Butein inhibits lipogenesis in *Caenorhabditis elegans*

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What is Butein?

- Flavonoid chalcone with potential therapeutic uses found in annatto seeds and lacquer trees

Why *Caenorhabditis elegans*?

- Nematode, eukaryotic, multi-organ animal model used in **obesity research**
- Different mutants are used to clarify mechanisms of action of bioactives on **lipid metabolism**

Butein reduced fat accumulation in *C. elegans*

Butein did not change pharynx pumping rate

- Pharynx is the organ that pumps food to inside of *C. elegans*
- Pharynx pumping rate is an indicator of food intake

Butein did not change moving speed of worms

- Moving speed of worms is an indicator of energy expenditure

The effects of butein on fat accumulation in different knockout mutants

sir-2.1, homolog of SIRT1, involved in energy homeostasis

skn-1, homolog of Nrf, involved in antioxidant pathways

sbp-1, homolog of SREBP, which regulates genes related to lipogenesis

fasn-1, homolog of FASN, which catalyzes the synthesis of fatty acids

fat-5, *fat-6* and *fat-7*, homologs of SCD, responsible for the desaturation of fatty acids

Butein downregulated the lipogenesis-related genes: *sbp-1*, *fasn-1* and *fat-7*

sbp-1, homolog of SREBP, which regulates genes related to lipogenesis
pod-2, homolog of ACC, which catalyzes the carboxylation of acetyl-CoA
fasn-1, homolog of FASN, which catalyzes the synthesis of fatty acids
fat-5, *fat-6* and *fat-7*, homologs of SCD, responsible for the desaturation of fatty acids

Butein did not change fatty acids profile

Butein downregulated *sbp-1* and *fasn-1* via SKN-1-dependent pathway in *C. elegans*

sbp-1, homolog of SREBP, which regulates genes related to lipogenesis

fasn-1, homolog of FASN, which catalyzes the synthesis of fatty acids

fat-6 and *fat-7*, homologs of SCD, share about 85% nucleotide identity and both are responsible for the desaturation of stearic acid (18:0) to oleic acid (18:1)

Butein reduced fat accumulation via SKN-1- and FAT-7-dependent pathways in *C. elegans*