding the processes that help the protein fold and move normally through the cell will help guide new therapies for this lethal lung disease in children.


This work demonstrates a novel role for MIA (Melanocyte Inhibitory Factor) in the regulation of lung maturation critical for survival after birth. MIA inhibits the processes that determine function of the lung, regulating genes that are required for breathing at birth. MIA suppresses lung maturation and its normal loss, prior to birth, is critical for the ability of the newborn to adapt to postnatal life.

**Division Publications**


32. Deshmukh HS, Shaver C, Case LM, Dietsch M, Wesselkamper SC, Hardie WD, Korfhagen TR, Corradi M, Nadel JA, Borchers MT, Leikauf GD. **Acrolein-activated matrix metalloproteinase 9 contributes to persistent mucin


Grants, Contracts, and Industry Agreements

Grant and Contract Awards

| Akeson, A | Pulmonary Lymphatic Development and Neonatal Lung Disease | March of Dimes - National | 6-FY07-317 | 06/01/07 - 05/31/10 | $73,695 / $221,209 |
| Bartman, T | Role of Chondronitin and Dermatan Sulfatation in Endocardial Cushion Morphogenesis | March of Dimes - National | | | $74,545 / $218,181 |
| | Analysis of NFATc1 as the Mechanism by Which Early Heart Function Regulates Endocardial Cushion and Valve Morphogenesis | American Heart Association - Ohio | 01/01/06 - 12/31/09 | $59,091 / $236,364 |
| Bridges, J | Characterization of LPCAT, a Lung LysoPC Acyltransferase: Identification of Catalytic Domains and | | | | |

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| Bridges, J | Characterization of LPCAT, a Lung LysoPC Acyltransferase: Identification of Catalytic Domains and | | | | |</p>
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Schibler, K
**NICHD Cooperative Multi-Center Neonatal Research Network**
National Institutes of Health
U10 HD 027853 04/01/06 - 03/31/11 $255,237 / $619,326

Shannon, J
**Lung Epithelium in Development and Disease**
March of Dimes - National
FY07622 06/01/08 - 11/30/08 $5,000 / $5,000

**Alveolar Type II Cells: Effects Of KGF**
National Institutes of Health (National Jewish Medical and Research Center)
R01 HL 029891 04/01/06 - 03/31/10 $6,993 / $69,870

**Role of HIF-1 in Fetal Lung Epithelial Differentiation**
National Institutes of Health
R01 HL 084376 02/01/07 - 01/31/12 $349,155 / $1,832,879

Trapnell, B
**Scientific Director Of Alpha1 Foundation**
Alpha One Foundation
07/01/06 - 06/30/08 $50,000 / $100,000

**Rare Disease Clinical Research Network**
National Institutes of Health
U54 RR 019498 09/30/03 - 07/31/08 $0,000 / $4,498,194

**Role of Anti-GM-CSF Antibodies in Myeloid Cell Function & Innate Immunity**
National Institutes of Health
R01 HL 085453 04/01/07 - 03/31/11 $250,000 / $1,000,000

Weaver, T
**Regulation Of Respiratory Epithelial Cell Homeostasis**
National Institutes of Health
P01 HL 061646 08/10/04 - 06/30/09 $1,320,624 / $6,892,425

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**Structure/Function Analyses Of SP-B In Transgenic Mice**
National Institutes of Health
R37 HL 056285 05/01/06 - 04/30/11 $358,472 / $1,885,203

Whitsett, J
**Genetic Control of Gestation and Lung Maturation in the Mouse**
March of Dimes - National
21-FY08-502 03/01/08 - 02/28/09 $25,100 / $25,100

**Pulmonary And Cardiovascular Development Training Grant**
National Institutes of Health
T32 HL 007752 07/01/04 - 06/30/09 $231,415 / $1,142,435

**ABCA3 and Alveolar Homeostasis**
National Institutes of Health
Service Collaborations

Hoath, S  
KAO Corporation  
$326,705

Steichen, J  
GC OB/GYN Inc.  
$12,025

Visscher, M  
Procter and Gamble  
$185,462