Division Details

**Division Data Summary**

<table>
<thead>
<tr>
<th>Research and Training Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Faculty</td>
</tr>
<tr>
<td>Number of Joint Appointment Faculty</td>
</tr>
<tr>
<td>Number of Research Fellows</td>
</tr>
<tr>
<td>Number of Research Students</td>
</tr>
<tr>
<td>Number of Support Personnel</td>
</tr>
<tr>
<td>Direct Annual Grant Support</td>
</tr>
<tr>
<td>Peer Reviewed Publications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Activities and Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Clinical Staff</td>
</tr>
<tr>
<td>Number of Other Students</td>
</tr>
</tbody>
</table>

Significant Accomplishments

**Pyrosequencing Core**

Our Division played a leading role in launching the new Pyrosequencing Core Laboratory for Genomic and Epigenomic Research. This core lab, directed by Hong Ji, PhD, facilitates the study of epigenetic regulation mechanisms underlying normal development and disease pathogenesis. Equipped with a Qiagen PyroMark Q96 system, the core detects and quantifies genetic variation via DNA methylation by pyrosequencing. The core has begun working with several researchers at Cincinnati Children’s and UC. It also helps faculty write grant proposals, two of which have been funded so far.

**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 principal investigator for the Cincinnati site. So far, Cincinnati Children’s has been involved in three studies; examining a decrease in fall asthma exacerbations, understanding easy vs. difficult-to-treat asthma, and studying immunotherapy against exposure to German cockroach, the most common species infesting apartments and other urban buildings.

**Cooperative Research Grant**

Gurjit Khurana Hershey, MD, PhD, also is principal investigator of an NIH-funded Asthma and Allergic Diseases Cooperative Research Center (AADCRC), which focuses on characterizing epithelial genes in allergic diseases.
Hershey also serves on the AADCRC steering committee. Epithelial cell genes play a central role in allergic disorders. The Center’s work will provide a basis for developing new therapies aimed at epithelial surfaces in the lung (asthma), on skin (atopic dermatitis), or in the gut (food allergy or eosinophilic esophagitis).

Significant Publications


The significance of this review is to summarize recent findings on the genetic and epigenetic regulation of responses to ambient air pollutants, specifically respirable particulate matter, and their association with the development of allergic disorders. Understanding these epigenetic biomarkers and how they integrate with genetic influences to translate the biologic effect of particulate exposure is critical to developing novel preventative and therapeutic strategies for allergic disorders.


Secondhand smoke is associated with a myriad of adverse health outcomes. Therefore, it is essential for clinicians to ask precise questions about exposures, particularly for children. We present 4 questions that incorporate several locations of exposure and provide a more comprehensive account of children’s smoke exposures than maternal smoking alone.


Our study demonstrates that KIF3A, a member of the kinesin superfamily of microtubule associated motors that are important in the transport of protein complexes within cilia, is a novel candidate gene for childhood asthma. Polymorphisms in KIF3A may in part be responsible for poor mucus and/or allergen clearance from the airways. Furthermore, our study provides a promising framework for the identification and evaluation of novel candidate susceptibility genes.

Division Publications


Faculty, Staff, and Trainees

Faculty Members
Gurjit Khurana Hershey, MD, PhD, Professor
  Leadership Division Director; Kindervelt Endowed Chair; Director, Physician 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**, PY2, University of Cincinnati
- **Hyun-Bae Jie, PhD**, PGY10, Harvard Medical School
- **Rachael Mintz-Cole, BS**, PL-5, University of Cincinnati
- **Zonghua Zhang, MD**, PGY2, Vanderbilt University
- **Chang Xiao, MD, PhD**, PY1, University of Cincinnati

Division Collaboration

**Allergy/Immunology; Immunobiology; Human Genetics; Pathology** » Marc Rothenberg, MD, PhD, Pablo Abonia, MD, Simon Hogan, PhD, Marsha Wills-Karp, PhD, DeBroski Herbert, 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 CCHMC 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; Adherence Psychology; General and Community Pediatrics; Emergency Medicine; Biomedical Informatics** » Carolyn Kercsmar, MD, Jeffrey Simmons, MD, Dennis Drotar, PhD, Rob Kahn, MD, Richard Ruddy, MD, Rick Strait, MD, and Bruce Aronow, PhD

Asthma Nasal Epithelial Study: A collaborative study determining the molecular heterogeneity of the gene expression profile in response to the treatment of acute asthma exacerbations in hospitalized children with asthma.

**Hematology/Oncology** » Susanne Wells, PhD

HPV Replication and Transformation in FA Squamous Cell Carcinomas; HPV Prevalence Studies in Fanconi Anemia Population.

Grants, Contracts, and Industry Agreements

<table>
<thead>
<tr>
<th>Grant and Contract Awards</th>
<th>Annual Direct</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BRANDT, E</strong></td>
<td></td>
</tr>
<tr>
<td>Molecular Epidemiology in Children's Environmental Health Training Program</td>
<td></td>
</tr>
<tr>
<td>National Institutes of Health(University of Cincinnati)</td>
<td></td>
</tr>
<tr>
<td>T32 ES 10957</td>
<td>07/01/09-03/31/12</td>
</tr>
</tbody>
</table>

<p>| BUTSCH KOVACIC, M         |              |
| Fanconi Anemia as a Model for Susceptibility to Human Papillomavirus Infection |              |</p>
<table>
<thead>
<tr>
<th>Grant Number</th>
<th>Start Date</th>
<th>End Date</th>
<th>Funding Agency</th>
<th>Funding</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01 HL 108102</td>
<td>07/01/11-06/30/16</td>
<td>$265,183</td>
<td>National Institutes of Health</td>
<td>Oxidative inactivation of β2-Agonists by Endogenous Peroxidases in the Asthmatic Airway</td>
<td>University of Cincinnati</td>
</tr>
<tr>
<td>U19 AI 070235</td>
<td>07/01/11-06/30/12</td>
<td>$39,032</td>
<td>National Institutes of Health</td>
<td>HERSHEY, G Epithelial Genes in Allergic Inflammation</td>
<td>University of Cincinnati</td>
</tr>
<tr>
<td>HHSN272200900052C</td>
<td>01/01/10-12/31/12</td>
<td>$250,000</td>
<td>National Institutes of Health</td>
<td>Inner City Asthma Consortium</td>
<td>Luther Foundation</td>
</tr>
<tr>
<td>R01 AR 054490</td>
<td>09/01/11-08/30/16</td>
<td>$999,999</td>
<td>National Institutes of Health</td>
<td>Impact of ADRB2 Polymorphisms on Treatment Response in Children with Acute Asthma Exacerbations</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>R01 HL 097135</td>
<td>09/01/09-07/31/14</td>
<td>$356,772</td>
<td>National Institutes of Health</td>
<td>Role of IL-13 Receptors in Atopic Dermatitis</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>R01 HL 097135</td>
<td>09/01/09-07/31/14</td>
<td>$356,772</td>
<td>National Institutes of Health</td>
<td>Impact of Early Life Diesel Exposure on Immune Patterning and Lung Structure/Function</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>K01 HL 103165</td>
<td>07/14/10-05/31/15</td>
<td>$118,974</td>
<td>National Institutes of Health</td>
<td>Admixture Mapping in African American Asthmatic Children</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>F30 HL 103087</td>
<td>07/01/10-06/30/14</td>
<td>$33,742</td>
<td>National Institutes of Health</td>
<td>Regulation of Foxp3 Expression by DNA Methylation in Mold-Induced Asthma</td>
<td>National Institutes of Health</td>
</tr>
</tbody>
</table>

**Current Year Direct** $3,123,602

Funded Collaborative Efforts

<table>
<thead>
<tr>
<th>Grant Number</th>
<th>Start Date</th>
<th>End Date</th>
<th>Funding Agency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kercsmar, C</td>
<td>01/01/2012-12/31/2012</td>
<td>20%</td>
<td>The John A Schroth Family Charitable Trust Foundation</td>
<td>Community-Based Asthma Intervention Program</td>
</tr>
</tbody>
</table>

**Total** $3,123,602