Dr. Jon Giles

Project Description
Title: Adipose Tissue Inflammation in Rheumatoid Arthritis
PI (Giles)

Rheumatoid arthritis (RA) patients are at risk for a number of adverse health outcomes that decrease lifespan and reduce quality of life. Among these, cardiovascular disease exerts the highest impact. In the non-RA population, emerging research has implicated the inflammatory potential of adipose tissue as a major contributor to cardiometabolic intermediates and atherogenesis. Interestingly, the parallels between the immunophenotype of RA synovitis and that of inflamed adipose tissue are striking, and suggest a possible relationship between the two. In support of this concept, prior studies from our group have demonstrated increased adiposity in RA compared to non-RA controls, and an altered distribution of adipose tissue. In addition, in our prior studies, measures of body fat were more potently associated with insulin resistance and atherosclerosis in RA compared to non-RA controls, suggesting that adipose tissue may qualitatively differ in RA in ways that lead to adverse outcomes. However, to date, no studies have explored adipose inflammation in RA patients, or the putative associations of adipose inflammation with cardiometabolic risk factors, atherosclerosis burden or plaque inflammation in RA patients.

We propose to explore these issues by evaluating adipose tissue immunophentypic characteristics and metabolic function from samples collected during percutaneous periumbilical subcutaneous adipose tissue needle aspiration. This study will be incorporated into an NIH-NIAMS funded cohort study investigating atherosclerosis and myocardial perfusion in RA using adenosine-stressed positron emission tomography (PET) perfusion scanning to evaluate coronary arterial function combined with fluorodeoxyglucose (FDG) as an innovative method for quantifying arterial inflammation. Within this context, we propose to explore differences in adipose tissue immunophenotype; production of inflammatory cytokines and chemokines; and glucose and free fatty acid metabolism between RA patients and non-RA controls matched on demographics and body mass index, and to explore differences in the associations of adipose tissue inflammation and metabolism with measures of systemic inflammation, total body insulin sensitivity, and cardiovascular risk factors between RA patients and non-RA controls. And, further,to explore the associations of measures of adipose inflammation and metabolism with measures of atherosclerosis, coronary artery function, and arterial inflammation in the RA patient group.