Abstract:

Sesqiterpene lactones, a group of plant secondary metabolites which include Cnicin from *Cnicus benedictus* plant, have an anti-proliferative and anti-tumor effect on mammalian cells by activating specific signaling pathways while also generating oxidative stress. These factors combined drive tumor cell apoptosis. A few of these compounds have reached clinical trials and seem to be a promising chemotherapeutics. The focus of this work is to elucidate the effect of cnicin on C-MYC transcription factor and oncoprotein which is overexpressed in majority of tumor tissues, the effect of cnicin on DEAD-box RNA helicase DDX3 and on the expression levels of several metabolic genes is also studied. Through the use of western blotting, immunodetection and qPCR it was found out, that cnicin is regulating the expression of C-MYC oncoprotein on both transcriptional and translational levels, while also lowering C-MYC protein stability probably through the effect on PIM-2 kinase. Cnicin is not affecting the total amount of DDX3 protein in cells, but it seems it is lowering its degradation rate. The possible transcriptional regulation of DDX3 by cnicin is still not clear and requires further research. With the use of LC-MS quantitative analysis and qPCR, it was found out that cnicin does not affect the metabolism of saccharides, but does affect the protein and nucleotide synthesis by affecting SLC1A5 glutamine transporter.

(Work is in Czech)