Faculty Listing and Clinical/Research Interests

Neonatal Faculty

Dr. Natarajan Balasubramaniyan's work is focused on understanding how epigenetic factors regulate the expression of FXR (Nuclear Receptors) target genes as part of normal hepatobiliary physiology and as a response/adaptation to experimental cholestasis. His studies provided novel insight into relatively unexplored areas of hepatic biology and pathobiology and aid in the design of new therapeutic strategies that will augment adaptive responses in the liver and retard or reverse the progression of cholestatic liver disease. *Associate Professor, PhD Researcher*

Dr. James Barry is the Medical Director of the University Hospital NICU (UCH NICU) and has championed quality improvement and patient safety, led initiatives that have led to decreased mortality and morbidity in premature infants, and created a Just Culture approach to event reviews in the UCH NICU. He has a growing expertise in business administration and Artificial Intelligence in neonatal critical care. *Professor*

Dr. Lauren Beard's research interests include unit-based quality improvement and patient safety, with the goal to translate such endeavors into improved neonatal outcomes and positive NICU experiences for families. Additionally, she serves as the Medical Director for the UC Health Highlands Ranch Hospital NICU. *Assistant Professor*

Dr. Stephanie Bourque's research specialization is in the evaluation of risk appropriate neonatal care through regionalization of care, back-transport of infants and subsequent follow-up care, with a specific interest in health care disparities, especially rural/urban disparities within the Rocky Mountain region. Additionally, she serves as the Co-Medical Director for the Children's Colorado NICU. *Assistant Professo*r

Dr. Laura Brown's research goals are to improve the muscle growth of the fetus during a pregnancy affected by intrauterine growth restriction (IUGR). The main question she hopes to answer is why muscle fails to grow properly even into adulthood after exposure to IUGR. By exploring the cellular mechanisms that control fetal muscle growth and development in IUGR, we will better understand why there are persistent abnormalities in muscle growth during childhood and adulthood. Furthermore, these findings will guide the development of nutritional strategies during pregnancy and early childhood to improve muscle growth and prevent the development of lifelong diseases. *Professor*

Dr. Eileen Chang's research focuses on cardiomyocyte growth, maturation, and metabolism, specifically in growth-restricted fetuses with the goal of determining therapeutic avenues to improve heart growth and cardiac function before and after birth. Her current projects include identifying mechanisms that drive cardiomyocyte proliferation and maturation in the growth-restricted fetus; and determining the effect of

fetal growth restriction on mitochondrial metabolism in the heart. *Instructor, PhD researcher*

Dr. Jill Chang's research interest is in defining the corticospinal tract development in intrauterine growth restriction and white matter tract integrity and function in perinatal brain injury. She comes to the University of Colorado School of Medicine from Northwestern University and Lurie Children's Hospital of Chicago. *Assistant Professor*

Dr. Stephanie Chassen's research interest is in the transport of fatty acids across the placenta during pregnancy, particularly in pregnancies affected by intrauterine growth restriction (IUGR). Fatty acids are crucial for brain development, and by exploring the cellular mechanisms in the placenta that are responsible for fatty acid transfer to the fetus we hope to better understand how this transfer is altered in IUGR. This information could help tailor perinatal nutritional strategies to improve long-term outcomes in these infants. *Assistant Professor*

Dr. Michael Cookson's research aims to understand how alterations in the intrauterine environment during chorioamnionitis and preeclampsia impact pulmonary vascular development in models of bronchopulmonary dysplasia and pulmonary hypertension. Working within the Pediatric Heart and Lung Center, his active project strives to understand the signaling mechanisms underlying abnormal lung development in a model of preeclampsia induced bronchopulmonary dysplasia and how these alterations affect endothelial cell biology. His lab interest in cardiopulmonary physiology is paralleled by his clinical focus on infants with congenital diaphragmatic hernia. *Assistant Professor*

Dr. Tristan Dear's research focuses on understanding differences in skeletal muscle development in fetal growth restriction (FGR). FGR infants are at higher risk of developing type 2 diabetes, obesity, and metabolic syndrome in adulthood. Through a better understanding of differences in vascular development and myofiber differentiation in utero, both in normally grown and growth-restricted fetuses, we can identify risks that predispose individuals to complications in adulthood and ultimately help guide future therapeutic interventions. *Instructor*

Dr. Robert Dietz studies the effects of ischemia on the developing brain thorough improved understanding of sub-acute and long-term outcomes of neuronal physiology. His basic translational research approach uses electrophysiology, behavior, biochemistry, molecular biology, and immunohistochemistry to elucidate mechanisms of neuronal injury after global and focal ischemia to identify potential therapeutic targets for neuronal protection and novel repair strategies. *Associate Professor*

Dr. Cassidy Delaney's research specialization is in pulmonary vascular biology. Her work is focused on elucidating the mechanisms by which platelets contribute to the initiation and progression of vascular inflammation in pulmonary hypertension. The overall goal of her work is to gain an understanding of the immune mechanisms that

mediate platelet function, to target immune-mediated platelet activation with novel immune-modulating anti-platelet therapies to ultimately improve the outcome of newborns with pulmonary hypertension. *Associate Professo*r

Dr. Nicolle Fernández Dyess's scholarly specialization is in medical education, specifically curriculum development/instruction and the career development of medical trainees. She has expertise in survey development/implementation and qualitative analysis. Additionally, she is the co-director of the School of Medicine's Future Leaders in Medical Education Trail, the director of the Residents and Fellows as Educators Elective through the Academy of Medical Educators, and the Associate Program Director of the Neonatal-Perinatal Medicine training program. *Assistant Professor*

Dr. Evgenia Dobrinskikh's research goals are to improve development of the lungs affected by pulmonary hypoplasia. The main question she is trying to answer is what cell-cell communications are distorted in hypoplastic lungs. Her current projects are using exploration of metabolic (global and spatial) changes, how they are affecting morphometric landscape changes, what cellular and extracellular signaling are involved in these changes in normal lung development and disease conditions (congenital diaphragmatic hernia, intrauterine growth restriction, preterm birth). *Assistant Professor, PhD Researcher*

Dr. Tina Fisher's research interests involve exploring and reducing communication disparities in the NICU and supporting local and regional quality improvement efforts to increase caregiver engagement. She is currently studying how to best integrate interpreters into intensive care workflow. *Assistant Professor.*

Dr. Jason Gien studies pulmonary hypertension, chronic lung disease, and acute kidney injury. *Professor*

Dr. Theresa Grover's previous research involved the regulation of fetal and neonatal pulmonary blood flow, mechanisms of pulmonary vascular and alveolar growth, persistent pulmonary hypertension of the newborn, bronchopulmonary dysplasia, and the role of vascular endothelial growth factor in lung development. She now focuses on clinical research related to disease-based outcomes such as congenital diaphragmatic hernia within the Children's Hospital National Consortium Database. *Professor*

Dr. Kathleen Hannan is a health services researcher with a particular interest in health disparities in the population of neonates with medical complexity and technology dependence. She follows infants discharged from our NICUs in the Special Care Clinic and is currently involved in population-level analyses and local and regional prospective studies investigating healthcare utilization and the experience of families of complex neonates. *Assistant Professor*

Dr. Sadie Houin's clinical interest is the management and prevention of bronchopulmonary dysplasia (BPD), and she is medical director of the SPROUT team which manages babies with the most severe BPD. Her interest extends to those babies that require tracheostomy and chronic ventilation, and she is the NICU medical director of the Ventilator Care program. Her scholarly interests mirror her clinical ones and center around exploring current BPD management practices and assessing how standardization impacts outcomes, both for the baby and the family. *Assistant Professor*

Dr. Susan Hwang's research interests include the transition of care of high-risk infants from hospital to home, infant care practices of preterm infants after hospital discharge, and the effect of family engagement in the NICU on short and long term outcomes. She collaborates with public health and government agencies to assess trends in maternal and infant health, particularly focused on racial/ethnic disparities in receipt of care and in health outcomes. *Associate Professor*

Dr. John Kinsella's research interest include Inhaled Nitric Oxide, High Frequency Ventilation, ECMO, Pulmonary Hypertension, Acute Respiratory Failure. *Professor*

Dr. Karena Lawrence's scholarly focus is on medical education, communication, and point-of-care ultrasound. She has specific interests in curriculum development and assessment methods. In addition, she has extensive experience in simulation-based education including previous development of a hands-on curriculum using for NICU point-of care ultrasound, a progressive neonatal ECMO wet lab series, a patient actor based communication curriculum on difficult conversations, and recurring interdepartmental sessions on newborn resuscitation. Currently, she is developing the infrastructure for our neonatal point-of care ultrasound program and is re-designing our neonatal ECMO education series. *Associate Professor*

Dr. Erica Mandell's research specialization is in pulmonary vascular biology with a specific focus on vitamin D treatment in a chorioamnionitis model of chronic lung disease. Her main goals are to determine vitamin D's protective role in lung development after exposure to chorioamnionitis. She is currently developing a maternal vitamin D deficient model and an endothelial cell specific vitamin D receptor knock mouse model to study the pulmonary vascular effects of vitamin D. *Associate Professor*

Dr. Laura Marrs' research focuses on simulation and neonatal resuscitation. ***Assistant Professor***

Dr. Susan Niermeyer focuses on international child health, neonatal resuscitation, and high-altitude physiology including cardiopulmonary adaptation in infants at high altitude, acute mountain sickness in children, and fetal and neonatal origins of chronic mountain sickness. *Professor*

Dr. Thomas Parker's scholarly focus has transitioned from investigating the hormonal modulation of the developing fetal pulmonary circulation, the role of endogenous nitric

oxide in the developing lung circulation, the myogenic response in the fetal and newborn pulmonary circulation, the role of rho kinase in the modulation of pulmonary vascular tone, and the use of inhaled nitric oxide in treatment of persistent pulmonary hypertension of the newborn to more clinical aspects of medical education. His current work centers on the development and use of neonatal specific Entrustable Professional Activities (EPAs) as a source of more formative feedback He is also the Associate Program Director of the Neonatal-Perinatal Medicine training program and the Vice Chair of Education for the Department of Pediatrics. *Professor*

Dr. Theresa Powell is internationally recognized for her work in determining the molecular mechanisms regulating ion and macronutrient transport in the human placenta and characterizing changes in placental function in association to important pregnancy complications. Currently, the primary focus of Dr. Powell's research is to better understand how the abnormal metabolic environment of obesity or gestational diabetes in pregnant women affects placental function and the long-term health of her baby. Specifically, Dr. Powell is interested in identifying endocrine signals linking maternal adipose tissue to placental function and fetal growth and developing novel intervention paradigms for improving the maternal metabolic environment and pregnancy outcomes in obese women. *Professor, PhD researcher*

Dr. Regina Reynolds' research interests include neonatal nutrition, neonatal nutrient metabolism, growth and body composition of the neonate, especially the preterm infant and neonates with congenital heart disease. *Associate Professor*

Dr. Paul Rozance is interested in the fetal consequences of intrauterine growth restriction (IUGR). IUGR results in metabolic and developmental adaptations which set up an individual for long term health problems including hypertension, cardiovascular disease, pulmonary disease, obesity, and diabetes. His overall goal is to define the mechanisms responsible for these adverse outcomes. His main focus is on the pancreatic beta-cells which secrete insulin (the dominant fetal growth hormone). He also is collaborating in experiments determining the developmental and metabolic consequences of IUGR on fetal lungs, liver, muscle, and large arteries. In conjunction with defining the developmental consequences of IUGR he is testing the ability of fetal interventions to reverse these adverse consequences with the ultimate goal of designing interventions to treat IUGR and improve fetal growth. *Professor*

Dr. Rebecca Shay is a clinical researcher with a focus on quality improvement, systems of care delivery, and patient safety. She is specifically interested in studying procedural components of neonatal intubations, surfactant administration practices, and predictors of extubation successes while assessing for associated short- and long-term patient outcomes. She is a member of local and multi-center resuscitation interest groups, and she serves as a member of the executive committee for the National Emergency Airway Registry for Neonates. *Assistant Professor*

Dr. Laura Sherlock's research specialization is in selenium, a vital anti-inflammatory and antioxidant micronutrient. Preterm infants are at high risk for inadequate selenium

status, and she is investigating how selenium deficiency contributes to acute and chronic inflammatory injury. *Assistant Professor*

Dr. Danielle Smith's scholarly interests focus on Quality Improvement and Patient Safety. As Medical Director of the Children's Hospital Colorado NICU, she leads several multidisciplinary quality improvement projects and participates in national collaboratives to reduce hospital acquired conditions. *Associate Professor*

Dr. Jane Stremming's research interests are fetal and neonatal metabolism, growth, and nutrition. She is currently studying the hormonal regulation of growth and placental nutrient transport in the normally growing fetus and the fetus with growth restriction. She is also interested in optimizing growth in the NICU using targeted human milk fortification. *Assistant Professor*

Dr. Aniekan Udoko's research interests include the examination of racial/ethnic and socioeconomic drivers of disparity in neonatal-perinatal outcomes utilizing qualitative and quantitative methodologies with a goal of improving health care delivery via quality improvement initiatives, community engagement, and advocacy. *Instructor*

Dr. Pavika Varma is a clinical researcher with specific interests in pulmonary hypoplasia and complex congenital heart disease. She is currently developing a clinical guideline for the comprehensive management of infants with pulmonary hypoplasia secondary to obstructive uropathies. Clinically, she is a core member of the ECMO & CDH team in the CHCO NICU and also works extensively with the Colorado Fetal Care Center to assist in the prenatal management of infants with complex cardiopulmonary disease. *Assistant Professor*

Dr. Stephanie Wesolowski's lab studies how altered nutrient supply programs fetal metabolism and how these changes may persist after birth and increase susceptibility to adult metabolic disease. Primary research is aimed at understanding the effects of intrauterine growth restriction (IUGR) on liver metabolism and function using integrative approaches in physiology and metabolism combined with novel molecular techniques in cell biology, epigenetics, and metabolomics. Current studies are focused on understanding the mechanisms for the early activation of fetal hepatic glucose production and development of hepatic insulin resistance, specifically the role of reduced glucose versus oxygen supply to the fetus, both key features of placental insufficiency and resulting IUGR. This is important in understanding why IUGR offspring have increased susceptibility to diabetes across their lifespan. Additional projects are investigating the effects of maternal high fat diet and obesity on offspring metabolism, specifically the early development of non-alcoholic fatty liver disease (NAFLD) and immune cell reprogramming. *Associate Professor, PhD researcher*

Dr. Alicia White's research goal is to develop strategies to optimize fetal growth and metabolism in pregnancies complicated by altered nutrient delivery. She is currently studying how the hormonal regulation of nutrient availability affects fetal pancreas development. *Assistant Professor*

Dr. Randall Wilkening's research activities have included placental transfer and function; fetal metabolic responses to placental dysfunction; and fetal organ blood flow and metabolism. *Professor and Section Head, Neonatology*

Dr. Clyde Wright 's research interest include further defining the unique characteristics of the NFkB inhibitory proteins (IκBs) and their role in modulating hyperoxia-induced NF-κB activation. He hopes to identify interventions that protect preterm infants from bronchopulmonary dysplasia. *Professor*

Dr. Erica Wymore's clinical research interests include cardiopulmonary physiology, hemodynamics and the effect of mesenteric perfusion, as well as early lung injury in prematurity. She has earned an MPH, utilizing epidemiological methods to analyze multicenter data for clinical research. Her main focus is investigating markers of inflammation and cytokine production in early lung injury and the progression to bronchopulmonary dysplasia among the heterogenous population of extremely low birth weight infants and also interested in the effects of maternal cannaboid use on neonatal outcomes. *Associate Professor*

Dr. Jeanne Zenge's main focus is in clinical Neonatology, with a particular interest in neonatal telemedicine. She is a member of the SPROUT (Supporting Preemie Respiratory Outcomes) team, Standardized Pediatric Research on Outcomes and Utilization of Telehealth, and currently is evaluating the use of tele-signout for NICU discharges and the effectiveness of teleconsultation. She is also the Program Director for the Neonatal-Perinatal Medicine Training Program. *Associate Professor of Clinical Practice*