

Diagnostic for Occupational Asthma



Center for Technology Commercialization

TECHNICAL FIELD

Diagnostic: Asthma (2002-1023)

BACKGROUND

The most common occupational lung disorder is occupational asthma (OA), accounting for 9-15% of asthma in adults. OA is typically caused by exposure to diisocyanate chemicals. Identifying exposed populations at risk for developing OA has been problematic. Serum-specific antibodies for diisocyanate human serum albumin conjugates have been detected in less than half of confirmed cases. Because of these limitations, researchers have focused on identifying genetic markers present in at-risk populations. For example, two of the HLA class II alleles have been identified as being significantly increased in workers with diisocyanate asthma (DA), while two other HLA class II alleles are increased in asymptomatic workers. In addition, exposed workers who possess the null genotype of glutathione-S-transferase are almost 2 times more likely to develop DA.

The current invention identifies a combination of genetic polymorphisms as susceptibility markers for DA.



APPLICATIONS

1. **Diagnostic test for occupational asthma**
2. **Identification of at-risk populations for occupational asthma**
3. **Research tool**

ADVANTAGES

- **Diagnosis using genetic markers would be safer than the current inhalation challenge**

INVESTIGATOR

Gurjit Hershey, MD, PhD
Director, Institute for Personalized and Predictive Medicine
Professor, Division of Allergy and Immunology
Cincinnati Children's Hospital Medical Center

STATUS

Technology available for licensing.

CONTACT

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TECHNOLOGY

Dr. Gurjit K. Hershey and her colleagues have identified combinations of polymorphisms in IL4RA, IL-13, and CD14 that may represent genetic susceptibility markers of hexamethylene diisocyanate (HDI)-induced asthma. They found that the IL4RA (I50V) II genotype was associated with diisocyanate asthma (DA) in HDI-exposed workers. Also identified were gene-gene interactions associated with DA, including IL4RA (I50V) II and IL-13 (R110Q) RR genotypes; IL4RA (I50V) II and IL-13 (R110Q) RR combination; IL4RA (I50V) II and CD14 (C159T) CT combination; and the triple combination of IL4RA (I50V) II, IL-13 (R110Q) RR, and CD14 (C159T) CT[‡].

Our objective is to find a collaborator interested in developing a diagnostic test for DA using the genetic markers identified by Dr. Hershey.

[‡]Hershey, *et al.* Ann. Allergy Asthma Immunol. 2006; 97: 800-806.

THE INVENTOR

Gurjit Khurana Hershey, MD, PhD
Director, Institute for Personalized and Predictive Medicine

BACKGROUND

Dr. Khurana Hershey is the Director of the Translational Research Program in Allergy and Asthma and Professor of Pediatrics at Cincinnati Children's Hospital Medical Center and the University of Cincinnati College of Medicine.



As part of her role as Director of Center for Translational Research in Asthma and Allergy, Dr. Hershey has developed a comprehensive database of allergic children seen in allergy and asthma clinics at CCHMC. Extensive phenotypic information including clinical, demographic, and quality of life data is available for nearly 2000 children and has been entered into a comprehensive database. DNA samples are available on over 98% of these children. This registry serves as a basis for multiple projects and grants.

Dr. Hershey is an elected member of the Society for Pediatric Research and a Diplomat of the American Academy of Allergy, Asthma and Immunology. She is a recognized leader in the allergy field and serves on the Editorial Board of the Journal of Allergy and Clinical Immunology and has been asked to serve on several NIH study sections and focus groups. She is the Principal Investigator of an NIH Asthma and Allergic Diseases Cooperative Research Center. She was recently named one of the Five Leading Women in Healthcare in the Greater Cincinnati Metropolitan Area by Women's Business Cincinnati Magazine, and nominated Outstanding Woman at Cincinnati Children's Hospital Medical Center. Her other honors include being awarded the Basil O'Connor Starter Scholar Award and the Asthma and Allergy Foundation of American Investigator Award. Her research has been supported by numerous sources including the National Institutes of Health, March of Dimes and the American Heart Association.