



## Annual Report 2008-2009

**Division of Neonatology**  
Department of Pediatrics  
William Maniscalco, M.D., Chief

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### I. GENERAL DESCRIPTION

#### Mission

The Division of Neonatology of the University of Rochester School of Medicine and Dentistry 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 at Strong; in addition, the Special Care Nursery (SCN) at Rochester General Hospital 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.

### **Primary Faculty**

**Sanjiv B. Amin, M.B.B.S., M.D.,M.S.**

Associate Professor of Pediatrics

**Kaiser Bijli, Ph.D.**

Research Assistant Professor of Pediatrics

**Soumyaroop Bhattacharya, M.Ed., M.S.**

Senior Associate of Pediatrics

**Patricia R. Chess, M.D.**

Associate Professor of Pediatrics and of Biomedical Engineering  
Chair, Department of Pediatrics, Unity Hospital  
Medical Director, ECMO Service, Golisano Children's Hospital at Strong

**Carl T. D'Angio, M.D.**

Associate Professor of Pediatrics  
Director, Pediatric Clinical Research Office  
Associate Director, SCRC

**Rita Dadiz, D.O.**

Assistant Professor of Pediatrics  
Director, Simulation-Based Emergency and Safety Training Program, Division of Neonatology

**David A. Dean, Ph.D.**

Professor of Pediatrics and of Biomedical Engineering

**Fabeha Fazal, Ph.D.**

Research Assistant Professor of Pediatrics

**Jacob N. Finkelstein, Ph.D.**

Professor of Pediatrics, of Radiation Oncology, and of Environmental Medicine  
Associate Director, Strong Children's Research Center  
Director of Research, Division of Neonatology

**Ronnie Guillet, M.D., Ph.D.**

Professor of Pediatrics  
Director, Neonatal-Perinatal Medicine Fellowship Program  
Chief, Department of Pediatrics, Highland Hospital

**Sema Hart, M.D.**

Associate Professor of Pediatrics

**Carl Johnston, Ph.D.**

Research Assistant Professor of Pediatrics

**Nirupama Laroia, M.D.**

Associate Professor of Pediatrics  
Medical Director, Special Care Nursery, and Section Chief, Neonatology, Rochester General Hospital

**Ruth A. Lawrence, M.D.**

Professor of Pediatrics and of Obstetrics and Gynecology

Director, Newborn Nursery, Golisano Children's Hospital at Strong  
 Director, Breastfeeding and Human Lactation Study Center  
 Director, Ruth A. Lawrence Finger Lakes Regional Poison and Drug Information Center

**William M. Maniscalco, M.D.**

Professor of Pediatrics  
 Chief, Division of Neonatology

**Thomas J. Mariani, Ph.D.**

Associate Professor of Pediatrics, Medicine and Environmental Medicine

**Mohamad Minhajuddin, Ph.D.**

Research Assistant Professor of Pediatrics

**Robert H. Notter, M.D., Ph.D.**

Professor of Pediatrics and of Environmental Medicine

**Michael A. O'Reilly, Ph.D.**

Associate Professor of Pediatrics and of Environmental Medicine  
 Associate Director, Neonatology Research

**Dale L. Phelps, M.D.**

Professor of Pediatrics

**Gloria S. Pryhuber, M.D.**

Associate Professor of Pediatrics and of Environmental Medicine  
 Associate Director, Neonatal-Perinatal Medicine Fellowship Program

**Arshad Rahman, Ph.D.**

Associate Professor of Pediatrics and of Environmental Medicine

**Timothy P. Stevens, M.D., M.P.H.**

Associate Professor of Pediatrics  
 Medical Director, Neonatal Intensive Care Unit, Golisano Children's Hospital at Strong

**Robert J. Swantz, M.D.**

Associate Professor of Pediatrics  
 Director, Pediatric Sub-Internship  
 Director, Pediatric Clerkship  
 Associate Medical Director, Neonatal Intensive Care Unit, Golisano Children's Hospital at Strong  
 Medical Director, Neonatal Transport Team, Golisano Children's Hospital at Strong

**Jennifer Young, Ph.D.**

Research Assistant Professor of Pediatrics

## **II. Clinical Activities**

### **Golisano Children's Hospital at Strong**

Our clinical goal is to provide outstanding care to all ill newborns in the Finger Lakes Region. The neonatal intensive care unit at Golisano Children's Hospital at Strong is a level IV facility that can treat all neonatal medical and surgical illnesses. Our 52-bed NICU has extensive technical capabilities, including ECMO, inhaled nitric oxide, and HFOV. In academic year 2008 our 10 board-certified neonatologists treated 1,136 newborns in the NICU; these patients had the full range of medical, surgical, and cardiac disorders. The average daily census in the NICU, in 2007, was 50 patients, for a total of 18,834 patient days. Of the 3,043

patients born at Strong Memorial Hospital, 863 were admitted to the NICU. An additional 248 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 2008, 97 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 Normal Newborn Nursery at Strong Memorial Hospital. Two board-certified pediatricians establish policy and procedures and care for normal newborns.

### **Rochester General Hospital, Unity Hospital, Highland Hospital**

At Rochester General Hospital, the Neonatology Division cared for 452 patients in the Level II Special Care Nursery in academic year 2008, amounting to 3,278 patient days. The average daily census was 9.0. As a community hospital, the Rochester General SCN is an important training site for Pediatric and Family Medicine residents and medical students. Members of the Neonatology Division are medical directors for the nurseries at Rochester General, Highland, and Unity hospitals, and are responsible for establishing consistent policy 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 Neonatal Continuing Care Clinic (NCCC) or in the Neonatal Tracking Program. In the NCCC, patients are evaluated by a pediatric neurologist, developmental psychologist, social worker, neonatal nurse practitioner, and neonatologist; in 2007, the NCCC conducted 277 evaluations. The NCCC 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 periodic 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 2008, 1,840 forms were returned by parents and 4,109 forms were returned by pediatricians. To date, over 26,000 patients have been followed by the tracking program.

### **NICU Quality Improvement Programs / Initiatives (2008-2009)**

- a. IVH Reduction Bundle
  1. Significantly reduced the incidence of hypothermia among ELBW infants admitted to the NICU from the Delivery Room.
  2. Studied Sodium Bicarb Use in the NICU – With Kristin Scheible created a metabolic acidosis algorithm.
  3. Introduced greater Tcom use to reduce inadvertent hypo / hypercarbia among ventilated VLBW infants.
- b. NEC Reduction Bundle
  1. Promote Breast Milk in NICU.
  2. Established 7-day / week lactation consult service and created a Multi-disciplinary Breast Milk Committee
- c. Family Satisfaction Bundle
  1. Created the Family Advisory Council Steering Committee.
  2. Reviewed Press Ganey Satisfaction Survey Tool and Data Collection Process.
- d. Patient Safety
  1. Created a Line Safety Course to educate NICU mid-level providers on early diagnosis and treatment of cardiac tamponade and sterile technique in line placement.
  2. Implemented full online order entry in the NICU.

- e. ROP Bundle
  - 1. Targeted oxygen saturation program (OWL).
- f. Developmental Care
  - 1. Sedation for non –emergent intubation.
  - 2. Expand the Perinatal Hospice Program for women and their fetuses who have been diagnosed with a lethal anomaly prior to delivery.
- g. BPD Reduction / Improved Pulmonary Care Bundle
  - 1. Expanded the collaborative Pulmonary / Neonatology discharge program.
- h. Reduced NICU LOS by:
  - 1. Collaborative Pulmonary / Neonatology discharge program to allow for more frequent discharge on pulmonary medications.
  - 2. Creation of the NICU Diagnosis Worksheet that improved documentation leading to correct DRG assignment.
- i. Central Line Associated Blood Stream Infection (CLABSI) Initiative

### **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 15 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 Golisano Children’s Hospital; 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. The Neonatology Division and the High Risk Perinatology Division jointly sponsor Perinatal Forums three times per year for our region. These forums draw nurses, physicians, lactation consultants and others for presentations and discussion of region-wide issues.

### **Outreach Teaching Assignments**

Arnot Ogden Medical Center, Elmira, NY	William Maniscalco
Corning Hospital, Corning, NY	William Maniscalco
F.F. Thompson Health System, Canandaigua, NY	Timothy Stevens
Geneva General Hospital, Geneva, NY	Nirupama Laroia
Highland Hospital, Rochester, NY	William Maniscalco
Jones Memorial Hospital, Wellsville, NY	William Maniscalco
Lakeside Memorial Hospital, Brockport, NY	Gloria Pryhuber
Nicholas Noyes Memorial Hospital, Dansville, NY	Robert Swantz
Park Ridge Hospital, Rochester, NY	Nirupama Laroia
Olean General Hospital, Olean, NY	William Maniscalco
Rochester General Hospital, Rochester, NY	Ronnie Guillet
St. James Mercy Hospital, Hornell, NY	Carl D’Angio
Schuyler Hospital, Montour Falls, NY	William Maniscalco
United Memorial Medical Center, Batavia, NY	Patricia Chess
Via Health of Wayne, Newark, NY	Robert Swantz

### **Perinatal Forum Topics (2008-2009)**

Medical decision making: The ethics of personal choice  
 Elective Delivery Before 39 Weeks  
 Does Vitamin D Make the World Go Round?  
 Caring for Women in Diverse Cultures  
 Practices Regarding Workplace Breastfeeding

### III. Research and Other Scholarly Activities

#### Research Projects by Faculty Member

##### **Sanjiv B. Amin, M.B.B.S.,M.D., M.S.**

Dr. Amin's research interests include studying the effects of jaundice and other environmental toxins on developing nervous system in neonates using auditory brainstem responses. He is funded to study the level of jaundice that leads to transient or permanent abnormal changes in auditory nervous system and later abnormal language development. He is also studying the effect of lead on a developing auditory nervous system; in addition, he is investigating the role of iron status and hormone deficiency on brain development. Dr. Amin's future interests include long-term follow-up of neonates enrolled in bilirubin study to evaluate neurological outcomes. In addition, he is interested in studying genetic polymorphism to determine why there are ethnic differences in bilirubin production and susceptibility to bilirubin-induced neurotoxicity. He has been involved in exploring a new technique using fluorescent spectrophotometry to measure free bilirubin levels, which is considered to be the best biochemical measure of predicting bilirubin-induced neurotoxicity. His other current interest is evaluating the clinical risk factors that can alter brain development. This work is supported by an NIH K23 and a National Institute of Neurological Disorders and Stroke R21

##### **Kaiser M. Bijli, Ph.D.**

Dr. Bijli's research seeks to understand how the pro-inflammatory mediators such as thrombin and tumor necrosis factor alpha (TNF $\alpha$ ) mediate the activation of NF- $\kappa$ B, an essential regulator of intercellular adhesion molecule-1 (ICAM-1) in endothelial cells. ICAM-1 is an inducible adhesive protein that serves as a counter-receptor for  $\beta_2$ -integrins (CD11/CD18) present on the surface of leukocytes. Interaction of ICAM-1 with  $\beta_2$ -integrins ensures stable adhesion of PMN to the vascular endothelium and subsequently, its migration across the endothelial barrier. PMN trafficking by this mechanism in pulmonary tissue and air spaces contributes to the development of lung vascular injury and tissue edema associated with various disease states including Acute Respiratory Distress Syndrome (ARDS). Despite the appreciation of the central role of NF- $\kappa$ B in ICAM-1 expression, precise signaling mechanisms controlling NF- $\kappa$ B activation and thereby ICAM-1 expression in endothelial cells remains largely unknown. The focus of Dr. Bijli's research is to address the mechanisms by which tyrosine kinases, particularly c-Src, Syk and Pyk2, regulate NF- $\kappa$ B activation and ICAM-1 expression in endothelial cells and to determine the contribution of ICAM-1 in the mechanism of lung PMN sequestration and PMN-dependent lung vascular injury in mice. Dr. Bijli's work is supported by participation in an NIR RO1 grant.

##### **Patricia R. Chess, M.D.**

Dr Chess's research is on lung injury and repair in the neonate, focusing on mechanical forces in the lung. Models used include murine ventilation and in vitro strain. Clinical areas of work include use of ECMO, omega-3 lipids to treat TPN-induced liver dysfunction, surfactant replacement therapy, and optimal modes of ventilation. Mechanisms of cellular signaling in response to mechanical strain and nanoparticles are being investigated, concentrating on p42/44 MAP Kinase and ROS signal transduction pathways involved in the stimulation of proliferation induced by mechanical strain in alveolar epithelial cells and related cell lines. *In vitro* studies are complemented by a ventilated murine model. Also being examined are surfactant dysfunction and the inflammatory response in aspiration and ventilator-induced lung injury, and the additional effects of oxygen on these injury models. A porcine model of acute lung injury is being used to optimize conditions of gene delivery of ENaC and Na K-ATPase subunits during acute lung injury or acute respiratory distress syndrome (ALI/ ARDS) followed by testing efficacy in treating established ALI-ARDS from surfactant depletion or sepsis. This work is funded by NYSDOH. Dr. Chess also participates in NIH RO1 and NIH R21/33 grants.

##### **Carl T. D'Angio, M.D.**

Dr. D'Angio's research focuses on immunizations in the premature infant. In the previous year, he completed work, funded by the National Institute of Allergy and Infectious Diseases, showing that extremely premature infants generated antibody levels similar to those of full-term infants following administration of mumps-measles-rubella and chickenpox vaccines. He continues to lead a multi-center project funded by the National Institute of Child Health and Human Development investigating the

responses of premature infants to the conjugate pneumococcal vaccine. During this past winter, he and investigators at four other centers [CG1] evaluated influenza vaccine in premature infants, and he has received funding from the Thrasher Research Fund for similar work in the coming influenza season. Dr. D'Angio is also involved in research into catheter-related thrombosis in newborns, prevention of catheter-related infections, and the effects of parental reading on early literacy skills in former premature infants.

#### **Rita Dadiz, D.O.**

Dr. Dadiz's main interest is to improve postgraduate medical and nursing education and patient care through simulation-based training. She is currently investigating the use of high-fidelity computerized mannequins to improve teamwork and communication between obstetric and neonatal providers during high-risk deliveries. Standardized hand-off and evaluation tools are being developed and tested for reliability and validity. The impact of simulation-based training will be evaluated in the actual delivery room environment. Her research and interests in education are supported by the Dean's Teaching Fellow Program at the University of Rochester School of Medicine and Dentistry.

Dr. Dadiz also studies the use of inhaled nitric oxide in newborns with persistent pulmonary hypertension. Last year, she participated in a multi-centered study supported by INO Therapeutics to monitor the neurodevelopmental outcomes of neonates who receive nitric oxide therapy. Currently, she is collaborating on a study investigating methemoglobin levels as a predictor of response to nitric oxide.

#### **David A. Dean, Ph.D.**

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, several 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, the laboratory is studying 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. Further, new work is aimed at understanding 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 the 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 are underway to 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 NIH RO1 and R21 grants.

#### **Fabeha Fazal, Ph.D.**

Dr. Fazal's research concerns the expression of endothelial adhesiveness, resulting in polymorphonuclear leukocytes (PMN) adhesion and sequestration, a critical event in the pathogenesis of acute lung injury. The pro-coagulant thrombin, a serine protease released during intravascular coagulation initiated by tissue injury and sepsis, is an important mediator of PMN adhesion by virtue of inducing in the endothelial cell surface the expression of intercellular adhesion molecule-1 (ICAM-1; CD54) via an NF- $\kappa$ B-dependent pathway. Interaction of ICAM-1 with its counter receptor,  $\beta_2$ -integrins (CD11/CD18), enables PMN to adhere firmly and stably to the vascular endothelium and to migrate across the endothelial barrier. PMN trafficking by this mechanism in pulmonary tissue and air spaces contributes to the development of lung vascular injury and tissue edema associated with various inflammatory disease states, including Acute Respiratory Distress Syndrome (ARDS). Despite the appreciation of the key role of ICAM-1 in the pathogenesis of acute lung injury, little is known about the mechanisms by which thrombin promotes ICAM-1 expression in endothelial cells. The focus of Dr. Fazal's research is to address the role of actin cytoskeleton in regulating thrombin-induced NF- $\kappa$ B activation and ICAM-1 in endothelial cells and to

determine the contribution of ICAM-1 in the mechanism of lung PMN sequestration and PMN-dependent lung vascular injury associated with intravascular coagulation. This work is funded by a grant from the American Lung Association.

**Jacob N. Finkelstein, Ph.D.**

Dr. Finkelstein's laboratory research emphasizes 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. Previous 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. In addition, the type II cell also 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 also 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 nanomaterials 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's work 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 Department of Defense.

**Ronnie Guillet, M.D., Ph.D.**

Dr. Guillet's primary research focus is in 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. She is directing several studies on neonatal seizures, including long-term EEG monitoring, seizure burden, long-term follow-up, evaluation of current treatment, and potential new modes of treatment. In addition, she is the overall primary investigator for long-term follow-up of children around the world who were enrolled in the CoolCap Study (head cooling with systemic hypothermia for infants with neonatal encephalopathy). Other areas of clinical research interest for Dr. Guillet include the Auditory Brainstem Evoked Response—in particular, its use as a tool to evaluate brain maturation and its relationship to hyperbilirubinemia in preterm infants. She is also involved in a study to examine the potential genetic contributions to preterm birth. This work is supported in part by grants from the NIH.

**Carl Johnston, Ph.D.**

Dr. Johnston's work seeks to understand how the postnatal lung copes with external stress. A critical biological factor playing a role in childhood pulmonary susceptibility is that a significant portion of lung development takes place 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. In addition, 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 depends heavily on mRNA analysis, microarray technology, immuno-histochemistry, and in situ hybridization. This work is supported by participation in several NIH grants.

**Nirupama Laroia, M.D.**

Dr. Laroia's research interests have focused on neonatal seizures, especially those related to stroke and hypoxic ischemic injury in the newborn. Her work has included development of 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 and long-term follow-up of infants with neonatal stroke and intraventricular hemorrhage. She will also be working on a breast milk study for preterm infants that will be funded by Prolacta Bioscience.

**Ruth A. Lawrence, M.D.**

Dr. Lawrence's focus in neonatal care has been nutrition—particularly in human milk and breastfeeding. Because she believes that human lactation has suffered from considerable neglect, she has been spending time revising her textbook, *Breastfeeding: A Guide for the Medical Profession*, now in its sixth edition (2005); her work includes researching the current literature and creating a computerized database and developing consensus. Specific research projects are also being done in collaboration with Dr. Cynthia Howard at Rochester General Hospital. The current funded study involves Vitamin D and its levels in human milk. Breastfeeding mother-infant pairs are recruited to test the impact of high-dose Vitamin D (4000 units daily) by measuring the levels of Vitamin D in the mother's milk and in her baby. The tests are also followed by densitometry.

Dr. Lawrence has also been involved in efforts to provide human milk for prematures. A product has been produced exclusively from human milk to be used to supplement the milk of a mother who is feeding a premature infant. The product was developed in consultation with Dr. Lawrence by Prolacta Bioscience, a human milk bank. The study will be funded by Prolacta. A blinded, randomized study of the supplement will test its impact on the growth of the prematures as well as the incidence of infections compared to breastfeeding prematures who are supplemented with a bovine product.

Other work based on clinical toxicology issues and prevention education is funded by Health and Human Services grants through the Health Resources and Services Administration and carried out at the Poison Center.

**William M. Maniscalco, M.D.**

Dr. Maniscalco's laboratory research is concerned with 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 angiostatic 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, Ph.D.**

The broad objectives of Dr. Mariani's laboratory are to identify the genetic mechanisms of susceptibility to chronic lung diseases, particularly focusing upon their developmental antecedents and the influence of environmental factors. Dr. Mariani's research program focuses upon defining 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). 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 NIH and FAMRI.

**Mohammad Minhajuddin, Ph.D.**

Dr. Minhajuddin's research seeks to clarify the mechanisms by which pro-inflammatory mediators such as thrombin and tumor necrosis factor alpha (TNF $\alpha$ ) regulate the activation of NF- $\kappa$ B and expression of intercellular adhesion molecule-1 (ICAM-1), an inducible endothelial adhesive protein that serves as a counter-receptor for  $\alpha_2$ -integrins (CD11/CD18) present on the surface of leukocytes. Interaction of ICAM-

I with  $\alpha_2$ -integrins enables PMN to adhere stably to the vascular endothelium and to migrate across the endothelial barrier. PMN trafficking by this mechanism in pulmonary tissue and air spaces contributes to the development of lung vascular injury and tissue edema associated with various disease states including Acute Respiratory Distress Syndrome (ARDS). While the mechanisms responsible for mediating NF- $\kappa$ B activation and ICAM-1 expression have been elucidated in some detail, precious little is known about the events responsible for suppressing these responses. The focus of Dr. Minhajuddin's research is to understand how Mammalian Target of Rapamycin (mTOR) modulates NF- $\kappa$ B activation and ICAM-1 expression in endothelial cells and to determine the consequences of altered ICAM-1 expression on lung PMN sequestration and PMN-dependent lung vascular injury and tissue edema in mice. This work is supported by participation in an NIH RO1 grant.

#### **Robert H. Notter, M.D., Ph.D.**

Dr. Notter's research focuses on the bioengineering, biophysics, activity and dysfunction of endogenous and exogenous pulmonary surfactants. Active lung surfactant is essential for normal breathing, and a major emphasis of laboratory studies is on developing optimal synthetic lipid/peptide surfactant drugs for treating the neonatal respiratory distress syndrome (NRDS), clinical acute lung injury (ALI), and acute respiratory distress syndrome (ARDS). A multidisciplinary, inter-university collaborative format of biophysical, biochemical, cell biological, physiological, and medical research is used to bioengineer and develop novel synthetic peptides and lipids having high molecular activity. Complementary physiological studies define mechanisms of surfactant activity and dysfunction, and the efficacy exogenous surfactants in animal models of NRDS and ALI/ARDS. Dr. Notter's research over the past thirty-five years helped to define and develop current clinically-effective therapy for NRDS in premature infants with animal-derived surfactants, and this is being extended in on-going studies to define new synthetic surfactants for use not only in NRDS but also in ALI/ARDS as well. Dr. Notter's research has received over three decades of consecutive Federal funding from the National Institutes of Health. Research projects of particular current emphasis are:

- Fundamental studies on the molecular bioengineering design and biophysics of novel synthetic amphipathic peptides, and their surface-active interactions with lipids;
- Studies of the activity and physiological efficacy of fully-synthetic exogenous surfactants containing amphipathic peptides combined with lipids in animal models of NRDS and ALI/ARDS;
- Synthesis and interfacial properties of novel, highly-active phospholipase-resistant phospholipid and phosphonolipid analog molecules for use in synthetic exogenous surfactants;
- Mechanisms of surfactant dysfunction and replacement in clinically-relevant animal models of inflammatory lung injury including pulmonary contusion, gastric aspiration, oxygen/chlorine-exposure, *in vivo* lavage, and pulmonary infection.

#### **Michael A. O'Reilly, Ph.D.**

Dr. O'Reilly's laboratory investigates mechanisms controlling lung epithelial cell survival and differentiation in response to oxidative stress caused by exposure to high oxygen (hyperoxia). Although hyperoxia is often used to treat patients with respiratory distress, it stimulates cell death in adults and permanently disrupts lung development in neonates. Research in the laboratory focuses on two major lines of investigation: First, to understand how hyperoxia activates the p53-dependent expression of the cell cycle inhibitor p21 and how p21 controls cell growth, survival, and inflammation; second, to understand how neonatal exposure to hyperoxia stimulates differentiation of alveolar epithelial progenitor cells and why this leads to long-term susceptibility to subsequent respiratory insults. These studies will allow the development of novel therapies for treating patients requiring oxygen, as well as provide valuable information on other conditions involving persistent oxidative stress, including inflammation, neurodegeneration, cancer, and the aging process. Research funding comes from two NIH ROs, the March of Dimes, and participation in other NIH grants.

#### **Dale L. Phelps, M.D.**

Dr. Phelps' research is on neonatal clinical trials in retinopathy of prematurity (ROP). Inositol supplementation from birth to reduce ROP is her main project, funded by both the National Institute of Child Health and Development and the National Eye Institute. In addition, on behalf of the Division of Neonatology, she participates in the ongoing follow-up of studies initiated during her five years with the National Institute of Child Health and Human Development Neonatal Research Network, funded since

2001. These studies include randomized controlled trials of early CPAP in preterm birth, two levels of target pulse oximetry, aggressive vs. conservative phototherapy, hypothermia for hypoxic encephalopathy, and several important observational studies.

#### **Gloria S. Pryhuber, M.D.**

Dr. Pryhuber's laboratory studies examine intercellular TNF- $\alpha$  signal transduction in acute and chronic lung disease. Up to 300,000 adults and infants in the United States each year suffer morbidity and mortality due to acute inflammatory lung diseases such as pneumonia, acute respiratory distress syndrome (ARDS), and respiratory distress of prematurity; many times that number suffer from chronic, fibrotic lung disease. The proinflammatory cytokine, tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), is a major pathogenic factor in both acute and chronic lung inflammation. Dr. Pryhuber's laboratory is applying advances in cellular and molecular biology to understanding how TNF- $\alpha$  and oxidant stress interact to alter pulmonary cell survival, gene expression, and function, with an ultimate goal of improving therapy for inflammatory lung disease. Cell culture and whole-animal models are utilized to determine signaling mechanisms by which members of the TNF receptor superfamily, of which TNF receptors I and II (TNFR1 and TNFR2) are representative, regulate gene expression, inflammation, and apoptosis in the lung—more specifically, in the epithelial cells of the alveolar space. One goal is to demonstrate the role of the TNF receptors in low-grade silica-induced pulmonary inflammation and fibrosis, as well as to develop the chimeric bone marrow transplant mouse model to be used to determine the importance of expression of TNF receptors on bone marrow derived versus parenchymal cells in silica-induced lung injury. Another project is to understand the importance of, and the mechanisms by which, alveolar epithelial cells, both type I and type II, react as targets of *Pneumocystis carinii*, TNF- $\alpha$ , and activated inflammatory cells, independently and collectively. In addition, collaborative work provides neonatal lung tissue to support the study of chronic lung diseases of prematurity. Dr. Pryhuber's work is funded by an NIH R01 and participation in an NIH Program Project.

#### **Arshad Rahman, Ph.D.**

Dr. Rahman and his research group want to know how pro-inflammatory mediators such as the procoagulant thrombin and tumor necrosis factor alpha (TNF $\alpha$ ) mediate polymorphonuclear leukocytes (PMN) sequestration and emigration in the lung and thus induce lung vascular injury. In particular, they are interested in defining the critical signaling pathways mediating expression of intercellular adhesion molecule (ICAM-1; CD54), an inducible endothelial adhesive protein that serves as a counter-receptor for  $\beta_2$ -integrins (CD11/CD18) present on the surface of leukocytes. Interaction of ICAM-1 with  $\beta_2$ -integrins enables PMN to adhere firmly and stably to the vascular endothelium and to migrate across the endothelial barrier. PMN binding to endothelial cells by this mechanism contributes to the development of lung vascular injury and tissue edema. Expression of ICAM-1 relies on activation of the transcription factor NF- $\kappa$ B. However, precise signaling mechanisms controlling NF- $\kappa$ B activation and thereby ICAM-1 expression in endothelial cells remains largely unknown. Thus, unveiling the signaling events responsible for NF- $\kappa$ B activation holds the potential for development of strategies to selectively block ICAM-1 expression and thereby inappropriate PMN sequestration and PMN-mediated lung vascular injury associated with inflammatory disease states including Acute Respiratory Distress Syndrome (ARDS). Dr. Rahman and colleague use multidisciplinary approaches ranging from cultured endothelial cells and *in vivo* mouse models with targeted gene deletions to molecular biology and lung physiology to pursue this concept. This work is supported by an NIH R01 grant and participation in other grants. Ongoing research focuses on:

- How mammalian target of rapamycin (mTOR) suppresses NF- $\kappa$ B activation and ICAM-1 expression in cultured endothelial cells and how these events contribute in dampening lung PMN sequestration and PMN-dependent lung vascular injury and tissue edema in mouse models of acute lung injury (ALI).
- How tyrosine kinases, particularly c-Src and Syk, mediate NF- $\kappa$ B activation and ICAM-1 expression in cultured endothelial cells and how the altered ICAM-1 expression promotes lung PMN sequestration and PMN-dependent lung vascular injury and tissue edema in mouse models of ALI.
- How changes in actin dynamics facilitate NF- $\kappa$ B activation and ICAM-1 expression in cultured endothelial cells and how the altered ICAM-1 expression influences lung PMN

sequestration and PMN-dependent lung vascular injury and tissue edema in mouse models of ALI.

**Timothy P. Stevens, M.D., M.P.H.**

Dr. Stevens's primary research interest is on pulmonary outcome of premature infants, with emphasis on the neonatal antecedents of later airway dysfunction that cause preterm infants to require ongoing pulmonary care in childhood. With funding from the National Institute of Child Health and Human Development Neonatal Research Network and a NICHD K23 Award, two prospective clinical research projects are underway 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 is investigating 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 being investigated as predictors of later symptomatic airway dysfunction in premature infants 28-32 weeks' gestation.

**Robert J. Swantz, M.D.**

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 design, implementation, management and evaluation of the medical school curriculum.

**Jennifer L. Young, Ph.D.**

Dr. Young's research focuses on understanding extracellular matrix (ECM) signaling during lung injury and repair. Specifically, the focus of the laboratory is on understanding 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 have found that CCN1 together with TNF $\alpha$  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 TNF $\alpha$  causes cell death of primary lung cells *in vivo*, thus contributing to lung injury. Dr. Young's studies focus on elucidating the molecular mechanism(s) of cell death and survival of primary lung cells in response to CCN1 and TNF $\alpha$  using cultured cells as well as *in vivo* models of lung injury.

In addition to CCN1's apoptotic function, they have found that CCN1 functional knock-out mice have greatly reduced lung inflammation after LPS treatment. This suggests that CCN1, in addition to playing a role in apoptosis and cell survival, is likely to be involved in the inflammatory response as well. Thus, they are actively investigating the modulation of inflammation by CCN1 in models of acute lung injury and fibrosis *in vivo*. The ultimate goal of these studies is to gain a better understanding of the complex pathology of lung diseases so that better treatments can be developed. Research funding comes from the American Heart Association.

**Scientific Presentations**

**Abstracts Presented at 2009 Pediatric Academic Societies' Annual Meeting, Baltimore, Maryland**

Amin SB, Miravalle N. Influence of Free Fatty Acids on Bilirubin-Albumin Binding and Unbound Bilirubin in Premature Infants, Poster

Amin SB, Miravalle N. Perinatal Clinical Factors and Bilirubin-Albumin Binding Affinity in Premature Infants. Poster

Amin SB. Effect of Phototherapy on Bilirubin-albumin Binding Affinity and Unbound Bilirubin in Preterm Infants. Poster

Amin SB, Orlando M. In Utero Iron Status and Auditory Neural Maturation in Premature Infants. Poster

Bulanowski, M, Amin, SB, D'Angio, CT. Perental Reading Behavior and Language Development in Premature Infants. Poster

Guillet, R, Burchfiel, J, Kwon, J. Neonatal Seizure Cessation: A Reliable Clinical Definition. Poster

Nirupama Laroia, Howard C, Amin SB. Hepatitis B vaccine and CRP in premature infants

Kristin M Scheible, MD, Carl T D'Angio, MD and Premature Infant Vaccine Collaborative. Immunogenicity of Trivalent Inactivated Influenza Vaccine in Extremely Low Birth Weight Infants. Platform Presentation

Scheurer-Monaghan, AM, Stevens, T, Haidar-Ahmad, Z, Lowmaster, G, Guillet, R. Delivery Room Triage of Infants of Medication Dependent Diabetic Mothers (MDDM). Poster

Stevens, T, Huyck, H, Halterman, JS, Panthagani, ID, Mylag, AM, Pryhuber, G. Circulating Markers of Oxidant Stress and Supplemental Oxygen Exposure in VLBW Infants. Poster

**Abstracts Presented at 2009 American Thoracic Society 105<sup>th</sup> International Conference, San Diego, CA**

Benson RP, Rahman I, Pryhuber G, Finkelstein JN, Chess PR. Pulmonary Epithelial Cell Proliferation Is Induced by Mechanical Ventilation In Vivo and Altered by ROS and Inflammatory Signaling Pathways. Poster Discussion

Bhattacharya, S, Basu, A, Mariani, TJ. An Expression Profiling Data Repository for Lung disease Gene Discovery. Poster

Bhattacharya, S, Kho, AT, Carey, VJ, Tantisira, KG, Gaedick, R, Srisuma, S,, Weiss, ST, Leeder, JS, Mariani, TJ. Expression Profiling Identifies Disease Biomarkers as Key Determinants of Lung Growth. Poster

Bijli, KM, Minhajuddin, M, Fazal, F, Rahman, A. Recruitment of p300 by Syk regulates ICAM-1 expression in endothelial cells via acetylation of RelA/p65. Poster Discussion

Fazal, F, Levy, K, Minhajuddin, M, Bijli, KM, Finkelstein, JN, Rahman, A. Importin  $\alpha$ 4 mediates thrombin-induced ICAM-1 expression in endothelial cells by facilitating RelA/p65 nuclear translocation. Poster Discussion

Minhajuddin, M, Fazal, F, Bijli, K, Rahman, A. Mammalian target of rapamycin: a bump in the pathway to NF- $\kappa$ B activation and ICAM-1 expression in endothelial cells. Poster Discussion

Srisuma, S, Bhattacharya, S, Mariani, TJ. SERPINE2 Deficiency Results in congenital Airspace Enlargement and Dysregulation of Emphysema-Related Genes. Poster

Yee, M, Chess, P, Wang, Z, Zhou, R, Dean, DA, Notter, R, O'Reilly, MA. Neonatal exposure to 60% oxygen permanently alters alveolar development and compliance in adult mice without altering surfactant biophysical activity. Poster

### **Abstracts Presented at Other National Research Meetings (2008-2009)**

Soumyaroop Bhattacharya, Sorachai Srisuma, Shivraj Tyagi, Dawn L. DeMeo, Steven D. Shapiro, Raphael Bueno, Edwin K. Silverman, John J. Reilly and Thomas J. Mariani. Molecular Biomarkers for Quantitative and Discrete COPD Phenotypes. Asian Pacific Society for Respiriology, Bangkok, Thailand, 2008. Invited Speaker

Alvin Kho, Soumyaroop Bhattacharya, Vincent J. Carey, Roger Gaedigk, J. Steven Leeder, Isaac S. Kohane, Kelan G. Tantisira, Scott T. Weiss, Thomas J. Mariani. Gene Expression Profiles of the Developing Human Lung Predict Fetal Age in Mice and Men. Asian Pacific Society for Respiriology,

Nodzo SR, Davidson BA, Knight Pr, Notter RH, Raghavendran K: Surfactant dysfunction in lung contusion correlates with severity of lung injury. Presented at Third Annual Academic Surgical Congress (ASC), February 13, 2008 Huntington Beach, CA, Abstract #268 (Trauma and Critical Care II: Sepsis).

Rahman A, Minhajuddin M, Fazal F, Bijli KM. Modulatory role of mammalian target of rapamycin in regulating endothelial ICAM-1 expression and lung PMN recruitment. Presented at 2009 Experimental Biology Meeting, New Orleans, LA  
Poster

Walther FJ, Hernandez-Juviel J, Gordon LM, Waring AJ, Notter RH: Critical role for the N-terminal insertion sequence of surfactant protein B analogs. American Thoracic Society National Meeting, 2008. Poster

Walther FJ, Waring AJ, Hernandez-Juviel J, Gordon LM, Jung C-L, Ruchala P, Sharma S, Wang Z, Notter RH: Super mini-B: a critical role for the N-terminal insertion sequence of surfactant protein B analogs. Society for Pediatric Research, 2009. Poster

### **Study Sections and Advisory Committee Memberships**

#### **Sanjiv B. Amin, M.B.B.S, M.D., M.S.**

Mail Reviewer for NIH, 2007

Reviewer for Private Finding Agency, 2008

#### **Patricia R. Chess, M.D.**

Pediatric Planning Committee, American Thoracic Society; abstract reviewer for annual meeting, 2001 - present

Research Grant Review Committee, American Lung Association, 2001 – present

Austrian Science Fund ad hoc reviewer, 2002-present

NYS-DOH Perinatal grant reviewer, 2006-present

#### **Carl T. D'Angio, M.D.**

Grant Review Committee, New York State Empire Clinical Research Investigator Program, 2005-2006

Ad Hoc Grant Reviewer

Canadian Institutes of Health Research, 2005

Clinical Trials Review Committee, National Institutes of Health/National Heart, Lung, and Blood Institute, 2006

Wellcome Trust, 2006

#### **David A. Dean, Ph.D.**

Co-Chair, "Lung, Respiration, and Resuscitation Study section" of the American Heart Association, 2007

Member, Gene and Drug Delivery Study section, NIH, 2007-2010

External advisory committee, program project grant on "Pathophysiology of alveolar epithelial lung injury," Northwestern University, 2007-present

Cardiovascular Gene Therapy Committee member, American Society for Gene Therapy, 2007-2010

**Jacob N. Finkelstein, Ph.D.**

Ad hoc Reviewer:

National Cancer Institute (NCI),  
 National Heart, Lung, and Blood Institute (NHLBI)  
 National Institute of Environmental Health Science (NIEHS)  
 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)

Scientific Advisory Board member

California National Primate Center Davis California  
 San Joaquin Valley Particulate Matter research Center Davis California  
 NIEHS Board of Scientific Councillors

**Ronnie Guillet, M.D., Ph.D.**

Member, National Quality Forum, Perinatal Steering Committee, 2008

Member (ad hoc), NIH Study Section, 2009

**Carl Johnston, Ph.D.**

ATS-EOH Program Committee, 2005-2007

**Ruth A. Lawrence, M.D.**

Advisory Committee to promote breastfeeding among clients at Early Head Start, Washington, D.C.;

Pediatric Advisory Committee, FDA, present

**Thomas J. Mariani, Ph.D.**

Ad Hoc Reviewer

March of Dimes, 2009

NIH/Lung Cellular and Molecular Immunobiology Scientific Review Group, 2006, 2007, 2008

NIH/Lung Injury Repair and Remodeling Scientific Review Group, 2007

**Robert H. Notter, M.D., Ph.D.**

Standing National Grant Review Committee, Ikaria/INO/Forest Advancing Newborn Medicine Fellowship Grant Program, 2001- present

Solicited Ad Hoc Grant Reviewer for NIH and foundations

**Michael A. O'Reilly, Ph.D.**

Lung Injury Repair and Remodeling Study Section, National Institutes of Health, 2004-2008

Respiratory Study Section, Veterans Administration, 2004-2008

External Advisor for EPA funded PM Center directed by Jonathan Samet, Chair of Epidemiology at Johns Hopkins Bloomberg School of Public Health, 2007

Ad hoc Reviewer

Swiss National Foundation, Switzerland, 2007

**Dale L. Phelps, M.D.**

Special Emphasis Review Panel: National Eye Institute, National Institutes of Health, 2006

Ad Hoc Reviewer

NICHD Program Project Grant Application: March 20, 2008

**Gloria S. Pryhuber, M.D.**

Reviewer for local EHSC Pilot Project Grant Program (Department of Environmental Medicine, Environmental Health Sciences Center), 2007

Ad Hoc Reviewer

Special Emphasis Panel/Scientific Review Group 2008/05 HLBP 1, Program Project, National Institutes of Health, February, 2008

Lung Cellular, Molecular, and Immunobiology Study Section, National Institutes of Health, February,

2008

**Arshad Rahman, Ph.D.**

Study Section, National Advisory Review Committee, Vascular Wall Biology 1, American Heart – Association, 2004 - 2007

Member, NIH Center for Scientific Review Special Emphasis Panel, Review Group: 2009/05 ZRG1 CVS-F (03) M, Vascular Pathophysiology, 2009

Member, NIH Center for Scientific Review Special Emphasis Panel for Challenge (RC1) grant application, Review Group: ZRG1 VH-D (58) R, 2009

Member, NIH Center for Scientific Review Special Emphasis Panel, Review Group: 2009/10 ZRG1 CVRS-G (02) M, 2009

**IV. Teaching Activities****Pediatric Residents**

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

**Neonatal-Perinatal Medicine Fellowship Program**

The three-year, ACGME accredited, Neonatology Fellowship fully meets the requirements of the Neonatal-Perinatal Medicine subspecialty board of the American Board of Pediatrics. The program provides intensive training in clinical care of high-risk newborns in a Level IIID NICU (including ECMO, HFOV, and inhaled nitric oxide), a Level II Special Care nursery, an 8-bed Level I nursery, within a 13-county referral region. Fellows acquire active clinical and/or laboratory-based research experience, including study design, institutional review, study performance, analysis, presentation, and publication. Several alternative career development tracks are available, including the traditional Basic Science/Clinical Science Concentration, a Clinical Evaluation Sciences Concentration, including courses within the Master of Public Health Program: two Combined Programs, a Master of Public Health-Clinical Investigation track, and a Master of Science in Business Administration-Medical Management (MSBA-MM) track. Additional commitment may be required if a Combined Program is elected.

**Neonatal-Perinatal Medicine Fellows (2008-2009)**

Margaret Bulanowski, M.D. (third year completed 6/30/08)  
Medical School: Medical University, Warsaw, Poland  
Residency Program: St. Barnabas, Bronx, New York

Julie Riccio, M.D. (second year completed 6/30/08)  
Medical School: State University of New York Upstate Medical University  
Residency Program: State University of New York, Upstate Medical University, Syracuse, New York

Kristin Scheible, M.D. (second year completed 6/30/08)  
Medical School: University of Rochester School of Medicine and Dentistry, Rochester, New York  
Residency Program: Golisano Children's Hospital at Strong, University of Rochester, Rochester, New York

Andrea Scheurer, M.D. (second year completed 6/30/08)  
 Medical School: Wayne State University, Detroit, Michigan  
 Residency Program: Wayne State University/Children's Hospital of Michigan, Detroit, Michigan

Susana Arriagada, M.C. (first year completed 10/06/09)  
 Medical School: University of Chile  
 Residency Program: University of Chile, Santiago

Mazen Mayrouz, M.B.Ch.S., M.S. (first year completed 01/01/10)  
 Medical School: Alexandria University  
 Residency Program: Alexandria University Hospital, Egypt

### **Basic Science Teaching in Graduate/Undergraduate Courses**

In addition to the clinical-related 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, Notter, 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 participate in lecturing to medical students during courses in the Double Helix Curriculum.

### **Education and Training of Basic Science Undergraduate and Graduate Students**

Division of Neonatology faculty perform teaching activities relating to the training of non-medical graduate students and postdoctoral fellows, in addition to medical residents and clinical fellows. Graduate students and basic science postdoctoral fellows currently in the Division or completing their studies in the past year are:

#### **Current Graduate Students and Mentors in Laboratories**

Melissa Badding  
 Program: Toxicology  
 Thesis Advisor: David Dean

Randi (Potter) Benson  
 Program: Toxicology, Ph.D.  
 Mentor(s): Patricia Chess, Primary Advisor; Jacob Finkelstein, Co-Advisor

Robert Chang  
 Program: Chemical Engineering, Ph.D. (received December 2006)  
 Mentor: Robert Notter, Thesis Advisor

James DeGiulio  
 Integrated Graduate Program, Ph.D., Northwestern University (received December 2007)  
 Thesis Advisor: David Dean

Sean Gehen  
 Program: Toxicology, Ph.D.  
 Mentor(s): Michael O'Reilly, Thesis Advisor

Jennifer Gewandter  
 Program: Biochemistry and Biophysics, Ph.D.  
 Mentor(s): Michael O'Reilly, Thesis Advisor

Casey Manning  
 Program Toxicology  
 Mentor: Jacob Finkelstein, Thesis Advisor

Aaron Miller  
 Medical Scientist Training Program, Integrated Graduate program, Northwestern University  
 Thesis Advisor: David Dean

Erik Rushton  
 Program: Toxicology, Ph.D.  
 Mentor(s): Jacob Finkelstein, Thesis Advisor

Sara Saperstein  
 Program: Toxicology, Ph.D.  
 Mentor(s): Jacob Finkelstein, Thesis Advisor; Gloria Pryhuber, Co-Advisor

Chia (Ta) Thach  
 Program: Toxicology  
 Mentor: Jacob Finkelstein

Erin Vaughn  
 Integrated Graduate Program, Northwestern University  
 Thesis Advisor: David Dean

Peter Vitiello  
 Program: Toxicology, Ph.D.  
 Mentor: Michael O'Reilly, Thesis Advisor

YuChieh (Melissa) Wu  
 Program: Biomedical Genetics, Ph.D.  
 Mentor: Michael O'Reilly, Thesis Advisor

#### **Faculty on Graduate Student Thesis Committees**

**Patricia Chess**  
 Robert Chang, Chemical Engineering, Ph.D. (received December 2006)

**David Dean**  
 Kelly Kopp, Ph.D. 2003 – present student in IGP, Cell Biology, Northwestern University  
 Chris Heier, Ph.D. 2005 – present student in IGP, Molecular Biology and Genetics, Northwestern University  
 Ted Thurn, Ph.D. 2005 – present student in IGP Cancer Biology, Northwestern University  
 Eric Brown, Ph.D. 2006 – present student in Cell Biology, Northwestern University  
 Ling Yiu, Ph.D. 2007 – present student in Chemical and Biomolecular Engineering, Georgia Institute of Technology

**Jacob Finkelstein**  
 David Adenuga, Ph.D. student in Toxicology  
 Sam Caito, Ph.D. student in Toxicology  
 Xianglu Han, Ph.D. student in Toxicology  
 Jamie O'Brien, Ph.D. student in Toxicology  
 Nelissa Perez Nazario student in Immunology  
 Mike Morovan Ph.D. student in Neurobiology and Anatomy  
 Elizabeth Mary Vancza, Ph.D. student in Toxicology NYU

**Michael O'Reilly**

Patrick Brandt, Ph.D. student in Biochemistry, 2004 - 2007  
 Samantha England, Ph.D. student in Biomedical Genetics, 2006 - present  
 Grace Vangelson, Ph.D. student in Neuroscience 2006 - present  
 Zhengyu Yin, Ph.D. student in Toxicology, 2006 – present  
 Zhiyong Mao, Ph.D. student in Biology, 2005 - present

**Gloria Pryhuber**

Sara Saperstein, Ph.D. student in Toxicology, 2004 - present  
 Moyinoluwa (David) Adenuga, Ph.D. student in Toxicology, 2006 - present  
 Helen Ngai Ph.D. student in Microbiology and Immunology, Final Exam Committee Chair, 2008

**Arshad Rahman**

Jeremy Bechelli, M.S. student in Microbiology, 2007-2008  
 Sean Gehen, Ph.D. student in Environmental Medicine, 2004 – 2007  
 Jennifer Head, Ph.D. student in Environmental Medicine, 2008-present  
 Jennifer Gewandter Ph.D. student in Biochemistry, 2008 - present  
 Randi Potter, Ph.D. student in Environmental Medicine, 2004 - present  
 Yu-Chieh Wu, Ph.D. student in Biomedical Genetics, 2007 – present

**Teaching Honors and Awards (2006-2009)****Rita Dadiz, D.O.**

Dean's Teaching Fellow, University of Rochester School of Medicine and Dentistry, 2008-2010  
 Ruth A. Lawrence Academic Faculty Service Award in Training, Department of Pediatrics, 2009

**Jacob N. Finkelstein, Ph.D.**

Health Leadership Award, March of Dimes, 2006

**Ronnie Guillet, M.D., Ph.D.**

Ruth A. Lawrence Academic Faculty Service Award in Training, 2007

**Ruth A. Lawrence, M.D.**

Athena Award, Women's Council Rochester, 2008.  
 Community Champion, Perinatal Network of Monroe County, 2006  
 Health Leadership Award, March of Dimes, 2006  
 Horace Mann Medal, Antioch College, 2007  
 Lifetime Achievement Award (1st), Academy of Breastfeeding Medicine, 2006

**Michael A. O'Reilly, Ph.D.**

Dean's Incentive Award, University of Rochester Research, 2005, 2006, 2007

**Timothy P. Stevens, M.D., M.P.H.**

University of Rochester Medical Center Board Excellence Award, 2008

**Major Educational Presentations and Programs (2007-2009)****Sanjiv B. Amin, M.B.B.S., M.D., M.S.**

Invited lecturer, Medical Knowledge Core Curriculum Conference for Neonatology fellows, University of Rochester, 2005-2008  
 Invited lecturer, Pathophysiology Core Conferences for second-year medical students, University of Rochester, 2006-2007  
 Invited lecturer, Dental Ground Rounds. University of Rochester 2008

Invited lecturer, Auditory Research Seminar, University of Rochester, 2008  
 Cardio-respiratory monitoring and apnea in premature infants, Neonatal Fellows Conference, University of Rochester, 2007

**Patricia R. Chess, M.D.**

Genes to Generations 3rd year medical student course. Pulmonary Development lecturer U of R School of Medicine and Dentistry, 2001-present  
 Research Ethics/ Integrity (IND 503) session facilitator, 2007  
 Nursing Care of the High risk neonate course 436 UofR School of Nursing Follow-up of the NICU graduate. ROP 2007-present  
 Pediatric Fellows' Core Curriculum, Ten minute Presentations. 2006- present  
 Necrotizing Enterocolitis, Not gone, and certainly not forgotten. Harriet Davis Teaching Day, 2007  
 Feedback and Evaluation. Pediatric and Medicine-Pediatrics Residency Competency Core, University of Rochester, 2007-present  
 The use of Omegaven to ameliorate HAL-induced cholestatic jaundice, Townsend Conference, 2007  
 Smoking cessation in the NICU, FLR Perinatal Forum, 2008, Townsend Day, 2008  
 Improved Perinatal Outcomes through Reduction of Elective Deliveries Prior to 39 weeks of Gestation. NYS Perinatal QI Award Presentation, 2008 NYSPA Conference- workshop leader, MOD, 2008  
 Cultural Diversity in Perinatal Care, FLR Perinatal Forum, 2008.  
 Assessment of the Cyanotic Newborn, FBP care providers, 2008  
 Congenital Diaphragmatic Hernia: Past, Present, and Future, Grand Rounds UofR 2009.  
 Anemia in the Fetus and Newborn. Grand Rounds, Unity Hospital, 2009  
 High frequency ventilation, Syracuse University RT program, 2009

**Rita Dadiz, DO**

Introducing Mock Codes and Simulation to the NICU, Fellows' Conference, URM, 2007  
 Obstetric and neonatal multidisciplinary simulation-based team training. URM, 2007-present.  
 Neonatal cases. Pediatric Noon Conference, URM, 2008.  
 Resuscitation of the newborn infant: A new look. Townsend Teaching Day, Rochester General Hospital, 2008.  
 Delivery room and newborn nursery simulations. URM, 2008-present.  
 Mega Obstetrical Emergency Simulation. Workshops at District II/NY Annual Meeting, American College of Obstetrics and Gynecology, New York City, 2008.  
 In-situ NICU mock codes. URM, 2009-present.  
 Training for the unexpected. Simulation course facilitator, Center for Obstetrics and Gynecology Simulation, URM, 2009-present.  
 Calcium, phosphorus and magnesium. Fellow Neonatal Medical Knowledge Base Curriculum, URM, 2009.  
 Primary care of the NICU graduate. Pediatric Noon Conference, URM, 2009.

**Carl T. D'Angio, M.D.**

Genes to Generations. Medical student course, University of Rochester School of Medicine and Dentistry, 2001-2006  
 Pulmonary Biology lecturer, University of Rochester School of Medicine and Dentistry, 2001-2006  
 Research Ethics/Integrity (IND 503) session facilitator, University of Rochester School of Medicine and Dentistry, 2005 - present  
 Statistics lecturer, Pediatric fellows core lecture series, University of Rochester School of Medicine and Dentistry, 2005 - present

**David Dean, Ph.D.**

Abstract Reviewer, Molecular conjugates, American Society and outs of DNA trafficking, 2007, for Gene Therapy Annual Meeting, 2008  
 Mechanism of Cytoplasmic and Nuclear DNA trafficking, University of Pittsburgh, Department of Pharmaceutical Sciences, School of Pharmacy, 2007  
 Effects of cyclic stretch on the intracellular trafficking of plasmids in cells and animals, University of Rochester, Department of Biomedical Engineering, 2007

Pulmonary gene therapy: the ins and outs of DNA trafficking,,University of Rochester, Lung Biology Seminar Series, 2007

Cytoplasmic and intranuclear trafficking of plasmids Stanford University, Department of Pediatrics, Frontiers In Gene Therapy Lecture Series, 2008

**Fabeha Fazal, Ph.D.**

Evidence for Actin Cytoskeleton-Dependent and -Independent Pathways for RelA/p65 Nuclear Translocation in Endothelial Cells. 11th Annual Scientific Symposium, James P. Wilmot Cancer Center, University of Rochester, 2006

Essential role of cofilin-1 and mDia-1 in regulating thrombin-induced actin dynamics and RelA/p65 nuclear translocation in endothelial cells. 12<sup>th</sup> Annual Genetics Day, University of Rochester, 2008

RhoA/ROCK/Cofilin/Actin pathway in controlling thrombin-induced RelA/p65 nuclear translocation and ICAM-1 expression in endothelial Cells. 12th Annual Scientific Symposium, James P. Wilmot Cancer Center, University of Rochester, 2007

**Jacob N. Finkelstein, Ph.D.**

Co-director, Advanced Pulmonary Toxicology (TOX 564)

Discussion facilitator and participant, Overcoming Obstacles to Effective Research Design in Nanotoxicology. Cambridge, Massachusetts, 2006

Invited Speaker

Development of Deployable Toxicity Sensors. U.S. Army Corps of Engineers workshop, 2006

Health Hazards of Particulate Matter/Nanomaterials. TRAC 2007 Toxicology and Risk Assessment conference, Cincinnati, Ohio, 2007

Lecturer, Core Toxicology (TOX 521)

**Ronnie Guillet, M.D., Ph.D.**

Breaking Bad News. Pediatric Noon Conference, University of Rochester School of Medicine and Dentistry, 2007

Neonatal Seizures: Current NICU Practice. National Institute of Neurological Disorders and Stroke Workshop on Improving Treatment for Neonatal Seizures, Bethesda, Maryland, 2007

Phenobarbital for Neonatal Seizures: Too Much of a Good Thing? Pediatric Grand Rounds, Charlottesville, Virginia, 2007

Phenobarbital for Neonatal Seizures: Too Much of a Good Thing? Pediatric Grand Rounds, University of Rochester School of Medicine and Dentistry, 2007

Phenobarbital Prophylaxis after Resolution of Neonatal Seizures—Assessment of Current Practice. Neonatology Grand Rounds, Pittsburgh, 2007

What Is “Bad News” and How Do You Communicate It? Pediatric Noon Conference, Charlottesville, Virginia, 2007

Neonatal Seizures: What’s Old, What’s New Nemaocolin Conference Nemaocolin, 2008

**Carl Johnston, Ph.D.**

Critical time points in postnatal lung development. Neonatology Clinical Research Seminar Series, Buffalo Children’s Hospital, 2006

Critical time points in postnatal lung development. Neonatology Clinical Research Seminar Series, University of Rochester Medical Center, 2006

**Nirupama Laroia, M.D.**

Changes in Neonatal Resuscitation .Obstetrics & Gynecology Grand Rounds. Rochester General Hospital., 2006

Hypoxia-Ischemia in the Newborn, 2007

Intraventricular Hemorrhage and Post Hemorrhagic Hydrocephalus. Current Knowledge for 2007. Neonatal Nurse Practitioner course #436. Neonatal neurology, 2006-2007

Perinatal Medicine: Pre-Eclampsia—An Update. Neonatal Outcomes Following Pre-Eclampsia, Invited speaker. 12<sup>th</sup> Annual Rochester Conference, 2007

Newborn Health. Lectures in Rochester Institute of Technology Physician Assistant Program, 2006-2007

Thermoneutral Regulation and the Effect of Physical Environment on the Premature Infant. Faculty

moderator, Neonatology Medical Knowledge Curriculum for Neonatology Fellows, 2006-2007

**Ruth A. Lawrence, M.D.**

Training pharmacists, nurses, residents and fellows in the Poison Center Developing program in toxicology and drug information with the Wegmans School of Pharmacy at St John Fisher College, 2008

Academy of Breastfeeding Medicine (ABM) Protocols. Vermont Lactation Consultant Association Meeting, Burlington, Vermont, 2008

Breastfeeding Goals 2020. Healthy People 2020. New York City, New York, 2008.

Galactogogues: Products, Process, and Problems. La Leche League International: 35<sup>th</sup> Annual Seminar for Physicians on Breastfeeding: Breastfeeding: A Global Priority, Chicago, Illinois, 2007

Human Milk and Drugs & Toxins. Neonatal Pharmacology: Neonatal Nutrition, Boston, Massachusetts, 2008

Hyperbilirubinemia. Columbia University, New York City, New York, 2008

Hyperbilirubinemia: The Good News and the Bad News. Vermont Lactation Consultant Association Meeting, Burlington, Vermont, 2008

Is it safe to prescribe...? Pharmacology and Breastfeeding. Association of Women's Health, Obstetrics and Neonatal Nurse: 58<sup>th</sup> Annual Meeting, 2008

The Issues of Vitamin D. Vermont Lactation Consultant Association Meeting Burlington, Vermont, 2008

Keynote Address. Young Women of Distinction Award, Rochester, New York, 2008

Lactation and Breastfeeding. Annual course for second-year medical students, University of Rochester Medical Center, 2007

LLLI Lecture: Management of Breastfeeding. La Leche League International: 35<sup>th</sup> Annual Seminar for Physicians on Breastfeeding: Breastfeeding: A Global Priority, Chicago, Illinois, 2007

Maternal Depression and Lactation. Breastfeeding Grand Rounds: School of Public Health University at Albany, Rensselaer, New York, 2007

MRSA and Other Problem Infections. Vermont Lactation Consultant Association Meeting, Burlington, Vermont, 2008

Poison Hazards and Prevention. Lecture and presentation to managers: Wegman's Headquarters, Rochester, NY, 2007

Standing on the Shoulders of Giants: First Lifetime Achievement Award Response and Introduction of the Second Annual Founders' Lecture. Academy of Breastfeeding Medicine: 12<sup>th</sup> Annual International Meeting: Frontiers in Breastfeeding Medicine, Fort Worth, Texas, 2007

When is it Necessary to Supplement the Breastfeeding Infant?. La Leche League International: 3<sup>rd</sup> International Breastfeeding Symposium, Bilbao, Spain, 2007

The "Whys and Hows" of Breastfeeding Promotion in Hospitals. New York City Department of Health and Mental Hygiene: Raising the Bar on Breastfeeding Promotion: Achieving Breastfeeding as a Norm in NYC. New York City, New York, 2008

Lecture at Atlantic City, NJ, Statement at Healthy People, 2008

Lecture at Boston, MA, 2020 Hearings, 2008

Babies Were Born to Breastfeed: The Compelling Evidence. Pediatric Grand Rounds, University of Florida College of Medicine, Gainesville, Florida, 2007

The Baby-Friendly Hospital Initiative: Yesterday, Today and Tomorrow, National Satellite Broadcast, School of Public Health/N.Y. State Department of Health. SUNY Albany, Albany, New York, 2006

Breastfeeding Problems and Solutions. Obstetrics and Pediatric Grand Rounds, Boonshoft School of Medicine, Wright State University, Dayton, Ohio, 2007

Do Breastfed Infants Need Supplements? Elizabeth R. McAnarney Lecture, Academy of Medicine/Pediatric Society, Rochester, New York, 2006

Epidemiology of Breastfeeding. Nutritional Epidemiology course for graduate students, University of Rochester Medical Center, 2007

Galactogogues and Breastfeeding; Current Controversies in Breastfeeding; Ask the Experts.

Presentations at the International Conference on the Theory and Practice of Human Lactation Research and Breastfeeding Management, Orlando, 2007

Meeting the Challenges for Women. Regional Perinatal, Monroe County annual meeting, 2007

The Role of Breastfeeding in the Prevention of Obesity. New York State Childhood Obesity Prevention Summit, NYS Childhood Obesity Conference, Desmond Hotel and Conference Center, Albany, New York, 2006

What the Research Tells Us: Contraindications to Breastfeeding. Expert Work Group on Breastfeeding,

Early Head Start National Resource Center, Arlington, Virginia, 2007  
 Winning a Victory for Humanity. The Horace Mann Award. Antioch College Alumni Association  
 Reunion, Antioch, Ohio, 2007

**William M. Maniscalco, M.D.**

Mechanisms of Lung Injury in BPD. 69th Perinatal and Developmental Medicine symposium, Marco  
 Island, Florida, 2006  
 Pathogenic Mechanisms in BPD. Neonatology Fellows Lecture Series, 2007  
 James Kendig Memorial Lecture Introduction, Townsend Teaching Day, 2009  
 Regulation of Lung Microvascular Development in BPD. NIH Collaborative Program in BPD annual  
 meeting, Bethesda, Maryland, 2006  
 Use of Antenatal Steroids for Lung Maturation: Ethics and Efficacy. 69th Perinatal and Developmental  
 Medicine symposium, Marco Island, Florida, 2006

**Thomas J. Mariani, Ph.D.**

University of Rochester Tox 521 (2 lectures), 2009  
 Visiting Faculty and Speaker, Annual Retreat of the University of Giessen Lung Center, Geisen, Germany  
 2009  
 Invited Chair and Speaker, Biochemical Basis of Respiratory Disease, Biochemical Society, Charnwood,  
 United Kingdom | 2009  
 Co-Chair, Postgraduate Course, Systems Biology of Lung Disease, American Thoracic Society  
 International Conference, San Diego, CA, 2009  
 Co-Chair, Mini-Symposium, NOVEL MOUSE MODELS OF DEVELOPMENT AND DISEASE FOR  
 2009 American Thoracic Society International Conference, San Diego, CA, 2009  
 Facilitator, Thematic Poster Session, PULMONARY FIBROSIS: THE FIBROBLAST, American Thoracic  
 Society International Conference, San Diego, CA, 2009  
 Co-Chair, Scientific Symposium, TARGETING PROTEASES IN PULMONARY INFLAMMATION  
 AND REMODELING: NEW INSIGHTS INTO DISEASE PATHOPHYSIOLOGY, American  
 Thoracic Society International Conference, San Diego, CA, 2009  
 Invited Speaker, Targeting PPARs to Modulate Disease, Scientific Symposium, EMERGING  
 THERAPEUTIC TARGETS IN LUNG DISEASE, American Thoracic Society International  
 Conference, San Diego, CA, 2009  
 Channing Laboratory Pulmonary Fellow Research Topics, Brigham and Women's Hospital/Harvard  
 Medical School (1 lecture), 2008  
 Instructor, Postgraduate Course, LUNG DEVELOPMENT AND STEM CELLS, American Thoracic  
 Society International Conference, Toronto, Ontario, Canada, 2008  
 Pulmonary Division Fellowship Research Seminar Series, Director, 2007 - 2008  
 Human Genetics MERIT CME Course, Harvard Medical School (1 lecture), 2005 - 2008  
 Scholars in Clinical Science, Harvard Medical School, (1 lecture), 2003 - 2008  
 Core Competencies, Molecular and Integrative Physiology Program, Harvard School of Public Health, (1  
 lecture), 2002 - 2008  
 Techniques in Molecular Biology, Brigham and Women's Hospital/Harvard Medical School, (1  
 lecture+lab), 2002 - 2007  
 Lecturer, Lung Biology and Disease Program, University of Rochester, 2009  
 Lecturer, Neonatology Clinical Research Meeting, University of Rochester, 2008  
 Lecturer, Tufts University Medical Center, 2008  
 Invited Speaker - PPARg in Lung Maturation and Maintenance, Emory University | 2007  
 Invited Speaker - PPARg in Lung Maturation and Maintenance, University of Colorado Health Sciences  
 Center | 2007  
 Invited Speaker - PPARg in Lung Maturation and Maintenance, University of Rochester School of Invited  
 Medicine | 2007  
 Speaker - The Role of FGF Signaling in Lung Maturation, Cincinnati Children's Hospital Research  
 Foundation | 2007  
 Invited Speaker and Session Chair, Environmental and Hereditary Factors in Lung Pathobiology,  
 Experimental Biology, Washington, DC | 2007  
 Functional Genomics of Lung Development and Disease Susceptibility, Albany Medical

College | 2006  
 Invited Speaker - Functional Genomics of Lung Development and Disease Susceptibility, University of Pittsburgh School of Public Health | 2006  
 Invited Speaker - Postnatal Lung Maturation, University of Pittsburgh School of Medicine | 2006  
 Invited Speaker and Session Chair, Genomics and Proteomics of Environmental Lung Disease, Physiological Genomics and Proteomics of Lung Disease, Fort Lauderdale, FL | 2006  
 Mini-Symposium Chair, Uncovering Disease Mechanisms, American Thoracic Society International Conference, San Diego, CA | 2006  
 Symposium Chair and Invited Speaker, Molecular Basis of Lung Morphogenesis, American Thoracic Society International Conference, San Diego, CA | 2006  
 Invited Speaker, Mechanistic Insights, 5th International Multidisciplinary Conference on COPD (COPD5), Birmingham, United Kingdom | 2006

**Michael A. O'Reilly, Ph.D.**

Courses, 2005-2006

IND 410 Biochemistry core course (3 lectures)  
 PTH 507 Cancer Biology (1 lecture)  
 TOX 521 Toxicology core course (9 lectures)  
 TOX 522 Toxicology core course (1 lecture)  
 TOX 564 Pulmonary Toxicology elective (13 lectures)

Courses, 2006-2007

PTH 507 Cancer Biology (1 lecture)  
 TOX 521 Toxicology core course (5 lectures)

Courses, 2007-2008

Tox 564 Pulmonary Toxicology Elective (15 lectures)  
 Tox 521 Toxicology Core Course (4 lectures)  
 PTH 507 Cancer Biology (1 lecture)  
 Ethics 501 Ethics Core Course (5 lectures)

Buying Time to Survive Oxidative Stress: New Functions for the Cell Cycle Inhibitor p21. The University of South Alabama, 2007

Using Mice to Explain Why BPD Graduates Are Susceptible to Viral Infection. Columbus Children's Hospital, Columbus, Ohio, 2007

Identification of a label-retaining population of Type II epithelial progenitor cells during alveolar repair in the session Novel concepts in stem cells: lung derived stem cells and alternative mechanisms of action". Topic Symposium Speaker, American Thoracic Society Meeting, 2007

Buying time to survive oxidative stress: New functions for the cell cycle inhibitor p21 St. Louis University, St. Louis, MO, 2007

Effect of neonatal hyperoxia on alveolar development and susceptibility to influenza A virus infection. Tufts Medical Center, Department of Pediatrics, Boston MA, 2007

**Dale L. Phelps, M.D.**

Effect of Clinical Trials and Recent Research on the Practical and Medical Management of ROP. National Israel Neonatology annual meeting, the Dead Sea, Israel, 2006

Incidence, History and Pathophysiology of ROP. National Israel Neonatology Association annual meeting, the Dead Sea, Israel, 2006

Managing ROP in Your NICU, Miami Neonatology 2007, 31<sup>st</sup> Annual International conference, Miami Beach, Florida., 2007

Retinopathy of Prematurity—an Update. The Landsman Special Lecture, Soroka Medical Center, Beer-Sheva, Israel, 2006

Retinopathy of Prematurity, NeoPrep CME Course, August 19-25, Atlanta, Georgia, 2007

ROP: A Review of Recent Developments, Hot Topics in Neonatology, Washington DC, 2007

ROP: The Oxygen Story, Miami Neonatology, Annual International Conference, Miami Beach, Florida, 2007

ROP: The Practical and the Inevitable. Ramban Hospital-Myers's Children's Hospital, Haifa, Israel, 2006  
 Science, Evidence and Practice. Improving Quality and Ensuring Safety. Retinopathy of Prematurity.

American Academy of Pediatrics national conference and exhibition, Atlanta, Georgia, 2006

State of the Art in ROP. Kaplan Hospital, Rehovot, Israel, 2006  
 The Neonate with ROP--Prevention and Care, NEO The Conference for Neonatology, Lake Buena Vista, Florida, 2008

**Gloria S. Pryhuber, M.D.**

Histopathology of Neonatal Lung Disease. Prematurity Basic Science Teaching Day, University of Rochester Medical Center, four sessions per year, 2002-2006  
 Perspectives on Neonatal Chronic Lung Disease. Invited speaker. Children's Hospital at Buffalo, University of Buffalo, 2006  
 Poster Design: Presenting Your Hard Work. Pediatric Fellows Academic Core Curriculum, University of Rochester Medical Center, 2006-2008  
 Skeletal Dysplasias, NPM Fellow Neonatal Knowledge Base Curriculum, URM, 2007  
 Respiratory Anatomy and Physiology I, NPM Fellow Neonatal Knowledge Base Curriculum, URM, 2008

**Arshad Rahman, M.D.**

Courses, 2007-2009  
 TOX 564 Pulmonary Toxicology elective (14 lectures)  
 Courses, 2007-2008  
 TOX 564 Pulmonary Toxicology elective (15 lectures)  
 TOX 521 Toxicology core course (1 lecture)  
 TOX 522 Pulmonary and Cardiovascular Toxicology (1 lecture)  
 TOX 521 Genetic Toxicology (2 lectures)

Presentations, 2006-2009

Mammalian Target of Rapamycin: An Endogenous Modulator of Endothelial ICAM-1 Expression? National Jewish Medical and Research Center, Denver, Colorado, 2006  
 Endothelial ICAM-1 and Acute Lung Injury. International Conference on Cardio-Pulmonary Regulation in Health and Disease: Molecular and Systemic Integration, Delhi, India, 2007  
 Endothelial ICAM-1 and Acute Lung Injury. First-Year Toxicology Graduate Students, University of Rochester Medical Center, 2005-2007  
 Endothelial ICAM-1 and Acute Lung Injury. First-Year Cellular and Molecular Basis of Medicine (CMM) Graduate Students, University of Rochester Medical Center, 2007  
 Endothelial ICAM-1 and Acute Lung Injury, First-Year Toxicology Graduate Students, University of Rochester Medical Center, 2008  
 Endothelial ICAM-1 and Acute Lung Injury. First-Year Cellular and Molecular Basis of Medicine (CMM) Graduate Students, University of Rochester Medical Center, 2008  
 Mammalian Target of Rapamycin: An Endogenous Modulator of Endothelial ICAM-1 Expression and Lung Inflammation?, Cardiovascular Research Institute, University of Rochester Medical Center, 2009  
 New Endothelial Signals Controlling Neutrophil Trafficking into the Lung, Pulmonary Biology Research Seminar Series, University of Rochester Medical Center, 2009.

**Timothy P. Stevens, M.D., M.P.H.**

Collaborating physician, three neonatal nurse practitioners, 2003 - present  
 Neonatal Intensive Care Unit, Neonatology Web site, a resource for resident, fellow and nursing education and clinical care. The site is updated comprehensively once each year and frequently throughout the academic year. 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. Twice yearly CME talks, FF Thompson Hospital, Canandaigua, New York, 2001 - present  
 American Academy of Pediatrics  
 Prep® - The Course, Care of the Fetus and Newborn, Jacksonville, FL, 2008

**Robert J. Swantz, M.D.**

RIME and Reason: Medical Education in the Practice Setting. CME program for Regional Postgraduate Teaching Morning, Department of Pediatrics, Strong Memorial Hospital, 2007

Portfolios: I Thought They Were for Stockbrokers? How Educational Portfolios are Important to the Clerkship Director's Career. Workshop annual meeting of Council on Medical Student Education in Pediatrics, Atlanta, GA, 2008

**V. Faculty Data****Memberships and Leadership Roles in Scholarly Societies****Sanjiv B. Amin, M.B.B.S.,M.D., M.S.**

American Academy of Pediatrics, 1993 - present

Early Hearing Detection and Intervention, 2003 - present

New York Chapter, 2006 - present

Perinatal Society, 1999 - present

Society for Pediatric Research, 2003 - present

**Kaiser M. Bijli, Ph.D.**

American Thoracic Society

American Physiological Society

American Heart Association, 2007

**Patricia R. Chess, M.D.**

American Academy of Pediatrics, 1990 - present

American Thoracic Society, 1994 - present

Perinatal Research Society, 2005 - present

Society for Pediatric Research, 2000 - present

**Rita Dadiz, D.O.**

American Academy of Pediatrics, 2001-present

Society for Simulation in Healthcare, 2008-present

**Carl T. D'Angio, M.D.**

American Academy of Pediatrics, 1991 - present

Perinatal Research Society, 2006 - present

Society for Pediatric Research, 1999 - present

**David Dean, Ph.D.**

American Thoracic Society

American Society of Cell Biology

American Society for Gene Therapy

Cardiovascular Gene Therapy Committee

Society for Experimental Biology

**Fabeha Fazal, Ph.D.**

American Thoracic Society

**Jacob N. Finkelstein, Ph.D.**

American Association for the Advancement of Science

American Chemical Society (Division of Biological Chemistry)

American Society for Biochemistry and Molecular Biology

American Society for Cell Biology

American Thoracic Society

New York Academy of Sciences  
 Radiation Research Society  
 Society for Leukocyte Biology  
 Society for Pediatric Research  
 Society of Toxicology (Inhalation Section)

**Ronnie Guillet, M.D., Ph.D.**

American Academy of Pediatrics  
 New York State Perinatal Association  
 Society for Pediatric Research  
 American Pediatric Society

**Sema Hart, M.D.**

American Academy of Pediatrics, 1991 - present

**Carl Johnston, Ph.D.**

American Thoracic Society  
 Radiation Research Society  
 Society of Toxicology

**Nirupama Laroia, M.D.**

American Academy of Pediatrics  
 Breast Feeding Medicine  
 International Child Health; committee chair, India Giani Scholarship Fund  
 Neonatal Perinatal Medicine  
 Eastern Society for Pediatric Research  
 Indian Academy of Pediatrics  
 National Neonatology Forum (India)

**Ruth A. Lawrence, M.D.**

Professional

Academic Affairs Committee, St. Bernard's School of Theology and Ministries, 1991 - present  
 Academy of Breastfeeding Medicine—Advisory Board member and former president, 1996 - present  
 American Academy of Pediatrics, 1960 - present  
 Chair and member, Section on Breastfeeding, 2002 - present  
 American Association of Poison Control Centers, 1962 - present  
 American Institute of Nutrition, a constituent society of the Federation of American Societies for  
 Experimental Biology, 1996 - present  
 American Pediatric Society, 1986 - present  
 Medical Nutrition Council of the American Society for Nutrition, 2006 - present  
 Sigma Delta Epsilon, Graduate Women in Science, honorary member, 1999 - present  
 United States Breastfeeding Committee—vice president and member of Executive Committee, 2002 –  
 2007, member 1995 - present

Community

Girl Scouts of Genesee Valley, honorary Board member, 2003 - present  
 March of Dimes, Upstate N.Y. Chapter—member, Board of Directors, 2005 - present  
 Our Lady of Mercy High School, Rochester, New York—member, Board of Directors, 2004 - present

**William M. Maniscalco, M.D.**

American Pediatric Society  
 American Thoracic Society  
 Perinatal Research Society  
 Society for Pediatric Research

**Thomas J. Mariani, Ph.D.**

American Association for the Advancement of Science, 1991 - Present

American Thoracic Society, 1996 - *Present*

Group Leader and Reviewer, RCMB Program Committee, 2004-2007

Chair-Elect, ATS RCMB Assembly Program Committee, 2008-2009

Chair, ATS RCMB Assembly Program Committee, 2009-2010

American Society for Cell Biology, 1997 - *Present*

American Physiological Society, 2005 - *Present*

**Mohammad Minhajuddin, Ph.D.**

American Thoracic Society

**Robert Notter, M.D., Ph.D.**

Sigma Xi

Society for Pediatric Research

Tau Beta Pi

*Who's Who in Science and Engineering*

*Who's Who in the World*

*Who's Who in America*

*Who's Who in Medicine and Healthcare*

**Michael A. O'Reilly, Ph.D.**

American Physiological Society

American Thoracic Society

Sigma Beta

**Dale L. Phelps, M.D.**

American Academy of Pediatrics

American Association for Pediatric Ophthalmology and Strabismus—honorary member, 2006 - present

American Pediatric Society, 1987 - present

Association for Research in Vision and Ophthalmology (ARVO), 1988 - present

New York State Perinatal Association

Perinatal Research Society, 1986 - present—council member 1986, 1987, 1991; president 1993

Rochester Pediatric Society, 1988 - present

Society for Pediatric Research, 1979 – present

American Association of Pediatric Ophthalmology and Strabismus, Honorary Membership, 2006 - present

**Gloria S. Pryhuber, M.D.**

American Academy of Pediatrics

American Physiological Society

American Thoracic Society

Society for Pediatric Research

Alpha Omega Alpha Medical Honor Society

International Cytokine Society

**Arshad Rahman, Ph.D.**

American Heart Association

American Physiological Society

American Society for Biochemistry and Molecular Biology

American Thoracic Society

Shock Society

**Timothy P. Stevens, M.D., M.P.H.**

American Academy of Pediatrics, 1998 - present; fellow, 1990 - present

American Thoracic Society, 2006 - present

Society for Pediatric Research, 2006 - present

**Robert J. Swantz, M.D.**

American Academy of Pediatrics

Fellow, 1993 - present  
 Fellow, Perinatal Section, 1997 - present  
 Council on Medical Student Education in Pediatrics, 1994 - present  
 Faculty Development Task Force -2008

**Jennifer L. Young, Ph.D.**

American Society for Cell Biology  
 American Thoracic Society

**Service Activities**

**Sanjiv B. Amin, M.B.B.S., M.D., M.S.**

New York Chapter Champion, Newborn Hearing Committee, American Academy of Pediatrics, 2005 – present

GCRC Committee Member, Rochester, NY, 2007 – present

New Born Hearing Committee, University of Rochester, NY

ROP Committee Member, University of Rochester, NY

ROR Committee Member, University of Rochester, NY

Medical Knowledge Core Curriculum Committee Member, University of Rochester, NY

Neonatal Clinical Trials Group Member, University of Rochester, NY

**Patricia R. Chess, M.D.**

Abstract Reviewer

American Thoracic Society, 2004 - present

Pediatric Academic Society, 2004 – present

Reviewer: *AJP Lung, AJP Cell, J Peds, Archives of Diseases of Childhood and Adolescence, Tox Applied Pharm, Acta Paediatrica, J Cellular Physiol, J Peds, Peds*

Presenter/Facilitator: Neonatal lung disease: clinical and animal studies: at ATS 2008,

Co-director, NYS Finger Lakes Perinatal Forum, 2006 - present

Chair of Pediatrics, Unity (formerly Parkridge) Hospital, 2006 - present

Medical director, ECMO Program, 1998 - present—oversee provision of care to ECMO patients, ELSO Registry

Member

American Lung Association Research Grant Review Committee (national), 2001 - present

Palliative Care Team, 2005 - present

Pediatric Planning Committee, American Thoracic Society, 2005 - present

Neonatal specialist, Preferred Care Health Insurance Children's Health Care Team, 1999 - present

Outreach coordinator, United Memorial Hospital, Batavia, New York, 2000 present (biannual)

**Rita Dadiz, D.O.**

Neonatal Resuscitation Program, URMC, 2008-present

Obstetrics Simulation Steering Committee, URMC, 2008-present.

Mentoring Working Group, University of Rochester, 2009.

**Carl T. D'Angio, M.D.**

Associate chair, Board 2, Research Subjects Review Board, University of Rochester, 2004 - present

Editorial Board, *Pediatric Health*

Faculty Senate Research Policy Committee, University of Rochester, 2006 - present

Data Safety and Monitoring Board

Effects of Massage on Immune System of Preterm Infants. NIH/NCCAM R21 AT001872, 2005 - present

Maternal Oral Therapy to Reduce Obstetric Risk (MOTOR) Trial. NIH/NIDCR, 2003 - present

Pregnancy Outcomes and Periodontal Therapy (OPT) Trial. NIH/NIDCR R01 DE14338, 2003-2006

**David Dean, Ph.D.**

Abstract Reviewer: American Society for Gene Therapy, 2004 – present

Ad Hoc Reviewer, 2007 – present

*Gene Therapy*

*Molecular Therapy*

*Cancer Gene Therapy*

*Journal of Gene Medicine*

*Journal of Controlled Release*

*Expert Opinion in Drug Delivery*

Editorial Board Member

*American Journal of Physiology: Lung Cellular and Molecular Physiology*, 2006 - present

*Experimental Biology and Medicine*, 2006 – present

**Fabeha Fazal, Ph.D.**

Reviewer

*Journal of Biochemistry and Molecular Biology*

*Frontiers in Bioscience: Molecular Biology in Clinical Practice*

*Chemical Research in Toxicology*

**Jacob N. Finkelstein, Ph.D.**

Director of Enrichment, Environmental Health Sciences Center, 1999 - present

Director of University Facilities Core, Environmental Health Sciences Center

Steering Committee, Pulmonary Training Grant

Steering Committee, Toxicology Training Program

**Ronnie Guillet, M.D., Ph.D.**

Committees

URMC

Strong Hospital

Town-Gown Committee, Department of Pediatrics, member

Neonatology Morbidity and Mortality Committee, member

Perinatal Morbidity and Mortality Committee, member

Prenatal Diagnosis Committee, member

Fellowship Committee, Department of Pediatrics, member

Graduate Medical Education Committee, member

Highland Hospital

Medical Executive Committee

Pediatric Morbidity and Mortality Committee, chair

Perinatal Practice Committee

OB Quality Committee

Pediatric Practice Committee

Reviewer

*Pediatrics*, reviewer

*Journal of Pediatrics*, reviewer

*Neurology*, reviewer

*Families, Systems and Health*, reviewer

*American Journal of Perinatology*, reviewer

Abstract reviewer and moderator, Pediatric Academic Society annual meeting, 2004-2007

Participant, Improving Treatment for Neonatal Seizures workshop, Washington, D.C., 2007

**Sema Hart, M.D.**

Regional instructor, Neonatal Resuscitation Program (605-6309), 2004 - present

**Carl Johnston, Ph.D.**

ATS-EOH Program Committee, 2005-2007

**Nirupama Laroia, M.D.**

Member, Perinatal Data Systems (PDS) advisory group

**Ruth A. Lawrence, M.D.**

Consultant, Food and Drug Administration Advisory Council, 2007 - present

Poison Center: Back-up consultation; daily rounds on active cases Monday-Friday

**William M. Maniscalco, M.D.**

Member, Pediatric Promotion Committee

Outreach Coordinator, Arnot-Ogden Hospital, Corning Hospital, and Schuyler Hospital

Abstract Reviewer, Pediatric Academic Societies, 2008

Reviewer:

*American Journal of Physiology: Lung Cell and Molecular Physiology,*

*American Journal of Respiratory Medicine, Critical Care Medicine*

*American Journal of Perinatology*

*Journal of Perinatology*

*Pediatric Research*

*Pediatrics*

**Thomas J. Mariani, Ph.D.**

Scholarship Oversight Committee, Department of Pediatrics, The Children's Hospital, Boston, MA | 2008

Lung Structural and Functional Imaging Steering Committee, Brigham and Women's Hospital | 2007 - 2008

Pulmonary Division Faculty Search Committee, Brigham and Women's Hospital | 2007 - 2008

Editorial Board, American Journal of Respiratory Cell and Molecular Biology | 2003 - Present

Associate Editor, Gene Express, American Thoracic Society Website | 2004 - 2006

Reviewer:

Developmental Biology | 2007 - Present

Applied Bioinformatics | 2006 - Present

Bioinformatics | 2006 - Present

International Journal of COPD | 2006 - Present

Nucleic Acids Research | 2006 - Present

Biotechniques | 2005 - Present

Journal of Clinical Investigation | 2005 - Present

Pediatrics Research | 2005 - Present

Respiratory Research | 2005 - Present

American Journal of Pathology | 2004 - Present

BMC Bioinformatics | 2004 - Present

BMC Genomics | 2004 - Present

Physiological Genomics | 2004 - Present

Cancer Research | 2003 - Present

Clinical Chemistry | 2003 - Present

Journal of Cellular Physiology | 2003 - Present

American Journal of Pulmonary and Critical Care Medicine | 2002 - Present

Developmental Dynamics | 2002 - Present

American Journal of Physiology | 2000 - Present

American Journal of Respiratory Cell and Molecular Biology | 1999 - Present

**Robert Notter, M.D., Ph.D.**

Pediatrics Promotions Committee

Perinatal Research Committee

Dean's Ad Hoc Promotions Committee, Medical Center

**Michael A. O'Reilly, Ph.D.**

Reviewer, 2007 - present

*American Journal of Pathology*  
*Journal of Biological Chemistry*  
*American Journal of Physiology, Lung Cell and Molecular Physiology*  
*American Journal of Respiratory and Critical Care Medicine*  
*American Journal of Respiratory Cell and Molecular Biology*

Editorial Board

*American Journal of Physiology: Lung Cellular and Molecular Physiology*, 2003 - present  
*American Journal of Respiratory Cell and Molecular Biology*, 2007 - present

**Dale L. Phelps, M.D.**

Chair and committee member: DSMC for the NIH-NHLB: Multicenter Clinical Trial (Inhaled Nitric Oxide in Premature Infants), 2000 - 2007

Member

AAO/AAP/AAPOS Joint Statement on ROP Screening, 1997 - present  
 Advisory Committee, General Clinical Research Center through 2007  
 Advisory Committee, Pediatric Clinical Research Office through 2007  
 DSMB for the Division of Lung Diseases Clinically Oriented Research. NIH-NHLBI, 2007  
 DSMB for the Maternal Fetal Medicine Network. NIH-NICHD, 2006 - present  
 DSMC for the NIH-NEI PEDIG Group Trials: Multiple Trials Group in Pediatric Ophthalmology, 1997 - present

Presenter/Reviewer

*Journal of the American Medical Association*

Reviewer

*American Journal of Ophthalmology*  
*Archives of Ophthalmology*  
*Investigative Ophthalmology and Visual Sciences*  
*Journal of Pediatrics*  
*Journal of Perinatology*  
*Journal of the American Association of Pediatric Ophthalmology and Strabismus*  
*Pediatric Research*  
*Pediatrics*

**Gloria S. Pryhuber, M.D.**

Acting director, Neonatal-Perinatal Medicine Fellowship Program, 2005-2006

Co-chair: American Thoracic Society Poster discussion session, 2003-2006; mini symposium, May 2007

Facilitator, American Thoracic Society Thematic Poster Presentation, 2003-2007

Member

Dean's Research Advisory Committee, 2000 - present  
 Department of Pediatrics Technology Committee, 2000 - present  
 Graduate Medical Education Committee, 2000 - present; representative, Pediatric Fellowship, 2006

Reviewer

*American Journal of Physiology: Lung Cell and Molecular Biology*  
*American Journal of Respiratory Cell and Molecular Biology*  
*Clinical Chemistry and Laboratory Medicine*  
*Pediatrics*  
*Pediatric Research*  
*The Journal of Pediatrics*  
*Toxicological Sciences*  
*Trends in Pharmacological Sciences*

**Arshad Rahman, Ph.D.**

Editorial Board

*American Journal of Physiology: Lung Cellular and Molecular Physiology*  
*Recent Patent Reviews on Anti-Infective Drug Discovery*  
*Science of Advanced Materials*

Reviewer

*American Journal of Physiology: Gastrointestinal and Liver Physiology*  
*American Journal of Physiology: Heart and Circulatory Physiology*  
*American Journal of Physiology: Regulatory Integrative and Comparative Physiology*  
*Blood*  
*European Respiratory Journal*  
*Journal of Immunology*  
*Leukemia and Lymphoma*  
*Microvascular Research*  
*Toxicological Sciences*  
 Ad hoc Committee for Promotion, Dr. Zheng-Gen Jin, 2007

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Abstract reviewer, Neonatal Epidemiology and Follow-Up, Pediatric Academic Society, Washington, D.C., 2006

Member, Steering Committee, Finger Lakes Region Perinatal Forum, 2005 - present

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Pediatric Education Committee, 1995 - present

Curriculum Steering Committee, University of Rochester School of Medicine and Dentistry, 2006 – 2008

LCME Task Force, Committee on the Educational Program for the MD Degree, University of Rochester, School of Medicine and Dentistry, 2006 – 2007

Admissions Committee, University of Rochester School of Medicine and Dentistry, 2007 - present

Third and Fourth Year Instruction Committee: Chair, 2007 –2008; vice-chair, 2006-2007

**VI. Three-Year Bibliography (2006-2009)**

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