ABSTRACT

TITLE:	The Production of TNF-a By Raw 264.7 Macrophage Cells as a Result of Exposure to Aggregatibacter Actinomycetemcomitans
AUTHOR(S):	Haase, Cristin B.
PRESENTED AT:	8th Annual Natural & Behavioral Sciences Undergraduate Research Symposium Program, Fort Lewis College, 2013

ABSTRACT: The goal of this research was to link a common periodontal pathogen to the chronic inflammation of type 2 diabetes through the production of TNF-a (Tumor Necrosis Factor - alpha) by inflammatory cells. TNF-a has been shown to interrupt the insulin pathway by deactivating tyrosine kinase phosphorylation required for glucose uptake. Aggregatibacter actinomycetemcomitans (A.A.) is a gram-negative bacterium found in the oral cavity in numbers that directly correlate to the severity of periodontitis. Heat-killed A.A. were suspended in media and RAW 264.7 macrophage cells were exposed to a negative control of no treatment, a positive control of lipopolysaccharide (LPS) known to induce TNF-a production, or a concentration of 5.9x105 of heat killed A.A. The amount of TNF-a produced by the macrophages was measured using a TNF-a Quantikine Elisa from R&D Systems. The macrophage cells that received treatment of heat killed A.A. and LPS produced significantly larger amounts of TNF-a (40 pg/mL and 25 pg/mL, respectively) compared to the negative control of no treatment (3 pg/mL). These results indicate that periodontal pathogens such as A.A., through chronic inflammation, have the potential to induce insulin resistance that may lead to type 2 diabetes.