

New discovery opens doors to manipulating fat production in the body

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Move over diet and exercise, a new weight control method is in the works and it involves manipulating the production of fat cells at their source. A new research report published in the March 2016 issue of *The FASEB Journal* shows that at least some human fat cells are actually produced from stem cells that originate in bone marrow. As a result, scientists hope to one-day manipulate the type or quantity of fat cells created to ultimately reduce the risk of diseases impacted by the prevalence of unhealthy fat, such as cardiovascular disease, types 2 diabetes, high blood pressure, sleep apnea, asthma, pulmonary hypertension, gall bladder disease, kidney disease, some cancers, and perhaps obesity itself.

"Our study suggests that it may be the type of fat-storing cells produced in our bodies that determines risk for disease, rather than the amount of fat," said Dwight J. Klemm, Ph.D., a researcher involved in the work from the University of Colorado Anschutz Medical Campus in Aurora, Colorado. "This paradigm highlights the possibility of new strategies to prevent and reverse fat-related chronic disease by controlling the production of different types of fat-storing cells."

To make their discovery, Klemm and colleagues recruited human subjects who received [bone marrow transplants](#) for clinical reasons from a different human donor many months before the study. A small sample of [fat tissue](#) was removed from just under the skin next to the belly button. The DNA from the fat cells in the tissue sample was evaluated to determine if it came from the person who donated the bone marrow or

the transplant recipient. They found the presence of donor DNA, which indicated that some of the fat cells had grown from cells that originated in the transplanted bone marrow. Previous research with mice indicates that fat-storing cells produced from [bone marrow](#) stem cells may be particularly harmful because they produce substances that promote inflammation and hinder the ability of other cells to respond to insulin.

"This research may help unravel many of the mysteries associated with weight gain, weight loss, and the effects that excessive fat has on the body," said Thoru Pederson, Ph.D., Editor-in-Chief of *The FASEB Journal*. "The more we learn about this interesting discovery, the closer we are toward shutting down the harmful effects of [fat cells](#) at the source."

More information: K. M. Gavin et al. De novo generation of adipocytes from circulating progenitor cells in mouse and human adipose tissue, *The FASEB Journal* (2015). [DOI: 10.1096/fj.15-278994](https://doi.org/10.1096/fj.15-278994)

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