1145-93-1516 **Cara J. Sulyok***, csulyok@vols.utk.edu. *Modeling the Immune Response of Celiac Disease.* Preliminary report.

Celiac disease is a hereditary autoimmune disease that affects approximately 1 in 133 Americans. It is caused by a reaction to the protein gluten found in wheat, rye, and barley. After ingesting gluten, a patient with celiac disease may experience a range of unpleasant symptoms while small intestinal villi, essential to nutrient absorption, are destroyed in an immune process mediated by T cells. The only known treatment for this disease is a lifelong gluten-free diet and there is currently no drug treatment. A gluten-free diet will not address the damage in all cases; this is referred to as refractory celiac disease.

This preliminary work provides a mathematical framework to better understand the biological and immunological mechanisms in celiac disease. The model will be able to analyze various theories behind the progression of this disease by capturing the dynamics of a healthy subject, a patient with celiac disease, and a patient with refractory celiac disease. By doing so, we can evaluate and suggest potential therapies to mitigate the effects of celiac disease. (Received September 22, 2018)