DIVISION OF NEOONATOLGY

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Division Overview

The Division of Neonatology of the University of Rochester Medical Center is dedicated to excellence in patient care, to diligent research and to providing outstanding education and training of physicians and scientists. Our values dictate that all colleagues, trainees, patients, and families are treated with respect. The major clinical site is the Neonatal Intensive Care Unit (NICU) at Golisano Children’s Hospital. Our NICU was selected as one of the top NICUs in the country by US News and World Report in 2012. The Special Care Nursery (SCN) at Rochester General Hospital (RGH) is integral to our patient care mission. Our basic research focuses on the molecular and cellular regulation of lung development and injury. Patient-oriented research spans important neonatal diseases, with a focus on treatment of lung, neurological, and retinal disorders. Our faculty members provide clinical education and training to medical students, residents, postdoctoral fellows, nurse practitioners, and community practitioners. An important part of our mission is training in basic and clinical research at many levels, ranging from undergraduates to doctorates in medicine and the basic sciences.

Clinical Activities

Golisano Children’s Hospital

Our clinical goal is to provide outstanding care to all ill newborns in the Finger Lakes Region. The neonatal intensive care unit (NICU) at Golisano Children’s Hospital (GCH) is a level IV facility that can treat all neonatal medical and surgical illnesses. Our 60-bed NICU has extensive technical capabilities, including ECMO, inhaled nitric oxide, and HFOV. Construction is nearly complete on our new children’s hospital that will have an all new NICU, expanding our capacity with 64 individual patient rooms. In 2013 – 2014, our 15 board-certified neonatologists treated 1291 newborns in the NICU; these patients had the full range of medical, surgical, and cardiac disorders. The average daily census in the NICU in 2013– 2014 was 60.7 patients, for a total of 22,155 patient days. Of the 3020 patients born at Strong Memorial Hospital, 1041 were admitted to the NICU. An additional 250 patients who were born at either community hospitals or at other regional hospitals were transferred to our NICU for advanced care. Our neonatal transport service transferred patients from 19 referring hospitals. Approximately 1 in 12 newborns in our region was treated in the NICU at Golisano Children's Hospital. In 2013 – 2014, 84 patients were transferred back to their community hospital for convalescent care and to be closer to their families.

Our very busy NICU is the site for training Pediatric and Internal Medicine-Pediatric house officers, postdoctoral fellows, medical students, neonatal nurse practitioners and physician assistant students. The Neonatology Division also supervises the Newborn Nursery (NBN) at Strong Memorial Hospital. Two board-certified pediatricians establish policy and procedures and care for newborns under routine care.

Rochester General Hospital, Unity Hospital, Highland Hospital

At RGH, in 2013 – 2014 the Neonatology Division saw 2470 births and cared for 417 patients in the Level II Special Care Nursery (SCN), yielding an average daily census of 6.6. As a community hospital, the SCN is an important training site for Pediatric and Family Medicine residents and medical students. Members of the Neonatology Division serve as medical directors for the nurseries at Rochester General, Highland, and Unity Hospitals, and are responsible for establishing consistent policies and procedures for local hospitals.
Neonatal Continuing Care Program
To provide outstanding medical care, it is essential that we follow the neurodevelopmental outcome of our NICU graduates. The Neonatal Continuing Care Program follows all patients who are discharged from the NICU, either in the Infant and Toddler Clinic (part of the Strong Center for Developmental Disabilities) or in the Neonatal Tracking Program. In the Infant and Toddler Clinic, patients are evaluated by a developmental pediatrician, social worker, a nurse practitioner and a neonatology fellow; in 2013 – 2014, the clinic conducted 363 evaluations. The Infant and Toddler Clinic also evaluates patients who were not in the NICU, but referred from the Monroe County Early Intervention Program. The Neonatal Tracking Program follows all NICU graduates to age 10 through serial questionnaires sent to the patient’s family and pediatrician. The NCCC teams review the tracking forms to identify patients who may need formal evaluation and to obtain long-term follow-up data. In 2013-2014, 1410 forms were returned by parents and 2764 forms were returned by pediatricians. To date, over 26,000 patients have been followed by the tracking program.

NICU Quality Improvement Programs / Initiatives
In 2013 – 2014, the NICU initiated several New York State (NYS)-wide and locally developed quality improvement initiatives:

NYS Perinatal Quality Collaborative: The NICU worked with the NYS Perinatal Quality Collaborative to improve growth outcomes of patients < 31 weeks gestation and to reduce the rate of Central Line Associated Bloodstream Infections (CLABSIs).

- Growth: the proportion of infants < 31 weeks gestation discharged < 10th percentile has decreased. This has been accomplished through use of trophic feedings, earlier introduction of feedings (median age at first feeding decreased from 4 days in 2011 to 3 days in 2012), earlier advancement of protein and lipid in TPN, and routine nutrition rounds during which growth of current inpatients is reviewed.
- CLABSI: after decreasing for several years, the CLABSI rate plateaued in 2012. To generate improvement going forward, the NICU has implemented routine use of central catheter insertion and catheter maintenance checklists. Compliance with checklist use will be quantified and reported to NYS. In addition, we have conducted a NICU-wide educational program on care and maintenance of central catheters.

NYS Medical Home Grant: As part of a NYS Medical Home Grant awarded to SMH, the NICU has focused on reducing nosocomial infections (NI) caused by either primary blood stream infections (BSIs) (primary BSI, including CLABSIs and BSIs without a source) and secondary BSIs (BSIs attributed to a specific source). Specific efforts have included:

- Alcohol caps on all hep locks.
- Proper collection of blood cultures to reduce contamination.

Locally Initiated Quality Improvement (QI) Projects:

- Reducing incidence of severe ROP: a re-education effort was initiated to emphasize appropriate oxygen saturation targets.
- Educating parents on safe sleep practices: In 2013-14, the NICU and NBN implemented mandatory education in safe sleep practices for parents of all newborns. This initiative was developed in response to an increase in sudden infant death noted by the SMH Pediatric ED staff.
- IVH Reduction Bundle: More judicious use of volume expansion in treating neonatal hypotension was reinforced as was reducing use of sodium bicarbonate.
- Improving the proportion of infants receiving breast milk at days of life 14 and 28 as well as at NICU discharge.

Regional Outreach Activities
The Neonatology Division is the Regional Perinatal Center for the Finger Lakes Region of New York State. Integral to the Division’s clinical activities are outreach visits to the 11 referring hospitals in our region. The goals of these visits are to review maternal and neonatal outcomes at the referring hospitals, provide feedback on patients transferred to the NICU at GCH, review clinical policies and procedures, and provide outreach education. In addition, the outreach team compares outcome statistics from the referring hospital to region-wide data. Each hospital is visited one to two times a year by a
neonatologist, high-risk perinatologist, neonatal nurse practitioner, and obstetrical nurse practitioner. Melissa Carmen, MD, is responsible for the majority of outreach teaching visits.

Outreach Hospitals:

- Arnot Ogden Medical Center, Elmira, NY
- Corning Hospital, Corning, NY
- F.F. Thompson Health System, Canandaigua, NY
- Highland Hospital, Rochester, NY
- Jones Memorial Hospital, Wellsville, NY
- Memorial Hospital, Dansville, NY
- Unity Hospital, Rochester, NY
- Olean General Hospital, Olean, NY
- Rochester General Hospital, Rochester, NY
- St. James Mercy Hospital, Hornell, NY
- Via Health of Wayne, Newark, NY

Research and Other Scholarly Activities

Sanjiv B. Amin, MBBS, MD, MS
Associate Professor, Pediatrics

Dr. Amin’s research interests include the effects of jaundice, nutritional, and environmental toxins on the developing nervous system in neonates using auditory brainstem responses. He has NIH funding to evaluate dental developmental outcome in premature infants and to study the level of jaundice associated with transient or permanent abnormal changes in auditory nervous system in premature and term neonates. In addition to assessing the antioxidant effect of jaundice on neonatal morbidities, he investigates language disorders and central auditory processing disorders of premature and late preterm neonates. Dr. Amin is interested in genetic polymorphism and ethnic differences in bilirubin production and susceptibility to bilirubin-induced neurotoxicity. He explored a new technique using fluorescent spectrophotometry to measure free bilirubin levels, a more specific marker of bilirubin-induced neurotoxicity. He studies the effect of lead and other environmental toxins on a developing auditory nervous system, and the role of nutritional (iron and Vitamin D), inflammatory, and hormonal factors on brain development. He has two randomized trials; the first evaluates the role of lipid administration in the development of cholestasis in neonates, and the second evaluates the association between iron deficiency and brain myelination. His work is supported by NICHD, CTIS, and NIDCR.

Melissa Carmen, MD
Assistant Professor, Pediatrics

Dr. Carmen is involved in various clinical trials through the NICHD Neonatal Research Network. She is Co-PI in the Transfusion of Prematures (TOP) study, which aims to determine if maintenance of higher hemoglobin levels in extremely low birth weight babies leads to improvement in the survival and rates of neurodevelopmental impairment at 22-26 months. Dr. Carmen is also site Co-PI for the INS-3 trial, a randomized controlled trial to assess the efficacy of inositol supplementation on improving ROP and BPD. In 2012, while still in training at the University of Buffalo, Dr. Carmen was awarded a Young Investigators Award from the Neonatal Resuscitation Program to study the use of pulse oximetry in the assessment of effective chest compressions during neonatal resuscitation. She continues to collaborate with the University of Buffalo to study this area of resuscitation in a newborn piglet model.

Patricia R. Chess, MD
Professor, Pediatrics

Dr. Chess’s research is on lung injury and repair in the neonate, focusing on mechanical forces in the lung. Collaborative work on assessing efficacy of a biophysically active phospholipase resistant synthetic surfactant in an LPS-induced injury murine model compliments this work. Clinical areas of investigation include optimal modes of ventilation, use of ECMO in respiratory failure, cardiorespiratory dysfunction in congenital diaphragmatic hernia, omega-3 lipids to treat TPN-induced liver dysfunction, and surfactant replacement therapy. A pulmonary potentially best practices bundle for VLBW infants in the NICU has been developed and implemented, and its effect on acute and chronic lung disease is also being investigated. A respiratory monitor to assess chest movement in babies on high frequency ventilation is being developed in collaboration with Biomedical Engineering at UR. Dr. Chess is the site PI for the NICHD neonatal network randomized controlled inositol trial to assess efficacy of inositol supplementation on improving ROP and BPD and efficacy of hydrocortisone to facilitate extubation in VLBW infants. Dr. Chess participates in grants from NICHD and NIH LB.

Rita Dadiz, DO
Associate Professor, Pediatrics

Dr. Dadiz incorporates simulation-based learning and debriefing methodologies into postgraduate medical and nursing education with the goal of improving interprofessional communication and teamwork during patient care. With validated evaluation tools, she is investigating the impact of simulation-based team training for obstetric and neonatal providers on communication and patient outcomes during high-risk deliveries. Dr. Dadiz is the recipient of an award from the Health Resources and Services Administration to train healthcare providers throughout the
Finger Lakes Region of New York State on the use of simulation-based learning and debriefing in quality improvement initiatives. Dr. Dadiz is also the site director for the International Network for Simulation-Based Pediatric Innovation, Research and Education (INSPIRE). The INSPIRE network is currently evaluating competency-based infant lumbar puncture training on interns’ lumbar puncture success rates. Dr. Dadiz is collaborating with Dr. Pasternack from the URMC Emergency Department to lead a qualitative study for the INSPIRE network examining the factors that facilitate and impede successful implementation of the lumbar puncture competency-based assessment program.

Carl T. D’Angio, MD
Professor, Pediatrics

Dr. D’Angio is the principal investigator for the joint University of Rochester – University of Buffalo center of the NICHD Neonatal Research Network (NRN); which performs clinical trials and observational studies on critically ill newborns cared for in a consortium of 18 neonatal centers. The NRN currently seeks treatments for respiratory diseases, neonatal encephalopathy and necrotizing enterocolitis, among other disorders. Dr. D’Angio serves as the URMC site investigator for the Prematurity and Respiratory Outcomes Program (PROP), an NIH-funded longitudinal study of the antecedents of respiratory disease in the first year among premature infants. He is an investigator at UR’s new NIAID-funded Respiratory Pathogens Research Center, which will explore respiratory infections among premature infants.

Dr. D’Angio studies infections, immunology and immunizations in the premature infant. He is concerned with comprehension of research permission among parents of infant research subjects, for which he completed an NICHD-funded randomized controlled trial of a cover sheet to improve understanding of research consent.

David A. Dean, PhD
Professor, Pediatrics

Dr. Dean’s laboratory is focused on the mechanisms of intracellular trafficking of plasmids and DNA-protein complexes as it relates to nonviral gene delivery to the lung. While many aspects of non-viral vector design are being addressed, critical areas that have not received adequate attention are the cytoplasmic movement and nuclear import of vector DNA. Clearly, without the translocation of plasmid DNA into the nucleus, no gene expression, or gene therapy can take place. To this end, they study how plasmids interact with microtubules and microtubule-associated motor proteins to move in a directed fashion through the cytoplasm using a variety of intracellular imaging techniques, biochemical assays, and mass spectrometry approaches. Studies are also underway to understand how plasmids translocate the nuclear pore complex to gain entry into the nucleus in both general and cell-specific situations. New work examines whether and how plasmids move within the nucleus and how this relates to their ability to be expressed. Taken together, these studies will help design improved vectors for gene therapy as well as provide insight into the basic biology of the cell. The second focus of the laboratory is to develop novel treatments for acute lung injury and asthma using electric fields for gene delivery to the lungs of living animals. Dr. Dean’s laboratory has shown that genes can be delivered to the lungs of small and large animals by electroporation and that genes can have significant therapeutic activity. Using this approach, they have been able to prevent and treat acute lung injury in an endotoxin-induced mouse model of lung injury as airway hyperreactivity in an ovalbumin-sensitization model of asthma. Current studies assess safety and efficacy in a large animal preclinical model in hopes of one day taking this to the clinic. Dr. Dean’s research is supported by several NIH RO1 and R21 grants.

Fabeha Fazal, PhD
Assistant Professor, Pediatrics

Dr. Fazal’s laboratory investigates the role and regulation of cytoskeletal dynamics in endothelial cell (EC) inflammation, permeability, and apoptosis in the settings of acute and chronic lung diseases. A key event underlying the pathogenesis of acute lung injury involves adhesion molecule-dependent transendothelial migration of polymorphonuclear leukocytes (PMN) into the lungs. Transcription factor NF-kB plays a critical role in the expression of adhesion molecules ICAM-1 and VCAM-1. Activation of NF-kB requires its release from the inhibitory protein IkBα in the cytoplasm and subsequently, its translocation to the nucleus. Whereas the mechanisms of its release have been elucidated, the cytoplasmic events regulating the translocation of NF-kB to the nucleus remain elusive. Dr. Fazal and colleague have uncovered novel and previously unrecognized role of actin cytoskeleton and non-muscle myosin light chain kinase (nmMLCK) in the regulation of cytoplasmic trafficking of NF-kB for its nuclear import to cause EC inflammation associated with intravascular coagulation and sepsis.

More recently Dr. Fazal’s research has focused on identifying the role of endoplasmic reticulum (ER) stress and mitochondrial dysfunction in the regulation of EC inflammation and permeability associated with ALI. Their findings show that ER stress regulator BiP and mitochondrial stress regulator Mortalin are mediators of EC inflammation and they may act in concert to regulate cytosolic and nuclear events to promote NF-kB activity. In addition, Dr. Fazal and Dr. Rahman collaborate to understand the role of nmMLCK in the pathogenesis of pulmonary emphysema caused by cigarette smoke (CS). They utilize genetically modified mice, primary cell cultures, and multidisciplinary approaches ranging from biochemical, cellular, and molecular biology to in vivo gene delivery and lung physiology to study the response of pulmonary endothelium during acute and chronic lung inflammation/injury.
Jacob N. Finkelstein, PhD
Professor, Pediatrics

Dr. Finkelstein’s laboratory investigates the role of cell-cell interactions in modulating the pulmonary injury response to physiological and toxicological stimuli. This work includes studies of oxidant-induced signaling in the pulmonary epithelium and macrophages and epithelial and inflammatory cell production of cytokines and chemokines in the regulation of the inflammatory response. Prior research focused on basic cell and molecular biology of the pulmonary alveolar type II cell as the site of pulmonary surfactant system and how oxidant injury can alter key regulatory processes. The type II cell plays an important role as the stem cell for renewal of the alveolar epithelium, both in the normal lung development and during epithelial repair and renewal following lung injury. The most recent data suggest that type II cells may be involved in regulating the inflammatory functions of alveolar macrophages, as well as the actions of interstitial fibroblasts during lung growth or pulmonary fibrosis.

Current research utilizes multiple models of injury with a special emphasis on environmental agents as modulators of cellular function. Studies of inhaled oxidant gases (ozone, hyperoxia), inhaled particulate matter (generated by combustion processes including diesel exhaust) and ionizing radiation (therapeutic as well as accidental release) all provide a platform to study the pulmonary injury response. Another important aspect of recent work is the interaction of engineered nonmaterials with cellular signaling systems and how these interactions may result in a toxic response.

The overall goal of the current research is to identify the key control mechanisms involved in epithelial cell and fibroblast proliferation, and in related extracellular matrix synthesis, processing, and assembly. Dr. Finkelstein seeks to define such mechanisms not only during normal lung growth and normal development, but also during the repair of epithelial damage, which may have important implications for pediatric and adult lung disease, including bronchopulmonary dysplasia (BPD). This work is funded by grants from the NIEHS, the EPA, NIAID, NSF and the DOD.

Ronnie Guillet, MD, PhD
Professor, Pediatrics

Dr. Guillet’s primary research focus is neonatal brain development and injury. The developing brain is at risk from the effects of centrally acting agents, including hypoxia, seizures, and medications; this risk is due in part to the fact that the brain may be more vulnerable during times of rapid maturational change. Dr. Guillet has an active clinical research program focused on the neonatal brain. As the Rochester co-investigator for the NICHD Neonatal Research Network grant, she assists the PI and is responsible for network studies involving new treatments for neonatal brain injury. Other areas of clinical research interest include the auditory brainstem evoked response, its use as a tool to evaluate brain maturation, and its relationship to maternal iron status prior to delivery. She is also involved in studies of acute kidney injury in premature infants. Her work is supported in part by grants from the NIH and FDA.

Carl Johnston, PhD
Research Assistant Professor, Pediatrics

Dr. Johnston explores the postnatal lung copes with external stress. A critical biological factor playing a role in childhood pulmonary susceptibility is the extent of lung development occurring postnatally. One of the environmental factors relevant to developmental lung disease is the recent increase in complexity and distribution, if not the levels, of airborne pollutants including allergens and endotoxins, respirable particulate matter, and irritant gases, exposure to which damages various cell types. Among the most important of these are the respiratory epithelium and critical immune effector cell populations. Combined exposures to multiple pollutants may activate several unique signaling pathways that are age dependent and, depending on the sequence of initiation, may result in responses not predicted by evaluating exposures to an individual pollutant. Dr. Johnston’s work relies on mRNA analysis, microarray technology, immuno-histochemistry, and in situ hybridization. This work is supported by participation in several NIH grants.

Nirupama Laroia, MD
Associate Professor, Pediatrics

Dr. Laroia focuses on neonatal seizures, especially those related to stroke and hypoxic ischemic injury in the newborn. She has developed criteria for long-term EEG monitoring in neonates at risk for seizures. Current projects include study of neuroprotective strategies in infants with hypoxic ischemic injury, Hyperbilirubinemia in the term neonate, use of donor milk in preterm infants, and a qualitative study looking at barriers to communication between obstetricians and pediatricians in the delivery room. Her research interests include neonatal global health with implementation of Helping Babies Breathe program in India.

Ruth A. Lawrence, MD
Professor, Pediatrics

Dr. Lawrence is a consultant to and an investigator with Dr. Ann Dozier in the Department of Public Health Sciences. She is the medical director for the Lactation Study Center, a drug information line, and the clinical toxicology service. Current projects include the impact of epidural anesthesia on breastfeeding; the impact of Depoprovera given to the mother before discharge on breastfeeding.

Dr. Lawrence has been involved in efforts to provide human milk for preemies. She was elected to the board of the newly established Mothers Milk Cooperative. Donors are screened by
This work is currently supported by research grants from the application of genome-wide expression array methods to disease and studies of human samples. He is a leader in the modeling in animals, exposure-related models of chronic lung of epithelial-mesenchymal interactions and expression of predominantly upon defining pathways contributing to regulation pathogen-driven respiratory disease. Work focuses seek to define key regulatory networks involved in lung antecedents and the influence of environmental factors. They diseases, particularly focusing upon their developmental antecedents. More diseased states such as asthma, chronic obstructive pulmonary development and maturation, and which may be perturbed in lung injury (ALI) and the acute respiratory distress syndrome (ARDS). The severe lung injury syndromes of ALI/ARDS can result from multiple direct pulmonary insults and are major causes of mortality and morbidity in the US and worldwide despite sophisticated medical intensive care. This multi-university collaborative research emphasizes basic science and translational studies to develop and test new highly-active synthetic lipid/peptide exogenous surfactants for treating NRDS and direct pulmonary forms of ALI/ARDS. Current NIH Bioengineering Research Partnership (BRP) studies in our laboratory examine the molecular bioengineering, computer analysis, synthesis, and physical chemistry of novel amphipathic peptides with structural homology to native surfactant proteins (SP), and the surface and pre-clinical pulmonary activity of these peptides combined with novel phospholipase-resistant lipids or synthetic biologic lipids in synthetic lung surfactants.

Dr. Lawrence collaborates with Dr. OJ Sahler on the effect of music on breast milk production. Music therapy may increase breastfeeding rates among mothers of premature infants not only in the first few days but also at 60 days post-delivery, most likely because of its relaxing effects. When a mother is having difficulty breast feeding, she is usually given instructions about ways to relax, including deep breathing, visualization exercises, or listening to music. A study of mothers listening to music during kangaroo care showed that music not only significantly decreased maternal anxiety, but also increased quiet sleep and reduced crying in the infant. There is a growing body of literature to support the notion that the benefit of live music is superior to recorded music in inducing relaxation in infants although there are few studies in mothers. This is a particularly important finding given the evidence that maternal anxiety/stress as reflected in increased cortisol levels in breast milk can negatively affect infant temperament.

William M. Maniscalco, MD
Professor, Pediatrics

Dr. Maniscalco studies pulmonary microvascular development in lung injury. Using various animal models, including a non-human primate model of BPD, this work examines the effects of oxygen and ventilation of immature lung on the development of alveolar capillaries. The major goals of the research are to characterize microvascular development in lung injury and investigate angiogenic and angio-static regulators in normal and injured lung. Recent work has linked expression of inflammatory CXC chemokine mediators, which regulate angiogenesis and are part of the pathophysiology of BPD, to impaired lung microangiogenesis.

Thomas J. Mariani, PhD
Associate Professor, Pediatrics

The broad objective of Dr. Mariani's research is the identification of the genetic mechanisms of susceptibility to chronic lung diseases, particularly focusing upon their developmental antecedents and the influence of environmental factors. They seek to define key regulatory networks involved in lung development and maturation, and which may be perturbed in diseased states such as asthma, chronic obstructive pulmonary disease (COPD) and bronchopulmonary dysplasia (BPD). More recent studies focus upon factors contributing to severity of pathogen-driven respiratory disease. Work focuses predominantly upon defining pathways contributing to regulation of epithelial-mesenchymal interactions and expression of extracellular matrix molecules. His laboratory utilizes genetic modeling in animals, exposure-related models of chronic lung disease and studies of human samples. He is a leader in the application of genome-wide expression array methods to pulmonary biology and lung disease gene/biomarker discovery. This work is currently supported by research grants from the NIH.

Jeffrey Meyers, MD
Assistant Professor, Pediatrics

Dr. Meyers primarily examines neonatal nutrition. The independent role of early nutrition in influencing long-term health is becoming better appreciated, particularly in preterm infants. In addition, body tissue accrual in preterm infants is altered at term-equivalent age. His previous research has investigated in-hospital nutritional factors that might affect body composition in preterm infants. He demonstrated the potential influence of parenteral nutrition on body composition at discharge in preterm infants. Currently, Dr. Meyers serves as a site PI for the MILK Trial, an NRN-funded study comparing neurodevelopmental outcomes in preterm infants fed primarily donor breast milk versus formula. Future direction includes investigating other influences, such as levels of pro-inflammatory cytokines, on altered body composition in preterm infants, and possible avenues to optimize tissue accrual in these at-risk infants. Long-term metabolic consequences of altered body composition in preterm infants also warrant further study in the era of the metabolic syndrome.

Robert H. Notter, MD, PhD
Professor Emeritus, Pediatrics

Dr. Notter's research focuses on pulmonary surfactant, a complex mixture of lipids and proteins essential for normal respiration. Lung surfactant deficiency in premature infants leads to the neonatal respiratory distress syndrome (NRDS), and surfactant dysfunction/inactivation in patients of all ages is an important contributor to the pathology of clinical acute lung injury (ALI) and the acute respiratory distress syndrome (ARDS). The severe lung injury syndromes of ALI/ARDS can result from multiple direct pulmonary insults and are major causes of mortality and morbidity in the US and worldwide despite sophisticated medical intensive care. This multi-university collaborative research emphasizes basic science and translational studies to develop and test new highly-active synthetic lipid/peptide exogenous surfactants for treating NRDS and direct pulmonary forms of ALI/ARDS. Current NIH Bioengineering Research Partnership (BRP) studies in our laboratory examine the molecular bioengineering, computer analysis, synthesis, and physical chemistry of novel amphipathic peptides with structural homology to native surfactant proteins (SP), and the surface and pre-clinical pulmonary activity of these peptides combined with novel phospholipase-resistant lipids or synthetic biologic lipids in synthetic lung surfactants.

Dr. Notter’s research also examines mechanisms of surfactant dysfunction in ALI/ARDS, and considers the use of exogenous surfactants in combination with other pharmaceuticals to concurrently target multiple aspects of lung injury pathology. Prior research helped to develop clinically-effective first-generation surfactant therapy for premature infants with animal-
derived surfactant drugs, and this is now being extended using sophisticated molecular bioengineering to define and develop novel fully-synthetic lipid/peptide lung surfactants for treating NRDS and direct pulmonary ALI/ARDS.

**Michael A. O’Reilly, PhD**  
Professor, Pediatrics

The O’Reilly lab is an interactive group of senior scientists, graduate students, technicians, and summer undergraduate scholars interested in understanding how neonatal oxygen disrupts lung development and the host response to respiratory viral infections. Premature exposure to oxygen is a major risk factor for neonatal lung disease and can cause bronchopulmonary dysplasia (BPD), a chronic form of lung disease frequently seen in preterm infants with very low birth weight. While better clinical care has reduced mortality, children born prematurely remain at increased risk for reduced lung function, respiratory viral infections, pulmonary hypertension, and asthma. According to the NHLBI, the annual cost of treating infants with BPD in 2005 was $26.2 billion dollars. Hence, there is an urgent need to understand how oxygen supplementation permanently disrupts lung development and how these changes enhance susceptibility to respiratory infections. Using the mouse as a model system, we seek to define how high oxygen at birth alters growth and differentiation of progenitor cells critical for lung development and host defense against infections. We also investigate how oxygen-induced damage activates molecular pathways that control whether cells live or die, collaborating with physicians who study health outcomes and treat children born prematurely. By integrating research findings in cells, mice, and humans, we hope to ultimately identify therapeutic opportunities for improving the long-term health of children born prematurely. This work is supported by several NIH grants.

**Dale L. Phelps, MD**  
Professor, Pediatrics

Dr. Phelps focuses on retinopathy of prematurity (ROP). Her NIH funded work has completed two pilot studies on the pharmacokinetics of inositol and its safety in extremely preterm infants, supplemented from birth to reduce ROP, and provided the necessary background to support a large multicenter randomized controlled trial funded by both the National Institute of Child Health and Human Development (NICHD) and the National Eye Institute. This multicenter research, which is FDA approved and NIH funded, began enrollment this year and targets three to four years to reach full enrollment (n=1760).

**Gloria S. Pryhuber, MD**  
Professor, Pediatrics

As a clinician scientist, Dr. Pryhuber maintains a basic science laboratory and serves as communicating PI for the University of Rochester/University at Buffalo (URUB) research site for the Prematurity and Respiratory Outcomes Program (PROP, NHLBI U01). Six Pediatric Pulmonary/Neonatology centers around the country comprise PROP, which identifies biomarkers and mechanisms of chronic lung disease in premature infants. In the development and now implementation of PROP, she works very closely with the Rochester Human Immunology Center to bring advances in immunologic techniques to the study of premature newborns. Because of her training as a neonatologist and the strong infrastructure of PROP and the NICHD Neonatal Research Network, including collaborative arrangements with the Maternal Fetal Medicine, Neonatology and Pediatric Pulmonary Divisions, Dr. Pryhuber has adequate numbers of premature and full term infant patients, ensuring the timely screening, enrollment, and completion of clinical studies/trials with these populations. Her laboratory has notable experience in collecting, storing, processing, and performing quality assessment and analysis of animal and human subject samples.

She works with a number of investigators at UR and external on Identification and Validation of Molecular Markers for BPD, to investigate and validate altered gene expression in human neonatal lung samples with and without chronic lung disease. She collaborates with the Human Immunology Center, and the Divisions of Neonatology, Pediatric Infectious Diseases, Pediatric Pulmonology, and Medicine Infectious Diseases. She has collaborated with Drs. Topham, Gill, and Caserta on two NIH proposals to study CD8+ T cells in responses to viruses and vaccines with correlations to gut microbiomes and measures of immune modulators in breast milk. She continues these collaborations for the National Respiratory Pathogens Research Center (RPRC, PIs David Topham and Ann Falsey). With Dr. Caserta, she has initiated a project entitled Impact of Respiratory Virus Infections and Bacterial Microbiome Shifts on Lymphocyte and Respiratory Function in Infants Born Prematurely or Full Term. Dr. Pryhuber is highly enthusiastic to work with this multidisciplinary group of collaborators and the promise of contribution to patient-specific tailoring of treatment and prophylaxis for respiratory morbidity in infants.

**Arshad Rahman, PhD**  
Associate Professor, Pediatrics

Dr. Rahman and his group want to know how pro-inflammatory mediators such as the coagulation protease thrombin and the pro-inflammatory cytokine TNFα, released in high amounts during sepsis and other inflammatory conditions, mediate neutrophil (PMN) sequestration and emigration in the lung and thus induce lung vascular injury. They seek definition of the critical signaling pathways mediating activation of the transcription factor NF-κB, a master regulator of inflammation, in the endothelium, an important cellular target of proinflammatory mediators in perpetuating and amplifying the inflammatory responses. NF-κB
is now also implicated in the resolution phase of inflammation, tissue repair and homeostasis, and in mitochondrial respiration. These emerging new roles of NF-κB have challenged the view of therapeutic inhibition of NF-κB and have yielded the concept that dampening rather than abolishing NF-κB activation may be a safe and effective treatment strategy for ALI/ARDS and other inflammation-associated diseases. Guided by this principle, Dr. Rahman and colleague focus on uncovering the intricate signaling network in control of NF-κB activation with a view to identifying the possible therapeutic targets whose inhibition may allow for selective suppression of detrimental inflammation without compromising the host defense response, tissue repair and homeostasis – a problem associated with current treatment options to control ALI/ARDS and other inflammatory disease states.

Dr. Rahman and colleague study the regulation and function of endothelial cell (EC) autophagy and its relationship with EC inflammation in the context of ALI. Their novel and exciting findings that autophagy and inflammation are linked in the lung endothelium have prompted them to identify the mechanistic link between these two fundamental processes (autophagy and inflammation), address the relevance of this linkage in the pathogenesis of ALI, and evaluate the therapeutic potential of autophagy inhibition against evolving ALI. The lab uses genetically modified mice, primary cell cultures, and multidisciplinary approaches ranging from biochemical, cellular, and molecular biology to in vivo gene delivery and lung physiology to address these questions of fundamental importance. Dr. Rahman’s work is supported by grants from NIH.

### Julie Riccio, MD
#### Assistant Professor, Pediatrics

Dr. Riccio focuses on patent ductus arteriosus in premature neonates. Her prior work assessed the use of Ibuprofen versus indomethacin for medical treatment of PDA among level 3 NICU’s across the United States. She also studied the effect of Ibuprofen, used for closure of the PDA, on bilirubin-albumin binding.

She is now piloting a study with a subset of NRN sites, headed by Children’s Hospital of Philadelphia. This pilot reviews the incidence and natural history of vocal cord injury after PDA ligation in premature infants. Dr. Riccio also serves as a sub-investigator with a study, *Noninvasive Optical Brain Imaging of Infants Born Prematurely*, for which Lauren Emberson, PhD, and Richard Aslin, PhD, of UR’s Department of Brain and Cognitive Sciences, manage follow up activities after discharge.

### Kristin Scheible, MD
#### Assistant Professor, Pediatrics

Premature infants are highly susceptible to severe disease from respiratory viral infection, and they suffer from diseases mediated in part by dysregulation of immune cells, including BPD, PVL and NEC. The selective susceptibility to viruses and inflammation-mediated diseases suggests a defect in CD8+ T cell responses compromising their antigen recognition and immune regulation. Little is known about the nature of CD8+ T cell responses in neonates, and less is known about CD8+ T cell behavior and function in premature infants. Her research focuses on the effect of early activation of CD8+ T cells in the context of premature infants with poor thymic recovery. Employing multiplexing technology such as high-parameter cytometry to analyze human umbilical and peripheral cells, she is able to examine T cell phenotype, homeostasis and antigen-specific responses, as well as trace changes that occur over time in postnatal immune development. By combining in vitro data with clinical data, she can understand the role that T cell dysregulation may play in mediating diseases of prematurity. Her work is supported by an NIH K12 award.

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### Laurie Steiner, MD
#### Assistant Professor, Pediatrics

Red blood cells comprise one in four cells in the human body. To maintain an appropriate hematocrit, the body must produce approximately 2 million red blood cells per second. The maturation of a committed erythroid progenitor to a functional red blood cell is a complex process that involves significant changes in gene expression during a time of rapid cell division. The goal of Dr. Steiner’s research is to understand the molecular mechanisms that drive this process, in both normal and disease states. She is particularly interested in studying how chromatin modifers regulate erythropoiesis, as they are potential therapeutic targets for the treatment of hemoglobinopathies, such as sickle cell anemia and betathalassemia. By combining genomics technologies, such as chromatin immunoprecipitation coupled with high throughput sequencing, with functional assays, such as shRNA knockdown, she is able to study how chromatin modifers regulate erythroid-specific gene expression and influence erythroid maturation. Complimentary to this project, she uses similar methodologies to study the cis- and trans- acting factors that regulate modifier genes of betathalassemia, with the hope of identifying new targets for therapeutic intervention. This area of research will enhance our understanding of how ubiquitously expressed chromatin modifiers exert cell-type specific effects, as well as provide novel insights into molecular pathways important in human disease. Her work is supported by a NIH K08 award, the Cooley’s Anemia Foundation, and the American Society for Hematology (ASH).

### Timothy P. Stevens, MD, MPH
#### Associate Professor, Pediatrics

Dr. Stevens researches pulmonary outcome of premature infants, with emphasis on the neonatal antecedents that cause preterm infants to require ongoing pulmonary care in childhood. Studies include two prospective clinical research projects investigating the effect of supplemental oxygen exposure on the risk of
wheezing in later childhood. As a secondary study to the NICHD SUPPORT Trial, a randomized trial of clinical treatment of high – vs. low – targeted oxygen saturations in preterm infants < 28 weeks’ gestation, Dr. Stevens investigates the effect of differential oxygen exposure on symptomatic airway dysfunction in preterm infants. In a Rochester-based cohort, the level of early oxygen exposure and consequent oxidant stress is investigated as predictors of later symptomatic airway dysfunction in premature infants 28-32 weeks’ gestation. Dr. Stevens is also interested in the effects of air pollution on preterm birth and pulmonary symptoms in preterm infants.

Robert J. Swantz, MD
Professor, Pediatrics

Dr. Swantz' primary research interest is undergraduate medical education. He directs the 3rd year Clerkship and 4th year Sub-Internship for the Department of Pediatrics, and is actively involved with the Dean's Office in the management and evaluation of the medical school curriculum and the admission and advancement of medical students.

Jennifer L. Young, PhD
Research Assistant Professor, Pediatrics

Dr. Young investigates extracellular matrix (ECM) signaling during lung injury and repair, specifically the role of the matricellular signaling molecule CCN1/Cyr61 in lung injury. CCN1 is an ECM-associated signaling molecule that functions to promote cell adhesion, migration, survival and differentiation in vascular development. In the context of the lung, they found that CCN1 together with TNFα causes apoptosis of alveolar epithelial cells and lung fibroblasts. Because CCN1 is induced in the lungs of patients with lung diseases such as chronic obstructive pulmonary disease (COPD) and acute respiratory distress syndrome (ARDS), they hypothesize that CCN1, together with inflammatory mediators such as TNFα, causes cell death of primary lung cells in vivo, thus contributing to lung injury. The studies focus on the molecular mechanism(s) of cell death and survival of primary lung cells in response to CCN1 and TNFα using cultured cells as well as in vivo models of lung injury.

In addition to CCN1’s apoptotic function, Dr. Young’s team found that CCN1 functional knock-out mice have greatly reduced lung inflammation after LPS treatment, suggesting that CCN1, in addition to playing a role in apoptosis and cell survival, is likely to be involved in the inflammatory response as well, leading them to investigate the modulation of inflammation by CCN1 in models of acute lung injury and fibrosis in vivo. The ultimate goal is better understand the complex pathology of lung diseases to improve treatments. Research funding comes from the American Heart Association.

Scientific Presentations

Abstracts Presented at 2014 Pediatric Academic Societies’ Annual Meeting, Vancouver, BC Canada

Amin SB, Wang H. Unbound Bilirubin is a Better Predictor than Total Serum Bilirubin of Jaundice Associated Apnea in Premature Infants.


Amin SB, Vogler D, Wang H. Predischarge Auditory Neural Myelination Predicts Language Outcome at 3 Years Corrected Age in Premature Infants.


Parikh P, Alfieris G, Swartz M, Dean D. Platform Session: Neonatology: Cardiology 1

Parikh P, Alfieris G, Swartz M, Dean D. Platform Session: Neonatology: Cardiology 1

Golisano Children’s Hospital 2013 – 2014 Annual Report
Abstracts Presented at 2014 American Thoracic Society 110th International Conference, San Diego


Abstracts Presented at Other National Research Meetings


Recent Study Sections and Advisory Committee Memberships

Sanjiv B. Amin, MBBS, MD, MS
- Reviewer for NIH Loan Repayment Proposals, 2010 – 2014
- CTSI/GCRC Advisory Committee member, University of Rochester

Patricia R. Chess, MD
- Pediatric Planning Committee, American Thoracic Society; 2001 – present
- Research Grant Review Committee, American Lung Association, 2001 – present
- Chair, Research Grant Review Committee, American Lung Association, 2013, 2014
- Pediatric Research Society Grant reviewer 2009 – present
- URSM, MD with Distinction in Research Committee 2011 – present
- UR, George Eastman Circle Advisory Committee 2011 – present

Carl T. D’Angio, MD
- Member, NIAID special Emphasis Panel, Medical Countermeasures for Biodefense and emerging Infectious Diseases, 2013

David A. Dean, PhD
- Member, Nanotechnology Study Section, NIH, 2011-2015
- External advisory committee, program project grant on Pathophysiology of Alveolar Epithelial Lung Injury, Northwestern University, 2007-present
- Respiratory Tract Gene Therapy Committee member, American Society for Gene Therapy, 2010-2013

Jacob N. Finkelstein, PhD
- Ad hoc Reviewer: National Cancer Institute (NCI), National Heart, Lung, and Blood Institute (NHLBI), National Institute of Environmental Health Science (NIEHS) ONES Review Panel, National Institute of Allergy and Immunologic Diseases, James and Esther King Biomedical Research Program (State of Florida Biomedical Research Program), Tobacco Related Diseases Research Program (California)
- Member F10A Study Section
- California National Primate Research Center, Davis CA
- Advisory Committee, San Joaquin Valley Particulate Matter Research Center, Davis CA

Ronnie Guillet, MD, PhD
- Steering Committee member, Efficacy of Intravenous Levetiracetam in Neonatal Seizures, funded by FDA
- DSMC member, Preterm Epo Neuroprotection (PENUT) Trial, funded by NINDS

Ruth A. Lawrence, MD
- Advisory Committee to promote breastfeeding among clients at Early Head Start, Washington, DC;
- Pediatric Advisory Committee, FDA
- Board of Directors, New York State Coalition for Breastfeeding
- Board of Directors, Mother’s Milk Cooperative
- Breastfeeding Medicine, Editor in Chief
- ABM Annual Summit, Chair, 2009-present

William Maniscalco, MD
- Pediatric Academic Society Abstract Reviewer
- Grant Reviewer, Strong Children’s Research Center, URMC

Thomas J. Mariani, PhD
- Permanent Member, NIH/Lung Injury Repair and Remodeling Scientific Review Group, 2012-2018

Robert H. Notter, MD, PhD
- Solicited Ad Hoc Grant Reviewer for NIH and foundations

Michael A. O’Reilly, PhD
- NIH, ad hoc reviewer, LIRR

Gloria S. Pryhuber, MD
- Grant Reviewer, NIH SEP/SRG KO1, KO8, R25, RO1 Reviews (2 – 3 Study Sections per year) 2010 – present
- URMC Committee Member: Clinical Research Review Process Improvement Team (CRRPIT) 2013

Timothy P. Stevens, MD, MPH
- New York State Obstetric and Neonatal Collaborative (NYSOQC) Steering Committee Member and Data Panel Chair 2008-present
Teaching Activities

Pediatric Residents

Faculty of the Division of Neonatology teach Pediatrics and Medicine-Pediatrics residents in the Neonatal Intensive Care Unit (NICU) at Golisano Children’s Hospital (GCH) and Pediatrics and Family Medicine residents in the Special Care Nursery (SCN) at Rochester General Hospital (RGH). The division faculty teach approximately 70-75 residents during rotations in the NICU and SCN. Clinical teaching activities include Attending Rounds (5 days/week), Work Rounds (7 days/week), Health Team Rounds (1 day/week), High-Risk Perinatology Rounds (1 day/week), NICU Pathology Rounds (1 day/4 weeks), and Ethics Rounds (1 day/4 weeks). Division faculty are active in teaching on the pediatric wards and in the Neonatal Resuscitation Program for residents in Pediatrics, Medicine-Pediatrics, Emergency Medicine, and Obstetrics and Gynecology.

Neonatal-Perinatal Medicine Fellowship Program

The three-year, ACGME-accredited, Neonatal-Perinatal Medicine Fellowship fully meets the requirements of the Neonatal-Perinatal Medicine subspecialty board of the American Board of Pediatrics, and is certified for 8 fellows. The program provides intensive training in clinical care of high-risk newborns within a 13-county referral region in a 60-bed Level IV NICU (including ECMO, HFOV, and inhaled nitric oxide), a 12-bed Level II Special Care Nursery, and an 8-bed Level I nursery. Fellows acquire research experience, including study design, institutional review, study performance, analysis, presentation skills, and publication. They may choose a traditional basic science / clinical science / translational science path, or they may pursue alternate career development tracks while meeting the ABP requirements for scholarly activity. These options include degrees from the Department of Public Health Sciences, the Simon School of Business, and the Warner School of education, namely: Master of Public Health (MPH), Master of Science in Clinical Investigation (MS-CLI), Master of Science in Medical Management (MS-MM), or Master of Science in Health Professions Education (MS-HPE).

ACGME Fellows, Neonatal – Perinatal Medicine

<table>
<thead>
<tr>
<th>Jayson Lingan, MD</th>
<th>1st year</th>
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<tbody>
<tr>
<td><strong>Medical School:</strong></td>
<td>University of the Philippines, Philippines</td>
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<tr>
<td><strong>Residency:</strong></td>
<td>Geisinger Medical Center, Danville, PA</td>
</tr>
<tr>
<td><strong>Awards:</strong></td>
<td>T32 Recipient, Pediatric Research: Bench to Bedside to Curbside. 2014.</td>
</tr>
<tr>
<td><strong>Research:</strong></td>
<td>The role of oxygen in closing the mitochondrial permeability transition pore and ultimately increasing mitochondrial function and cardiac myocyte differentiation</td>
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<tr>
<td><strong>Scholarship Oversight Committee:</strong></td>
<td>Mentor: George Porter, MD, PhD</td>
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<td></td>
<td>Rita Dadiz, DO</td>
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<td>Michael O’Reilly, PhD</td>
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<td>Paul Brookes, PhD (Anesthesiology)</td>
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<td>Patricia Chess, MD (ad hoc)</td>
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</tbody>
</table>
### Christina Sollinger, MD 1st year

**Medical School:** St. George’s University, Grenada  
**Residency:** University of Medicine and Dentistry of New Jersey, Newark, NJ  
**Awards:**  
- T32 Recipient, Pediatric Research: Bench to Bedside to Curbside. 2014.  

**Research:**  
- Identify signaling pathways involved in cardiac/diaphragmatic development in CDH

**Scholarship Oversight Committee:**  
Mentor: Kate Ackerman, MD  
Rita Dadiz, DO  
Eric Small, PhD (Medicine, Aab CVRI)  
Faqian Li, BMed, PhD (Pathology)  
Patricia Chess, MD (ad hoc)

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### Sarah Volz, DO 1st year

**Medical School:** West Virginia School of Osteopathic Medicine, Lewisburg, WV  
**Residency:** Good Samaritan Hospital Medical Center, West Islip, NY

**Research:**  
- To determine the efficacy of using a CMAC visualization tool to optimize intubation skills in trainees

**Scholarship Oversight Committee:**  
Mentor: Judith Fonzi, PhD (Warner School)  
Rita Dadiz, DO  
William Varade, MD  
Patricia Chess, MD (ad hoc)

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### Pratik Parikh, MBBS 2nd year

**Medical School:** Pramukh Swami Medical College  
**Residency:** St. Peters University Hospital  

**Awards:**  
- T32 Recipient, Pediatric Research: Bench to Bedside to Curbside. 2012.  
- Samuel W. Clausen Fellowship. Strong Children’s Research Center, Department of Pediatrics, URMC. 2014.  
- Travel Award, ESPR Annual Meeting, 2014.  

**Research:**  
- Gene therapy of PDA in mouse model

**Scholarship Oversight Committee:**  
Mentor: David Dean, PhD  
Rita Dadiz, DO  
George Porter, MD, PhD  
Patricia Chess, MD (ad hoc)

**Presentations:**  

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### Srujana Rallabandi, MBBS 2nd year

**Medical School:** Osmania Medical College  
**Residency:** East Carolina University  

**Awards:**  
- Dean’s Fellow. School of Medicine and Dentistry, University of Rochester Medical Center. 2012.

**Research:**  
- Antioxidant effects of unconjugated bilirubin in neonates

**Scholarship Oversight Committee:**  
Mentor: Sanjiv Amin, MBBS  
Rita Dadiz, DO  
William Maniscalco, MD  
Mina Chung, MD (Ophthalmology)  
Patricia Chess, MD (ad hoc)
### Ahmad El Samra, MD 3rd year

**Medical School:** American University of Beirut  
**Residency:** State University of New York Upstate Medical University

#### Awards:

#### Grants:

#### Research:
- Urinary markers of renal dysfunction in the Neonate

#### Scholarship Oversight Committee:
- Mentor: Ronnie Guillet, MD, PhD  
- Marc Lande, MD, MPH  
- Rita Dadiz, DO  
- Ayesa Mian, MD  
- Patricia Chess, MD (ad hoc)

#### Presentations:

### Kunal Gupta, MBBS 3rd year

**Medical School:** Government Medical College and Hospital  
**Residency:** Post Graduate Institute of Medical Education and Research (India)

#### Awards:
- T32 Recipient, Pediatric Research: Bench to Bedside to Curbside. 2012.  
- Samuel W. Clausen Fellowship. Strong Children’s Research Center, Department of Pediatrics, University of Rochester Medical Center. 2012.

#### Research:
- Effect of lipid intake on direct hyperbilirubinemia in late preterm and term infants with gastrointestinal surgical problems

#### Scholarship Oversight Committee:
- Mentor: Sanjiv Amin, MBBS  
- Marilyn Brown, MD  
- Rita Dadiz, DO  
- Patricia Chess, MD (ad hoc)

#### Presentations:

#### Publications:
- Gupta K, Amin S. Physiology of Neonatal Jaundice, Peri-FACTS, September 1, 2012, Case #1006, 2012  
Syed Shah, MBBS 3rd year

Medical School: Punjab Medical College
Residency: Bronx-Lebanon Hospital Center

Awards:
- Travel Award, ESPR Annual Meeting, 2014.
- Travel Award, PAS Annual Meeting, 2014.

Research:
- Correlation of cord blood regulatory T cell number and function with premature birth and severity of lung disease prior to discharge

Scholarship Oversight Committee:
Mentor: Gloria Pryhuber, MD
Deborah Fowell, PhD, Microbiology and Immunology
Rita Dadiz, DO
Patricia Chess, MD (ad hoc)

Presentations:

Publications:

Basic Science Teaching in Graduate / Undergraduate Courses
In addition to clinical teaching activities, several faculty in the Division of Neonatology have secondary appointments in other departments of the University of Rochester, and participate in teaching in graduate and undergraduate courses. These faculty members include Drs. Chess, Dean, Finkelstein, Mariani, O’Reilly, Pryhuber, and Rahman, who lecture in and/or direct graduate or undergraduate courses in the Toxicology Program and in the Departments of Environmental Medicine, Biomedical Engineering, and Chemical Engineering. Division faculty also in lecture to medical students during courses in the Double Helix Curriculum.

Teaching Honors and Awards
- Rita Dadiz, DO: Third place for research abstract, International Meeting on Simulation in Healthcare, 2014
- William Maniscalco, MD: Junior Faculty Mentoring Award 2014

Major Educational Presentations and Programs

Sanjiv B. Amin, MBBS, MD, MS
- Invited Speaker, Bottle or Breast: Weight Gain, National Neonatal Conference Meeting (NEOCON), India, 2012
- Invited Speaker, Bilirubin Induced Neurotoxicity, Grand Rounds, Michigan State University, East Lansing, MI 2012
- Informal Communication Assessment: Critical Information that can help in late-identified hearing loss, 2012

Invited Speaker, AAP and NYEHDI Collaboration to Create a Physician Residency Training Curriculum, EHDI Conference, Glendale, AZ, 2013
- Bilirubin Metabolism, Neonatal Medical Knowledge Fellow Seminar Series, 2013
- Bilirubin Pathophysiology, Neonatal Medical Knowledge Fellow Seminar Series, 2013
Melissa Carman, MD

- The Use of Pulse Oximetry in Newborn Screen for Congenital Heart Disease, Pediatric Grand Rounds, Rochester General Hospital, October 2012
- Apnea and Control of Breathing, NMKB, URMC, November 2012
- Screening for Congenital Heart Disease, Perinatal Outreach Visit, FF Thompson Hospital, Canandaigua, NY, September, 2012; Geneva General Hospital, Geneva, NY, November, 2012
- Neonatal Abstinence Syndrome, Perinatal Outreach Visit, Arnot Ogden Hospital, Corning, NY, February 2013
- Neonatal Hypoglycemia, Perinatal Outreach Visit, Corning Hospital, Corning, NY, February 2013
- Multiple NRP courses at both RGH and URMC, teaching both community and resident physician providers, 2012-2013

Patricia R. Chess, MD

- Genes to Generations 3rd year medical student course, Pulmonary Development lecturer, URSMD, 2001-present
- Nursing Care of the High Risk Neonate (course 436) URSON, Follow-up of the NICU graduate, ROP, 2007-present
- Academic Core Curriculum, Ten Minute Talks, URMC, Pediatrics, 2006 – present
- Feedback and Evaluation, Pediatric and Medicine-Pediatrics Residency Competency Core, URMC, 2007 – present
- Use of iNO/ECMO/High frequency NMKB, URMC, 2007 – present
- Effect of Timing of Elective Deliveries and admission to the Neonatal Intensive Care Unit, Cayuga Medical Center, Ithaca NY, 2011
- CDH: New approaches to an old problem, URMC, December 2012
- Cyanotic Congenital Heart Disease, Unity Grand Rounds, Unity Hospital, Rochester, NY, February 2012
- Moderator, American Academy of Pediatrics Perinatal Section Mid-Atlantic Conference, Hershey, PA 2012
- Parenteral Nutrition-Induced Cholestatic Jaundice: The role of restricted IV Lipid and Omega-3 Fat Emulsion: 6 years’ experience at UR, NYS Thruway Conference, URMC, 2012
- Persistent Pulmonary Hypertension and ECMO: ‘The Times They Are A Changin’, Contemporary Management of Neonatal Pulmonary Disorders, Tempe, AZ, 2012

Rita Dadiz, DO

- Obstetric and neonatal multidisciplinary simulation-based team training, URMC, 2007-present
- Delivery room and newborn nursery simulations, URMC, 2008 – present
- In-situ NICU mock codes, URMC, 2009 – present
- Training for the unexpected, Simulation course facilitator, Center for Obstetrics and Gynecology Simulation, URMC, 2009 – present
- Neonatal Simulations, Pediatric Residents’ Skills Block, URMC, 2012
- Disclosing Adverse Events, Medical Student Workshop, URSMD, 2012
- Simulation-Based Learning: Assessing Your Learners and Program, Dean’s Teaching Fellowship Program, URSMD, 2012
- Shoulder dystocia: a safer way forward (webinar). NYS Perinatal Quality Collaborative of the New York State Department of Health and New York State Partnership for Patients of the US Department of Health and Human Services, 2013
- Coming to the table: debriefing for patient safety (webinar). NYS Perinatal Quality Collaborative of the New York State Department of Health and New York State Partnership for Patients of the US Department of Health and Human Services, 2013
- Improving interdisciplinary communication for patient safety. Advances in Clinical Perinatal Medicine, Regional Perinatal Symposium, Syracuse, 2013
- Methemoglobin and the response to iNO in PPHN. Thruway Conference, Buffalo, 2013
- Simulation-based training to improve obstetric and pediatric communication. Research Update, University of Miami Miller School of Medicine. Miami. 2013
- Team building through the use of effective communication skills. Jointly sponsored by the Public Service Center, Office of Undergraduate Biology, and Biology Service Leaders. Cornell University. 2014
- Patient counseling and education. NY State Perinatal Quality Collaborative of the NY State Department of Health, Obstetric Prenatal Education Project. 2014
- Giving Bad News. Fellowship workshop. 2014
Carl T. D’Angio, MD
- Ethics and Professional Integrity in Research (IND 501/506), Course Director, URMC, 2013 – present
- Genes to Generations (medical student course), Pulmonary Biology Lecturer, URMC Research Ethics/Integrity (IND 503), Session Facilitator, URMC, 2005 – 2012
- Statistics Lecturer, Academic Core Curriculum, URMC, Pediatrics, 2005 – present

David A. Dean, PhD
- Development of cell-specific targeting approaches for pulmonary gene therapy, Mary Babb Randolph Cancer Center, West Virginia University, Morgantown, WV, 2012
- Intracellular trafficking of DNA and its impact on gene therapy, Department of Pharmaceutical and Biomedical Sciences, University of Georgia, Athens, GA, 2012
- Electroporation-mediated gene delivery to cells and animals, Gene Transfer Technologies into Multicellular Eukaryotes, Vienna, Austria, 2013
- Molecular considerations for effective gene therapy, Student Research Day Keynote Speaker, SUNY Upstate Medical University, Syracuse, NY, 2013

Fabeha Fazal, PhD
- Actin in Action: Role in Lung Vascular Inflammation, Lung Biology Research Seminar Series, Lung Biology and Disease Program, Department of Pediatrics, URMC, 2012

Jacob N. Finkelstein, PhD
- Co-director, Advanced Pulmonary Toxicology (TOX 564)
- Lecture, core Toxicology (TOX) 521)
- Participant, PATH 509: Environmental Pathology

Ronnie Guillet, MD, PhD
- From Fetus to Newborn, McGill University Teleconference, 2012
- Visiting Professor, University of Mississippi, January 2013
  o Neonatal Seizures. University of Mississippi, Neonatology Research Conference
  o Perinatal Regionalization. University of Mississippi, Perinatal Collaborative Care Conference
  o Breaking Bad News. University of Mississippi, Pediatric Grand Rounds
- TOX 560: Therapeutic Hypothermia, 2012
- The Transition from Fetus to Newborn; McGill University 2012, Cornell University, Ithaca, NY, 2012
- Therapeutic Hypothermia, Arnot Ogden Medical Center teleconference, 2013
- Junior Faculty Academic Curriculum Director, 2012 – present

Carl Johnston, PhD
- Pulmonary Inflammation. TOX521 Core Course, one 1 lecture, URMC, 2010 – present

Nirupama Laroia, MD
- Normal and Sick Newborn, Physician Assistant Program, Rochester Institute of Technology, 2000 – Present
- Neonatal Neurology, Neonatal Nurse Practitioner Course, URSON, 1999 – Present

Ruth A. Lawrence, MD
- Annual National Broadcast for World Breastfeeding Week, School of Public Health, SUNY Albany, August 2008 -2012
- Session Moderator, International Society Research in Human Milk and Lactation, Trieste, Italy, September 2012
- Academy of Breastfeeding Medicine Founders Meeting, September 2012
- Kellogg Foundation Board Conference, September 2012
- STEPPS Program for Malpractice Relief, URMC. November 2012
- The Revolution in Infant Feeding, 3rd Wednesday CME Speaker, URMC, November, 2012
- Epidemiology of Breastfeeding, URMC, February 2013
- The Revolution in Infant Feeding, Grand Rounds, URMC, January 2013
- Women’s Health / Breastfeeding, 2nd Year Medical Students, URMC, February 2013
- Newest Information on Breastfeeding, Brooklyn Hospital, 2013
- Breastfeeding Today, Cobb & Douglas Public Health, Atlanta, GA, May 2013
William M. Maniscalco, MD
- Care of newborns <28 weeks, USAID Conference, Moscow, Russia, May 2012

Thomas J. Mariani, PhD
- Genomics of Bronchopulmonary Dysplasia, Invited Speaker, ATS International Conference, Philadelphia, PA, 2013
- Genomics of Lung Development and Bronchopulmonary Dysplasia, Invited Speaker, Brasil Basic Science Lecture, Harbor-UCLA Medical Center, 2013
- Integrating Systems-Level Analysis to Define the Molecular Bases of Respiratory Disease, Invited Speaker, Computational Biology Seminar, IBM Research, Yorktown Heights, NY, 2013
- Bioinformatics Workshop, Co-Director and Lecturer, Queen’s University, Kingston, ON, 2012
- Life and Breath, Mini-Medical School, URMC, Department of Pediatrics, 2012
- Neonatal Origins of Adult Pulmonary Disease, Session Chair, American Thoracic Society International Conference, 2012
- Lung Development: Bench to Bedside, Session Chair, American Thoracic Society International Conference, 2012
- Genomics of BPD, Invited Speaker, Department of Pediatrics, University of Alabama, Birmingham, AL, 2012
- Mechanistic insights into a COPD candidate gene, Invited Speaker, Department of Medicine, University of Alabama, Birmingham, AL, 2012
- Invited Speaker, Genetic Contributions to Lung Disease in Preterm Infants, PAS, 2014
- Session Chair, The Systems Biology of Complex and Rare Pediatric Diseases, PAS, 2014
- Invited Speaker and Conference Vice-Chair, Gordon Research Conference on Lung Development, Injury and Repair, 2013

Jeffrey Meyers, MD
- Ca/Phos/Mg Metabolism, Fellow Neonatal Medical Knowledge Base Curriculum, URMC, 2012
- Host Defense of the Neonate, Fellow Neonatal Medical Knowledge Base Curriculum, URMC, 2012
- Pulmonary Development, URSMD, 2012
- Genes to Generations 3rd year medical student course, Pulmonary Development, University of Rochester, 2012, 2014

Michael A. O’Reilly, PhD
- TOX 594: Gene Environment Interactions Course Co-Director; oversaw 13 lectures
- TOX 521: Toxicology Core Course; Course Co-Director; gave 4 lectures
- PM425: Health promotion and preventive medicine, 1 lecture

Dale L. Phelps, MD
- Retinopathy of Prematurity: Mechanism and Prevention; Web Symposium Sponsored by the American Association of Pediatric Ophthalmology and Strabismus, December 2012
- Retinopathy of Prematurity, an Update; NEO the Conference for Neonatology; Sponsored by NEDNAX Center for Research, Education and Quality; Orlando, FL, February 2013

Gloria S. Pryhuber, MD
- TOX 522 Organ Systems Toxicology: Section on Pulmonary Toxicology, 2001-present
- Each year, teach 2-3 of the following: Lung Anatomy, Physiology and Experimental Models; Acute Lung Inflammation, Epithelial Injury and Repair; Cellular Mechanisms of Lung Injury and Repair
- The Prematurity and Respiratory Outcomes Program (PROP): Objectives, Design, and Implementation; Pediatric Grand Rounds; URMC; 2012

Arshad Rahman, MD
- Session Chair, Novel Airway Epithelial Barrier and Immune Responses, American Thoracic Society International Conference, San Francisco, CA, 2012
- Blocking NF-κB: An Inflammatory Issue; Cell Biology, Neurobiology and Anatomy Graduate Program; Loyola University Medical Center; Maywood, IL, 2012
- Mechanisms of Endothelial Cell Inflammation and Acute Lung Injury. Research In Progress Seminar, Department of Microbiology and Immunology, URMC. 2014
• Mechanisms of Endothelial Cell Inflammation and Acute Lung Injury, Department of Biochemistry, Aligarh Muslim University, India. 2014

**Kristin Scheible, MD**
- Neonatal Immunity, Fellow Neonatal Medical Knowledge Base Curriculum, URMC, 2012
- PDA Ligation and Pain Control in the NICU, New Fellows Orientation, Neonatology, URMC, 2012
- Time Management in Neonatology Fellowship, New Fellows Orientation, Neonatology, URMC, 2012

**Laurie Steiner, MD**
- Unbiased Identification of Functional Barrier Insulators in Primary Human Erythroid Cells, Experimental Hematology Seminar, URMC, February 2012
- Unbiased Identification of Functional Barrier Insulators in Primary Human Erythroid Cells, Neonatology Research Seminar, URMC, October 2012
- CTCF, Cohesin, and Erythroid Development; Forbes Visiting Scholar Program, URMC, 2012

**Timothy P. Stevens, MD, MPH**
- NICU / Neonatology Web Site: a resource for resident, fellow and nursing education and clinical care. It includes a medication reference, resident guide to common neonatal care and on-call issues, as well as PowerPoint presentations on common neonatal diseases and links to extramural pediatric and neonatal resources, 2004 – present
- Perinatal Outreach Program, semiannual CME talks, FF Thompson Hospital, Canandaigua, NY, 2001 - present

**Jennifer L. Young, PhD**
- Matricellular Protein CCN1 Regulates Shedding of Endothelial 1CAM1 Toxicology Research Day, URMC, 2012

**Sanjiv B. Amin, MBBS, MD, MS**
- New York Chapter Champion, Newborn Hearing Committee, American Academy of Pediatrics
- GCRC (CTSI) Advisory Committee Member, URMC
- New Born Hearing Committee, URMC
- ROP Oversight Committee Member, URMC
- Manuscript reviewer: 8 to 10 manuscripts for peer-review journals per year

**Melissa Carmen, MD**
- Regional Perinatal Outreach Coordinator
- Finger Lakes Regional Perinatal Resuscitation Program, URMC
- Assistant Coordinator, Neonatal Resuscitation Program, URMC

**Robert J. Swantz, MD**
- Perinatal Outreach Program, yearly CME talks, Newark-Wayne Community Hospital, Newark, NY, 1995 – present
- Perinatal Outreach Program, yearly CME talks, Nicholas Noyes Memorial Hospital, Dansville, NY, 2000 – present
- Course Director PED300: Pediatric Clerkship, URSM, 2000 – present
- Course Director PEDEXT: Pediatric Sub-Internship, URSM, 2000 – Present
- Genes to Generations, lecturer on health care costs, URSM, 2000 - Present
- Effective Teaching in the Clinical Setting, lecturer in Academic Core Curriculum, URMC, 2005 - present
- Effective Teaching, workshop for second year pediatric residents, URSM, 1996 – Present

**Patricia R. Chess, MD**
- Fellowship Director, Neonatal-Perinatal Medicine Fellowship Program
- Chair of Pediatrics, Unity Hospital
- Pediatric Academic Society
- Medical Director, ECMO Program, ELSO Registry
- APS/SPR Student Research Program Steering Committee
- Graduate Medical Education Committee Member
- UR Advisory Parent Council
- UR George Eastman Circle Advisory Council

**Service Activities**

**Prenatal Diagnosis Committee**
Rita Dadiz, DO
- Medical Advisor, Neonatal Resuscitation Program, URMC
- Program Faculty, International Meeting on Simulation in Healthcare
- Program Faculty, International Meeting on Simulation in Healthcare
- Member, Clinical Education Advisory Board, Center for Experiential Learning, URMC

Carl T. D’Angio, MD
- Associate Chair, Board 5, Research Subjects Review Board, University of Rochester
- Faculty Senate Research Policy Committee, UR
- Society for Pediatric Research Fellows Research Awards Selection Committee, Clinical Team

David A. Dean, PhD
- Abstract Reviewer, American Society for Gene Therapy
- Editorial Board Member, *American Journal of Physiology: Lung Cellular and Molecular Physiology*
- Editorial Board Member, *Experimental Biology and Medicine*

Fabeha Fazal, PhD
- Reviewer, *American Journal of Physiology: Heart and Circulatory Physiology*
- Reviewer, *Journal of Biochemistry and Molecular Biology*
- Reviewer, *Frontiers in Bioscience: Molecular Biology in Clinical Practice*
- Reviewer, *Chemical Research in Toxicology*
- Reviewer, *Respiratory Research*
- Reviewer, *International Journal of Biochemistry and Cell Biology*
- Reviewer, *Experimental Cell Research*

Jacob N. Finkelstein, PhD
- Director of Faculty Development Program, Environmental Health Sciences Center, URMC
- Policy Committee, Environmental Health Sciences Center, URMC
- Steering Committee, Pulmonary Training Grant
- Steering Committee, Toxicology Training Program

Ronnie Guillet, MD, PhD
- Perinatal Morbidity and Mortality Committee, URMC
- Prenatal Diagnosis Committee, URMC

Ruth A. Lawrence, MD
- Consultant, Food and Drug Administration Advisory Council

William M. Maniscalco, MD
- Member, Pediatric Tenure and Promotion Committee, URMC

Thomas J. Mariani, PhD
- Member, ATS RCMB Nominating Committee
- Director and Lecturer, Transcriptomics and Integrative Genomics Interest Group, University of Rochester
- Editorial Board, *American Journal of Respiratory Cell and Molecular Biology*
- Editorial Board, *American Journal of Physiology, Lung Cell and Molecular Biology*
- Member, Faculty Search Committees; Microbiology and Immunology, Biostatistics and Computational Biology; URMC
- Member, ATS RCMB Executive Committee

Jeffrey Meyers, MD
- OB service Team, Committee Member, URMC
- Perinatal Mortality Conference, Committee Member, URMC

Michael A. O’Reilly, PhD
- Editorial Board, *American Journal of Physiology: Lung Cellular and Molecular Physiology*
- Editorial Board, *American Journal of Respiratory Cell and Molecular Biology*
- Board of Directors, March of Dimes Finger Lakes Chapter
Dale L. Phelps, MD
- Member, AAO/AAP/AAPOS Joint Statement on ROP Screening
- Member, DSMB for the Division of Lung Diseases Clinically Oriented Research. NIH-NHLBI
- Member, DSMC for the Maternal Fetal Medicine Network. NIH-NICHD
- Member, DSMC for the NIH-NEI PEDIG Group Trials: Multiple Trials Group in Pediatric Ophthalmology

Gloria S. Pryhuber, MD
- Director, Histology Services, Departments of Pediatrics and Environmental Services, URMC
- Abstract Referee, Pediatric Academic Society Annual Meeting
- Session Moderator, Pediatric Academic Society Annual Meeting
- Session Moderator, Eastern Society for Pediatric Research Annual Meeting

Arshad Rahman, PhD
- Editorial Board, American Journal of Physiology: Lung Cellular and Molecular Physiology

Timothy P. Stevens, MD, MPH
- New York State Regional Perinatal Center Steering Committee
- Medical Director, NICU, URMC

Robert J. Swantz, MD
- Pediatric Education Committee, URMC
- Medical Student Promotion and Review Board, URSMD

Jennifer L. Young, PhD
- Abstract/Poster Reviewer, Toxicology Research Day, URMC

Three-Year Bibliography

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Dadiz R. Update on Newborn Resuscitation, Case #980. The University of Rochester Medical Center, Peri-FACTS Education Program, University of Rochester Medical Center, Rochester, NY, 2012.


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