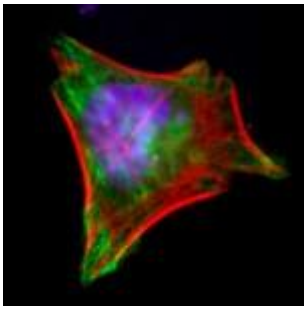
A new theory to explain autoimmunity: The Altered Glycan Theory of Autoimmunity



All cells of the body are made of four classes of molecules: nucleic acids, proteins, lipids and glycans. Of the four, glycans have been least studied and ignored in the intrinsic role they play in immune responses and in particular autoimmunity.

In the Journal of Autoimmunity, Maverakis et el collate the mounting evidence for the role of glycan structures in the pathology of autoimmunity. Autoimmune diseases have been strongly linked to a particular antibody class or subclass. For example, IgG4 is associated with pemphigus foliaceus and autoimmune pancreatitis. The authors review and propose that whilst the antigen specificity of the antibody will determine the "site of attack", the glycan/antibody isotype combination "will dictate the physical nature of the attack".

Based on these fundamental principles, the authors propose "The Altered Glycan Theory of Autoimmunity", where they state "that each autoimmune disease will have a unique glycan signature characterized by the site-specific relative abundances of individual glycan structures present on immune cells and extracellular proteins, especially the site-specific glycosylation patterns of the different Ig classes and subclasses." This theory would then explain that changes in glycan recognition patterns by antibodies of a specific class

would lead to aberrant (or self) recognition and precipitating membrane attack complexes and inflammation leading to pathophysiology.

Maverakis, E. et al. 2015. Glycans in the immune system and The Altered Glycan Theory of Autoimmunity: A critical review. *Journal of Autoimmunity*.