Resveratrol analogue, (E)-N-(2-(4-methoxy styryl) phenyl) furan-2-carboxamide induces G2/M cell cycle arrest through the activation of p53-p21</span><span>\textsuperscript{CIP1/WAF1} in human colorectal HCT116 cells.

Cheah FK\textsuperscript{1}, Lecap XH\textsuperscript{2,3}, Thomas NF\textsuperscript{4}, Chin HK\textsuperscript{4}, Ariffin A\textsuperscript{4}, Awang K\textsuperscript{4,5}.

\textsuperscript{a} Author information

Abstract

Resveratrol, a naturally occurring polyphenolic antioxidant, is a potential chemoprophylactic agent for various cancers, including colorectal cancer. Although emerging evidence continually suggests that a number of resveratrol derivatives may be better cancer chemopreventive candidates than resveratrol, studies on the mechanism of action of these derivatives are limited. This is the first study which investigates the mechanism underlying the cytotoxic effect of a synthesized resveratrol analogue, (E)-N-(2-(4-methoxy styryl) phenyl) furan-2-carboxamide (CS) on colorectal cancer. Previously, our group reported a series of synthesized resveratrol analogues, which showed cytotoxicity against a panel of cancer cell lines, in particular on colon cancer cells. In this study, we further discovered that CS also exerts a potent suppressive effect on HCT116 colorectal cancer cells. In contrast, normal colon cells (CCD-112 Con) were not sensitive to CS up to 72 h post treatment. CS caused cytotoxicity in HCT116 cells through several apoptotic events including activation of the Fas death receptor, FADD, caspase 8, caspase 3, caspase 9, and cleaved PARP, which occurred alongside cell cycle arrest from the up-regulation of p53 and p21. The results show that CS causes apoptosis via the activation of an extrinsic pathway leading to caspase activation and cell cycle arrest from activated p53. These findings suggest that CS may be a potential candidate for development as an anti-tumor agent in the future.

KEYWORDS: Apoptosis; Carboxamide stilbene; Colorectal cancer; p21; p53

PMID: 29754265 DOI: 10.1007/s10495-016-1457-8