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Frankincense oil derived from Boswellia carteri induces tumor cell specific cytotoxicity.

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Abstract

BACKGROUND:

Originating from Africa, India, and the Middle East, frankincense oil has been important both socially and economically as an ingredient in incense and perfumes for thousands of years. Frankincense oil is prepared from aromatic hardened gum resins obtained by tapping Boswellia trees. One of the main components of frankincense oil is boswellic acid, a component known to have anti-neoplastic properties. The goal of this study was to evaluate frankincense oil for its anti-tumor activity and signaling pathways in bladder cancer cells.

METHODS:

Frankincense oil-induced cell viability was investigated in human bladder cancer J82 cells and immortalized normal bladder urothelial UROtsa cells. Temporal regulation of frankincense oil-activated gene expression in bladder cancer cells was identified by microarray and bioinformatics analysis.

RESULTS:

Within a range of concentration, frankincense oil suppressed cell viability in bladder transitional carcinoma J82 cells but not in UROtsa cells. Comprehensive gene expression analysis confirmed that frankincense oil activates genes that are responsible for cell cycle arrest, cell growth suppression, and apoptosis in J82 cells. However, frankincense oil-induced cell death in J82 cells did not result in DNA fragmentation, a hallmark of apoptosis.

CONCLUSION:

Frankincense oil appears to distinguish cancerous from normal bladder cells and suppress cancer cell viability. Microarray and bioinformatics analysis proposed multiple pathways that can be activated by frankincense oil to induce bladder cancer cell death. Frankincense oil might represent an alternative intravesical agent for bladder cancer treatment.

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