Division Summary

**RESEARCH AND TRAINING DETAILS**

<table>
<thead>
<tr>
<th>Number of Faculty</th>
<th>52</th>
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<tr>
<td>Number of Joint Appointment Faculty</td>
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<tr>
<td>Number of Research Fellows</td>
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<td>Number of Research Students</td>
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**CLINICAL ACTIVITIES AND TRAINING**

| Number of Clinical Staff | 23 |
| Number of Staff Physicians | 13 |
| Number of Clinical Fellows | 14 |
| Number of Clinical Students | 10 |
| Number of Other Students | 10 |

Research Highlights

Suhas Kallapur, Alan Jobe, and Louis Muglia

Suhas Kallapur, Alan Jobe, and Louis Muglia, in the Perinatal Institute, together with Claire Chougnet in the Division of Immunobiology, have initiated important non-human primate studies with collaborating investigators at the California National Primate Research Center to determine the mechanism by which stress and infection interact to increase the risk for preterm birth and adverse outcomes of prematurity such as bronchopulmonary dysplasia, as well as alter immune system development. Initial findings were published in the Journal of Immunology, and have resulted in new grants from the NIH and Burroughs Welcome Fund.

Kurt Schibler, Ardythe Morrow

Kurt Schibler, Ardythe Morrow, and collaborators evaluated the consequences of antibiotic use in preterm infants with subsequent microbiome development. They found that infants treated in the first week of life had lower bacterial diversity in the second and third weeks of life. Infants receiving early antibiotics also experienced more cases of necrotizing enterocolitis, sepsis, or death than those not exposed to antibiotics (Journal of Pediatrics).

Neera Goyal

Neera Goyal and collaborators from Every Child Succeeds evaluated the impact of home visitation programs on pregnancy outcomes for high-risk mothers. They found that amongst these first time mothers enrolled
prenatally in home visiting, higher dosage of intervention is associated with reduced likelihood of adverse pregnancy outcomes (Pediatrics).

**Significant Publications**


This article summarizes existing data on influenza vaccination in pregnancy that demonstrates improvement in birth weight and reduction in risk for preterm birth in vaccinated mothers. These important health benefits from vaccination should lead to more robust implementation measures as well as a new research agenda for understanding disease mechanisms.


Goblet cell metaplasia is associated with common lung diseases that are susceptible to recurrent viral infections. The mechanisms linking goblet cell metaplasia and susceptibility to viral infection are incompletely understood. In this study, the transcription factor FOXA3 was found to induce goblet cell metaplasia in response to infection. Suppression of interferon signaling by FOXA3 was shown to provide one mechanism that may serve to limit ongoing Th1 inflammation during the resolution of acute viral infection; however, inhibition of innate immunity by FOXA3 simultaneously contributes to susceptibility to viral infections with the chronic lung disorders.


In this study, Kallapur, Jobe and colleagues define the effects of chorioamnionitis on the fetal immune system, IL-1β was administered intra-amnionically at ~80% gestation in rhesus monkeys. IL-1β caused histological chorioamnionitis, as well as lung inflammation (infiltration of neutrophils or monocytes in the fetal airways) and large increases in multiple proinflammatory cytokines. Importantly, IL-1β significantly altered the balance between inflammatory and regulatory T cells. The results show that the chorioamnionitis-induced IL-1/IL-17 pathway is involved in the severe inflammation that can develop in preterm newborns. Boosting regulatory T cells and/or controlling IL-17 may provide a means to ameliorate these abnormalities.

**Division Publications**


**Faculty, Staff, and Trainees**

**Faculty Members**

**Jeffrey A. Whitsett, MD**, Professor
- **Leadership** Co-Director, Perinatal Institute; Chief, Section of Neonatology, Perinatal and Pulmonary Biology
- **Research Interests** Lung Development; Surfactant

**Henry T. Akinbi, MD**, Associate Professor
- **Research Interests** Neonatal Infections and Blood Transfusions

**Sandip Bhattacharyya, MSc, PhD**, Assistant Professor
- **Research Interests** Inflammation Immunology, Signal Transduction

**James P. Bridges, PhD**, Assistant Professor
- **Research Interests** Hypoxia Inducible Factors and Downstream Target Genes in Chronic Lung Disease

**Tanya E. Cahill, MD**, Assistant Professor
- **Leadership** Director, High Risk Infant Follow-Up Program
- **Research Interests** Neonatal Abstinence Syndrome and High Risk Infant Follow-Up

**Michael W. Crossman, MD, PhD**, Assistant Professor
- **Research Interests** Bioethics

**Jay H. Dritz, MD**, Assistant Professor
- **Research Interests** Neonatal resuscitation, quality improvement

**Stephan W. Glasser, PhD**, Associate Professor
- **Research Interests** Gene Regulation in the Lung

**Neera K. Goyal, MD, MSHP**, Assistant Professor

**James M. Greenberg, MD**, Professor
- **Leadership** Co-Director, Perinatal Institute; Director, Division of Neonatology
- **Research Interests** Preterm Birth, Community Health, Pulmonary Vascular Development

**Beth E. Haberman, MD**, Associate Professor
- **Leadership** Medical Director, Cincinnati Children's NICU & Co-Medical Director, Mercy Anderson Hospital Nurseries
- **Research Interests** Infant Follow-up

**Eric S. Hall, PhD**, Assistant Professor
- **Research Interests** Biomedical Informatics

**Crystal D. Hill, MD**, Assistant Professor
- **Research Interests** Simulation and motility

**Steven B. Hoath, MD**, Professor Emeritus
- **Research Interests** Skin Development & Environmental Interactions

**Alan H. Jobe, MD, PhD**, Professor
Leadership
Director, Division of Perinatal Biology

Research Interests
Injury and Repair of the Preterm Lung

Beth Ann Johnson, MD, Assistant Professor

Tanya V. Kalin, MD, PhD, Associate Professor

Research Interests
Transcriptional Regulation of Carcinogenesis and Radiation-Induced Lung Fibrosis

Vladimir V. Kalinichenko, MD, PhD, Associate Professor

Research Interests
Fox Proteins in Lung Development

Suhas G. Kallapur, MD, Professor

Leadership
Director, Neonatology CME

Research Interests
Fetal Inflammation/Physiology, Lung Development/Inflammation, BPD, Developmental Immunology

Beena D. Kamath-Rayne, MD, MPH, Assistant Professor

Research Interests
Neonatal Outcomes and Public Health; Fetal Lung Maturity; Global Health

Heather C. Kaplan, MD, MSCE, Assistant Professor

Research Interests
Health Services Research; Improvement Science

Alan P. Kenny, MD, PhD, Instructor

Research Interests
Molecular Development of the Foregut Organs

Paul S. Kingma, MD, PhD, Associate Professor

Research Interests
Innate Immune Systems; Cystic Fibrosis; Neonatal Infection

Thomas R. Korfhagen, MD, PhD, Professor

Research Interests
Lung Defense

Timothy D. Le Cras, PhD, Associate Professor

Leadership
Director of Admissions, Molecular & Developmental Biology Graduate Program

Research Interests
Chronic Lung Diseases; Lung Development, Pulmonary Hypertension

Yutaka Maeda, DVM, PhD, Assistant Professor

Research Interests
Lung cancer, Asthma

Kristin R. Melton, MD, Associate Professor

Leadership
Associate Director, Neonatal-Perinatal Medicine Fellowship Training Program

Research Interests
Developmental Biology, Neural Crest Biology

Stephanie L. Merhar, MD, MS, Assistant Professor

Research Interests
Neonatal neuroimaging, infant follow up

Nagendra K. Monangi, MD, Assistant Professor

Research Interests
Maternal/Infant nutrition and vitamin D in preterm infants

Ardythe L. Morrow, PhD, Professor

Leadership
Director, Center for Interdisciplinary Research in Human Milk and Lactation

Research Interests
Molecular Epidemiology of Human Milk, Epidemiologic Methods, Prevention of Infectious Disease, Predictive Biomarkers of Neonatal Outcomes

Laurel B. Moyer, MD, Assistant Professor
Louis J. Muglia, MD, PhD, Professor
Leadership Co-Director, Perinatal Institute; Division of Neonatology; Director, Center for Prevention of Preterm Birth

Research Interests Genetics of Birth Timing; Neurobiology of the Stress Response

Vivek Narendran, MD, MBA, Professor
Leadership Medical Director, Univ. Hosp. NICU and Newborn Nursery; Medical Director, The Christ Hospital Nursery; Chair, Department of Pediatrics, the University Hospital

Research Interests C-PAP; Business Case for Quality Improvements; Preterm Infant Skin

Amy T. Nathan, MD, Assistant Professor
Leadership Medical Director, TriHealth Nurseries

Research Interests Immunobiology

Laurie A. Nommsen-Rivers, PhD, RD, IBCLC, Assistant Professor
Leadership Co-Chair, Seminar Series in Human Milk and Lactation

Research Interests Human Lactation and Breastfeeding

Anne-Karina T. Perl, PhD, Assistant Professor

Research Interests Alveolar Regeneration and Bronchiolar Injury/Repair

John H. Reuter, MD, PhD, Associate Professor
Leadership Chair, Department of Pediatrics at Bethesda North Hospital Nurseries

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

Research Interests Lung Development, Surfactant Biology

Jerod M. Rone, MD, Associate Professor
Leadership Medical Director, Kettering Medical Center NICU

Kurt R. Schibler, MD, Associate Professor
Leadership Director, Neonatology Clinical Research Program

Research Interests Neonatal Immunology, Necrotizing Enterocolitis

John M. Shannon, PhD, Professor
Leadership Director of Graduate Studies, Program in Molecular and Developmental Biology

Research Interests Lung Development, Foregut Embryology

Debora I. Sinner, PhD, Assistant Professor
Research Interests Wnt Signaling and Sox Transcription Factors in Lung Development and Disease

Andrew P. South, MD, MPH, Assistant Professor
Research Interests Outcomes and Etiology of Gastroschisis, Epidemiology of Late-Preterm Birth

Jean J. Steichen, MD, Professor Emeritus
Research Interests Infant Follow-up

Takuji Suzuki, MD, PhD., Assistant Professor
**Research Interests** Lung Immunology

**Bruce C. Trapnell, MD, MS, Professor**

**Leadership** Director, Rare Lung Diseases Network; Scientific Director, PAP Foundation; Co-Director, Cystic Fibrosis TDN Center

**Research Interests** Rare Lung Diseases; GM-CSF, Gene Therapy

**Christina J. Valentine, MD, Assistant Professor**

**Research Interests** Maternal and Infant Nutrition to improve perinatal health

**Laura Ward, MD, Assistant Professor**

**Leadership** Co-Medical Director, Mercy Anderson Hospital Nurseries

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

**Timothy E. Weaver, MS, PhD, Professor**

**Leadership** Associate Director, Division of Pulmonary Biology; Co-Director, Molecular and Developmental Biology Program

**Research Interests** Pathogenesis of Interstitial Lung Diseases

**Kathryn E. Wedig, MD, Associate Professor**

**Leadership** Director, High Risk Clinic at GSH; Medical Director, Mercy Hospital Fairfield

**Research Interests** Infant Follow-up, Neonatal Abstinence Syndrome

**Susan E. Wert, PhD, Associate Professor**

**Leadership** 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 L. Wexelblatt, MD, Assistant Professor**

**Leadership** Medical Director, Regional Newborn Services; Co-Medical Director Bethesda North Hospital Nurseries

**Research Interests** Late Preterm Infant, Quality Improvement

**Jonathan R. Wispé, MD, Professor**

**Research Interests** Perinatal Ethics, Theological Studies

**Yan Xu, PhD, Associate Professor**

**Leadership** Director, Bioinformatics Microarray Core, Division of Pulmonary Biology

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

**Joint Appointment Faculty Members**

**Kathryn A. Wikenheiser-Brokamp, MD, PhD, Associate Professor (Pathology)**

**Research Interests** Pulmonary Pathology, Pediatric and Adult Lung Diseases

**Clinical Staff Members**

- Beth A. Baisden, MD
- Stephen Bird, MD
- Mary Burwinkel, MD
- Thomas Catalanotto, MD
Diane Donley, MD
Horacio Falciglia, MD
Michelle French, MD
Angelique Gloster, MD
Jill Klein, MD
Katie Loudermilk, MD
Alisa McGill, MD
John Morrison, MD
Vasuda Narayanaswamy, MD
Miriam Peri, MD
Ajay Ponkshe, MD
Danna Premer, MD
John Robinson, MD
Deborah Rufner, MD
Kelley Shultz, MD
Jean Steichen, MD
Wambui Waruingi, MD
Kira Zimmerly, MD

Trainees

- Thomas Acciani, BS, University of Illinois, Urbana, IL
- Melinda Arnett, PhD, University of Kansas Medical Center, Kansas City, KS
- Aria Attila, MS, Georgetown University, Washington, DC
- Jonas Bacelis, PhD, University of Gothenburg, Sweden
- Olivia Ballard, BA, Miami University, Oxford, OH
- Katie Bezold, BS, Xavier University, Cincinnati, OH
- Yuqi Cai, PhD, Zhejiang University School of Medicine, Hangzhou, China
- Kimberly Carpenter, MD, North Shore-Long Island Jewish Health System, New Hyde Park, NY
- Xin-Hua Cheng, PhD, Miami University, Oxford, OH
- Juan Manuel Coya, PhD, Universidad Complutense, Madrid, Spain
- Rebecca Currier, BS, Louisiana Tech University, Ruston, LA
- Yina Du, MS, University of Cincinnati, Cincinnati, OH
- Joshua Euteneuer, MD, St. Louis Children's Hospital, St. Louis, MO
- Jill Fritz, BS, Miami University, Oxford, OH
- Logan Fulford, BS, Indiana State University, Terre Haute, IN
- David Hahn, BS, Northern Kentucky University, Highland Heights, KY
- Jamie Havrilak, BS, Susquehanna University, Selinsgrove, PA
- Melissa Landis, MD, Morgan Stanley Children's Hospital of NY Presbyterian, New York, NY
- Gloria Laryea, BS, University of Maryland, Eastern Shore, Princess Anne, MD
- Candice Lengyel, MD, University of Michigan, Ann Arbor, MI
- Gunlawadee Maneenil, MD, Prince of Songkla University, Songkhla, Thailand
- Masahiko Murase, MD, PhD, IBCLC, Showa University, Tokyo, Japan
- Chan-Wook Park, MD, PhD, Seoul National University College of Medicine, Seoul, Korea
- Priya Rajavelu, PhD, University of Madras, Chennai, Tamil Nadu, India
- Malia Ray, MD, University of Louisville, Louisville, KY
- Stefanie Riddle, MD, Cincinnati Children's, Cincinnati, OH
The causes of preterm birth, complications of prematurity and birth defects span the spectrum of divisional interests and approaches at Cincinnati Children’s. To make substantial progress in reducing infant mortality from these causes requires collaborative efforts across many programs. The Perinatal Institute at Cincinnati Children’s provides an organizing center, and driver, for efforts to improve outcomes for infants born prematurely, prevent prematurity, and reduce the incidence of birth defects to synergistically reduce infant mortality in our region. As such, our Institute’s faculty have close collaborations with investigators in multiple divisions within Cincinnati Children’s, the University of Cincinnati, the other leading research institutions in Ohio, and globally in Japan, Germany, Mexico, Argentina, Finland, China, and Australia. For the past four years the Division has offered a day-long educational seminar series addressing new approaches to patient care and clinical research for visiting faculty neonatologists from China, Taiwan, and Southeast Asia.
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<td><strong>Role of GPR116 in the Regulation of Alveolar Surfactant Pool Size</strong></td>
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<td><strong>Initiation and Progression of Preterm Lung Injury with Ventilation</strong></td>
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<td><strong>Role of Foxm1 in Lung Cancer Microenvironment</strong></td>
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<td>Foxf1 Transcription Factor in Development of Pulmonary Capillaries</td>
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<td>MUGLIA, L</td>
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<td>Maternal Temperament, Stress, and Inflammation in Preterm Birth</td>
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PERL, A

**FGF and PDGF Regulate Myofibroblast Differentiation in Alveolar Regeneration**
National Institutes of Health

R01 HL 104003
07/01/10-06/30/14
$235,620

PUKI, K

**Alteration of Microbial Flora in the Intestines of Preterm Neonates with Chorioamnionitis**
American Academy of Pediatrics

09/01/13-06/30/14
$3,000

SCHIBLER, K

**NICHD Cooperative Multicenter Neonatal Research Network**
National Institutes of Health

U10 HD 027853
04/01/11-03/31/16
$336,477

SHANNON, J

**LPCAT1 is Essential for Perinatal Lung Function and Survival**
National Institutes of Health

R01 HL 098319
07/01/10-06/30/14
$296,584

SINNER, D

**Molecular Mechanisms Underlying Upper Airway Patterning and Tracheomalacia**
National Institutes of Health

K01 HL 115447
08/01/12-07/31/17
$104,071

SOUTH, A

**Intestinal Motility and Gastroschisis**
The Gerber Foundation

07/01/13-06/30/16
$52,251

SUZUKI, T

**Synthetic Endonuclease-Mediated Gene-Editing Therapy of Hereditary Pulmonary Alveolar Proteinosis**
American Thoracic Society

10/31/13-10/30/14
$40,000

TRAPNELL, B

**Role of GM-CSF in Myeloid Cell Function and Innate Immunity**
National Institutes of Health
R01 HL 085453 04/01/11-03/31/16 $245,000

Childhood Interstitial Lung Disease (chILD) and Chemokine (C-C motif) Receptor 2 (CCR2) Deficiency
American Thoracic Society(The Johns Hopkins University)
10/31/13-10/30/15 $5,640

Macrophage Based Gene Therapy for Hereditary Pulmonary Alveolar Proteinosis
National Institutes of Health
R01 HL 118342 05/01/14-04/30/18 $428,386

Cincinnati Center for Clinical and Translational Sciences and Training - Pilot/Collaborative Studies
National Institutes of Health(University of Cincinnati)
UL1 TR 000077 04/03/09-03/31/15 $23,051

VALENTINE, C

DHA Attenuates Inflammatory Responses through Altering Rage Signaling
National Institutes of Health(The Research Institute at Nationwide Hospital)
R01 AT 006880 09/30/11-06/30/14 $11,626

Dietary Docosahexaenoic Acid for Women with Preeclampsia
National Institutes of Health(University of Cincinnati)
KL2 TR 000078 10/01/13-08/31/14 $62,673

WEAVER, T

Stard7, a Novel Inhibitor of Allergic Lung Disease
National Institutes of Health
R01 HL 122130 01/01/14-12/31/17 $250,000

The Role of Autophagy in the Pathogenesis of interstitial Lung Disease
National Institutes of Health
R01 HL 103923 08/01/11-06/30/15 $316,184

Digestive Health Center: Bench to Bedside Research in Pediatric Digestive Disease - P&F Study
National Institutes of Health
P30 DK 078392 06/01/12-05/31/17 $50,000

WEXELBLATT, S

Neonatal Abstinence Syndrome (NAS) Project - Per patient
Ohio Department of Jobs & Family Services(University Hospitals, Case Medical Center)
07/01/12-06/30/14 $84,624

WHITSETT, J

"Lung MAP" Atlas Research Center
National Institutes of Health
U01 HL 122642 06/15/14-04/30/19 $495,784

Airway Progenitor Cell Proliferation and Differentiation During Lung Repair
National Institutes of Health
U01 HL 110964 01/01/12-12/31/16 $528,069

Cleveland Clinic Center for Accelerated Innovations
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<td>Role of SREBP Network in Surfactant Lipid Homeostasis and Lung Maturation</td>
<td></td>
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<td>National Institutes of Health</td>
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<tr>
<td>R01 HL 105433</td>
<td>07/01/11</td>
<td>06/30/15</td>
<td>$285,650</td>
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</tbody>
</table>

**Current Year Direct** $11,073,774

<table>
<thead>
<tr>
<th>Industry Contracts</th>
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<tbody>
<tr>
<td>MORROW, A</td>
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<tr>
<td>Glycosyn LLC</td>
<td>$17,967</td>
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<tr>
<td>Mead Johnson &amp; Company</td>
<td>$135,408</td>
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</tbody>
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**Current Year Direct Receipts** $153,375

**Total** $11,227,149