



2018 Annual Report

Division of Allergy, Immunology & Rheumatology

DIVISION DESCRIPTION

The Division of Allergy, Immunology, and Rheumatology provides state-of-the-art, evidence-based care for children with asthma, allergies, immunologic disorders and rheumatologic diseases.

Our basic and clinical research projects are designed to better understand and find more effective treatments for these diseases.

2018 HIGHLIGHTS

- **Yury Bochkov, PhD**, received a one-year, \$50,000 award from Arctic Therapeutics, LLC, for his grant, "Testing RV-C Inhibitors and Receptor Function of Animal CDHR3 Sequences in HeLa cells." This project will test the effects of four new antiviral compounds on rhinovirus C (RV-C) binding and/or replication in transduced HeLa-E8 cells.
- The National Institutes of Health (NIH) awarded the Children's Respiratory and Environmental Workgroup (CREW) \$68,808,597 for five years to continue collecting standardized data from 10 birth cohorts around the country to better understand environmental causes of allergic diseases and asthma. The multicenter project is a collaboration between investigators in the University of Wisconsin Department of Pediatrics (PI **James Gern, MD**; co-investigators **Christine Seroogy, MD**; **Daniel Jackson, MD**; **Robert Lemanske Jr., MD**; **Anne Marie Singh, MD**; and project manager **Gina Crisafi**) and the Institute for Clinical and Translational Research (Umberto Tachinardi, MD; Mark Craven, PhD; Eneida Mendonca, MD, PhD; and **Robert Lemanske Jr., MD**).
- Principal investigator **James Gern, MD**, and co-investigators **Christine Seroogy, MD**; Anne Palmenberg, PhD, and **Yury Bochkov, PhD**, received a 5-year, \$6.8 million renewal of "Viral and Environmental Determinants of Rhinovirus Illness Severity," a cooperative agreement funded by the National Institutes of Health, National Institute of Allergy and Infectious Diseases (NIH/NIAID). The project will use new technologies to monitor approximately 200 current participants and an additional 100 newborns from farm and non-farm families (including 50 Amish newborns) to better define early life microbial exposures and immune development.
- **Anna Huttenlocher, MD**, and David Beebe, PhD (College of Engineering), received a five-year, \$3.76 million grant from the NIH/NIAID for their project, "Microscale Models of Inflammation and its Resolution." By applying bioengineering techniques and organotypic models using induced pluripotent stem cells, they aim to better understand chronic inflammation caused by improper immune cell clearance, and ultimately guide treatment strategies that lead to improved patient outcomes.

Drs. Huttenlocher and Beebe, along with Richard Davidson, PhD (Psychology), also received a three-year, \$600,000 Collaborative Health Sciences Program grant from the Partnership Education and Research Committee (PERC) of the Wisconsin Partnership Program. The project, "Towards an Integrated Understanding of Stress, Inflammation and Immune Response," aims to improve understanding of the complex regulation of the human immune system and the influence of lifestyle factors such as glucose consumption and stress on this regulation.

- **Daniel Jackson, MD**, became the new president of the Wisconsin Medical Alumni Association (WMAA).
- The NIH's National Heart Lung and Blood Institute selected **Robert F. Lemanske, Jr. MD**, as a member of the National Asthma Education and Prevention Program Coordinating Committee.

Dr. Lemanske was also the featured speaker at the 2018 University of Wisconsin School of Medicine and Public Health's Middleton Society's annual fundraising dinner. His lecture focused on results obtained from the Childhood Origins of Asthma birth cohort project, of which he has been the principal investigator since 1998), and how these results are now being applied to NIH-funded asthma prevention studies in preschool children.

- **Christine Seroogy, MD**, and Mei Baker, MD, received a three-year, \$120,000 Baldwin Wisconsin Idea Endowment Grant for their project, "Development and Implementation of Rapid Genetic Test to Improve Health Outcomes in Wisconsin Plain Newborns." They aim to develop and implement state-of-the-art genetic testing for Wisconsin Amish and Mennonite newborns to improve early diagnosis and treatment for disorders frequently found in those communities.
- **Judith Smith, MD, PhD**, received a one-year, \$81,736 Fall Competition grant from the UW-Madison Office of the Vice Chancellor for Research and Graduate Education for the project, "Sabotage of Host Defense Mechanisms by Brucella."

RECENT PUBLICATIONS

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** Publication had previously appeared in 2017 report as an ePub

GRANT SUPPORT

Principal Investigator	Sponsor	Title	Co-Investigators
Bochkov, Yury	National Institutes of Health (NIH) & Massachusetts General Hospital	Infant specific-IgE, rhinovirus-C bronchiolitis, and incident asthma in MARC-35	
Bochkov, Yury	Arctic Therapeutics	Testing RV-C inhibitors and receptor function of animal CDHR3 sequence in HeLa cells	
Busse, William W (UW Department of Medicine)	National Institutes of Health (NIH)	Inner city asthma consortium 3 (ICAC3)	AIR: James Gern (Co-PI), Daniel Jackson, Yury Bochkov, Sima Ramratnam
Drezner, Marc (UW-ICTR)	National Institutes of Health (NIH)	UW - Institute for Clinical & Translational Research	AIR: Anna Huttenlocher, Robert Lemanske, Christine Seroogy GPAM: Elizabeth Cox HemOnc: Paul Sondel, Margo Hoover-Regan
Gern, James E	National Institutes of Health (NIH) & Children's Hospital of Boston	Viral persistence & the microbiome in bronchiolitis and risk of recurrent wheeze	AIR: Yury Bochkov
Gern, James E	National Institutes of Health (NIH)	Mechanisms and environmental determinants of rhinovirus illness severity	AIR: Yury Bochkov, Christine Seroogy
Gern, James E	National Institutes of Health (NIH)	Children's respiratory research and environment workgroup (CREW)	AIR: Daniel Jackson; Robert Lemanske Jr., Christine Seroogy, Anne Marie Singh,

Gern, James E	National Institutes of Health (NIH)	Viral and environmental determinants of rhinovirus illness severity	AIR: Yury Bochkov, Christine Seroogy Molecular Virology: Ann Palmenberg
Huttenlocher, Anna	National Institutes of Health (NIH)	Adhesive regulation during cell migration	
Huttenlocher, Anna	Cancer Research Institute	The role of neutrophils and CXCL8-CXCR1/2 signaling in glioblastoma cell invasion	
Huttenlocher, Anna	Childhood Arthritis Rheumatology Research Alliance (CARRA) & Duke University	CARRA registry	
Huttenlocher, Anna	National Institutes of Health (NIH)	Cell migration and wound repair	
Huttenlocher, Anna	National Institutes of Health (NIH)	Integrated training for physician scientists (MSTP)	
Huttenlocher, Anna	Cancer Research Institute	Role of innate immune system in fibrolamellar hepatocellular carcinoma - Fhl2 as a putative molecular target	
Huttenlocher, Anna	American Heart Association	Mechanisms of macrophage-dependent neutrophil reverse migration during tissue damage	
Huttenlocher, Anna	Wisconsin Alumni Research Foundation	Engineering leukocytes generated from human iPS cells to treat human disease	
Beebe, David J (UW Department of Biomedical Engineering)	National Institutes of Health (NIH)	Microscale models of inflammation and its resolution	AIR: Anna Huttenlocher (Co-PI)
Davis, James M	National Institutes of Health (NIH)	Fungal and host factors in initiation of cryptococcal persistence	Infectious Diseases: Bruce Klein (Co-Mentor) AIR: Anna Huttenlocher (Primary Mentor)
Jackson, Daniel J	National Institutes of Health (NIH) & University of Arizona	ORBEX	AIR: Robert Lemanske Jr.

Jackson, Daniel J	National Institutes of Health (NIH)	COAST	AIR: Robert Lemanske Jr. (Co-PI), James Gern (Project II PI), Yury Bochkov (Core PI), Judy Smith, Christine Seroogy
Jackson, Daniel J	National Institutes of Health (NIH) & Children's Hospital of Boston	CASK/PARK	AIR: Robert Lemanske
Jackson, Daniel J	GlaxoSmithKline	An open-label study to characterize the pharmacokinetics and pharmacodynamics of mepolizumab administered subcutaneously in children from 6 to 11 years of age with severe eosinophilic asthma - 200363	
Jackson, Daniel J	GlaxoSmithKline	Mechanisms underlying asthma exacerbations prevented with & persistent despite immune-based therapy: a systems approach (MUPPITS-2)	
Jackson, Daniel J	GlaxoSmithKline	A long-term access programme for subjects with severe asthma who participated in a GSK-sponsored mepolizumab clinical study	
Denlinger, Loren (Department of Medicine)	National Institutes of Health (NIH)	The great lakes PrecISE partnership	AIR: Daniel Jackson
Lemanske, Robert F	National Institutes of Health (NIH) & Pennsylvania State University	AsthmaNet	AIR: Daniel Jackson
Seroogy, Christine M	National Institutes of Health (NIH) & Northwestern University & Indiana University	Lipid regulation of the development of responsiveness to allergen in neonates and infants	
Seroogy, Christine M	UWF - University of Wisconsin Foundation	Blood lead level testing in plain newborns	
Seroogy, Christine M	Wisconsin Partnership Program	Integrated metabolomics,	AIR: James Gern

		microbial fenomics and immune profiling in early infancy to identify biomarkers for allergic disease prevention	
Seroogy, Christine M	UWF - University of Wisconsin Foundation	Rapid genetic test to improve health outcomes in Wisconsin Plain newborns	
Singh, Anne M	National Institutes of Health (NIH)	S. aureus and regulatory T cells in the failure of oral tolerance	
Singh, Anne M	Collegium International Allergologicum	CIA travel grant	
Smith, Judith A	National Institutes of Health (NIH) & Federal University of Minas Gerais	Brucella survival strategy requires endoplasmic reticulum restructuring and interferes with innate immunity	
Smith, Judith A	National Institutes of Health (NIH)	Regulation of human immune function by 17q21 asthma risk polymorphism	
Smith, Judith A	National Institutes of Health (NIH)	Brucella epitope recognition by CD8+T cells	
Smith, Judith A	Wisconsin Alumni Research Foundation	Sabotage of host defense mechanisms by Brucella	