Ethanol extract of Brazilian red propolis induces apoptosis in human breast cancer MCF-7 cells through endoplasmic reticulum stress.


Source

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Abstract

Propolis, a natural product collected from plants by honey bees, is commonly used in folk medicines. Endoplasmic reticulum (ER) stress is known to induce apoptosis through the induction of CCAAT/enhancer-binding protein homologous protein (CHOP). Here, we investigated whether ethanol extracts of propolis and caffeic acid phenethyl ester (CAPE) induce apoptosis, mitochondrial dysfunction, and ER stress in human breast cancer MCF-7 cells and human fibroblasts. Among several ethanol extracts of propolis and CAPE, Brazilian red propolis (BRP) significantly reduced MCF-7 cell viability through the induction of mitochondrial dysfunction, caspase-3 activity, and DNA fragmentation but did not affect those of fibroblasts. Moreover, treatment with BRP significantly induced CHOP expression in MCF-7 cells compared to fibroblasts. Further, pretreatment with a chemical chaperone, 4-phenylbutyric acid, suppressed BRP-triggered MCF-7 cell death. Overall, we revealed that an ethanol extract of BRP induces MCF-7 cell apoptosis through, at least in part, ER stress-related signaling.

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