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Perivascular Adipose Tissue in Relation to Diet, Thermogenesis and Cardiovascular Health

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Thinking Matters: Abstract

Adipose tissue is a diverse and crucial component to vascular health due to its role in energy storage and heat production. The primary function of white adipose tissue (WAT) is energy storage while the function of mitochondria-rich brown adipose tissue (BAT) is heat production. Perivascular adipose tissue (PVAT), which surrounds blood vessels, contains both WAT and BAT adipocytes. Dietary calorie restriction is associated with increased lifespan with decreased adiposity. Increased prevalence of WAT-like PVAT, due to high-fat diets and obesity, leads to increased metabolic disfunction and cardiovascular-disease. We used a calorie-restriction model in C57BL6/J mice to test the hypothesis that lipid storage is decreased in PVAT with calorie-restriction compared to either a control chow or high fat diet. Fiji ImageJ was used to quantify the lipid content within PVAT tissue. Analysis showed that mice on a calorie-restricted diet had lower lipid percentage compared to PVAT tissues from the mice on a control diet. We plan on using immunofluorescence to detect thermogenic markers, UCP1 and GRP75, and anticipated higher expression in the calorie restricted PVAT as a result of increased BAT characteristics when compared to the control diet PVAT. The purpose of this research is to gain a deeper understanding of PVAT's role in cardiovascular health.