

Title: The α -gal syndrome – an emerging food allergy triggered by tick bites

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Ticks bearing pathogens can transmit infectious diseases such as Lyme borreliosis, tick-borne encephalitis and others. Recently, a non-infectious human disease, namely the alpha-gal syndrome (AGS), was shown to be of tick origin. AGS is characterized by the presence of IgE antibodies directed against the carbohydrate galactose- α -1,3-galactose (α -gal) and a delayed reaction upon ingestion of mammalian meat. Symptoms range from skin reactions to gastrointestinal symptoms, many patients experience anaphylaxis. Clinical reactions generally appear only 2-6 hours after meat consumption, hampering diagnosis, as patients not immediately make the link between mammalian food and allergic symptoms.

In Europe, *Ixodes ricinus* is the main tick species associated with sensitization to α -gal. However, not every tick bite will lead to sensitization and it is still not understood how the initial events after a tick bite will either lead to a short-lived natural inflammatory immune reaction or shift the immune response to an uncontrolled Th2 response and the production of specific IgE antibodies that potentially lead to allergic symptoms.

The ImmunoGal project aims at investigating early peripheral immune responses in individuals experiencing a tick bite. We will perform a deep immune analysis of blood samples collected upon a tick bite by using multi-omics and high-resolution techniques. We will longitudinally follow study participants for several weeks and determine their serological status. We expect to determine immune signatures predicting a reaction leading to allergic sensitization and answer fundamental questions on pathways leading from skin damage to allergic sensitization. Tick bites constitute an ideal model to elucidate the link between an environmental skin injury and Th2 immune responses leading to de novo allergic diseases. The identification of the tick species and search for pathogens will also generate crucial data that are important for tick surveillance in Luxembourg.

SPEAKER BIOSKETCH – Dr. Christiane HILGER (LIH)

NAME, SURNAME: Christiane HILGER

TITLE: PhD

RELEVANT PROFESSIONAL ACTIVITIES AND ACCOMPLISHMENTS:

Dr. Christiane Hilger is Principal Investigator and Group Leader in Molecular & Translational Allergology at the Luxembourg Institute of Health. With over 30 years of research experience, her work focuses on improving allergy diagnostics and understanding immunological mechanisms of allergic responses. She has authored more than 90 peer-reviewed publications and actively contributes to international expert groups and editorial boards in the field of allergy and immunology.

SPEAKER BIOSKETCH – Dr. Farah HANNACHI (CHL)

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RELEVANT PROFESSIONAL ACTIVITIES AND ACCOMPLISHMENTS:

Dr. Farah Hannachi is an Allergist MD and Head of Unit in Clinical Allergy and Immunology at the Centre Hospitalier de Luxembourg. With nearly a decade of active membership in the European Academy of Allergy and Clinical Immunology (EAACI) and a five-year tenure on its JM Board, she brings extensive expertise in allergy diagnostics, patient care, and clinical research to her work.