Obesity is considered a worldwide health concern. Most of obesity therapies are aimed at decreasing energy intake. However, recent data suggest that increasing cellular energy expenditure could be a useful approach to reduce adiposity. Adaptive thermogenesis, a biological process within the brown fat by which energy is dissipated in mitochondria, is a great tool to increase energy expenditure. Several studies have confirmed the presence of brown adipose tissue in adult humans. In fact, either repeated cold exposure or daily ingestion of some food ingredients acting on transient receptor potential channels recruits BAT in parallel with increased energy expenditure and decreased body fat.

Adipose tissue is traditionally classified as WAT and BAT, respectively. WAT is the more abundant adipose tissue, and is able to store energy as triglycerides. Conversely, BAT is highly vascularized and innervated, in particular by the sympathetic nervous system. The thermogenic property of brown fat cells is carried out in the lots of mitochondria that it have. Particular physiologic conditions such as cold exposure are able to induce the differentiation of white adipocytes into brown cells. This brown-like adipocytes (beige/brite adipocytes), can express a lots of UCP1, and therefore, have thermogenic property too.

The obesity pandemic requires new and novel treatments. The past few years have witnessed multiple studies conclusively showing that adult humans have functional BAT, a tissue that has a tremendous capacity for obesity-reducing thermogenesis. Combining this knowledge with recent advances in understanding BAT differentiation has created new interest in this tissue as a possible therapeutic approach for metabolic diseases. Although many questions remain regarding efficacy, safety, practicality, and durability of such treatments, we are encouraged that both classical and novel therapies targeting BAT thermogenesis may be available in the near future as therapies for obesity and diabetes.