Immune responses to red meat antigens

Red meat represents a staple food of the Western diet. However, scientific evidence indicates that excess consumption of red meat can also have adverse effects on human health. Together with the development of diabetes and colon cancer, frequent consumption of red meat is associated with an increased risk of cardiovascular disease. The mechanisms behind the contribution of red meat to atherogenesis are still not known. There are strong indications that α-Gal, an oligosaccharide produced only by mammals, but not by humans, may hold the answer.

On the other hand, red meat and specifically the oligosaccharide α-Gal are behind a special form of allergy, where some individuals produce IgE antibodies against α-Gal after being bitten by a tick, which leads to the development of red meat allergy. How the tick bite and which components of its saliva induce the production of IgE antibodies against a carbohydrate is a question that is also still unanswered.

We are looking for motivated students who would like to contribute to answering these questions.

The research will be focused on the following two topics:

1. Investigating whether α-Gal carrying lipids can induce the formation of foam cells and contribute to the development of atheroma plaques.
2. Evaluating the responses of immune cells to tick saliva and tick saliva proteins to try to find out which molecules may be responsible of the development of α-Gal allergy.

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