Researchers at the University of South Florida have successfully manipulated adipose stem cells ("ASCs") differentiating these cells from metabolically unhealthy visceral/omental into the metabolically healthier subcutaneous-like phenotype.

Visceral/omental fat is correlated to glucose intolerance, insulin resistance, hepatosteatosis, as well as in ectopic fat distribution in cardiac, skeletal and hepatic tissue significantly contributing to metabolic dysfunction. In contrast, subcutaneous fat often serves as a protective depot against the comorbidities of obesity.

Our researchers have identified factors and methods that modulate the ASCs of the omental adipose typically found in obese individuals; and induce differentiation of the ASCs into a subcutaneous-like state with a metabolic profile similar to that found in lean individuals.

This has the effect of reducing the amount of metabolically unhealthy omental adipose while increasing the amount of metabolically healthy subcutaneous-like adipose. Thus, this invention can reduce the comorbidities of obesity without the need of reducing overall adipose content.

This invention provides a revolutionary method for the treatment of metabolic diseases, particularly obesity, through the reprogramming of obese omental adipose stem cells. This reduces overall metabolic dysfunction potentially reducing comorbidities and improving overall health and quality of life.

**Advantages:**
- Reduces the disease promoting capacity of obese omental adipose
- Transforms existing adipose depots into a metabolically healthy subcutaneous-like state
- Does not require overall reduction in adipose tissue

**Transforming Metabolic Dysfunction to a Metabolically Healthy State**

**Characterization of ASCs in omental and subcutaneous tissue in both lean and obese adipose subjects demonstrates strong differences in metabolic effect.**

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