



- *Professor*
- *Department of Immunology and Genomic Medicine*
- *Department of Medicine*
- *Division of Allergy & Clinical Immunology (1)*

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#### Conditions Treated:

#### Research Areas:

- *Basic Immunology*
- *Cellular and Molecular Biology*

#### Programs & Services:

- *Division of Allergy and Clinical Immunology (Adult)*
- *Asthma Treatment Program (Adult)*
- *Department of Medicine*
- *Department of Immunology and Genomic Medicine*

#### Research Interests

My laboratory studies maternal effects on the immune system and development of allergic diseases, with a particular focus on asthma. Maternal effects are defined as influences of maternal environment, genotype or phenotype on the phenotype of the offspring. Maternal effects have been observed in a number of species, including mice and humans, for several environmental factors and in several tissues and systems of the offspring, including their immune system. Maternal effects may be beneficial, increasing offspring adaptation to changes in the environment and preventing a disease, and harmful, leading to a disease. List of maternally-influenced diseases includes asthma. The existence of maternal effects in asthma has been hypothesized because 1) asthma frequently starts in the first years of life, 2) aberrant gene variants account for only a small proportion of asthma prevalence (GWAS and rare variant studies), 3) childhood asthma associates with maternal environmental exposures and health status. Harmful maternal exposures and phenotypes with positive associations with childhood asthma include road traffic-related air pollution, cigarette smoke and maternal stress. Maternal environmental factors with negative association with childhood asthma include certain microorganisms, and in particular, bacteria present in the farming environment. The overarching goal of our laboratory is to delineate mechanisms underlying maternal effects on asthma. More specific goals are to define maternal information that is transferred to offspring, or lost and not transmitted to offspring, elucidate routes of information transfer (placenta, breast milk, gametes), delineate offspring cells and pathways that are programmed by this information, and study how these cells and pathways contribute to the development of asthma. We have particular interest in cells and pathways of the immune system. The translational goals are to identify early-life biomarkers of predisposition to asthma in humans and define molecular targets for development of preventive drugs. To accomplish our goals, we use mouse models, human cord blood samples, blood samples from young children with asthma, and a variety of immunological, signaling and transcriptomics approaches.

#### Education

1999 Medical University of Lodz, Poland, MD

2007 Medical University of Lodz, Poland, PhD  
2010 Medical University of Lodz, Poland, Habilitation degree

### **Fellowship**

1999 - 2002 University of Texas Medical Branch, Galveston, TX, Postdoctoral Fellowship  
2002 - 2004 National Jewish Health, Denver, CO, Postdoctoral Fellowship

### **Teaching or Professional Positions**

Associate Professor, Department of Medicine, Division of Allergy and Clinical Immunology and Department of Immunology and Genomic Medicine, National Jewish Health  
Associate Professor, [Department of Medicine, Division of Allergy, Asthma and Clinical Immunology, University of Colorado](#)  
Training Faculty Member, [Immunology Graduate Program, University of Colorado](#)  
Training Faculty Member, [Medical Scientist Training Program, University of Colorado](#)  
Training Faculty Member, [Biomedical Sciences Graduate Program, University of Colorado](#)

### **Affiliations with the University of Colorado Denver**

Associate Professor, Department of Medicine, Division of Allergy and Clinical Immunology and Department of Immunology and Genomic Medicine, National Jewish Health  
Associate Professor, [Department of Medicine, Division of Allergy, Asthma and Clinical Immunology, University of Colorado](#)  
Training Faculty Member, [Immunology Graduate Program, University of Colorado](#)  
Training Faculty Member, [Medical Scientist Training Program, University of Colorado](#)  
Training Faculty Member, [Biomedical Sciences Graduate Program, University of Colorado](#)

### **Professional Memberships**

American Academy of Asthma, Allergy, and Immunology  
American Association of Immunologists  
Collegium Internationale Allergologicum

### **Awards & Recognition**

2020-2024: R01AI143837  
2015-2024: R01HL122995  
2017: G. Barsumian, M.D. Memorial Fund Grant Award  
2015: National Jewish Health Outstanding Scientific Achievement Award  
2014-2015: American Lung Association Biomedical Research Grant  
2012-2013: Denver Children's Environmental Health Center Faculty Development Award (NIEHS PO1 ES-018181 and EPA GAD 834515010)  
2011-2014: Colorado Clinical and Translational Sciences Institute (CCTSI) KL2 Research Scholar Award (NIH, KL2 TR001080)  
2011-2013: Sheldon C. Siegel Asthma and Allergy Foundation of America Investigator Grant Award  
2011: DOM Basic Science Section Grant  
2010-2011: CCTSI Junior Faculty Pilot Award (NIH, UL1 TR001082)  
2005-2006: American Academy of Asthma, Allergy and Immunology Interest Section Award  
2000-2002: University of Texas James W. McLaughlin Award  
1998-1999: Ministry of Health Scholarship for Academic Excellence (Poland)  
1993-1998: Lodz Medical School Scholarship for Academic Excellence (Poland)  
1992-1993: Polish Children Fund Scholarship

### **Publications**

Qian Q, Chowdhury BP, Sun Z, Lenberg J, Alam R, Vivier E, Gorska MM. Maternal diesel particle exposure promotes offspring asthma through NK cell-derived granzyme B [published online ahead of print, 2020 Jun 29]. J Clin Invest. 2020;130324. doi:10.1172/JCI130324. PMID: 32407293

Lenberg J, Qian Q, Sun Z, Alam R, Gorska MM. Pre-pregnancy exposure to diesel exhaust predisposes offspring to asthma through IL-1 $\beta$  and IL-17A. *J Allergy Clin Immunol*. 2018, 141:1118-1122.e3. PMID: PMC5844783.

Manners S, Alam R, Schwartz DA, Gorska MM. A mouse model links asthma susceptibility to prenatal exposure to diesel exhaust. *J Allergy Clin Immunol*. 2014, 134:63-72.e7. PMID: PMC4065237.

Gorska MM, Alam R. A mutation in the human Uncoordinated 119 gene impairs TCR signaling and is associated with CD4 lymphopenia. *Blood*. 2012, 119:1399-1406. PMID: PMC3286207

Gorska MM, Stafford S, Liang Q, Goplen N, Dharajiyi N, Guo L, Sur S, Gaestel M, Alam R. MK2 controls the level of negative feedback in the NF- $\kappa$ B pathway and is essential for endothelial permeability and airway inflammation. *J. Exp. Med*. 2007, 204:1637-1652. PMID: PMC2118652

Gorska MM, Stafford SJ, Cen O, Sur S, and Alam R. Unc119, a Novel Activator of Lck/Fyn, is Essential for T Cell Activation. *J. Exp. Med*. 2004, 199:369-379. PMID: PMC2211793

#### **Doctor's Contact Information**

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