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Effects of activin and BMP-9 on high fat diet-induced obesity

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Prevalence of obesity and obesity-associated type 2 diabetes has become a major economic and medical burden worldwide. While white adipose tissues (WATs) function as a storage depot of lipids, brown adipose tissues (BATs) dissipate energy as heat by thermogenesis. Bone morphogenetic protein (BMP) signaling pathway has been reported to play a key role in adipogenesis and osteogenesis. BMP-4, BMP-7, and BMP-8b have been reported to modulate brown adipogenic gene expression and suppress obesity. We observed that BMP-9 enhanced brown adipogenesis of human adipose tissue derived stem cells. With our observation of cell culture system, we hypothesized that BMP-9 may be able to improve glucose metabolism by regulating expression of brown adipogenic genes. We reported that intraperitoneal injection of BMP-9 suppressed weight gaining in high fat diet-induced obese mouse model and decreased 16 h fasting blood glucose levels. Systemic injection of BMP-9 enhanced brown adipogenic gene expression in the subcutaneous WAT but not in the visceral WAT. However, BMP-2 rather increased fat mass and insulin resistance. In addition to BMP ligands, we also analyzed effects of activin, a TGF- β family ligand along with BMP, on high fat diet-induced obesity.

Biography

Dong Kun Lee has completed her Ph.D 1991 from University of Wyoming and postdoctoral studies from Rockefeller University. Research fields she has covered from Ph.D graduate school include basic protein chemistry, cancer biology, atherosclerosis/stroke, and obesity/diabetes. She has published more than 30 papers in reputed journals.

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