

Cytotoxic and apoptotic effects of leptocarpin, a plant-derived sesquiterpene lactone, on human cancer cell lines

Bosio C.

Tomasoni G.

Martínez R.

Olea A.F.

Carrasco H.

Villena J.

Sesquiterpene lactones have attracted much attention in drug research because they present a series of biological activities such as anticancer, antifungal, anti-inflammatory, antimicrobial and antioxidant. Leptocarpin (LTC) is a sesquiterpene lactone isolated from a native Chilean plant, *Leptocarpha rivularis*, which has been widely used in traditional medicine by Mapuche people. Previous work has demonstrated that LTC decreases cell viability of cancer cell lines. In this contribution, we analyze the mechanism of LTC cytotoxicity on different cancer cell lines. The results show that in all cases LTC induces an apoptotic process and inhibition of NF- κ B. Apoptosis has been confirmed by observing condensation of chromatin, nuclear fragmentation, release of cytochrome c into the cytosol, and increasing of caspase-3 activity. It has also been found that LTC is an effective inhibitor of NF- κ B, which suggests that leptocarpin-induced cytotoxicity involves in some degree the inhibition of NF- κ B signaling pathway. The concentration at which LTC inhibits NF- κ B activity to the control level is similar or even lower than that found for parthenolide and others sesquiterpene lactones. These results indicate that leptocarpine is a very interesting molecule that could be considered as therapeutic agent for cancer treatment. © 2015 Elsevier Ireland Ltd.

Apoptosis

Cancer cell lines

Cytotoxicity

Factor NF- κ B

Leptocarpin

Sesquiterpene lactones

apoptosis inducing factor

caspase 3

cytochrome c

cytotoxic agent

immunoglobulin enhancer binding protein

leptocarpin

unclassified drug

antineoplastic agent

cytochrome c

leptocarpin

sesquiterpene

apoptosis

Article

cancer cell line

cell viability

controlled study

drug cytotoxicity

drug effect

drug screening

drug structure

enzyme activity

flow cytometry

human

human cell

IC50

male

protein secretion

signal transduction

apoptosis

Asteraceae

chemistry

cytosol

drug effects

secretion (process)

tumor cell line

Antineoplastic Agents

Apoptosis

Asteraceae

Cell Line, Tumor

Cytochromes c

Cytosol

Humans

Sesquiterpenes