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Figure 1 Dust Mite; Magnified x850

American Asthma Foundation Announces Breakthrough Discovery

Common House Dust Mites Trigger Asthma Attacks by Tricking the Immune System

San Francisco, California, January 6, 2009: The American Asthma Foundation announced a research breakthrough that explains why tiny, household pests called dust mites are a major source of airborne allergens for patients with allergic asthma.

Dean Smith, Executive Director of the American Asthma Foundation, explains “that although dust mites are known to trigger asthma attacks, until now we did not know why the allergic response to the mites was so strong.” The mystery was solved as a result of research funded by the American Asthma Foundation’s Strategic Program for Asthma Research (SPAR). The results were published December 7, 2008 on www.nature.com, the on-line edition of *Nature*, a prestigious scientific journal. The lead investigator, Dr. Christopher Karp, and his colleagues found that house dust mites trick the immune system into believing that it is facing a bacterial infection. Thus misinformed, the immune system mounts a strong allergic response to the mites, a response that can trigger asthma attacks.

Dr. Karp is head of the Division of Molecular Immunology at Cincinnati Children’s Hospital Medical Center. In 2006, he received a three-year senior investigator award from the American Asthma Foundation’s Strategic Program in Asthma Research. The Program sponsors research that investigates new theories about the underlying causes of asthma with the goal of improving treatment and curing and preventing the disease. Dr. Karp’s colleagues included researchers at

Cincinnati Children's Hospital Medical Center and the University of Cincinnati College of Medicine, the University of Massachusetts Medical School, the Department of Internal Medicine at the University of Iowa, and the Veterans Affairs Medical Center in Iowa City, Iowa. Information on Dr. Karp's research can be found on www.americanasthma.org.

Asthma is a chronic, complex disease that is a major public health problem. Nearly one in every 13 people in the United States has asthma -- more Americans than have coronary heart disease or cancer or Parkinson's Disease. Asthma is the most serious chronic disease of childhood and disproportionately strikes the poor.

The American Asthma Foundation is the only national advocacy group in the United States devoted solely to asthma. Marion O. Sandler, Chairman of the Board, describes the Foundation's mission as "raising funds for research to improve treatment, prevent, and find a cure for the disease. Sad to say, there is no cure for asthma and little progress has been made in 50 years in improving treatment."

Elaborating on the organization's approach to research, Sandler explains, "The American Asthma Foundation underwrites a national grants program to attract the best scientific minds to address the asthma problem. Specifically, through its Strategic Program for Asthma Research the American Asthma Foundation supports highly original, cutting-edge asthma research by providing generous multi-year awards to scientists not previously involved in the study of asthma."

Over the past nine years, the American Asthma Foundation's Strategic Program for Asthma Research has awarded almost \$60 million to 110 outstanding researchers. These United States and Canadian scientists have been drawn from a wide range of fields including biology, epidemiology, medicine, pathology, and pharmacology. Citing the impact of SPAR awards, Executive Director Smith comments that "SPAR investigators having generated over \$35 million in new funds from other sources for asthma research. Additionally, over 70% of awardees have continued to study the disease after completion of their SPAR grant." Recently, the American Asthma Foundation's SPAR has expanded recruiting efforts to major universities in Australia, the United Kingdom, Ireland, and Sweden.

Detailing the positive outcomes achieved by SPAR-funded investigators, Smith notes, "To date, American Asthma Foundation SPAR awards have resulted in eleven promising breakthroughs, or new 'pathways,' that have led to support from

the pharmaceutical industry. Three of these breakthroughs have progressed to clinical trials. Because the time from a ‘discovery at the bench’ to a new therapy is often measured in decades, we are encouraged that several SPAR-supported projects are on the way to beating this timetable to find a possible therapy.” Smith also observes, “SPAR-supported investigators have published over 200 papers in peer-reviewed scientific journals, thereby helping to more broadly distribute the knowledge gained through research sponsored by the program.” The title of Dr. Karp’s *Nature* article is “Allergenicity Resulting from Functional Mimicry of a Toll-like Receptor Complex Protein.”

Executive Director Smith invites members of the public to help fund SPAR research to find a cure and better treatments for asthma by making a donation at the American Asthma Foundation’s website, www.americanasthma.org.”



Christopher Karp, M.D. Cincinnati Children's Hospital Medical Center;
Gunnar Esiason/Cincinnati Bell Chair;
Director, Division of Molecular Immunology;
Professor of Pediatrics;
Associate Director, Graduate Program in Immunobiology; and
Director, Cystic Fibrosis Research Center

Dr. Karp's research focuses on understanding the molecular mechanisms underlying regulation and dysregulation of inflammatory responses in human allergic, infectious, and genetic diseases. Interrelated, ongoing areas of study include: innate immune activation and counter-regulation; the biology and control of Toll-like receptor-driven signaling pathways; the molecular mechanisms underlying dysregulation of pulmonary inflammation in cystic fibrosis; and the identification and modifier genes for cystic fibrosis lung disease. Dr. Karp received his M.D. from the University of North Carolina School of Medicine and is a former Fellow in Infectious Diseases at Johns Hopkins University School of Medicine.