Cucurbitacins are highly oxidized triterpenoids commonly found in plants, especially in the family *Cucurbitaceae*. There are seventeen types of cucurbitacins and each of them has its derivatives. Cucurbitacins with the most prominent antitumor activity are B, D, E and I. Of these, cucurbitacin B and D are the most common in plants. This work focuses mainly on cucurbitacin D.

Cucurbitacin D often induces apoptosis in tumor cells, cell cycle arrest and thereby stops cell proliferation. Indicators of these processes are reduced levels of Bcl-xL, Bcl-2, p21, p27 and cyclins A and B proteins. The main effect of cucurbitacin D on tumor cells is the inhibition of the STAT3 signaling pathway. Whether this pathway is affected at the level of phosphorylation, dimerization, or STAT3 translocation into the nukleus, the result is blocking transcription of genes, which are activated thanks to STAT3 pathway. These are primarily genes that affect tumor growth, angiogenesis, cell invasion, and immune escape. Cucurbitacin D also affects other cell components and processes, such as the NF-κB transcription factor, the enzyme complex of proteasome and inflammasome.

However, current knowledge of cucurbitacin D and its mechanism of action is not yet sufficient for its use as an antitumor drug, although the results of its testing are very promising.