

## Cinnamaldehyde, a TRPA1 agonist, reduces visceral fat in high-fat and high-sucrose diet fed mice

Yasuko Tamura, Yusaku Iwasaki and Tatsuo Watanabe

*Global COE Program, Department of Food and Nutritional Sciences, Graduate School of Nutritional and Environmental Sciences, University of Shizuoka*

TRPA1 (transient receptor potential A1) is one of thermosensitive TRP ion channels. TRPV1 is other thermosensitive TRPs known as capsaicin receptor. Capsaicin reduces body fat accumulation in high-fat diet fed rodents by stimulating sympathetic nervous system through TRPV1 activation in sensory nerve endings. TRPA1 is coexpressed with TRPV1 in sensory nerves. We postulated that TRPA1 agonists also enhance energy metabolism through same mechanism as capsaicin. Then we investigated whether cinnamaldehyde (CNA), a flavor components in cinnamon and a TRPA1 agonist, reduces visceral fat accumulation in high-fat and high-sucrose fed mice.

Male C57Bl mice were housed individually and fed with high fat and high sucrose (HFS) diet or HFS + 0.1 to 1.0 % CNA for 1 month. After 8 h starvation mice were sacrificed and dissected under ether anesthesia. Blood was withdrawn from inferior vena cava and tissues were extirpated and weighed.

HFS diet feeding for 1 month induced deposition of fat tissues at mesenteric, perirenal and epididymal positions. By adding CNA at 0.1, 0.5 and 1.0% level, weight of mesenteric adipose tissue decreased significantly, and weights of perirenal and epididymal adipose tissue showed tendency to diminish. On blood components, no differences were found in all components measured. UCP1 protein contents in IBAT measured by Western blotting per 2.5 µg mitochondrial protein were also higher in 1.0% CNA group than those in HSF group. These data clearly show that CNA supplementation to HFS diet reduces visceral fat in mice probably through enhancement of energy metabolism.