The Food Allergy Research Network represents a network of clinicians and investigators focused on understanding and finding better ways to treat food allergic diseases. By building a collaborative team of public health researchers, translational and basic scientists, and clinicians, we take a multidisciplinary approach to achieve success.

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INNOVATION ENGINES AT NORTHWESTERN MEDICINE
FOOD ALLERGY RESEARCH CONSORTIUM
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FOOD ALLERGY RESEARCH CONSORTIUM

Food allergy affects up to 6 million, or 1 in 13, children in the United States. More than 40 percent of these children have experienced a life-threatening reaction. Additionally, the number of children affected by the disease continues to rise. Despite its clinical impact, there is no approved treatment or cure for food allergy. Patients are instructed to avoid the offending food and must carry injectable epinephrine in case of a severe reaction.

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 focused on addressing. The Food Allergy Research Consortium was established in 2014 with the goal of driving new advances in diagnosis, clinical care, and research in food allergy. It was founded and is led by Drs. Paul Bryce, Ruchi Gupta, and Anne Marie Singh of the Division of Allergy/Immunology and the Departments of Medicine and Pediatrics. Drawing from the diverse expertise in their approaches to understanding food allergy, the group’s research includes laboratory studies, animal models, and studies with patients.

A Unique Approach

These three investigators at Northwestern Medicine with expertise in Clinical, Basic Science, and Public Health food allergy research have come together to take a multidisciplinary approach to achieve success. By combining strategies focused on public health and epidemiological issues, clinical investigation, and mechanistic science, the Food Allergy Research Consortium (FARC) is striving towards halting the increase in food allergies, ensuring better and more effective diagnosis, advancing the understanding of immunological events, and developing cutting-edge treatments.

Additionally, FARC has been developing a network of allergy clinics throughout the Chicagoland area to facilitate our scientific investigations into food allergy. By partnering with these network clinics, FARC has extended the reach of our program to 1) develop a better representation of the spectrum of food allergy, and 2) increase our study’s reach to include more patients.

Goals of the Food Allergy Research Consortium:

- Developing a research network by engaging and collaborating with a diverse set of allergy clinical practices, from tertiary care centers to the private practice allergy community.
- Establishing a large informational database on food allergy to support prospective and retrospective studies.
- Establishing a network that can support large clinical trials of emerging therapeutics for food allergies.

Key Areas of Discovery

Population-based Food Allergy Research

Food allergy is increasing in both children and adults, and the reasons for this rise remain unknown. A national study of 40,000 families conducted by Northwestern researchers found that 1 in 13 children have a food allergy with the economic burden at almost $25 billion per year.

“We have a strong and emerging group of dedicated investigators—Drs. Bryce, Gupta, and Singh—who have joined forces to pursue an understanding of, and ultimately therapeutic management of, food allergy. Their innovative approach engages patient populations and allergy practices, leading us in a new direction toward these goals.”

Robert P. Schleimer, PhD, Roy and Elaine Patterson Professor of Medicine and Chief of the Division of Allergy/Immunology
The same researchers found that in the Chicago Public Schools system 38 stock epinephrine autoinjectors were used in one year for anaphylaxis. By combining the talents of investigators from both Northwestern Memorial Hospital and the Ann & Robert H. Lurie Children’s Hospital of Chicago, studies are aimed at food allergy epidemiology, improving clinical care, understanding the impact on children and families, and improving care and support in schools and the community.

**Mechanisms of Food Allergy Responsiveness**

Food allergy responses vary, ranging from atopic dermatitis (eczema) to life-threatening anaphylaxis. However, predicting individual risk and severity for a specific patient is not well documented. These studies aim to understand the epidemiology of severity of food allergy responses, the availability of new tests to predict food reaction outcomes and if differences in risk correspond to clinical phenotype. By determining the immunological events that predict severity, new tests to assess clinical reaction risk and severity can be developed. Additionally, novel findings can then be used in a discovery-based approach to develop new therapies for food allergy.

**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 determine why the immune system becomes reactive to foods and how these reactions then progress. The research uses advanced genetic and bioinformatics 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 leading the way for the next generation of therapeutic interventions and reflects Northwestern University’s goal of developing 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.

**Genetics of 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. We have already 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.
**The Next Generation**

The Food Allergy Research Consortium 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 important 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.

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**THROUGH NORTHWESTERN MEDICINE, WE ARE CREATING A NATIONAL EPICENTER FOR HEALTHCARE, EDUCATION, RESEARCH, COMMUNITY SERVICE, AND ADVOCACY.**

**NORTHWESTERN MEDICINE**

Northwestern Memorial HealthCare and Northwestern University Feinberg School of Medicine comprise Northwestern Medicine. Together we aspire to be the destination of choice for people seeking quality healthcare. We are building support to advance that care through leading-edge treatment and breakthrough discoveries.

Our commitment to transform healthcare and to be among the nation’s top academic medical centers can only be accomplished through innovation and excellence as exemplified by our **Food Allergy Research Consortium at Northwestern Medicine**. We invite interested friends to join us in supporting this breakthrough effort by providing gifts of endowment and outright support that will help to accelerate our research studies and training programs.