

How to Stimulate Brown Fat

Cyclooxygenase-2 might regulate how our bodies store and burn energy.

White fat cells store lipids, and brown fat cells burn lipids. Recently, we have learned that humans of all ages have brown fat cells. Creating more brown fat cells could help treat obesity.

A European team reports evidence that cyclooxygenase (COX)-2 is important in stimulating formation of brown fat cells. The most compelling evidence came from genetically engineered mice that expressed high levels of COX-2. These mice were 20% lighter in body weight than wild-type mice, a difference that was explained entirely by amount of fat; bone and muscle mass were preserved. The lower weight was due to higher energy expenditure, not to lower food intake. The mice also were protected against weight gain even when they were fed a high-fat diet and when hyperinsulinemia or glucose intolerance was induced. Moreover, the mice gained weight and produced white fat when they were fed a diet that included the COX-2 blocker celecoxib (Celebrex).

Comment: This study indicates that COX-2 production is very important in creating brown fat cells. COX-2 has been studied intensively for years, because of the pharmacological attractiveness of COX-2 blockers; our knowledge about COX-2 should facilitate development of drugs that encourage formation of brown fat in humans. Such drugs could play an important role in controlling obesity and the major metabolic abnormalities and diseases that are secondary to obesity.

— [Anthony L. Komaroff, MD](#)

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Vegiopoulos A et al. Cyclooxygenase-2 controls energy homeostasis in mice by de novo recruitment of brown adipocytes. *Science* 2010 May 28; 328:1158.