Dietary relevant mixtures of phytoestrogens inhibit adipocyte differentiation in vitro

Phytoestrogens (PEs) are naturally occurring plant components, with the ability to induce biological responses in vertebrates by mimicking or modulating the action of endogenous hormones. Single isoflavones have been shown to affect adipocyte differentiation, but knowledge on the effect of dietary relevant mixtures of PEs, including for instance lignans, is lacking. In the current study dietary relevant mixtures of isoflavones and their metabolites, lignans and their metabolites, coumestrol, and a mixture containing all of them, were examined for effects on adipogenesis in 3T3-L1 adipocytes, as well as tested for their PPARγ activating abilities. The results showed that mixtures of isoflavonoid parent compounds and metabolites, respectively, a mixture of lignan metabolites, as well as coumestrol concentration-dependently inhibited adipocyte differentiation. Furthermore, a mixture of isoflavonoid parent compounds, and a mixture of isoflavonoid metabolites were found to have PPARγ activating abilities. These results suggest that PEs can affect pathways known to play a role in obesity development, and indicate that the inhibitory effect on adipocyte differentiation does not appear to be strictly associated with PPARγ activation/inhibition. The current study support the hypothesis that compounds with endocrine activity can affect pathways playing a role in the development obesity and obesity related diseases.

General information
Publication status: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Technical University of Denmark
Contributors: Taxvig, C., Specht, I. O., Boberg, J., Vinggaard, A. M., Nellemann, C. L.
Pages: 265-271
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Food and Chemical Toxicology
Volume: 55
ISSN (Print): 0278-6915
Ratings:
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.26 SJR 1.02 SNIP 1.506
Web of Science (2013): Impact factor 2.61
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Original language: English
Keywords: Phytoestrogens, 3T3-L1, Adipocyte differentiation, PPARγ, In vitro
DOIs:
10.1016/j.fct.2012.12.060
Source: dtu
Source-ID: n::oai:DTIC-ART:elsevier/384386721::27612
Research output: Contribution to journal › Journal article – Annual report year: 2013 › Research › peer-review