Nature Reviews Endocrinology **11**, 317 (2015); published online 21 April 2015; doi:10.1038/nrendo.2015.62

METABOLISM

Transplantation comBATs obesity

New research shows that brown adipose tissue (BAT) transplantation reverses obesity in genetically obese mice. The findings complement previous results in diet-induced obese mice and highlight the potential of BAT therapies to reduce obesity and related metabolic diseases such as diabetes mellitus in humans.

Wanzhu Jin and colleagues transplanted BAT from male C57BL/6J mice into the dorsal subcutaneous region of age-matched and sex-matched leptin-deficient $Lep^{Ob/Ob}$ mice; sham-operated $Lep^{Ob/Ob}$ mice were used as controls. BAT-transplanted mice gained less weight than control mice, which was evident as early as 3 weeks after transplantation and peaked at 12 weeks after the surgery (51.6 g versus 60.3 g). Total-body fat was also reduced in transplanted mice compared with control mice (–11%), with marked reductions in subcutaneous adipose tissue, but not in epididymal adipose tissue, endogenous BAT or liver tissue. Furthermore, BAT transplantation completely ameliorated the hepatic steatosis observed in control $Lep^{Ob/Ob}$ mice, improved insulin sensitivity, increased energy expenditure (but not energy intake) and dramatically increased endogenous BAT activity (thermogenesis) when mice were challenged by cold (4 °C) conditions.

Overall, the results indicate that BAT transplantation reduces adiposity and improves glucose homeostasis in $Lep^{Ob/Ob}$ mice by substantially increasing energy expenditure, which is probably mediated by increased endogenous BAT activity. Acknowledging that BAT transplantation is not easy to perform in humans, Jin and colleagues are currently trying to identify BATokines (endocrine factors secreted by BAT) that could cause the same systemic metabolic effects as BAT transplantation.

David Holmes

Original article Liu, X. *et al*. Brown adipose tissue transplantation reverses obesity in Ob/Ob mice. *Endocrinology* doi:10.1210/en.2014-1598