

# New finding on the formation of fat tissue in man

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Credit: George Hodan/public domain

While all red and white blood cells derive from stem cells in the bone marrow, the scientific community has been divided over whether bone marrow cells are also able to produce other cell types. In the present study, the researchers wanted to ascertain whether cells from the bone marrow could develop into fat cells; the problem is, however, that no experimental method is available for determining the origins of these

cells in humans.

Using the fact that it is possible to differentiate between grafted and native cells, the researchers conducted their study on 65 adult patients of Karolinska University Hospital who had had transplants up to 31 years ago.

"This is an unprecedented follow-up period and one that can therefore give us a great deal more information than the relatively short studies previously done on mice," says Mikael Rydén, researcher at the Karolinska Institutet's Department of Medicine in Huddinge.

The results of the study, which have just been published in the journal *Cell Metabolism*, show that during a lifetime some 10 per cent of the graft recipients' subcutaneous fat consisted of donor-derived cells. And while this was independent of sex and age, the patients' BMI was an important factor in that overweight patients had up to 2.5 times more bone-marrow-derived fat cells than slim patients. According to the researchers, the results suggest that it is possible for [bone marrow cells](#) to develop into different cell types and that certain characteristics of the recipient, such as obesity, can influence this process.

"The next step for us is to find out exactly which bone marrow stem cells can become [fat cells](#)," says Professor Rydén. "These studies were done on people who had received a [bone marrow](#) transplant to treat leukaemia, and it remains to be seen if the results also apply to people who haven't had a transplant. If they do, it could lead to new therapies for patients with metabolic diseases, in which adipose cells play a key part."

**More information:** 'Transplanted Bone Marrow-Derived Cells Contribute to Human Adipogenesis', Mikael Rydén, Mehmet Uzunel, Joanna L. Hård, Erik Borgström, Jeff E. Mold, Erik Arner, Niklas

Mejhert, Daniel P. Andersson, Yvonne Widlund, Moustapha Hassan, Christina V. Jones, Kirsty L. Spalding, Britt-Marie Svahn, Afshin Ahmadian, Jonas Frisé, Samuel Bernard, Jonas Mattsson, Peter Arner, *Cell Metabolism*, online 16 July 2015.

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