Significant Accomplishments

Ohio Pediatric Asthma Repository Begins Studying Hospital Stays

In 2012, Gurjit Khurana Hershey, MD, PhD and the Division of Asthma Research, working in conjunction with Governor Kasich’s office, were awarded a grant from the Ohio Children’s Hospital Association (OCHA) and the Ohio Department of Job and Family Services (ODJFS) to develop and lead an asthma research study in conjunction with the five other free-standing children’s hospitals in Ohio. Utilizing a new central IRB infrastructure available to research institutions in Ohio, the Ohio Pediatric Asthma Repository (OPAR) began enrollment in December 2012 and now has 905 participants. The six-hospital group will analyze phenotypic, demographic, treatment, and outcome data to look for differences between patients, treatments and site pathways to see what factors impact reutilization and length of hospital stay.

Cincinnati Children’s Joins Three Clinical Trials Through Inner City Asthma Consortium

Cincinnati Children’s is one of 10 research centers to join the Inner City Asthma Consortium, the nation’s largest effort to study asthma in the inner city. Gurjit Khurana Hershey, MD, PhD, is the principal investigator for the Cincinnati site. Thus far, Cincinnati Children’s has been involved in three clinical trial studies:

- Preventative Omalizumab or Step-up Therapy for Severe Fall Exacerbations, which examines whether the drug therapy decreases autumn-season asthma exacerbations.
- Asthma Phenotypes in the Inner City, which seeks to differentiate easy vs. difficult-to-treat asthma.
- Biomarker-Based Cockroach Sublingual Immunotherapy, which evaluates immunotherapy against exposure to German cockroach, the most common species infesting apartments and other urban buildings.
Cooperative Research Center Studies Epithelial Cell Genes in Allergic Response

Gurjit Khurana Hershey, MD, PhD, is the principal investigator of an NIH-funded Asthma and Allergic Diseases Cooperative Research Center (AADCRC) and serves on the AADCRC steering committee. This Center focuses on characterizing epithelial genes in allergic diseases and delineating the mechanisms by which they contribute to allergic response. The overarching hypothesis is that epithelial cell genes play a central role in the pathogenesis of allergic disorders. The Center provides important insights about genes and pathways that may be important in epithelial-driven allergic inflammation and provides a basis for the design of new therapies aimed at epithelial surfaces, such as the lung in asthma cases, the skin in atopic dermatitis, or the gut in food allergy or eosinophilic esophagitis.

Research Highlights

Melinda Butsch Kovacic, PhD

Dr. Butsch Kovacic's studies have revealed strong associations between health outcomes, biomarkers of oxidative stress and socioeconomic factors. Dr. Butsch Kovacic has partnered with Cincinnati's CoreChange, a grassroots advocacy group, and Seven Hills Neighborhood Houses Center, a full service social service agency and community center in the West End of Cincinnati, to expand her research into the community using a community-based participatory research (CBPR) approach. To this end, we have utilized a $25K gift to implement a community-based research registry, needs assessments using a child-centered PhotoVoice approach and a 7 Health Habits at 7 Hills COACH (Coaching On Achieving Community Health) program. Adult focus groups have also been planned. To support the Seven Hills Center and buttress research efforts, we have partnered with numerous colleges across the University of Cincinnati to form "UCore7H". Some of UCore7H partners include Dr. Gwendolyn Yip-Ono- Community Philanthropist; Dr. Victor Garcia- Division of Pediatric Surgery and Co-founder of CoreChange; Mr. Michael Sharp- Director for UC's Center for Service Learning and Civic Engagement; Dr. Liam Ream - UC's Division of Professional Practice; Dr. Gisela Esco - UC's Vice Provost for Assessment and Student Learning; and Dr. Tina Whalen - Vice Dean of the School of Allied Health.

Hong Ji, PhD

Dr. Ji and her colleagues are actively recruiting children in the Emergency Department who are admitted due to asthma exacerbation. The purpose of this study is to understand the epigenetic basis of different responses to steroid treatment for asthma exacerbation in these children. The identified methylation biomarkers may be used to provide prognostic as well as predictive information to improve patient care for asthmatic children that respond poorly to standard therapy for exacerbation, and may lead to the development of novel therapeutic strategies. Dr. Ji recently received an NIH award to fund the goals of this study.

Tesfaye Mersha, PhD

Dr. Tesfaye Mersha is working on a project focused on examining Ethiopian Jews with asthma living in Israel and in Ethiopia. This study identifies genetically isolated immigrant populations exposed to native and host environments and provides a molecular mechanism to explain the effects of environment on the development and prevalence of asthma phenotypes. Dr. Mersha is collaborating with Dr. Eitan Kerem, Professor and Chairman of Pediatrics of the Hadassah Hebrew University Hospital in Israel, to study Ethiopian Jews (living in Israel and in Ethiopia) to answer these important questions: 1) Are there regions of the epigenome that are susceptible to environmental insults occurring before and after immigration? 2) Can epigenetic biomarkers be used to assess the risk of asthma in immigrant populations. The information obtained from this project will contribute to our understanding of these key questions.
Division Publications


Faculty, Staff, and Trainees

Faculty Members

**Gurjit Khurana Hershey, MD, PhD,** Professor

**Leadership** Division Director; Kindervelt Endowed Chair; Director, Medical Scientist Training Program

**Research Interests** Elucidating the mechanisms of allergic inflammation and asthma. The research centers on identifying genes important in asthma and allergy.

**Jocelyn Biagini Myers, PhD,** Assistant Professor
**Research Interests** Role of genetics in secondhand smoke-related pediatric asthma.

**Melinda Butsch Kovacic, MPH, PhD,** Assistant Professor  
**Leadership** Secretary/Treasurer, CCHMC Women's Faculty Association

**Research Interests** Using classical and molecular epidemiological approaches to evaluate environmental, infectious, genetic, and socioeconomic causes of chronic disease with current focuses on asthma and Fanconi anemia.

**Weiguo Chen, MD, PhD,** Assistant Professor  
**Research Interests** Mechanisms underlying airway hyperresponsiveness, inflammation and remodeling of allergic asthma.

**Hong Ji, PhD,** Assistant Professor  
**Leadership** Director, Pyrosequencing Core

**Research Interests** Epigenetic plasticity of development and disease; asthma epigenetics; genome-wide and locus specific DNA methylation analysis; epigenetic regulation of gene expression

**Tesfaye Mersha, PhD,** Assistant Professor  
**Research Interests** Integrating and using genomics, statistical genetics, biological profiling and pathway methods to elucidate the genetic architecture of complex diseases of public significance, including asthma.

**Umasundari Sivaprasad, PhD,** Assistant Professor  
**Research Interests** Allergic inflammation; atopic dermatitis; asthma; development of anti-inflammatory therapies

**Trainees**

**Eric Brandt, PhD,** PGY12, Institut Pasteur de Lille, France  
**Lili Ding, PhD,** PY3, University of Cincinnati  
**Rachael Mintz-Cole, BS,** PL-5, University of Cincinnati  
**Zonghua Zhang, MD,** PGY3, Vanderbilt University  
**Chang Xiao, MD, PhD,** PY2, University of Cincinnati

**Division Collaboration**

**Allergy/Immunology; Human Genetics; Pathology** » Marc Rothenberg, MD, PhD, Pablo Abonia, MD, Simon Hogan, PhD, Lisa Martin, PhD, and Keith Stringer, MD  
Asthma and Allergic Diseases Cooperative Research Center funded by the NIH.

**Pulmonary Medicine** » Carolyn Kercsmar, MD  
The Division of Asthma Research partners with the Pulmonary Asthma Center to form the Cincinnati Children’s Asthma Program to improve the health of children with asthma by integrating the evidence-based clinical care with innovative research that will lead to personalized asthma therapy for children living in the Greater Cincinnati area. Drs. Gurjit Khurana Hershey and Carolyn Kercsmar participate in an NIH-funded study entitled "Inner City Asthma Consortium" aimed at preventing asthma in inner-city children.

**Neonatology and Pulmonary Biology** » Tim Le Cras, PhD  
Impact of Early Life Diesel Exposure on Immune Patterning and Lung Structure/Function grant.

**Pulmonary Medicine; Hospital Medicine; Human Genetics** » Carolyn Kercsmar, MD, Jeffrey Simmons, MD, and Lisa Martin, PhD
Ohio Pediatric Asthma Repository

Hematology/Oncology; Pulmonary Medicine » Susanne Wells, PhD, Stella Davies, PhD, Parinda Mehta, MD, Kasiani Myers, MD, and Daniel Grosseohme, DMin
   HPV Replication and Transformation in FA Squamous Cell Carcinomas; HPV Prevalence Studies in Fanconi Anemia Population.

Neonatology and Pulmonary Biology » Jeffrey Whitsett, MD, Tim Le Cras, PhD, and Susan Wert, PhD
   Role of Serpinb3a in goblet cell hyperplasia

Pathology » Keith Stringer
   Role of Serpinb3a in mouse model of cutaneous inflammation

Division of Cellular and Molecular Immunology » Ian Lewkowich, PhD
   Transcriptional regulation of IL-17 induced genes in the nasal epithelium

Biostatistics and Epidemiology » Patrick Ryan, PhD
   Epigenetic Analysis of Individuals with Asthma and Non-Asthmatic Controls; Birth Cohort Study

Biostatistics and Epidemiology » Patrick Ryan, PhD and Rhonda Szczesniak, PhD
   Effects of environmental exposures on systemic oxidative stress levels and allergic disease risk and severity in individuals with asthma and allergies

Neonatology and Pulmonary Biology; Biostatistics and Epidemiology » Tim Le Cras, PhD and Patrick Ryan, PhD
   Immunologic Basis for Adverse Health Effects of Particulate Exposure on Childhood Asthma

Human Genetics » Lisa Martin, PhD
   Nasal Epithelial Cell Study

Molecular Immunology » Edith Janssen, PhD
   Human Dendritic Cell Differentiation project

Division of Pediatric General and Thoracic Surgery » Victor Garcia, MD
   CoreChange Project

Pulmonary Medicine; Hospital Medicine; Human Genetics » Carolyn Kercsmar, MD, Jeffrey Simmons, MD, and Lisa Martin, PhD
   A Multimedia Tool for Asthma study

Neonatology and Pulmonary Biology » Timothy Weaver, PhD
   Characterizing the mechanistic basis for the protective function of Stard7 in the lungs

Division of Anesthesiology » Senthil Sadhasivam, MD, MPH
   Ancestry informative markers development for morphine related pain medication

Human Genetics » Lisa Martin, PhD
   Admixture mapping in asthmatic African American children

Pulmonary Medicine » Carolyn Kercsmar, MD
   Severe asthmatics and rare variants association in admixed asthmatic children

Biostatistics and Epidemiology » Lili Ding, PhD and Mekibib Altaye, PhD
   Rare variants in admixed asthmatic children

Grants, Contracts, and Industry Agreements
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