Link Between Gluten and Immune Reaction Revealed for HLA-DQ8 Celiac Disease

CAMBRIDGE, MA, October 11, 2012 — A link between gluten and the immune system has literally been visualized in new research published today in a leading scientific journal, *Immunity*. The discovery is the collaborative work of research groups in Australia, the Netherlands and ImmusanT Inc. based in Cambridge, Massachusetts, led by Professor Jamie Rossjohn and Dr. Hugh Reid at Monash University, Dr. Bob Anderson of ImmusanT and Professor Frits Koning at the University of Leiden.

The use of x-ray crystallography enabled the researchers to visually determine how T cells interact with gluten that causes celiac disease in patients who have the DQ8 susceptibility gene, thereby providing insight into how celiac disease pathology is triggered. About half the population is genetically susceptible to celiac disease because they carry the immune response genes HLA-DQ2 or HLA-DQ8. At least one in 20 people who carry HLA-DQ2 and about one in 150 who have HLA-DQ8 develop celiac disease, but people with other versions of the HLA-DQ genes are protected.

This has led researchers to question how the immune system senses gluten.

“This is the first time that the intricacies of the interaction between gluten and two proteins that initiate immune responses have been visualized at a sub-molecular level. It is an important breakthrough for celiac disease and autoimmune disease,” stated Professor Jamie Rossjohn, National Health and Medical Research Fellow, Monash University.

This central event in celiac disease is of scientific and commercial interest. ImmusanT is currently developing a blood test and a therapeutic vaccine, Nexvax2®, for patients with celiac disease who carry HLA-DQ2. Nexvax2 uses three gluten peptides commonly recognized by gluten-reactive T cells. Nexvax2 is intended to restore immune tolerance to gluten and allow patients to return to a normal diet including gluten.

Future studies will investigate whether T cell activation by gluten in patients with HLA-DQ2 follows similar principles.

Dr. Bob Anderson, Chief Scientific Officer at ImmusanT commented, “Because we now know the gluten peptides responsible for celiac disease, this is a unique opportunity to interrogate the molecular events leading to a self-destructive immune response.”

“ImmusanT and its collaborators continue to uncover new insights that deepen our understanding of mechanisms of immunity in celiac disease,” said Leslie Williams, CEO and President of ImmusanT.

This work was supported by an Australian Research Council Linkage grant and ImmusanT.

About Celiac Disease

Celiac disease is an inherited autoimmune disorder that affects the digestive process of the small intestine. When a person with celiac disease consumes gluten, a protein found in wheat, rye and barley, the individual's immune system responds by triggering T cells to fight the offending proteins, damaging the small intestine and inhibiting the absorption of important nutrients into the body. With no available drug therapy, the only option for the approximately 1 percent of the global population that has celiac disease is to eliminate gluten from the diet. Compliance is often challenging and nearly half the people on the strict elimination diet still have residual damage to their small intestine.

Undiagnosed, celiac disease is a major contributor to poor educational performance and failure to thrive in children. Untreated disease in adults is associated with increased risk of fractures and osteoporosis, problems during pregnancy and birth, short stature, dental enamel hypoplasia, dermatitis, recurrent stomatitis and cancer.

About ImmusanT Inc.

ImmusanT is a privately-held biotechnology company focused on restoring tolerance to gluten in celiac disease by harnessing new discoveries in immunology that aim to improve diagnosis and treatment and return patients to a normal diet, good health and improved quality of life. The company is developing Nexvax2®, a therapeutic vaccine for celiac disease, and a companion diagnostic and monitoring tool to improve celiac disease management. ImmusanT's targeted immunotherapy discovery platform can be applied to a variety of epitope-specific autoimmune diseases. More information can be found at www.ImmusanT.com.

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