

The skinny on brown fat

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Last year, researchers made a game-changing realization: brown fat, the energy-burning stuff that keeps babies warm, isn't just for the youngest among us. Adults have it, too (if they are lucky, anyway), and it is beginning to look like the heat-generating tissue might hold considerable metabolic importance for familiar and irritating trends, like our tendency to put on extra weight as we age. If we can find a way to hold onto, make more, or activate brown fat, it might be one way to help keep us slim, according to scientists who have written a series of minireviews appearing in a special April issue of *Cell Metabolism*.

"It's a new metabolic world; we can now ask questions we wouldn't have considered even one year ago," says Jan Nedergaard of Stockholm University, who authored one of the five reviews.

Brown fat was once the preoccupation of a few researchers studying rodents and newborn mammals. "At times, their work was deemed more an exercise in scientific curiosity than an issue relevant to human health," write [Cell Metabolism](#) editors Nikla Emambokus and Charlotte Wang in an editorial.

That all changed when three papers in the [New England Journal of Medicine](#) showed that adults have brown [fat cells](#) in their necks, where, as Sven Enerbäck of Göteborg University explains, it has the unique ability to safely dissipate chemical energy in the form of heat. When we spend a lot of time in the cold, the amount of brown fat we have goes up.

The minireviews take stock of all that experts know today about these

special adipocytes and what more they need to find out. Enerbäck reviews the recent evidence for brown fat in humans and discusses how new technologies will make further study possible. Saverio Cinti and Andrea Frontini of the University of Ancona describe how run-of-the-mill white fat turns into brown fat and vice versa.

Bruce Spiegelman of Harvard and his colleagues pick up the discussion by reviewing the molecular-level controls on brown fat's development. They also outline evidence that brown adipocytes are in some ways more like muscle tissue than white adipocytes. Leslie Kozak of Pennington Biomedical Research Center asks under what circumstances we could expect brown adipocytes to burn extra calories. Nedergaard and Barbara Cannon wrap up the series with provocative speculation about the decline of brown fat with age, among other issues.

The reviews suggest [brown fat](#) might be an answer to obesity, whether as a solution for those who are already overweight or as a strategy to prevent those who aren't from getting too heavy in the first place. Maybe it's as simple as turning down the thermostat.

"Today we have the choice of utilizing this system to reduce obesity simply by reducing the ambient temperature, making it analogous to going for a jog," Kozak writes. "Tomorrow the promise will also be reached with the development of ... drugs that mimic the normal cold response by the central nervous system to increase brown adipocyte numbers in adipose tissue."

Provided by Cell Press

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