

Pediatric Food Allergy Fellowship

LENGTH OF FELLOWSHIP: One year training in food allergy principles and management.

ACADEMIC AFFILIATION: McGill University, Montreal Children's Hospital.

NAME OF HOSPITALS: Montreal Children's Hospital, Crowley Clinic, and Montreal General hospital (McGill University Hospital Centre).

FELLOWSHIP PROGRAM DIRECTOR: Dr. Moshe Ben-Shoshan

FUNDING: Candidates must secure funding as per Postgraduate Medical Education (PGME) guidelines to apply for this fellowship.

NUMBER OF FELLOWSHIP POSITIONS: One

PROGRAM ENTRY REQUIREMENTS:

Fellows must have completed a residency in Pediatric Allergy and Immunology at an accredited institution. Knowledge of allergy and immunology is considered part of prior training, and the eligibility to practice as an allergist is a prerequisite for Food Allergy fellowship training.

BACKGROUND

Almost 3,500,000 Canadians are reported to have food allergy, a life-threatening condition associated with substantial social and economic burden.¹⁻⁷ * Studies suggest a worrisome increase in food allergy prevalence in the last decade mainly in North America.^{5,7} * It is estimated that the annual cost (direct & indirect) for Canadians with food allergies is 2.9 billion dollars.^{8,9,10} Moreover, up to 20% of households in Canada have at least one member with a food allergy, while another 30% consider food allergies when purchasing or preparing foods (e.g., their school age child attends a school where certain allergenic foods are prohibited).^{4,11,12} * Cases of food-induced anaphylaxis, the most severe manifestation of food allergy, have almost doubled in the last decade among Canadian children presenting to the emergency department (ED).^{2,13} *

Only 10 years ago management relied solely on avoidance of the offending allergen and rescue treatment for accidental reactions with epinephrine injection.¹⁴ * Almost 80% of children¹⁵⁻¹⁷ * sensitized and protected from accidental reactions through gradual and medically supervised introduction of the allergic food, via a process called **oral immunotherapy (OIT)**.^{15,17} * OIT has a marked effect on immunological and clinical markers and allows for several fold increases in the threshold of food required to trigger an allergic reaction.¹⁷⁻¹⁹ * This increase in tolerance protects children from reactions after accidental exposure to their food allergen, and in some cases allows normal introduction into their diet.¹⁷ * Accordingly, protocols for OIT for the main food allergens have been recently incorporated in clinical practice and their clinical benefits have been acknowledged in European and Canadian official guidelines.^{17,20} However, adoption of OIT as a management strategy for food allergy has been slow, largely because the most widely used

OIT protocols elicit more allergic reactions than they avoid.^{16,21} * **Recently, two cases of fatality related to OIT occurred in Canada. In the first case, it was reported that a nine year old Ontarian girl died due to anaphylaxis occurring during milk OIT.²² In the second case, a Quebec teen lost her life due to a severe milk-allergic reaction. The Quebec teen's parents are currently spearheading a petition that calls for the provincial government to dedicate funds to opening oral immunotherapy (OIT) clinics in regions beyond Montreal.²³** While thousands of children have undergone OIT treatment with regular, store-bought foods, an approach endorsed by the Canadian^{17*} and European²⁰ allergy associations, it requires intense medical management, which limits its accessibility. Hence, while the clinical benefits of OIT inducing desensitization are promising, it is crucial to determine the safest protocols. At the Montreal Children's Hospital, we are dedicated to developing safe and effective protocols for conducting oral immunotherapy (OIT) on a daily basis for at least 500 children annually who suffer from severe food allergies.

RESEARCH ACTIVITY

Research in food allergy at the Montreal Children's Hospital is robust and ongoing, with a focus on oral immunotherapy (OIT) and the development of safe, effective protocols for managing severe food allergies. Our group has contributed significantly to the field, with numerous publications in peer-reviewed journals (marked with an asterisk in the references). We are actively involved in national and international allergy meetings, where trainees regularly present posters and deliver oral presentations on food allergy research. Supported by the Montreal Children's Hospital Foundation, CIHR, and the National Peanut Allergy Board in the US, our research platform is well-positioned to advance the understanding and treatment of food allergies.

MISSION

The Food Allergy Fellowship at the Montreal Children's Hospital aims to provide comprehensive training in food allergy assessment, diagnosis, and management, with a focus on oral immunotherapy (OIT). The fellowship pursues three major objectives:

1. **Clinical:** To prepare fellows for independent practice in the diagnosis and management of food allergies, including proficiency in conducting food allergy testing, interpreting results, developing personalized treatment plans, and implementing OIT protocols.
2. **Teaching and Formation:** To provide fellows with extensive hands-on experience and structured learning opportunities, including participation in journal clubs, small group teachings, and educational sessions, to develop their skills as educators and mentors.
3. **Research:** To equip fellows with the skills necessary to conduct high-quality research in food allergy, including study design, data analysis, and manuscript preparation, contributing to the growing body of literature in this field.

Thus, the candidate will develop a strong mastery of food allergy diagnosis and management, including the indications, contraindications, and limitations of various diagnostic and therapeutic approaches. They will learn to work within a multidisciplinary team (allergists, clinicians, nurses, and researchers) and develop appropriate clinical judgment, self-discipline in further learning, and research skills.

TEACHING FACULTY

The fellowship is supported by a team of four experienced allergists who contribute to training residents and fellows.

- **Dr. Moshe Ben-Shoshan** - Specialist in pediatric allergy and clinical immunology, with extensive research on food allergy prevalence, anaphylaxis, and oral immunotherapy. Dr. Ben-Shoshan led the first nationwide Canadian study on severe food allergies and established a Canada-wide anaphylaxis registry, contributing significantly to the epidemiology and management of food allergies.
- **Dr. Karen Sigman** - Pediatric allergist with a focus on allergy and immunology. Dr. Sigman is dedicated to improving the quality of life for children with allergies through compassionate care and clinical expertise.
- **Dr. Bruce Mazer** - Renowned for his expertise in allergy and immunology, particularly in immunoglobulin therapy and allergic asthma. Dr. Mazer is passionate about pediatric care and advancing research in the field, making him a key mentor for fellows.
- **Dr. Christine T. McCusker** - Expert in allergy and immunology, with a focus on allergic asthma and innovative treatments. Dr. McCusker is actively involved in research and clinical care, contributing to the development of new approaches in pediatric allergy management.
- **Dr. Reza Alizadehfar** - Assistant Professor of Pediatrics at McGill University and an attending physician in the division of allergy and clinical immunology at the Montreal Children's Hospital and Montreal General Hospital. His clinical and research interests include the epidemiology and genetics of food allergy as well as primary immunodeficiencies.

ACADEMIC FACILITIES

The Montreal Children's Hospital provides facilities for food allergy management and research, including: (60% of time)

- Dedicated food allergy clinics managing at least 2,000 children per year with severe food allergies.
- Research laboratories equipped for immunological studies and clinical trials.
- Access to the Center of Innovative Medicine (CIM) for managing high-risk patients undergoing OIT.
- A unique research platform for developing and implementing OIT protocols.
- Support from the Montreal Children's Hospital Foundation, CIHR, and the National Peanut Allergy Board in the US for research and training initiatives.
- Plan for multidisciplinary EoE clinic every 4 mths

Montreal General Hospital (MGH) – Eosinophilic Esophagitis (EOE) Clinic (1 clinic/4 mths) (10% of time)

Fellows will participate in the **Eosinophilic Esophagitis (EOE) Clinic** at the Montreal General Hospital (MGH) under the supervision of **Dr. Natacha Tardio**, a specialist in gastroenterology and EOE management. EOE is a chronic, immune-mediated condition often triggered by food allergens, making it highly relevant to food allergy management. In this clinic, fellows will:

- Gain experience in diagnosing and managing EOE, including the use of elimination diets, topical steroids, and biologic therapies.
- Collaborate with gastroenterologists, allergists, and dietitians to develop comprehensive care plans for patients with EOE.
- Learn to interpret endoscopic and biopsy results in the context of food allergy and immunotherapy.
- Participate in multidisciplinary discussions on complex cases, enhancing their ability to manage overlapping allergic and gastrointestinal conditions.

This rotation will provide fellows with a deeper understanding of the intersection between food allergies and gastrointestinal disorders, broadening their clinical expertise and preparing them for complex patient cases.

Crowley Clinic – Outpatient Oral Immunotherapy (OIT) Clinic (30% of time)

Fellows will also rotate through the **Outpatient Oral Immunotherapy (OIT) Clinic** at the **Crowley Clinic**, where they will gain hands-on experience in implementing and managing OIT protocols for children with food allergies. Under the guidance of experienced allergists, fellows will:

- Assess patients for OIT eligibility, including reviewing medical history, allergy testing results, and risk factors.
- Develop and implement individualized OIT protocols for various food allergens (e.g., peanut, milk, egg).
- Monitor patients during OIT sessions, managing any adverse reactions and adjusting protocols as needed.
- Educate patients and families on OIT procedures, home dosing, and emergency management of allergic reactions.
- Participate in follow-up visits to assess desensitization progress and long-term outcomes.

CURRICULUM

The Food Allergy Fellowship is a one-year program designed to provide comprehensive training in the assessment, diagnosis, and management of food allergies, with a particular emphasis on oral immunotherapy (OIT). The curriculum focuses on developing cognitive skills, technical skills, and competencies in education and research, structured around the CanMEDS framework. At the end of the fellowship, the trainee will have acquired the following competencies:

MEDICAL EXPERT

- Demonstrate proficiency in conducting food allergy assessments, including history taking, physical examination, and diagnostic testing (e.g., skin prick tests, specific IgE measurements, oral food challenges).
- Interpret diagnostic test results accurately and develop personalized management plans for patients with food allergies.

- Implement and manage OIT protocols for various food allergens, ensuring patient safety and efficacy. Develop problem solving skills to address issues arising from OIT.
- Recognize and manage anaphylaxis and other allergic reactions promptly and effectively.
- Understand the immunological mechanisms underlying food allergies and the principles of immunotherapy.

COMMUNICATOR

- Effectively communicate with patients and families about food allergy diagnosis, management, and the OIT process, including obtaining informed consent.
- Provide clear instructions on allergen avoidance, emergency action plans, and the use of epinephrine auto-injectors.
- Document clinical encounters and research findings accurately and comprehensively.

COLLABORATOR

- Work effectively within a multidisciplinary team, including allergists, nurses, dietitians, and researchers, to provide holistic care for patients with food allergies.
- Collaborate with schools, caregivers, and community organizations to ensure a safe environment for patients with food allergies.

LEADER

- Demonstrate leadership in the implementation and optimization of OIT protocols.
- Contribute to quality improvement initiatives aimed at enhancing patient safety and outcomes in food allergy management.

HEALTH ADVOCATE

- Advocate for patients with food allergies, promoting awareness and understanding of the condition in the community.
- Advocate for safe practices in allergy management
- Support policies and practices that improve access to safe and effective treatments, such as OIT.

SCHOLAR

- Critically appraise scientific literature related to food allergy and immunotherapy.
- Design and conduct research studies, analyze data, and prepare manuscripts for publication.
- Present research findings at national and international conferences.

PROFESSIONAL

- Uphold the highest standards of professionalism, ethics, and patient confidentiality.
- Engage in continuous professional development and lifelong learning in the field of food allergy.

FELLOWS DUTIES AND RESPONSIBILITIES

It is recognized that fellows may acquire skills at different rates, so evaluations will be based on competency rather than solely on the number of procedures or tasks completed. However,

fellows are expected to actively participate in clinical, educational, and research activities as outlined below.

Clinical Responsibilities

- Attend four clinics per week, seeing patients with food allergies under the supervision of attending allergists.
- Participate in OIT sessions, including patient selection, protocol implementation, and follow-up.
- Provide in-house on-call coverage as required.

Academic Responsibilities

- Dedicate a specified percentage of time or number of days per week (averaged over the year) to academic activities.
- Participate in all educational activities, such as journal clubs, rounds, and small group teachings.
- Conduct or contribute to at least one research project, with the goal of producing a manuscript suitable for publication.
- Teach and supervise residents and medical students rotating through the food allergy clinic.

Research Responsibilities

- Under the mentorship of Dr. Moshe Ben-Shoshan, design, coordinate, and implement research studies related to food allergy and OIT.
- Analyze data, present results at local and national meetings, and prepare manuscripts for peer-reviewed journals.
- Participate in research seminars and the hospital's research day.

EVALUATION SYSTEM

- Trainees will be evaluated based on their clinical performance, research productivity, participation in educational activities, and professionalism.
- Trainees are expected to follow the Code of Conduct set out by McGill University
- Evaluations will be conducted using standardized forms, and results will be uploaded to One45.
- Regular feedback sessions, at a minimum every 3 months, will be held to discuss progress, identify areas for improvement, and set goals.
- Trainees will also have the opportunity to provide feedback on staff and rotations to ensure a supportive learning environment.

Supervision: fellows will work closely with attending physicians to provide patient and guidance. They will at times also supervise trainees in our residency program under the guidance of the attending physician.

Educational resources: The fellow will have a desk and access to computer at the Montreal Children's Hospital. They will have training in order to have access to our Centre for Innovative Medicine (CIM) where we carry out some of our research activities.

Other resources: fellow will have access patient's files through EMR as well as clinics related to food allergy and research assistance personnel related to OIT eg. research coordinator and nurse

Conference /Reading materials: fellows are expected to engage in self-directed learning by reading relevant literature and attending conferences to stay up to date on the latest research and guidelines in the field. As this fellowship is covering cutting edge research and care, most of the reading material is not available in textbooks but through reading journal articles. Conference leave will be supported by the program, however, financial support will depend on travel grant acceptance/personal resourcesvacation: fellows will have vacation and leave followed by PGME guidelines

CONCLUSION

The Food Allergy Fellowship at the Montreal Children's Hospital is committed to training the next generation of allergists with expertise in food allergy management, particularly in the evolving field of oral immunotherapy. Through a combination of clinical excellence, research opportunities, and educational activities, fellows will be well-prepared to address the growing burden of food allergies and improve patient outcomes across Canada and world wide.

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