In his Commentary, Vladimír Štrbák (1) raises an interesting point by linking the reported effects of cell shrinking and swelling to the proposed adipocyte-driven model for weight regain. Particularly intriguing is the fact that adipocyte shrinking seems to hamper their glucose uptake by keeping Akt in the dephosphorylated state (2), whereas adipocyte swelling facilitates glucose uptake (3).

In the proposed model I gave two options to the shrunken adipocytes. One is re-storage of fat with return to the original volume, the driving force for weight regain, and the other is adjustment of the extracellular matrix to accommodate the smaller cells. But there may be a third option, i.e., uptake of (some) water by the shrunken cells to compensate in part for the lost cell volume. Laaksonen et al. (4) observed that the water content of adipose tissue of 27 obese men and women was significantly increased after 9 weeks on a very-low-calorie diet and that it increased further during a 1 year weight maintenance period. Moreover, at various time points during the follow up, increase in subcutaneous adipose tissue water content correlated with increase in insulin sensitivity. Although the authors assume that the increased water content is due to increase in blood flow and blood volume, it cannot be excluded that also the cells take up water inducing to some extent the effects of cell swelling including improved glucose uptake. Indeed, one of the consistent metabolic effects of adipocytes in obese/overweight subjects after weight loss and a short period of weight maintenance is an improved glucose uptake capacity (5).

Although Štrbák rightly distinguishes acute from chronic cell volume changes, and although results from cells in vitro may differ from what may happen in the in vivo situation, all the effects of acute volume changes demonstrated by Štrbák (6) and others are definitely worth to be considered in the adipobiological model for weight regain.

References