Comment on: Elias et al. Adipose Tissue Overexpression of Vascular Endothelial Growth Factor Protects Against Diet-Induced Obesity and Insulin Resistance. Diabetes 2012;61:1801–1813

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Vascular endothelial growth factor (VEGF) has been investigated for playing a role in energy metabolism. Bosch and colleagues (1) studied the transgenic mouse model of adipose tissue–specific VEGF overexpression (aP2VEGF). It was firm that VEGF expression and blood vessels were increased in adipose tissue of the transgenic mice. The demonstration of aP2VEGF mice protecting against diet-induced obesity and insulin resistance was interesting and elegant.

Recent work by our group studied the effect of conditional VEGF repression on a genetic mouse model (2). The VEGF-repressed mice were lean and resistant to diet-induced obesity, and we noticed that brown-like adipocytes were developing in the white adipose tissue significantly, which was surprising. Besides the morphology changes, brown adipose–specified genes (*UCP-1*, *BMP-7*, *CIDEA*, *PRDM16*, etc.) were increased in the white adipose tissue and white-specific gene (*Leptin*) was decreased. VEGF repression upregulated expression of VEGF-B (another growth factor of VEGF family) and its downstream fatty acid transport proteins. The laboratory of Eriksson and colleagues (3) has reported that VEGF-B controls endothelial fatty acid uptake through its receptors VEGFR1 and Nrp-1. The function and location of VEGF receptors may play delicate roles. VEGF upregulation or downregulation possibly induces transcriptional signaling on target cells through the receptors. Either lower or higher expression of VEGF causes energy unbalancing, which becomes fairly important in endocrine research, as well as other areas of medical science. To explore the mechanisms of VEGF-related energy metabolisms would bring an understanding of diseases such as obesity, diabetes, and cancer.

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