

Origin of fat cells

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Adipose tissue expansion involves the enlargement of existing adipocytes, the formation of new cells from committed preadipocytes, and the coordinated development of the tissue vascular network. Here we find that murine endothelial cells (ECs) of classic white and brown fat depots share ultrastructural characteristics with pericytes, which are pluripotent and can potentially give rise to preadipocytes. Lineage tracing experiments using the VE-cadherin promoter reveal localization of reporter genes in ECs and also in preadipocytes and adipocytes of white and brown fat depots. Furthermore, capillary sprouts from human adipose tissues, which have predominantly EC characteristics, are found to express *Zfp423*, a recently identified marker of preadipocyte determination. In response to PPAR γ activation, endothelial characteristics of sprouting cells are progressively lost, and cells form structurally and biochemically defined adipocytes. Together these data support an endothelial origin of murine and human adipocytes, suggesting a model for how adipogenesis and angiogenesis are coordinated during adipose tissue expansion.