

INNOVATION ENGINES AT NORTHWESTERN MEDICINE
INFLAMMATION, AUTOIMMUNITY, IMMUNOLOGY

FOOD ALLERGY RESEARCH PROGRAM



The growing prevalence of food allergy and the relative lack of treatment options represent significant problems that research at Northwestern University Feinberg School of Medicine is addressing. By combining strategies focused on public health and epidemiological issues, clinical investigation, and mechanistic science, we are striving towards halting the increase in food allergies, ensuring better and more effective diagnosis, understanding the immunological events, and developing cutting-edge treatments.

Clinical Food Allergy Research

Food allergy is increasing in both children and adults, and the reasons for this increase remain unknown. Studies performed right here in the Chicago Public Schools system by Northwestern food allergy researchers have shown that 1 in 13 children has a food allergy. By combining the talents of investigators from both Northwestern Memorial Hospital and the Ann & Robert H. Lurie Children's Hospital of Chicago, studies aimed at defining lifestyle and environmental influences on food allergy are being examined. Due to the size and uniquely diverse population in the Greater Chicago region, we are seeking to establish a consortium with allergists throughout the communities to profile over one million affected individuals, with both children and adults being included.

Genetics and Mechanisms Food Allergy Program

At this time, very few genes have been shown to influence food allergy and, yet, we know that allergies tend to run in families. Using the advanced genomic sequencing capabilities of the Next-Generation Sequencing Core at Northwestern, we plan to map the genetic associations specifically in families where food allergy is prevalent. In identifying the genes responsible in each case, we believe that we can begin to map pathways and mechanisms that come together to explain food allergy. Already, we have established key genetic signatures of patients with Eosinophilic Esophagitis, a food allergy-associated disorder of the esophagus. Further studies are defining the key immunologic responses that identify patients who outgrow their allergies versus those who retain theirs. In understanding such differences, we hope to be able to identify mechanisms that can be targeted for future therapies.



Discovery Science Food Allergy Program

Food allergies generally cannot be treated with the approaches used for other allergic diseases, suggesting that unknown mechanisms may be responsible. The Discovery Science program within the Division of Allergy-Immunology uses state-of-the-art science to dissect why the immune system becomes reactive to foods and how these reactions then progress. The research uses advanced genetic and bioinformatic approaches and combines them with novel animal models that allow visualization and assessment of food allergy responses. This science has led to discoveries that are targets for the next generation of therapeutic interventions and is aimed at Northwestern University being the first to develop new options for food allergy treatment. The Discovery Science program was the first to show that cell-coupled therapy, which is already in clinical trials for treating autoimmune disease, is effective in

treating peanut-induced anaphylactic reactions using preclinical models. Studies are now progressing to combine these approaches with leading-edge nanotechnology methods for delivery.

The Food Allergy Program at Northwestern is geared toward a new understanding of the causes, genetic susceptibilities, impact, and treatment of food allergy. Until recently, food allergy was not recognized to be widespread, and few academic programs studied this disease. This has created an intense need for investigators trained to use rigorous preclinical, translational, and clinical models to study this crippling disease.

At Northwestern, we are training a new generation of leaders in this field. This assures that the impact of sponsoring research and training at Northwestern will be felt for generations to come.

For more information about philanthropic opportunities relating to Food Allergy research, please contact:

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