

Section of Neonatology, Perinatal and Pulmonary Biology



Division Data Summary

Research and Training Details

Number of Faculty	49
Number of Joint Appointment Faculty	1
Number of Research Fellows	13
Number of Research Students	12
Number of Support Personnel	95
Direct Annual Grant Support	\$8,710,340
Direct Annual Industry Support	\$187,905
Peer Reviewed Publications	97

Clinical Activities and Training

Number of Clinical Staff	15
Number of Clinical Fellows	14
Inpatient Encounters	86,977
Outpatient Encounters	2,168

Division Photo



Row 1: S Wert, L Nommsen-Rivers, N Goyal, J Greenberg, J Whitsett, Y Xu, A Nathan
Row 2: H Kaplan, D Premer, S Kallapur, T Weaver, A Perl, T Kalin, S Glasser, A Kenny, B Johnson, J Bridges, M Ikegami, E Hall, V Narendran, S Merhar, K Melton C Valentine
Row 3: K Wikenheiser-Brokamp, T Suzuki, D Sinner, L Ward, K Schibler, A Jobe, N Hillman, V Kalinichenko, J Shannon, J Reuter, W Rice, S Hoath

Significant Publications

Binder S, Hill K, Meinzen-Derr J, **Greenberg JM**, **Narendran V**. **Increasing VLBW deliveries at subspecialty perinatal centers via perinatal outreach.** *Pediatrics*. 2011 Mar;127(3):487-93. Mar, 2011.

This work utilizes regional data from the greater Cincinnati area to demonstrate the importance of referral of “high risk” mothers to tertiary obstetrical centers for the care and delivery of their preterm infants. Maternal, rather than infant transfer, reduces perinatal morbidity and mortality related to preterm birth. This publication highlights the benefits of our regionalized clinical program.

McCormack FX, Inoue Y, Moss J, Singer LG, Strange C, Nakata K, Barker AF, Chapman JT, Brantly ML, Stocks JM, Brown KK, Lynch JP 3rd, Goldberg HJ, Young LR, Kinder BW, Downey GP, Sullivan EJ, Colby TV, McKay RT, Cohen MM, Korbee L, Taveira-DaSilva AM, Lee HS, Krischer JP, **Trapnell BC**; National Institutes of Health Rare Lung Diseases Consortium; MILES Trial Group. **Efficacy and safety of sirolimus in lymphangi leiomyomatosis.** *N Engl J Med*. 364(17):1595-606. Apr 28, 2011.

This is a landmark publication, demonstrating the first effective treatment for the life-threatening pulmonary complications of lymphangi leiomyomatosis (LAM). It is a carefully controlled, double blind, multicenter study, led by Dr. McCormack (UC) and Dr. Trapnell (CCHMC-UC), began as a part of the “Rare Lung Disease Consortium” here at CCHMC.

Kamath BD, Marcotte MP, Defranco EA. **Neonatal morbidity after documented fetal lung maturity in late preterm and early term infants.** *Am J Obstet Gynecol*. 204 (6):518.e1-518.e8. Jun, 2011.

It is increasingly clear that late preterm delivery poses significant risks to the newborn. This work demonstrates increased pulmonary morbidity, admission to special care units for multiple complications of prematurity, in spite of documented pulmonary maturation, a finding of national significance in reducing the

rate of preterm birth and associated complications that occur even in late “preterms.” This work demonstrates that pulmonary maturity is not sufficient to ensure neonatal outcomes comparable to infants born at term.

Kaplan HC, Lannon C, Walsh MC, **Donovan EF**; Ohio Perinatal Quality Collaborative. **Ohio statewide quality-improvement collaborative to reduce late-onset sepsis in preterm infants.** *Pediatrics*. 127(3):427-35. Mar, 2011.

Cooperation among Ohio delivery hospitals and the use of centralized databases, provide the infrastructure to document and reduce late onset sepsis in very preterm infants. This work demonstrates the value of a multi-center improvement collaborative to improve neonatal outcomes and reduce health care costs.

Morrow AL, Meinzen-Derr J, Huang P, **Schibler KR**, , Keddache M, **Kallapur SG**, Newburg DS, Tabangin M, Warner BB, Jiang X. **Fucosyltransferase 2 non-secretor and low secretor status predicts severe outcomes in premature infants.** *J Pediatr*. 158(5):745-51. May, 2011.

This work identifies secretor and nonsecretor status of the mother/infant dyad as an important risk factor for the necrotizing enterocolitis (NEC) and death of low birth weight/preterm infants. It is the first genetic test that indicates the risk for severe outcomes for preterm infants, and provides support for the importance of the innate immune system and its likely interaction with the microbiome in the pathogenesis of NEC and neonatal sepsis.

Division Highlights

Beena Kamath, MD, MPH

Dr. Kamath, along with colleagues Emily DeFranco, DO, (Dept. of OB/GYN University of Cincinnati) and Michael Marcotte, MD (Dept. of OB/GYN Good Samaritan Hospital), reported important findings regarding previously unappreciated limitations of fetal lung maturity testing to predict readiness for postnatal life.

Noah Hillman, MD, Alan Jobe, MD, PhD, Machiko Ikegami, PhD, and Suhas Kallapur, MD Neonatal MRI Imaging

These investigators led a pre-clinical study of MRI imaging using a novel prototype MRI developed by Dr. Chuck Dumoulin and his colleagues in the CCHMC Imaging Research Center. Preterm lambs were delivered by Cesarean section, treated with pulmonary surfactant, stabilized on mechanical ventilation and subjected to sequential MRI imaging. Successful studies of brain, lung, and gastrointestinal structures were conducted. Findings are being applied toward development of a clinical MRI device scheduled for installation in the CCHMC NICU by January 2012.

James Greenberg, MD, Eric Hall, PhD, and Jareen Meinzen-Derr, PhD Infant Mortality Reduction

This group is working with the Anderson Center to support the CCHMC Community Health Strategic goal to reduce infant mortality in Hamilton County to the national average of 6.9/1000 live birth by 2015. They continue work on geographic analytic method to identify key “hot spots” for targeted interventions to reduce preterm birth through coordination of care.

Heather Kaplan, MD, Edward Donovan, MD, and Carole Lannon, PhD Multi-Institutional Quality Improvement to Reduce Late-Onset Sepsis

These investigators demonstrated the efficacy of a state-wide quality collaborative (Ohio Perinatal Quality Collaborative) to reduce infections in the NICU.

Division Collaboration

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

Faculty Members

Jeffrey A. Whitsett, MD, Professor

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

Laurel Bookman, MD, Assistant Professor

Research Interests Implementation Science, International Health

James Bridges, PhD, Instructor

Research Interests Hypoxia Inducible Factors and Downstream Target Genes in Chronic Lung Disease

Tanya E. Cahill, MD, Assistant Professor

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

Horacio Falciglia, MD, Professor Emeritus

Research Interests Seleniun Status and Neonatal Sepsis; Neonatal Mortality

Stephan W. Glasser, PhD, Associate Professor

Research Interests Gene Regulation in the Lung

James M. Greenberg, MD, Professor

Co-Director, Perinatal Institute; Director, Division of Neonatology

Research Interests Preterm Birth, Community Health, Pulmonary Vascular Development

Beth E. Haberman, MD, Assistant Professor

Medical Director, Cincinnati Children's NICU & Co-Medical Director, Mercy Anderson Hospital Nurseries

Research Interests Infant Follow-up

Eric Hall, PhD, Assistant Professor

Research Interests Biomedical Informatics

Noah H. Hillman, MD, Assistant Professor

Research Interests Pulmonary Physiology, Neonatal Resuscitation, Lung Injury/Repair

Steven B. Hoath, MD, Professor

Medical Director, Skin Sciences Program

Research Interests Skin Development & Environmental Interactions

Machiko Ikegami, MD, PhD, Professor

Director, Surfactant and Metabolic Function Core

Research Interests Surfactant Metabolism; Lung Injury

Alan H. Jobe, MD, PhD, Professor

Director, Division of Perinatal Biology

Research Interests Injury and Repair of the Preterm Lung

Tanya V. Kalin, MD, PhD, Assistant 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, Associate Professor

Director, Neonatology CME

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

Beena Kamath, MD, MPH, Assistant Professor

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

Heather 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, Assistant Professor

Research Interests Innate Immune Systems; Cystic Fibrosis; Neonatal Infection

Thomas R. Korfhagen, MD, PhD, Professor

Research Interests Lung Defense

Timothy Le Cras, PhD, Associate Professor

Director of Admissions, Molecular & Developmental Biology Graduate Program

Research Interests Chronic Lung Diseases; Lung Development, Pulmonary Hypertension

Kristin R. Melton, MD, Associate Professor

Associate Director, Neonatal Fellowship Training Program

Research Interests Developmental Biology, Neural Crest Biology

Ardythe L. Morrow, PhD, Professor

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

Vivek Narendran, MD, MBA, Associate Professor

Medical Director, Univ. Hosp. NICU & 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

Medical Director, TriHealth Nurseries

Research Interests Immunobiology

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

Co-Chair, Seminar Series in Human Milk and Lactation

Research Interests Human Lactation and Breastfeeding

Anne-Karina Perl, PhD, Assistant Professor

Research Interests Alveolar Regeneration and Bronchiolar Injury/Repair

John H. Reuter, MD, PhD, Associate Professor

Co-Medical Director, Bethesda North Hospital Nurseries

Research Interests

Ward R. Rice, MD, PhD, Professor

Director, Neonatal Fellowship Training Program; Director, Newborn Services, St. Elizabeth Medical Center

Research Interests Lung Development, Surfactant Biology

Kurt R. Schibler, MD, Associate Professor

Principal Investigator, NICHD Neonatal Research Network

Research Interests Neonatal Immunology, Necrotizing Enterocolitis

John M. Shannon, PhD, Professor

Director of Graduate Studies, Program in Molecular and Developmental Biology

Research Interests Lung Development, Foregut Embryology

Debora I. Sinner, PhD, Instructor

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., Instructor

Research Interests Lung Immunology

Bruce C. Trapnell, MD, MS, Professor

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

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

Laura Ward, MD, Assistant Professor

Co-Medical Director, Mercy Anderson Hospital Nurseries

Research Interests Use of Human Milk in the NICU

Timothy E. Weaver, MS, PhD, Professor

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

Director, High Risk Clinic @ GSH; Medical Director, Mercy Hospital Fairfield

Research Interests Infant Follow-up, Neonatal Abstinence Syndrome

Susan E. Wert, PhD, 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

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

Research Interests Late Preterm Infant, Quality Improvement

Yan Xu, PhD, Associate Professor

Director, Microarray-Bioinformatics Core, Division of Pulmonary Biology

Research Interests Bioinformatics, Systems Biology, Transcriptional Network

Joint Appointment Faculty Members

Kathryn Wikenheiser-Brokamp, MD/PhD, Associate Professor

Pathology

Research Interests Pulmonary Pathology, Pediatric and Adult Lung Diseases

Clinical Staff Members

- Stephen Bird, MD
- Mary Burwinkel, MD
- Thomas Catalanotto, MD
- Christine Chappell, MD
- Diane Donley, MD
- Michelle French, MD
- Pamela Holmes, MD
- Katie Loudermilk, MD
- Alisa McGill, MD
- Miriam Peri, MD
- Ajay Ponshe, MD
- Danna Premer, MD
- John Robinson, MD
- Deborah Rufner, MD
- Kira Zimmerly, MD

Trainees

- Thomas Acciani, BS, University of Illinois Urbana
- Ceyda Acun, MD, PL6, George Washington University Hospital, Washington, DC
- David Balli, BA, DePauw University, Greencastle, IN
- Clare Berry, PhD, University of Western Australia
- Valerie Besnard, PhD, Universite Rene Descartes - Paris V
- Craig Bolte, PhD, University of Cincinnati
- Gang Chen, MS, PhD, Yangzhou University, China
- Elizabeth Davies, BSc, University of Southampton, UK
- David Dewar, MD, PL4, Michigan State University, East Lansing, MI
- Jill Fritz, BS, Miami University, Oxford, OH
- Tate Gisslen, MD, PL4, University of Minnesota Medical School, Minneapolis, MN
- Corryn Greenwood, MD, PL5, Mayo Clinic School of Graduate Medical Education, Rochester, NY
- David Hahn, BS, Northern Kentucky University
- Hans Michael Haitchi, MD, PhD, University of Southampton, UK
- Jamie Havrilak, BS, Susquehanna University, Selinsgrove, PA
- Prakruti Jambula, MD, PL6, Univ. of Oklahoma HSC, Oklahoma City, OK
- Venkata Kuppala, MD, PL6, The Cleveland Clinic, Cleveland, OH
- Ryosuke Kusano, MD, Kyoto Prefectural University of Medicine, Japan
- Audrone LaForgia, MD, PL5, EVMS/Children's Hospital of the King's Daughters, Norfolk, VA
- Alexander Lange, PhD, University of Cincinnati
- Karunyakanth Mandapaka, MS, University of Cincinnati

- Rafael Mena, MD, PL6, Cincinnati Children's Hospital Medical Center - UCMC, Cincinnati, OH
- Stephanie Merhar, MD, PL6, Cincinnati Children's Hospital Medical Center - UCMC, Cincinnati, OH
- Anne Minter, BA, Miami University, Oxford, OH
- Nagendra Monangi, MD, PL5, Osmania Medical College, Hyderabad, India; University of South Alabama, Mobile, AL
- Elizabeth Mushaben, BS, College of Mount St. Joseph
- Gaston Ofman, MD, Favaloro University School of Medicine, Buenos Aires, Argentina
- Laurent Plantier, MD, PhD, Universite of Paris, France
- Malia Ray, MD, University of Louisville, Kentucky
- Xiaomeng Ren, MD, PhD, Chinese Academy of Medical Sciences and Peking Union Medical College
- Christine Sarlone, MD, PL6, Univ. of Tennessee HSC, Memphis, TN
- Atsuyasu Sato, MD, PhD, Kyoto University, Japan
- Jennifer Smith, MD, PL4, University of Louisville School of Medicine, Louisville, KY
- Kevin Stutey, MD, PL4, Eastern Virginia Medical School, Norfolk, VA
- Diana Taft, BA, Cornell University, Ithaca, NY
- David Tompkins, MS, University of Texas
- Elizabeth Wetzell, MD, MSc, PL6, Indiana Univ. SOM, Indianapolis, IN
- Tim Wolfs, PhD, Royal Netherlands Academy of Arts and Sciences, The Netherlands
- Qing Yan Xie, BA, MS, Beijing University of Technology, Wuhan, China

Significant Accomplishments

Diagnosis and Treatment of Pulmonary Alveolar Proteinosis

National Institutes of Health funding was approved for Bruce Trapnell, MD, MS, and coworkers who have developed lung markers for the diagnosis of hereditary and acquired disorders of surfactant metabolism. They have found that pulmonary alveolar proteinosis (PAP) is a heterogeneous disorder caused, in part, by autoimmunity against GM-CSF and by mutations in GM-CSF receptors, enabling correct diagnosis and treatment of these life-threatening disorders. New treatment modalities, including gene therapy, are being tested in the clinics.

Pathogenesis of Interstitial Lung Disease and Emphysema

New NIH funding was approved for studies, led by Timothy Weaver, PhD, to identify the mechanisms causing lung remodeling in idiopathic pulmonary fibrosis associated with mutations in the surfactant protein-C gene, a cause of life-threatening pulmonary disease in children and adults. Anne Karina Perl, PhD, leads the work identifying the role of growth factors to enhance lung growth in children and adults with emphysema.

Genetic Networks Linking Mucus Metaplasia and Inflammation

NIH funding was approved for the study of a new genetic network regulating airway epithelial cell differentiation and mucus production related to cystic fibrosis, asthma and COPD in work led by Thomas Korfhagen, MD, PhD, and Jeffrey Whitsett, MD. A master regulator of mucus production and its impact on lung structure and inflammation are being studied as a target for therapy for chronic lung diseases in children and adults.

Division Publications

1. Akeson A, Herman A, Wiginton D, Greenberg J. **Endothelial cell activation in a VEGF-A gradient: relevance to cell fate decisions.** *Microvasc Res.* 2010; 80:65-74.
2. Akinbi H, Meinen-Derr J, Auer C, Ma Y, Pullum D, Kusano R, Reszka KJ, Zimmerly K. **Alterations in the host defense properties of human milk following prolonged storage or pasteurization.** *J. Pediatr. Gastroenterol. Nutr.* 2010; 51:347-52.
3. Ambalavanan N, Walsh M, Bobashev G, Das A, Levine B, Carlo WA, Higgins RD, Collaborators:, Jobe AH, Schibler K. **Intercenter differences in bronchopulmonary dysplasia or death among very low birth weight infants.** *Pediatrics.* 2011; 127:e106-16.
4. Balli D, Zhang Y, Snyder J, Kalinichenko VV, Kalin TV. **Endothelial cell-specific deletion of transcription factor FoxM1 increases urethane-induced lung carcinogenesis.** *Cancer Res.* 2011; 71:40-50.
5. Bell EF, Hansen NI, Morriss FH, Jr., Stoll BJ, Ambalavanan N, Gould JB, Lupton AR, Walsh MC, Carlo WA, Shankaran S, Das A, Higgins RD, Collaborators:, Jobe AH. **Impact of timing of birth and resident duty-hour restrictions on outcomes for small preterm infants.** *Pediatrics.* 2010; 126:222-31.
6. Benjamin DK, Jr., Stoll BJ, Gantz MG, Walsh MC, Sanchez PJ, Das A, Shankaran S, Higgins RD, Auten KJ, Miller NA, Walsh TJ, Lupton AR, Carlo WA, Kennedy KA, Finer NN, Duara S, Schibler K, Chapman RL, Van Meurs KP, Frantz ID, 3rd, Phelps DL, Poindexter BB, Bell EF, O'Shea TM, Watterberg KL, Goldberg RN, Collaborator:, Jobe AH. **Neonatal candidiasis: epidemiology, risk factors, and clinical judgment.** *Pediatrics.* 2010; 126:e865-73.
7. Binder S, Hill K, Meinen-Derr J, Greenberg JM, Narendran V. **Increasing VLBW deliveries at subspecialty perinatal centers via perinatal outreach.** *Pediatrics.* 2011; 127:487-93.
8. Boghossian NS, Hansen NI, Bell EF, Stoll BJ, Murray JC, Lupton AR, Shankaran S, Walsh MC, Das A, Higgins RD, Collaborators:, Jobe AH, Schibler K. **Survival and morbidity outcomes for very low birth weight infants with Down syndrome.** *Pediatrics.* 2010; 126:1132-40.
9. Bookman L, Engmann C, Srofenyoh E, Enweronu-Laryea C, Owen M, Randolph G, Price W, Barker P. **Educational impact of a hospital-based neonatal resuscitation program in Ghana.** *Resuscitation.* 2010; 81:1180-2.
10. Bookman L, Troy R, McCaffrey M, Randolph G. **Using quality-improvement methods to reduce variation in surfactant administration.** *Qual Saf Health Care.* 2010; 19:e23.
11. Boppana SB, Ross SA, Shimamura M, Palmer AL, Ahmed A, Michaels MG, Sanchez PJ, Bernstein DI, Tolan RW, Jr., Novak Z, Chowdhury N, Britt WJ, Fowler KB, Collaborator:, Schibler K. **Saliva polymerase-chain-reaction assay for cytomegalovirus screening in newborns.** *N Engl J Med.* 2011; 364:2111-8.
12. Borok Z, Whitsett JA, Bitterman PB, Thannickal VJ, Kotton DN, Reynolds SD, Krasnow MA, Bianchi DW, Morrissey EE, Hogan BL, Kurie JM, Walker DC, Radisky DC, Nishimura SL, Violette SM, Noble PW, Shapiro SD, Blaisdell CJ, Chapman HA. **Cell Plasticity in Lung Injury and Repair: Report from an NHLBI Workshop, April 19-20, 2010.** *Proc Am Thorac Soc.* 2011; 8:215-22.
13. Chantry CJ, Nommsen-Rivers LA, Peerson JM, Cohen RJ, Dewey KG. **Excess weight loss in first-born breastfed newborns relates to maternal intrapartum fluid balance.** *Pediatrics.* 2011; 127:e171-9.
14. Chavez Valdez R, Ahlawat R, Wills-Karp M, Nathan A, Ezell T, Gauda EB. **Correlation between serum caffeine levels and changes in cytokine profile in a cohort of preterm infants.** *J Pediatr.* 2011; 158:57-64, 64 e1.
15. Chen S, Rong M, Platteau A, Hehre D, Smith H, Ruiz P, Whitsett J, Bancalari E, Wu S. **CTGF disrupts alveolarization and induces pulmonary hypertension in neonatal mice: implication in the pathogenesis of severe bronchopulmonary dysplasia.** *Am J Physiol Lung Cell Mol Physiol.* 2011; 300:L330-40.
16. Collins JJ, Kallapur SG, Knox CL, Nitsos I, Polglase GR, Pillow JJ, Kuypers E, Newnham JP, Jobe AH, Kramer BW. **Inflammation in fetal sheep from intra-amniotic injection of *Ureaplasma parvum*.** *Am J*

Physiol Lung Cell Mol Physiol. 2010; 299:L852-60.

17. Dando SJ, Nitsos I, Newnham JP, Jobe AH, Moss TJ, Knox CL. **Maternal administration of erythromycin fails to eradicate intrauterine ureaplasma infection in an ovine model**. *Biol Reprod*. 2010; 83:616-22.
18. D'Angio CT, Heyne RJ, O'Shea TM, Schelonka RL, Shankaran S, Duara S, Goldberg RN, Stoll BJ, Van Meurs KP, Vohr BR, Das A, Li L, Burton RL, Hastings B, Phelps DL, Sanchez PJ, Carlo WA, Stevenson DK, Higgins RD, Collaborator:, Jobe AH. **Heptavalent pneumococcal conjugate vaccine immunogenicity in very-low-birth-weight, premature infants**. *Pediatr Infect Dis J*. 2010; 29:600-6.
19. Davis AS, Hintz SR, Van Meurs KP, Li L, Das A, Stoll BJ, Walsh MC, Pappas A, Bell EF, Laptook AR, Higgins RD, Collaborator:, Schibler K. **Seizures in extremely low birth weight infants are associated with adverse outcome**. *J Pediatr*. 2010; 157:720-5 e1-2.
20. Davis JA, Visscher MO, Wickett RR, Hoath SB. **Role of TNF-alpha polymorphism -308 in neurosensory irritation**. *Int J Cosmet Sci*. 2011; 33:105-12.
21. Davis JA, Visscher MO, Wickett RR, Hoath SB. **Influence of tumour necrosis factor-alpha polymorphism-308 and atopy on irritant contact dermatitis in healthcare workers**. *Contact Dermatitis*. 2010; 63:320-32.
22. Donovan EF, Besl J, Paulson J, Rose B, Iams J. **Infant death among Ohio resident infants born at 32 to 41 weeks of gestation**. *Am J Obstet Gynecol*. 2010; 203:58 e1-5.
23. Duvoix A, Miranda E, Perez J, Sorensen GL, Holmskov U, Trapnell BC, Madsen J, Clark HW, Edwards LD, Miller BE, Tal-Singer RM, Lomas DA. **Evaluation of full-length, cleaved and nitrosylated serum surfactant protein D as biomarkers for COPD**. *COPD*. 2011; 8:79-95.
24. Ehrenkranz RA, Das A, Wrage LA, Poindexter BB, Higgins RD, Stoll BJ, Oh W, Collaborators:, Jobe AH, Schibler K. **Early nutrition mediates the influence of severity of illness on extremely LBW infants**. *Pediatr Res*. 2011; 69:522-9.
25. Farkas T, Cross RW, Hargitt E, 3rd, Lerche NW, Morrow AL, Sestak K. **Genetic diversity and histo-blood group antigen interactions of rhesus enteric caliciviruses**. *J Virol*. 2010; 84:8617-25.
26. 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.
27. Galambos C, Levy H, Cannon CL, Vargas SO, Reid LM, Cleveland R, Lindeman R, deMello DE, Wert SE, Whitsett JA, Perez-Atayde AR, Kozakewich H. **Pulmonary pathology in thyroid transcription factor-1 deficiency syndrome**. *Am J Respir Crit Care Med*. 2010; 182:549-54.
28. Goldenberg RL, McClure EM, Macguire ER, Kamath BD, Jobe AH. **Lessons for low-income regions following the reduction in hypertension-related maternal mortality in high-income countries**. *Int J Gynaecol Obstet*. 2011; 113:91-5.
29. Gower WA, Wert SE, Ginsberg JS, Golan A, Whitsett JA, Noguee LM. **Fatal familial lung disease caused by ABCA3 deficiency without identified ABCA3 mutations**. *J Pediatr*. 2010; 157:62-8.
30. 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.
31. Han X, Gilbert S, Groschwitz K, Hogan S, Jurickova I, Trapnell B, Samson C, Gully J. **Loss of GM-CSF signalling in non-haematopoietic cells increases NSAID ileal injury**. *Gut*. 2010; 59:1066-78.
32. Hardie WD, Hagood JS, Dave V, Perl AK, Whitsett JA, Korfhagen TR, Glasser S. **Signaling pathways in the epithelial origins of pulmonary fibrosis**. *Cell Cycle*. 2010; 9:2769-76.
33. Hillman NH, Kallapur SG, Pillow JJ, Nitsos I, Polglase GR, Ikegami M, Jobe AH. **Inhibitors of inflammation and endogenous surfactant pool size as modulators of lung injury with initiation of ventilation in**

- preterm sheep.** *Respir Res.* 2010; 11:151.
34. Hillman NH, Polglase GR, Pillow JJ, Saito M, Kallapur SG, Jobe AH. **Inflammation and lung maturation from stretch injury in preterm fetal sheep.** *Am J Physiol Lung Cell Mol Physiol.* 2011; 300:L232-41.
35. Hintz SR, Kendrick DE, Wilson-Costello DE, Das A, Bell EF, Vohr BR, Higgins RD, Collaborator:, Jobe AH. **Early-childhood neurodevelopmental outcomes are not improving for infants born at < 25 weeks' gestational age.** *Pediatrics.* 2011; 127:62-70.
36. Isemann B, Meinzen-Derr J, Akinbi H. **Maternal and neonatal factors impacting response to methadone therapy in infants treated for neonatal abstinence syndrome.** *J Perinatol.* 2011; 31:25-9.
37. Jobe AH, Kallapur SG. **Long term consequences of oxygen therapy in the neonatal period.** *Semin Fetal Neonatal Med.* 2010; 15:230-5.
38. Kalin TV, Ustiyani V, Kalinichenko VV. **Multiple faces of FoxM1 transcription factor: lessons from transgenic mouse models.** *Cell Cycle.* 2011; 10:396-405.
39. Kamath BD, MacGuire ER, McClure EM, Goldenberg RL, Jobe AH. **Neonatal Mortality From Respiratory Distress Syndrome: Lessons for Low-Resource Countries.** *Pediatrics.* 2011; 127:1139-1146.
40. Kamath BD, Marcotte MP, DeFranco EA. **Neonatal morbidity after documented fetal lung maturity in late preterm and early term infants.** *American Journal of Obstetrics and Gynecology.* 2011; 204:518.e1-8.
41. Kaplan HC, Brady PW, Dritz MC, Hooper DK, Linam WM, Froehle CM, Margolis P. **The influence of context on quality improvement success in health care: a systematic review of the literature.** *Milbank Q.* 2010; 88:500-59.
42. Kaplan HC, Lannon C, Walsh MC, Donovan EF. **Ohio statewide quality-improvement collaborative to reduce late-onset sepsis in preterm infants.** *Pediatrics.* 2011; 127:427-35.
43. Kaplan HC, Lorch SA, Pinto-Martin J, Putt M, Silber JH. **Assessment of surfactant use in preterm infants as a marker of neonatal intensive care unit quality.** *BMC Health Serv Res.* 2011; 11:22.
44. Kaplan HC, Tabangin ME, McClendon D, Meinzen-Derr J, Margolis PA, Donovan EF. **Understanding variation in vitamin A supplementation among NICUs.** *Pediatrics.* 2010; 126:e367-73.
45. Kemp MW, Saito M, Newnham JP, Nitsos I, Okamura K, Kallapur SG. **Preterm birth, infection, and inflammation advances from the study of animal models.** *Reprod Sci.* 2010; 17:619-28.
46. Kemp MW, Saito M, Nitsos I, Jobe AH, Kallapur SG, Newnham JP. **Exposure to in utero lipopolysaccharide induces inflammation in the fetal ovine skin.** *Reprod Sci.* 2011; 18:88-98.
47. King BA, Kingma PS. **Surfactant protein D deficiency increases lung injury during endotoxemia.** *Am J Respir Cell Mol Biol.* 2011; 44:709-15.
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Grants, Contracts, and Industry Agreements

Grant and Contract Awards

Annual Direct / Project Period Direct

BRIDGES, J

Cystic Fibrosis Foundation Research Development Program (Project 4)

Cystic Fibrosis Foundation

07/01/071-06/30/11

\$40,000

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

HILLMAN, N

Lung Injury with Resuscitation of the Preterm

National Institutes of Health

K08 HL 097085

08/01/09-07/31/14

\$121,000

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

Efficacy of SP-D Containing Surfactant for Treatment of Premature Newborns

March of Dimes - National

06/01/09-05/31/12

\$94,764

JOBE, A

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

National Institutes of Health

R01 HL 097064

09/24/09-07/31/13

\$350,495

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

National Institutes of Health

U01 HL 101800

05/01/10-04/30/15

\$346,019

Jobe, A	Core	\$152,329
Chougnet, C	Project	\$92,592
Kingma, P	Project	\$20,266
Young, L	Project	\$49,538
Morrow, A	Project	\$30,933

Biomarkers of Immunologic Function and Preterm Respiratory Outcomes

University of Pennsylvania(National Institutes of Health)

U01 HL 101794

12/01/10-04/30/12

\$25,574

KALIN, T

Role of Foxm1 in Lung Cancer Microenvironment

National Institutes of Health

R01 CA 142724	07/01/10-06/30/15		\$207,500
Role of Foxm1 in the Pathogenesis of Prostate Cancer			
Department of Defense Army			
W81XWH0910389	07/01/09-06/30/12		\$74,888
KALINICHENKO, V			
Foxf1 Transcription Factor in Development of Pulmonary Capillaries			
National Institutes of Health			
R01 HL 084151	05/01/11-04/30/15		\$250,000
KALLAPUR, S			
Mechanisms of Fetal Inflammatory Response Syndrome Induced by Chorioamnionitis			
National Institutes of Health			
R01 HD 057869	02/03/09-01/31/14		\$241,397
KENNY, A			
Secreted BMP Antagonists in Foregut Organ Development			
National Institutes of Health			
K08 HL 105661	12/08/10-11/30/15		\$121,300
KINGMA, P			
Surfactant Protein D in Pulmonary and Systemic Host Defense			
National Institutes of Health			
K08 HL 089505	07/01/08-06/30/13		\$120,850
KORFHAGEN, T			
RELM Peptides Alter Lung Defense			
National Institutes of Health			
R21 HL 083599	09/01/09-08/31/11		\$150,000
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		\$347,205
LeCras, T		\$127,047	
Hershey, G		\$220,158	
Pathogenesis of Neonatal Lung Disease			
American Heart Association			
	01/01/07-12/31/11		\$90,909
MORROW, A			
Novel Genetic and Salivary Glycan Biomarkers for Risk of NEC in ELBW Infants			
National Institutes of Health			
R01 HD 059140	01/15/09-12/31/13		\$513,785
The Role of Human Milk in Infant Nutrition and Health			
National Institutes of Health			
P01 HD 013021	08/01/09-07/31/14		\$972,187
Jiang, Xi	Core D	\$85,727	
Jiang, Xi	Project 2	\$111,904	
Cincinnati Center for Clinical and Translational Sciences and Training (Design, Biostatistics & Ethics)			
National Institutes of Health(University of Cincinnati)			
UL1 RR 026314	04/03/09-03/31/14		\$87,392

NOMMSEN-RIVERS, L

Antidepressant Therapy in Breastfeeding Mothers

University of Cincinnati(National Institutes of Health)	07/01/10-06/30/11	\$90,000
Maternal Metabolic Health and Delayed Lactogenesis		
University of Cincinnati	01/15/11-06/30/11	\$49,986
Mediating Factors in the Relationship between Obesity and Poor Lactation Outcomes		
National Institutes of Health R21 HD 063275	09/07/10-08/31/12	\$238,074
PERL, A		
FGF and PDGF Regulate Myofibroblast Differentiation in Alveolar Regeneration		
National Institutes of Health R01 HL 104003	07/01/10-06/30/14	\$250,000
Role of EGF Receptor Repeating Airway Epithelium and Airway Wall Thickening		
American Lung Association	07/01/09-06/30/11	\$40,000
SCHIBLER, K		
NICHD Cooperative Multicenter Neonatal Research Network		
National Institutes of Health U10 HD 027853	04/01/11-03/31/16	\$200,000
NICHD Cooperative Multicenter Neonatal Research Network Capitation		
Research Triangle International(National Institutes of Health) U10 HL 027853	04/01/11-03/31/16	\$57,870
SHANNON, J		
LPCAT1 is Essential for Perinatal Lung Function and Survival		
National Institutes of Health R01 HL 098319	07/01/10-06/30/14	\$317,457
Role of HIF-1alpha in Fetal Lung Epithelial Differentiation		
National Institutes of Health R01 HL 084376	02/01/07-01/31/12	\$358,040
TRAPNELL, B		
Macrophage-based Human Gene Therapy for Hereditary PAP		
National Institutes of Health R21 HL 106134	12/15/10-11/30/12	\$125,000
QUANTitative Chest Computed Tomography Unmasking Emphysema Progression in Alpha-1 Antitrypsin Deficiency (QUANTUM-1)		
Alpha One Foundation	07/01/10-06/30/11	\$14,577
Role of Anti-GM-CSF Antibodies in Myeloid Cell Function and Innate Immunity		
National Institutes of Health R01 HL 085453	04/01/11-03/31/16	\$250,000
WEAVER, T		
Role of SFTPC in Pathogenesis of Interstitial Lung Disease		
National Institutes of Health R01 HL 086492	12/01/08-11/30/13	\$290,155
WHITSETT, J		
Pulmonary and Cardiovascular Development Training Grant		
National Institutes of Health T32 HL 007752	07/01/09-06/30/14	\$250,879
Reagents for Detection and Isolation of Pulmonary Progenitor Cell Populations		
National Institutes of Health(Oregon Health Sciences University) RC1 HL100371	09/30/09-08/31/11	\$107,229

Transcriptional Control of Respiratory Epithelial Progenitor Cells

National Institutes of Health

R01 HL 090156

09/28/07-06/30/11

\$381,790

Transcriptional Programming of Asthma Related Pathology in Respiratory Epithelial Cells

National Institutes of Health

R01 HL 095580

04/01/09-03/31/13

\$319,763

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

National Institutes of Health

RC1 HL 100315

09/01/09-08/31/11

\$270,508

ABCA3 and Alveolar Homeostasis

National Institutes of Health

R01 HL 085610

07/10/06-06/30/11

\$313,747

Cystic Fibrosis Foundation Research Development Program (Core 1)

Cystic Fibrosis Foundation

07/01/07-06/30/11

\$50,000

XU, Y**Cystic Fibrosis Foundation Research Development Program (Project 3)**

Cystic Fibrosis Foundation

07/01/07-06/30/11

\$80,000

Current Year Direct**\$8,710,340****Industry Contracts****IKEGAMI, M**

Chiesi Farmaceutici SPA

\$133,447

TRAPNELL, B

Applied Genetic Technology Corpation

\$54,458

Current Year Direct Receipts**\$187,905****Total****\$8,898,245**