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

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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)

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