

PROBATION: MAPPING NANOVESICLES-VEHICLED PROTEINS RELEASED FROM BROWN ADIPOSE TISSUE

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Non-shivering thermogenesis is an adaptive response involving metabolic pathways that dissipate energy to produce heat. Brown adipose tissue (BAT) is the main thermic rheostat in the body and has received a lot of interest after the discovery of metabolically active adipose depots in the neck and supraclavicular region of adults that take up glucose after cold stimulation. For this reason, this tissue is now viewed as an attractive therapeutic target for metabolic diseases including type 2 diabetes (T2D).

In addition to its metabolic function, BAT releases circulating nano-vesicles vehicled molecules as well as endocrine factors and hormones-like factors that can modulate brown adipocytes in a paracrine/autocrine manner. We have preliminary data showing that nanovesicles isolated from sera of cold-exposed mice enhances oxidative metabolism in brown adipocytes and ignite thermogenesis in room acclimated mice. Interestingly, pharmacological inhibition of exosome biogenesis, blunted thermogenic program both in vitro and in vivo systems. Through deep proteomics approach, we mapped proteins resilient in nanovesicles released from BAT in cold- exposed mice and discovered novel mediators to be exploited for improving systemic oxidative and glucose metabolism.