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Cytotoxic, Antiproliferative and Apoptosis-inducing Activity of L-Amino Acid Oxidase from Malaysian Calloselasma rhodostoma on Human Colon Cancer Cells


DOI: 10.1111/bcpt.13060

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Abstract

The aim of this study was to investigate the cytotoxic, antiproliferative activity and the induction of apoptosis by L-amino acid oxidase isolated from Calloselasma rhodostoma crude venom (CR-LAAO) on human colon cancer cells. CR-LAAO was purified using three chromatographic steps: molecular exclusion using G-50 gel filtration resin, ion-exchange by MonoQ column and desalted on a G25 column. The purity and identity of the isolated CR-LAAO was confirmed by SDS-PAGE and LC-MS/MS. CR-LAAO demonstrated time- and dose-dependent cytotoxic activity on SW480 (primary human colon cancer cells) and SW620 (metastatic human colon cancer cells) with an EC50 values of 6 μg/ml and 7 μg/ml at 48 hr, respectively. Quantification of apoptotic cells based on morphological features demonstrated significant increase in apoptotic cell population in both SW480 and SW620 cells which peaked at 48 hr. Significant increase in caspase-3 activity and reduction in Bcl-2 levels were demonstrated following CR-LAAO treatment. These data provide evidence on the potential anticancer activity of CR-LAAO from the venom of C. rhodostoma for therapeutic intervention of human colon cancer. © 2018 Nordic Association for the Publication of BCPT (former Nordic Pharmacological Society)

Funding details

FRGS/2/2014/SKK01/MUSM/01/1

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Publisher: Blackwell Publishing Ltd

ISSN: 17427835
CODEN: BCPTB
PubMed ID: 29908095
Language of Original Document: English
Abbreviated Source Title: Basic Clin. Pharmacol. Toxicol.
2-s2.0-85054610306
Document Type: Article
Publication Stage: Final
Source: Scopus