

2014 Research Annual Report

Section of Neonatology, Perinatal and Pulmonary Biology



Division Summary

RESEARCH AND TRAINING DETAILS

Number of Faculty	52
Number of Joint Appointment Faculty	1
Number of Research Fellows	11
Number of Research Students	12
Number of Support Personnel	14
Direct Annual Grant Support	\$11,073,774
Direct Annual Industry Support	\$153,375
Peer Reviewed Publications	148

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

Division Photo



Row 1: T Weaver, S Bhattacharyya, N Monangi, N Goyal
Row 2: M Pavlicev, A Perl, J Greenberg, K Schibler, B Poindexter, A Nathan, H Kaplan
Row 3: Y Xu, B Kamath-Rayne, L Muglia, T Korfhagen, D Sinner, J Shannon, K Wikenheiser-Brokamp, V Kalinichenko, J Bridges, J Whitsett, S Wert
Row 4: A Kenny, T Suzuki, Y Maeda, S Glasser, H Deshmukh, E Hall, B Trapnell, S Wexelblatt

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 Wellcome 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

Steinhoff MC, MacDonald N, Pfeifer D, **Muglia LJ**. Influenza vaccine in pregnancy: policy and research strategies. *Lancet*. 2014 May 10;383(9929):1611-3.

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.

Chen G, **Korfhagen TR**, Karp CL, Impey S, Xu Y, Randell SH, **Kitzmiller J**, **Maeda Y**, Haitchi HM, Sridharan A, Senft AP, **Whitsett JA**. *Foxa3 induces goblet cell metaplasia and inhibits innate antiviral immunity*. *Am J Respir Crit Care Med*. 2014 Feb 1;189(3):301-13.

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.

Kallapur SG, Presicce P, Senthamaraikannan P, Alvarez M, Tarantal AF, Miller LM, **Jobe AH**, Chougnet CA. *Intra-amniotic IL-1 β induces fetal inflammation in rhesus monkeys and alters the regulatory T cell/IL-17 balance*. *J Immunol*. 2013 Aug 1;191(3):1102-9.

In this study, Kallapur, Jobe and colleagues define the effects of chorioamnionitis on the fetal immune system, IL-1 β was administered intra-amniotically at ~80% gestation in rhesus monkeys. IL-1 β 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-1 β 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

1. Acciani TH, Brandt EB, Khurana Hershey GK, Le Cras TD. **Diesel exhaust particle exposure increases severity of allergic asthma in young mice**. *Clin Exp Allergy*. 2013; 43:1406-18.
2. Adams-Chapman I, Bann CM, Das A, Goldberg RN, Stoll BJ, Walsh MC, Sanchez PJ, Higgins RD, Shankaran S, Watterberg KL, Duara S, Miller NA, Heyne RJ, Peralta-Carcelen M, Goldstein RF, Steichen JJ, Bauer CR, Hintz SR, Evans PW, Acarregui MJ, Myers GJ, Vohr BR, Wilson-Costello DE, Pappas A, Vaucher YE, Ehrenkranz RA, McGowan EC, Dillard RG, Fuller J, Benjamin DK, Jr., Eunice Kennedy Shriver National Institutes of Child H, Human Development Neonatal Research N. **Neurodevelopmental outcome of extremely low birth weight infants with Candida infection**. *J Pediatr*. 2013; 163:961-7 e3.
3. Adams-Chapman I, Bann CM, Vaucher YE, Stoll BJ, Eunice Kennedy Shriver National Institute of Child HaHDNR, Network. **Association between feeding difficulties and language delay in preterm infants using Bayley Scales of Infant Development-Third Edition**. *J Pediatr*. 2013; 163:680-5 e1-3.

4. Adams-Chapman I, Hansen NI, Shankaran S, Bell EF, Boghossian NS, Murray JC, Laptook AR, Walsh MC, Carlo WA, Sanchez PJ, Van Meurs KP, Das A, Hale EC, Newman NS, Ball MB, Higgins RD, Stoll BJ, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Ten-year review of major birth defects in VLBW infants.** *Pediatrics*. 2013; 132:49-61.
5. Alleman BW, Bell EF, Li L, Dagle JM, Smith PB, Ambalavanan N, Laughon MM, Stoll BJ, Goldberg RN, Carlo WA, Murray JC, Cotten CM, Shankaran S, Walsh MC, Laptook AR, Ellsbury DL, Hale EC, Newman NS, Wallace DD, Das A, Higgins RD, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Individual and center-level factors affecting mortality among extremely low birth weight infants.** *Pediatrics*. 2013; 132:e175-84.
6. Alsidawi S, Morris JC, Wikenheiser-Brokamp KA, Starnes SL, Karim NA. **Mucoepidermoid carcinoma of the lung: a case report and literature review.** *Case Rep Oncol Med*. 2013; 2013:625243.
7. Apostolakis-Kyrus K, Valentine C, DeFranco E. **Factors associated with breastfeeding initiation in adolescent mothers.** *J Pediatr*. 2013; 163:1489-94.
8. Batton B, Li L, Newman NS, Das A, Watterberg KL, Yoder BA, Faix RG, Laughon MM, Stoll BJ, Higgins RD, Walsh MC, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Evolving blood pressure dynamics for extremely preterm infants.** *J Perinatol*. 2014; 34:301-5.
9. Blackwell TS, Tager AM, Borok Z, Moore BB, Schwartz DA, Anstrom KJ, Bar-Joseph Z, Bitterman P, Blackburn MR, Bradford W, Brown KK, Chapman HA, Collard HR, Cosgrove GP, Deterding R, Doyle R, Flaherty KR, Garcia CK, Hagood JS, Henke CA, Herzog E, Hogaboam CM, Horowitz JC, King TE, Jr., Loyd JE, Lawson WE, Marsh CB, Noble PW, Noth I, Sheppard D, Olsson J, Ortiz LA, O'Riordan TG, Oury TD, Raghu G, Roman J, Sime PJ, Sisson TH, Tschumperlin D, Violette SM, Weaver TE, Wells RG, White ES, Kaminski N, Martinez FJ, Wynn TA, Thannickal VJ, Eu JP. **Future directions in idiopathic pulmonary fibrosis research. An NHLBI workshop report.** *Am J Respir Crit Care Med*. 2014; 189:214-22.
10. Boghossian NS, Hansen NI, Bell EF, Stoll BJ, Murray JC, Carey JC, Adams-Chapman I, Shankaran S, Walsh MC, Laptook AR, Faix RG, Newman NS, Hale EC, Das A, Wilson LD, Hensman AM, Grisby C, Collins MV, Vasil DM, Finkle J, Maffett D, Ball MB, Lacy CB, Bara R, Higgins RD, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Mortality and morbidity of VLBW infants with trisomy 13 or trisomy 18.** *Pediatrics*. 2014; 133:226-35.
11. Brandt EB, Kovacic MB, Lee GB, Gibson AM, Acciani TH, Le Cras TD, Ryan PH, Budelsky AL, Khurana Hershey GK. **Diesel exhaust particle induction of IL-17A contributes to severe asthma.** *J Allergy Clin Immunol*. 2013; 132:1194-1204 e2.
12. Bridges JP, Ludwig MG, Mueller M, Kinzel B, Sato A, Xu Y, Whitsett JA, Ikegami M. **Orphan G protein-coupled receptor GPR116 regulates pulmonary surfactant pool size.** *Am J Respir Cell Mol Biol*. 2013; 49:348-57.
13. Bridges JP, Schehr A, Wang Y, Huo L, Besnard V, Ikegami M, Whitsett JA, Xu Y. **Epithelial SCAP/INSIG/SREBP Signaling Regulates Multiple Biological Processes during Perinatal Lung Maturation.** *PLoS One*. 2014; 9:e91376.
14. Cai Y, Balli D, Ustiyani V, Fulford L, Hiller A, Misetich V, Zhang Y, Paluch AM, Waltz SE, Kasper S, Kalin TV. **Foxm1 expression in prostate epithelial cells is essential for prostate carcinogenesis.** *J Biol Chem*. 2013; 288:22527-41.
15. Chantray CJ, Dewey KG, Peerson JM, Wagner EA, Nommsen-Rivers LA. **In-hospital formula use increases early breastfeeding cessation among first-time mothers intending to exclusively breastfeed.** *J Pediatr*. 2014; 164:1339-45 e5.

16. Chen G, Korfhagen TR, Karp CL, Impey S, Xu Y, Randell SH, Kitzmiller J, Maeda Y, Haitchi HM, Sridharan A, Senft AP, Whitsett JA. **Foxa3 induces goblet cell metaplasia and inhibits innate antiviral immunity.** *Am J Respir Crit Care Med.* 2014; 189:301-13.
17. Chun S, Plunkett J, Teramo K, Muglia LJ, Fay JC. **Fine-mapping an association of FSHR with preterm birth in a Finnish population.** *PLoS One.* 2013; 8:e78032.
18. Clancy JP, Dupont L, Konstan MW, Billings J, Fustik S, Goss CH, Lymp J, Minic P, Quittner AL, Rubenstein RC, Young KR, Saiman L, Burns JL, Govan JR, Ramsey B, Gupta R, Arikace Study G. **Phase II studies of nebulised Arikace in CF patients with Pseudomonas aeruginosa infection.** *Thorax.* 2013; 68:818-25.
19. Cornett B, Snowball J, Varisco BM, Lang R, Whitsett J, Sinner D. **Wntless is required for peripheral lung differentiation and pulmonary vascular development.** *Dev Biol.* 2013; 379:38-52.
20. Cotten CM, Goldstein RF, McDonald SA, Goldberg RN, Salhab WA, Carlo WA, Tyson JE, Finer NN, Walsh MC, Ehrenkranz RA, Laptook AR, Guillet R, Schibler K, Van Meurs KP, Poindexter BB, Stoll BJ, O'Shea TM, Duara S, Das A, Higgins RD, Shankaran S, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Apolipoprotein E genotype and outcome in infants with hypoxic-ischemic encephalopathy.** *Pediatr Res.* 2014; 75:424-30.
21. Cundiff WB, McCormack FX, Wikenheiser-Brokamp K, Starnes S, Kotloff R, Benzaquen S. **Successful management of a chronic, refractory bronchopleural fistula with endobronchial valves followed by talc pleurodesis.** *Am J Respir Crit Care Med.* 2014; 189:490-1.
22. Dabritz J, Bonkowski E, Chalk C, Trapnell BC, Langhorst J, Denson LA, Foell D. **Granulocyte macrophage colony-stimulating factor auto-antibodies and disease relapse in inflammatory bowel disease.** *Am J Gastroenterol.* 2013; 108:1901-10.
23. Dando SJ, Nitsos I, Polglase GR, Newnham JP, Jobe AH, Knox CL. **Ureaplasma parvum undergoes selection in utero resulting in genetically diverse isolates colonizing the chorioamnion of fetal sheep.** *Biol Reprod.* 2014; 90:27.
24. Davis AS, Hintz SR, Goldstein RF, Ambalavanan N, Bann CM, Stoll BJ, Bell EF, Shankaran S, Laptook AR, Walsh MC, Hale EC, Newman NS, Das A, Higgins RD, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Outcomes of extremely preterm infants following severe intracranial hemorrhage.** *J Perinatol.* 2014; 34:203-8.
25. De Jesus LC, Pappas A, Shankaran S, Li L, Das A, Bell EF, Stoll BJ, Laptook AR, Walsh MC, Hale EC, Newman NS, Bara R, Higgins RD, Eunice Kennedy Shriver National Institute of H, Human Development Neonatal Research N. **Outcomes of small for gestational age infants born at <27 weeks' gestation.** *J Pediatr.* 2013; 163:55-60 e1-3.
26. DeFranco E, Chen AM, Xu F, Hall E, Hossain M, Haynes E, Jones D, Muglia L. **Air pollution and risk of prematurity: exposure to airborne particulate matter during pregnancy is associated with preterm birth risk.** *Am J Obstet Gynecol.* 2014; 210:S346-S346.
27. Defranco E, Erlich S, Muglia L. **Influence of IOM recommended weight gain and interpregnancy interval on preterm birth.** *Am J Obstet Gynecol.* 2014; 210:S346.
28. DeMauro SB, D'Agostino JA, Bann C, Bembaum J, Gerdes M, Bell EF, Carlo WA, D'Angio CT, Das A, Higgins R, Hintz SR, Laptook AR, Natarajan G, Nelin L, Poindexter BB, Sanchez PJ, Shankaran S, Stoll BJ, Truog W, Van Meurs KP, Vohr B, Walsh MC, Kirpalani H, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Developmental outcomes of very preterm infants with tracheostomies.** *J Pediatr.* 2014; 164:1303-10 e2.
29. Dykes DM, Towbin AJ, Bonkowski E, Chalk C, Bezold R, Lake K, Kim MO, Heubi JE, Trapnell BC, Podberesky DJ, Denson LA. **Increased prevalence of luminal narrowing and stricturing identified by**

- enterography in pediatric Crohn's disease patients with elevated granulocyte-macrophage colony stimulating factor autoantibodies.** *Inflamm Bowel Dis.* 2013; 19:2146-54.
30. Falciglia HS, Greenwood CS. **Double Volume Exchange Transfusion: A Review of the "Ins and Outs".** *NeoReviews.* 2013; 14:e513-e520.
31. Falciglia HS, Miller JD, Hasselfeld KA, Engel AM, Falciglia GA, Walsh PM, Brady WK. **Relationship between maternal and infant plasma selenium levels with sepsis and various outcomes measures..** *Neonatal Intensive Care.* 2013; 26.
32. Fritz JM, Dong M, Apsley KS, Martin EP, Na CL, Sitaraman S, Weaver TE. **Deficiency of the BiP cochaperone ERdj4 causes constitutive endoplasmic reticulum stress and metabolic defects.** *Mol Biol Cell.* 2014; 25:431-40.
33. Gathungu G, Kim MO, Ferguson JP, Sharma Y, Zhang W, Ng SM, Bonkowski E, Ning K, Simms LA, Croft AR, Stempak JM, Walker N, Huang N, Xiao Y, Silverberg MS, Trapnell B, Cho JH, Radford-Smith GL, Denson LA. **Granulocyte-macrophage colony-stimulating factor autoantibodies: a marker of aggressive Crohn's disease.** *Inflamm Bowel Dis.* 2013; 19:1671-80.
34. Gisslen T, Hillman NH, Musk GC, Kemp MW, Kramer BW, Sentharamaikannan P, Newnham JP, Jobe AH, Kallapur SG. **Repeated exposure to intra-amniotic LPS partially protects against adverse effects of intravenous LPS in preterm lambs.** *Innate Immun.* 2014; 20:214-24.
35. Glasser SW, Maxfield MD, Ruetschilling TL, Akinbi HT, Baatz JE, Kitzmiller JA, Page K, Xu Y, Bao EL, Korfhagen TR. **Persistence of LPS-induced lung inflammation in surfactant protein-C-deficient mice.** *Am J Respir Cell Mol Biol.* 2013; 49:845-54.
36. Goldenberg RL, McClure EM, Jobe AH, Kamath-Rayne BD, Gravette MG, Rubens CE. **Stillbirths and neonatal mortality as outcomes.** *Int J Gynaecol Obstet.* 2013; 123:252-3.
37. Goyal NK, Hall ES, Jones DE, Meinzen-Derr JK, Short JA, Ammerman RT, Van Ginkel JB. **Association of maternal and community factors with enrollment in home visiting among at-risk, first-time mothers.** *Am J Public Health.* 2014; 104 Suppl 1:S144-51.
38. Goyal NK, Hall ES, Meinzen-Derr JK, Kahn RS, Short JA, Van Ginkel JB, Ammerman RT. **Dosage Effect of Prenatal Home Visiting on Pregnancy Outcomes in At-Risk, First-Time Mothers.** *Obstetrical & Gynecological Survey.* 2014; 69:125-126.
39. Goyal NK, Hall ES, Meinzen-Derr JK, Kahn RS, Short JA, Van Ginkel JB, Ammerman RT. **Dosage effect of prenatal home visiting on pregnancy outcomes in at-risk, first-time mothers.** *Pediatrics.* 2013; 132 Suppl 2:S118-25.
40. Goyal NK, Teeters A, Ammerman RT. **Home visiting and outcomes of preterm infants: a systematic review.** *Pediatrics.* 2013; 132:502-16.
41. Hall ES, Folger AT, Kelly EA, Kamath-Rayne BD. **Evaluation of gestational age estimate method on the calculation of preterm birth rates.** *Matern Child Health J.* 2014; 18:755-62.
42. Hall ES, Goyal NK, Ammerman RT, Miller MM, Jones DE, Short JA, Van Ginkel JB. **Development of a linked perinatal data resource from state administrative and community-based program data.** *Matern Child Health J.* 2014; 18:316-25.
43. Hamvas A, Deterding R, Balch WE, Schwartz DA, Albertine KH, Whitsett JA, Cardoso WV, Kotton DN, Kourembanas S, Hagood JS. **Diffuse lung disease in children: summary of a scientific conference.** *Pediatr Pulmonol.* 2014; 49:400-9.
44. Hamvas A, Deterding RR, Wert SE, White FV, Dishop MK, Alfano DN, Halbower AC, Planer B, Stephan MJ, Uchida DA, Williams LD, Rosenfeld JA, Lebel RR, Young LR, Cole FS, Noguee LM. **Heterogeneous pulmonary phenotypes associated with mutations in the thyroid transcription factor gene NKX2-1.** *Chest.* 2013; 144:794-804.

45. Hao H, Maeda Y, Fukazawa T, Yamatsuji T, Takaoka M, Bao XH, Matsuoka J, Okui T, Shimo T, Takigawa N, Tomono Y, Nakajima M, Fink-Baldauf IM, Nelson S, Seibel W, Papoian R, Whitsett JA, Naomoto Y. **Inhibition of the growth factor MDK/midkine by a novel small molecule compound to treat non-small cell lung cancer.** *PLoS One*. 2013; 8:e71093.
46. Henderson LB, Melton K, Wert S, Couriel J, Bush A, Ashworth M, Noguee LM. **Large ABCA3 and SFTPC deletions resulting in lung disease.** *Ann Am Thorac Soc*. 2013; 10:602-7.
47. Hillman NH, Gisslen T, Polglase GR, Kallapur SG, Jobe AH. **Ventilation-induced increases in EGFR ligand mRNA are not altered by intra-amniotic LPS or ureaplasma in preterm lambs.** *PLoS One*. 2014; 9:e96087.
48. Hillman NH, Kemp MW, Noble PB, Kallapur SG, Jobe AH. **Sustained inflation at birth did not protect preterm fetal sheep from lung injury.** *Am J Physiol Lung Cell Mol Physiol*. 2013; 305:L446-53.
49. Hoggatt AM, Kim JR, Ustiyani V, Ren X, Kalin TV, Kalinichenko VV, Herring BP. **The transcription factor Foxf1 binds to serum response factor and myocardin to regulate gene transcription in visceral smooth muscle cells.** *J Biol Chem*. 2013; 288:28477-87.
50. Jan Treda C, Fukuhara T, Suzuki T, Nakamura A, Zaini J, Kikuchi T, Ebina M, Nukiwa T. **Secretory leukocyte protease inhibitor modulates urethane-induced lung carcinogenesis.** *Carcinogenesis*. 2014; 35:896-904.
51. Jobe A. **Surfactant for Respiratory Distress Syndrome.** *Neoreviews*. 2014; 15:e236-e245.
52. Jobe AH. **Oxygen saturation targeting-an illusion.** *J Pediatr*. 2014; 164:679-81.
53. Jobe AH. **Postnatal steroids and the brain at 18 years.** *J Pediatr*. 2014; 164:679-681.
54. Jobe AH. **Sensory deprivation in private rooms in the NICU.** *J Pediatr*. 2014; 164:1-3.
55. Jobe AH. **A Risk of Sensory Deprivation in the Neonatal Intensive Care Unit.** *J Pediatr*. 2014; 164:1265-7.
56. Jobe AH. **Supplemental oxygen for preterm infants in the delivery room.** *J Pediatr*. 2014; 164:1246.
57. Jobe AH. **Biomarkers for hypoxic ischemic encephalopathy.** *J Pediatr*. 2014; 164:431-3.
58. Jobe AH. **Neuro protection for infants.** *J Pediatr*. 2014; 164:431-3.
59. Jobe AH. **Oxygenation during transition from birth.** *J Pediatr*. 2013; 163:309-311.
60. Jobe AH. **Treatments for retinopathy of prematurity.** *J Pediatr*. 2013; 163:1537-9.
61. Jobe AH. **Low flow or no flow after CPAP.** *J Pediatr*. 2013; 163:1-3.
62. Jobe AH. **Monoamine oxidase association with SIDS?** *J Pediatr*. 2013; 163:1-3.
63. Jobe AH. **Double jeopardy for moderately preterm infants.** *J Pediatr*. 2013; 163:1235-9.
64. Jobe AH. **Gestational age and breastfeeding at term.** *J Pediatr*. 2013; 163:1235-9.
65. Jobe AH. **Growth restriction and postnatal cardiovascular status.** *J Pediatr*. 2013; 163:1235-9.
66. Jobe AH. **Chorioamnionitis and neurodevelopment.** *J Pediatr*. 2013; 163:613-5.
67. Jobe AH, Kamath-Rayne BD. **Fetal lung development and surfactant.** In: R Creasy, R Resnik, eds. *Creasy and Resnik's Maternal Fetal Medicine - Principals and Practice*. Philadelphia, PA: Elsevier; 2013:175-186.
68. Jobe AH, Tibboel D. **Update in pediatric lung disease 2013.** *Am J Respir Crit Care Med*. 2014; 189:1031-6.
69. Kallapur SG, Presicce P, Rueda CM, Jobe AH, Chougnnet CA. **Fetal immune response to chorioamnionitis.** *Semin Reprod Med*. 2014; 32:56-67.
70. Kallapur SG, Presicce P, Senthamaikannan P, Alvarez M, Tarantal AF, Miller LM, Jobe AH, Chougnnet CA. **Intra-amniotic IL-1 β induces fetal inflammation in rhesus monkeys and alters the regulatory T cell/IL-17 balance.** *J Immunol*. 2013; 191:1102-9.
71. Kamath-Rayne BD, DeFranco EA. **Amniocentesis for fetal lung maturity testing.** *Am J Obstet Gynecol*.

2014; 210:588-9.

72. Kamath-Rayne BD, DeFranco EA. **Cohort study finds newborn respiratory complications less common when mothers of babies with fetal lung immaturity at 34-37 weeks' gestation given antenatal steroids.** *Evid Based Nurs.* 2013; 16:99-100.
73. Kamath-Rayne BD, Smith HC, Muglia LJ, Morrow AL. **Amniotic fluid: the use of high-dimensional biology to understand fetal well-being.** *Reprod Sci.* 2014; 21:6-19.
74. Kaplan HC, Froehle CM, Cassedy A, Provost LP, Margolis PA. **An exploratory analysis of the model for understanding success in quality.** *Health Care Manage Rev.* 2013; 38:325-38.
75. Kennedy KA, Wrage LA, Higgins RD, Finer NN, Carlo WA, Walsh MC, Laptook AR, Faix RG, Yoder BA, Schibler K, Gantz MG, Das A, Newman NS, Phelps DL, Health SSGotEKSNIoC, Human Development Neonatal Research N. **Evaluating retinopathy of prematurity screening guidelines for 24- to 27-week gestational age infants.** *J Perinatol.* 2014; 34:311-8.
76. Kim J, Stirling KJ, Cooper ME, Ascoli M, Momany AM, McDonald EL, Ryckman KK, Rhea L, Schaa KL, Cosentino V, Gadow E, Saleme C, Shi M, Hallman M, Plunkett J, Teramo KA, Muglia LJ, Feenstra B, Geller F, Boyd HA, Melbye M, Marazita ML, Dagle JM, Murray JC. **Sequence variants in oxytocin pathway genes and preterm birth: a candidate gene association study.** *BMC Med Genet.* 2013; 14:77.
77. Kocalis HE, Hagan SL, George L, Turney MK, Siuta MA, Laryea GN, Morris LC, Muglia LJ, Printz RL, Stanwood GD, Niswender KD. **Rictor/mTORC2 facilitates central regulation of energy and glucose homeostasis.** *Mol Metab.* 2014; 3:394-407.
78. Kumar P, Shankaran S, Ambalavanan N, Kendrick DE, Pappas A, Vohr BR, Poindexter BB, Das A, Higgins RD, Network NNR. **Characteristics of extremely low-birth-weight infant survivors with unimpaired outcomes at 30 months of age.** *J Perinatol.* 2013; 33:800-5.
79. Kurland G, Deterding RR, Hagood JS, Young LR, Brody AS, Castile RG, Dell S, Fan LL, Hamvas A, Hilman BC, Langston C, Noguee LM, Redding GJ, Network ATSCoCILDcatcR. **An official American Thoracic Society clinical practice guideline: classification, evaluation, and management of childhood interstitial lung disease in infancy.** *Am J Respir Crit Care Med.* 2013; 188:376-94.
80. Kuypers E, Jellema RK, Ophelders DR, Dudink J, Nikiforou M, Wolfs TG, Nitsos I, Pillow JJ, Polglase GR, Kemp MW, Saito M, Newnham JP, Jobe AH, Kallapur SG, Kramer BW. **Effects of intra-amniotic lipopolysaccharide and maternal betamethasone on brain inflammation in fetal sheep.** *PLoS One.* 2013; 8:e81644.
81. Kuypers E, Willems MG, Collins JJ, Wolfs TG, Nitsos I, Jane Pillow J, Polglase GR, Kemp MW, Newnham JP, Delhaas T, Jobe AH, Kallapur SG, Kramer BW. **Altered canonical Wingless-Int signaling in the ovine fetal lung after exposure to intra-amniotic lipopolysaccharide and antenatal betamethasone.** *Pediatr Res.* 2014; 75:281-7.
82. Kuypers E, Wolfs TG, Collins JJ, Jellema RK, Newnham JP, Kemp MW, Kallapur SG, Jobe AH, Kramer BW. **Intraamniotic lipopolysaccharide exposure changes cell populations and structure of the ovine fetal thymus.** *Reprod Sci.* 2013; 20:946-56.
83. Lackritz EM, Wilson CB, Guttmacher AE, Howse JL, Engmann CM, Rubens CE, Mason EM, Muglia LJ, Gravett MG, Goldenberg RL, Murray JC, Spong CY, Simpson JL, Setting PBRP. **A solution pathway for preterm birth: accelerating a priority research agenda.** *Lancet Global Health.* 2013; 1:E328-E330.
84. Lakshmi CV, Pramod G, Geeta K, Subramaniam S, Rao MB, Kallapur SG, Murki S. **Outcome of very low birth weight infants with abnormal antenatal Doppler flow patterns: a prospective cohort study.** *Indian Pediatr.* 2013; 50:847-52.
85. Lambermont VA, Kuypers E, Collins JJ, Pillow JJ, Newnham JP, Polglase GR, Nitsos I, Kemp MW, Jobe AH, Kallapur SG, Kramer BW. **Effects of intra-amniotic lipopolysaccharide exposure on the fetal lamb**

- lung as gestation advances.** *Pediatr Res.* 2014; 75:500-6.
86. Landis MW, Butler D, Lim FY, Keswani S, Frischer J, Haberman B, Kingma PS. **Octreotide for chylous effusions in congenital diaphragmatic hernia.** *J Pediatr Surg.* 2013; 48:2226-9.
87. Lange AW, Haitchi HM, LeCras TD, Sridharan A, Xu Y, Wert SE, James J, Udell N, Thurner PJ, Whitsett JA. **Sox17 is required for normal pulmonary vascular morphogenesis.** *Dev Biol.* 2014; 387:109-20.
88. Laryea G, Schutz G, Muglia LJ. **Disrupting hypothalamic glucocorticoid receptors causes HPA axis hyperactivity and excess adiposity.** *Mol Endocrinol.* 2013; 27:1655-65.
89. Lemay DG, Ballard OA, Hughes MA, Morrow AL, Horseman ND, Nommsen-Rivers LA. **RNA sequencing of the human milk fat layer transcriptome reveals distinct gene expression profiles at three stages of lactation.** *PLoS One.* 2013; 8:e67531.
90. Liu Y, Huang P, Jiang B, Tan M, Morrow AL, Jiang X. **Poly-LacNAc as an age-specific ligand for rotavirus P[11] in neonates and infants.** *PLoS One.* 2013; 8:e78113.
91. Louderback KM, Wills TA, Muglia LJ, Winder DG. **Knockdown of BNST GluN2B-containing NMDA receptors mimics the actions of ketamine on novelty-induced hypophagia.** *Transl Psychiatry.* 2013; 3:e331.
92. Madala SK, Edukulla R, Phatak M, Schmidt S, Davidson C, Acciani TH, Korfhagen TR, Medvedovic M, Lecras TD, Wagner K, Hardie WD. **Dual targeting of MEK and PI3K pathways attenuates established and progressive pulmonary fibrosis.** *PLoS One.* 2014; 9:e86536.
93. Madala SK, Edukulla R, Schmidt S, Davidson C, Ikegami M, Hardie WD. **Bone marrow-derived stromal cells are invasive and hyperproliferative and alter transforming growth factor-alpha-induced pulmonary fibrosis.** *Am J Respir Cell Mol Biol.* 2014; 50:777-86.
94. Madala SK, Korfhagen TR, Schmidt S, Davidson C, Edukulla R, Ikegami M, Violette SM, Weinreb PH, Sheppard D, Hardie WD. **Inhibition of the alphavbeta6 integrin leads to limited alteration of TGF-alpha-induced pulmonary fibrosis.** *Am J Physiol Lung Cell Mol Physiol.* 2014; 306:L726-35.
95. Majzoub JA, Muglia LJ, Srivatsa A. **Disorders of the posterior pituitary.** In: MA Sperling, ed. *Pediatric Endocrinology, Expert Consult.* Philadelphia, PA: Elsevier; 2014:405-443.
96. Marko CK, Menon BB, Chen G, Whitsett JA, Clevers H, Gipson IK. **Spdef null mice lack conjunctival goblet cells and provide a model of dry eye.** *Am J Pathol.* 2013; 183:35-48.
97. Matthay MA, Anversa P, Bhattacharya J, Burnett BK, Chapman HA, Hare JM, Hei DJ, Hoffman AM, Kourembanas S, McKenna DH, Ortiz LA, Ott HC, Tente W, Thebaud B, Trapnell BC, Weiss DJ, Yuan JX, Blaisdell CJ. **Cell therapy for lung diseases. Report from an NIH-NHLBI workshop, November 13-14, 2012.** *Am J Respir Crit Care Med.* 2013; 188:370-5.
98. McCormack FX, Wilmott C, Young LR, Wikenheiser-Brokamp K. **An atoll variant that mocks.** *Am J Respir Crit Care Med.* 2013; 188:110.
99. McElroy JJ, Gutman CE, Shaffer CM, Busch TD, Puttonen H, Teramo K, Murray JC, Hallman M, Muglia LJ. **Maternal coding variants in complement receptor 1 and spontaneous idiopathic preterm birth.** *Hum Genet.* 2013; 132:935-42.
100. Merhar SL, Ramos Y, Meinzen-Derr J, Kline-Fath BM. **Brain magnetic resonance imaging in infants with surgical necrotizing enterocolitis or spontaneous intestinal perforation versus medical necrotizing enterocolitis.** *J Pediatr.* 2014; 164:410-2 e1.
101. Monangi N, Slaughter JL, Dawodu A, Smith C, Akinbi HT. **Vitamin D status of early preterm infants and the effects of vitamin D intake during hospital stay.** *Arch Dis Child Fetal Neonatal Ed.* 2014; 99:F166-8.
102. Mueller C, Chulay JD, Trapnell BC, Humphries M, Carey B, Sandhaus RA, McElvaney NG, Messina L, Tang Q, Rouhani FN, Campbell-Thompson M, Fu AD, Yachnis A, Knop DR, Ye GJ, Brantly M, Calcedo R, Somanathan S, Richman LP, Vonderheide RH, Hulme MA, Brusko TM, Wilson JM, Flotte TR. **Human Treg**

- responses allow sustained recombinant adeno-associated virus-mediated transgene expression. *J Clin Invest*. 2013; 123:5310-8.
103. Muglia LJ, Kumar D. **Introduction to evolutionary genomic approaches to human disease.** *Appl Transl Genomic*. 2013; 2:41.
 104. Natarajan G, Shankaran S, Laptook AR, Pappas A, Bann CM, McDonald SA, Das A, Higgins RD, Hintz SR, Vohr BR, Extended Hypothermia Subcommittee of the Eunice Kennedy Shriver National Institute of Child Health and Human Development, Network. **Apgar scores at 10 min and outcomes at 6-7 years following hypoxic-ischaemic encephalopathy.** *Arch Dis Child Fetal Neonatal Ed*. 2013; 98:F473-9.
 105. Newman T, Lengyel C, Pavlicev M, Muglia LJ. **Human Evolution, Genomics, and Birth Timing: New Approaches for Investigating Preterm Birth.** *NeoReviews*. 2014; 15:e17-e27.
 106. Nolan K, Kattamuri C, Luedeke DM, Deng X, Jagpal A, Zhang F, Linhardt RJ, Kenny AP, Zorn AM, Thompson TB. **Structure of protein related to Dan and Cerberus: insights into the mechanism of bone morphogenetic protein antagonism.** *Structure*. 2013; 21:1417-29.
 107. Ohls RK, Christensen RD, Kamath-Rayne BD, Rosenberg A, Wiedmeier SE, Roohi M, Lacy CB, Lambert DK, Burnett JJ, Pruckler B, Schrader R, Lowe JR. **A randomized, masked, placebo-controlled study of darbepoetin alfa in preterm infants.** *Pediatrics*. 2013; 132:e119-27.
 108. Ohls RK, Kamath-Rayne BD, Christensen RD, Wiedmeier SE, Rosenberg A, Fuller J, Lacy CB, Roohi M, Lambert DK, Burnett JJ, Pruckler B, Peceny H, Cannon DC, Lowe JR. **Cognitive outcomes of preterm infants randomized to darbepoetin, erythropoietin, or placebo.** *Pediatrics*. 2014; 133:1023-30.
 109. Olbrych S, Jones HN, Smith KS, Habli M, Cnota JF, Hinton AC, Muglia LJ, Polzin WJ, Hinton RB. **Hypoplastic Left Heart Syndrome and Related Fetal Growth Abnormalities Are Associated With Placental Vascular Micropathology and Leptin Dysregulation.** *Circulation*. 2013; 128.
 110. Parker TA, Aucott SW, Bendel CM, Dammann CE, Rice WR, Savich RD, Wertheimer FB, Barry JS. **The new 6-unit individualized curriculum for pediatric residents: the perspective of neonatology fellowship program directors.** *J Perinatol*. 2013; 33:910-3.
 111. Pasha O, McClure EM, Wright LL, Saleem S, Goudar SS, Chomba E, Patel A, Esamai F, Garces A, Althabe F, Kodkany B, Mabeya H, Manasyan A, Carlo WA, Derman RJ, Hibberd PL, Liechty EK, Krebs N, Hambidge KM, Buekens P, Moore J, Jobe AH, Koso-Thomas M, Wallace DD, Stalls S, Goldenberg RL, Investigators ET. **A combined community- and facility-based approach to improve pregnancy outcomes in low-resource settings: a Global Network cluster randomized trial.** *BMC Med*. 2013; 11:215.
 112. Pati SK, Pinninti S, Novak Z, Chowdhury N, Patro RK, Fowler K, Ross S, Boppana S, Investigators NCS. **Genotypic diversity and mixed infection in newborn disease and hearing loss in congenital cytomegalovirus infection.** *Pediatr Infect Dis J*. 2013; 32:1050-4.
 113. Pavlicev M, Wagner GP, Noonan JP, Hallgrimsson B, Cheverud JM. **Genomic correlates of relationship QTL involved in fore- versus hind limb divergence in mice.** *Genome Biol Evol*. 2013; 5:1926-36.
 114. Payne MS, Kemp MW, Kallapur SG, Kannan PS, Saito M, Miura Y, Newnham JP, Stock S, Ireland DJ, Kramer BW, Jobe AH. **Intrauterine *Candida albicans* infection elicits severe inflammation in fetal sheep.** *Pediatr Res*. 2014; 75:716-22.
 115. Peralta-Carcelen M, Bailey K, Rector R, Gantz M, Network NNR. **Behavioral and socioemotional competence problems of extremely low birth weight children.** *J Perinatol*. 2013; 33:887-92.
 116. Polglase GR, Tingay DG, Bhatia R, Berry CA, Kopotic RJ, Kopotic CP, Song Y, Szyld E, Jobe AH, Pillow JJ. **Pressure- versus volume-limited sustained inflations at resuscitation of premature newborn lambs.** *BMC Pediatr*. 2014; 14:43.
 117. Romick-Rosendale LE, Legomarcino A, Patel NB, Morrow AL, Kennedy MA. **Prolonged antibiotic use**

induces intestinal injury in mice that is repaired after removing antibiotic pressure: implications for empiric antibiotic therapy. *Metabolomics*. 2014; 10:8-20.

118. Saito M, Payne MS, Miura Y, Ireland DJ, Stock S, Kallapur SG, Kannan PS, Newnham JP, Kramer BW, Jobe AH, Keelan JA, Kemp MW. **Polymyxin B agonist capture therapy for intrauterine inflammation: proof-of-principle in a fetal ovine model.** *Reprod Sci*. 2014; 21:623-31.
119. Sen P, Dharmadhikari AV, Majewski T, Mohammad MA, Kalin TV, Zabielska J, Ren X, Bray M, Brown HM, Welty S, Thevananther S, Langston C, Szafranski P, Justice MJ, Kalinichenko VV, Gambin A, Belmont J, Stankiewicz P. **Comparative analyses of lung transcriptomes in patients with alveolar capillary dysplasia with misalignment of pulmonary veins and in foxf1 heterozygous knockout mice.** *PLoS One*. 2014; 9:e94390.
120. Shaikhkhailil AK, Curtiss J, Puthoff TD, Valentine CJ. **Enteral zinc supplementation and growth in extremely-low-birth-weight infants with chronic lung disease.** *J Pediatr Gastroenterol Nutr*. 2014; 58:183-7.
121. South AP, Stutey KM, Meinen-Derr J. **Metaanalysis of the prevalence of intrauterine fetal death in gastroschisis.** *Am J Obstet Gynecol*. 2013; 209:114 e1-13.
122. Stark AR, Carlo WA, Vohr BR, Papile LA, Saha S, Bauer CR, Oh W, Shankaran S, Tyson JE, Wright LL, Poole WK, Das A, Stoll BJ, Fanaroff AA, Korones SB, Ehrenkranz RA, Stevenson DK, Peralta-Carcelen M, Wilson-Costello DE, Bada HS, Heyne RJ, Johnson YR, Lee KG, Steichen JJ, Eunice Kennedy Shriver National Institute of Child H, Human Development Neonatal Research N. **Death or neurodevelopmental impairment at 18 to 22 months corrected age in a randomized trial of early dexamethasone to prevent death or chronic lung disease in extremely low birth weight infants.** *J Pediatr*. 2014; 164:34-39 e2.
123. Steinhoff MC, MacDonald N, Pfeifer D, Muglia LJ. **Influenza vaccine in pregnancy: policy and research strategies.** *Lancet*. 2014; 383:1611-3.
124. Sun X, Bartos A, Whitsett JA, Dey SK. **Uterine deletion of Gp130 or Stat3 shows implantation failure with increased estrogenic responses.** *Mol Endocrinol*. 2013; 27:1492-501.
125. Suzuki T, Mayhew C, Salles A, Chalk C, Carey BC, Malik P, Wood RE, Trapnell BC. **Use of induced pluripotent stem cells to recapitulate pulmonary alveolar proteinosis pathogenesis.** *Am J Respir Crit Care Med*. 2014; 189:183-93.
126. Tang X, Liu XJ, Tian C, Su Q, Lei Y, Wu Q, He Y, Whitsett JA, Luo F. **Foxa2 regulates leukotrienes to inhibit Th2-mediated pulmonary inflammation.** *Am J Respir Cell Mol Biol*. 2013; 49:960-70.
127. Tkach JA, Merhar SL, Kline-Fath BM, Pratt RG, Loew WM, Daniels BR, Giaquinto RO, Rattan MS, Jones BV, Taylor MD, Tiefermann JM, Tully LM, Murphy EC, Wolf-Severs RN, LaRuffa AA, Dumoulin CL. **MRI in the neonatal ICU: initial experience using a small-footprint 1.5-T system.** *AJR Am J Roentgenol*. 2014; 202:W95-W105.
128. Tocco NM, Hodge AE, Jones AA, Wispe JR, Valentine CJ. **Neonatal therapeutic hypothermia-associated hypomagnesemia during parenteral nutrition therapy.** *Nutr Clin Pract*. 2014; 29:246-8.
129. Trapnell BC. **The dawn of protein-folding therapeutics.** *Am J Respir Crit Care Med*. 2014; 189:1-3.
130. Trapnell BC, Luisetti M. **The parallel lives of alpha1-antitrypsin deficiency and pulmonary alveolar proteinosis.** *Orphanet J Rare Dis*. 2013; 8:153.
131. Uchida K, Nakata K, Carey B, Chalk C, Suzuki T, Sakagami T, Koch DE, Stevens C, Inoue Y, Yamada Y, Trapnell BC. **Standardized serum GM-CSF autoantibody testing for the routine clinical diagnosis of autoimmune pulmonary alveolar proteinosis.** *J Immunol Methods*. 2014; 402:57-70.
132. Valentine CJ, Schlaudecker EP. **50 years ago in the Journal of Pediatrics: poliomyelitis antibodies in human colostrum and milk.** *J Pediatr*. 2014; 164:82.
133. Varma S, Mahavadi P, Sasikumar S, Cushing L, Hyland T, Rosser AE, Riccardi D, Lu J, Kalin TV,

- Kalinichenko VV, Guenther A, Ramirez MI, Pardo A, Selman M, Warburton D. **Grainyhead-like 2 (GRHL2) distribution reveals novel pathophysiological differences between human idiopathic pulmonary fibrosis and mouse models of pulmonary fibrosis**. *Am J Physiol Lung Cell Mol Physiol*. 2014; 306:L405-19.
134. Visscher M, Narendran V. **The Ontogeny of Skin**. *Adv Wound Care (New Rochelle)*. 2014; 3:291-303.
135. Vohr BR, Stephens BE, McDonald SA, Ehrenkranz RA, Laptook AR, Pappas A, Hintz SR, Shankaran S, Higgins RD, Das A, Extended Hypothermia Follow-up Subcommittee of the NNRN. **Cerebral palsy and growth failure at 6 to 7 years**. *Pediatrics*. 2013; 132:e905-14.
136. Wadhawan R, Oh W, Hintz SR, Blakely ML, Das A, Bell EF, Saha S, Laptook AR, Shankaran S, Stoll BJ, Walsh MC, Higgins RD, Network NNR. **Neurodevelopmental outcomes of extremely low birth weight infants with spontaneous intestinal perforation or surgical necrotizing enterocolitis**. *J Perinatol*. 2014; 34:64-70.
137. Wagner EA, Chantry CJ, Dewey KG, Nommsen-Rivers LA. **Breastfeeding concerns at 3 and 7 days postpartum and feeding status at 2 months**. *Pediatrics*. 2013; 132:e865-75.
138. Wambach JA, Casey AM, Fishman MP, Wegner DJ, Wert SE, Cole FS, Hamvas A, Nogee LM. **Genotype-Phenotype Correlations for Infants and Children with ABCA3 Deficiency**. *Am J Respir Crit Care Med*. 2014; 189:1538-43.
139. Watson RA, Wagner GP, Pavlicev M, Weinreich DM, Mills R. **The evolution of phenotypic correlations and "developmental memory"**. *Evolution*. 2014; 68:1124-38.
140. Whitsett JA. **The molecular era of surfactant biology**. *Neonatology*. 2014; 105:337-43.
141. Wiles JR, Leslie N, Knillans TK, Akinbi H. **Prolonged QTc Interval in Association With Medium-Chain Acyl-Coenzyme A Dehydrogenase Deficiency**. *Pediatrics*. 2014; 133:e1781-6.
142. Winkler T, Mahoney EJ, Sinner D, Wylie CC, Dahia CL. **Wnt signaling activates shh signaling in early postnatal intervertebral discs, and re-activates shh signaling in old discs in the mouse**. *PLoS One*. 2014; 9:e98444.
143. Wolfe KB, Snyder CC, Gisslen T, Kemp MW, Newnham JP, Kramer BW, Jobe AH, Kallapur S. **Modulation of lipopolysaccharide-induced chorioamnionitis in fetal sheep by maternal betamethasone**. *Reprod Sci*. 2013; 20:1447-54.
144. Wolfs TG, Kramer BW, Thuijls G, Kemp MW, Saito M, Willems MG, Senthamarai-Kannan P, Newnham JP, Jobe AH, Kallapur SG. **Chorioamnionitis-induced fetal gut injury is mediated by direct gut exposure of inflammatory mediators or by lung inflammation**. *Am J Physiol Gastrointest Liver Physiol*. 2014; 306:G382-93.
145. Yang D, Baumann JM, Sun YY, Tang M, Dunn RS, Akeson AL, Kernie SG, Kallapur S, Lindquist DM, Huang EJ, Potter SS, Liang HC, Kuan CY. **Overexpression of vascular endothelial growth factor in the germinal matrix induces neurovascular proteases and intraventricular hemorrhage**. *Sci Transl Med*. 2013; 5:193ra90.
146. Young L, Lee HS, 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, Downey GP, Swigris JJ, Taveira-DaSilva AM, Krischer JP, Trapnell BC, McCormack FX, Group MT. **Serum VEGF-D a concentration as a biomarker of lymphangioleiomyomatosis severity and treatment response: a prospective analysis of the Multicenter International Lymphangioleiomyomatosis Efficacy of Sirolimus (MILES) trial**. *Lancet Respir Med*. 2013; 1:445-52.
147. Zafar MA, McCormack FX, Rahman S, Tencza C, Wikenheiser-Brokamp KA, Young LR, Shizukuda Y, Elwing JM. **Pulmonary vascular shunts in exercise-intolerant patients with lymphangioleiomyomatosis**. *Am J Respir Crit Care Med*. 2013; 188:1167-70.

148. Zhang G, Muglia LJ, Chakraborty R, Akey JM, Williams SM. **Signatures of natural selection on genetic variants affecting complex human traits.** *Applied & Translational Genomics*. 2013; 2:78-94.

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Division Collaboration

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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Biostatistics and Epidemiology »

Cancer and Blood Disease Institute »

Center for Autoimmune Genetics and Etiology »

Developmental Biology »

Fetal Care Center »

Gastroenterology, Hepatology, and Nutrition »

General and Community Pediatrics »

Human Genetics »

Immunobiology »

James M. Anderson Center for Health Systems Excellence »

Pulmonary Medicine »

Radiology »

Reproductive Sciences »

Grants, Contracts, and Industry Agreements

Grant and Contract Awards

Annual Direct

BRIDGES, J

Role of GPR116 in the Regulation of Alveolar Surfactant Pool Size

American Heart Association

13SDG17090028	07/01/13-06/30/17	\$70,000
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JOBE, A

Initiation and Progression of Preterm Lung Injury with Ventilation

National Institutes of Health

R01 DH 072842	08/01/12-05/31/17	\$207,176
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PROP Attrition Reduction Study

National Institutes of Health(Children's Hospital of Philadelphia)

U01 HL 101794	05/01/12-04/30/14	\$982
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Data Coordinating Center for the Prematurity and Respiratory Outcomes Program

National Institutes of Health(University of Pennsylvania)

U01 HL 101794	09/20/10-04/30/15	\$60,834
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JOBE, A / CHOUGNET, C (MPI)

Biomarkers of Immunologic Function and Preterm Respiratory Outcomes

National Institutes of Health

U01 HL 101800	05/01/10-04/30/15	\$375,863
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Jobe, A	Core	\$115,930
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Chougnet, C	Project	\$80,237
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Chougnet, C	Project	\$33,684
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Kingma, P	Project	\$20,229
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Hardie, W	Project	\$111,771
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Morrow, A	Project	\$14,012
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KALIN, T

Role of Foxm1 in Lung Cancer Microenvironment

National Institutes of Health

R01 CA 142724	07/01/10-06/30/15	\$189,199
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Transcriptional Regulation of Cancer Progression and Metastasis by Foxm1

American Cancer Society National

07/01/13-06/30/17	\$175,000
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KALINICHENKO, V

Foxf1 Transcription Factor in Development of Pulmonary Capillaries

National Institutes of Health

R01 HL 084151	05/01/11-04/30/15	\$245,000
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LECRAS, T / HERSHEY, G (MPI)**Impact of Early Life Diesel Exposure Immune Patterning and Lung Structure/Function**

National Institutes of Health

R01 HL 097135	09/01/09-07/31/14	\$305,215
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LeCras, T	\$119,129
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Hershey, G	\$186,086
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MERHAR, S**Functional MRI to Predict Visual, Auditory, and Motor Outcomes in Infants with Brain Injury**

Thrasher Research Fund

08/01/12-07/31/14	\$9,451
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Protein Supplementation in Infants with Brain Injury

The Gerber Foundation

PN12-004-424-3068	06/01/12-05/31/15	\$6,666
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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	\$921,236
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Jiang, X	Project 2	\$109,146
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Jiang, X	Core D	\$84,618
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MUGLIA, L**March of Dimes Prematurity Research Center**

March of Dimes

22-FY13-543	07/01/13-12/31/13	\$969,396
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Dey, S	Project 3	\$130,486
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March of Dimes Prematurity Research Center Ohio Collaborative

March of Dimes

22-FY14-470	01/01/14-12/31/14	\$1,929,801
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Dey, S	Project 3	\$263,636
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MUGLIA, L / CHOUGNET, C (MPI)**Maternal Temperament, Stress, and Inflammation in Preterm Birth**

National Institutes of Health

R01 HD 078127	09/01/13-08/31/17	\$505,993
Muglia, L		\$433,973
Chougnet, C		\$72,020
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
PURI, 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		

National Institutes of Health(Cleveland Clin Lerner Col of Med of CWRU)		
U54 HL 119810	09/26/13-07/31/20	\$12,000
Omics of Lung Diseases		
National Institutes of Health		
K12 HL 119986	09/01/13-05/31/18	\$249,818
Pulmonary and Cardiovascular Development Training Grant		
National Institutes of Health		
T32 HL 007752	07/01/09-06/30/14	\$258,283
Single Cell NexGen RNA Sequencing of Human Lung		
National Institutes of Health(Duke University)		
U01 HL 110967	01/01/14-12/31/14	\$49,020
Transcriptional Control of Submucosal Gland Formation and Function		
National Institutes of Health		
R01 HL 108907	07/01/11-04/30/15	\$254,823
Transcriptional Programming of Asthma Related Pathology in Respiratory Epithelia		
National Institutes of Health		
R01 HL 095580	04/15/13-03/31/18	\$338,555
Cystic Fibrosis Foundation Research Development Program (Core 1)		
Cystic Fibrosis Foundation		
	03/01/12-06/30/15	\$50,000
Molecular Atlas of Lung Development - Data Coordinating		
National Institutes of Health(Duke University)		
U01 HL 122638	06/15/14-04/30/19	\$34,773
XU, Y		
Role of SREBP Network in Surfactant Lipid Homeostasis and Lung Maturation		
National Institutes of Health		
R01 HL 105433	07/01/11-06/30/15	\$285,650
Current Year Direct		\$11,073,774
Industry Contracts		
MORROW, A		
Glycosyn LLC		\$17,967
Mead Johnson & Company		\$135,408
Current Year Direct Receipts		\$153,375
Total		\$11,227,149