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Induction of apoptosisin human colon cancer cells by isorhamnetin glycosides from *Opuntia ficus-indica*

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Induction of apoptosis in human colon cancer cells by isorhamnetin glycosides from Opuntia ficus-indica: The aim of this investigation was to study how different glycosilation patterns of isorhamnetin derived from Opuntia ficus-indica affect their potential as a natural chemotherapeutic compounds. Isorhamnetin glycosideswere isolated by semi-preparative chromatography and identified with LC/MSD TOF and were chosen by their abundance in O. ficus-indica. It has already been reported that the isorhamnetin aglycone induced caspase dependent apoptosis on cancerous lung cells. On the other hand, it has been established that biological activities of flavonoids differ between aglycones and glycosides, and that monosaccharides type, number and position also exert an important effect. Therefore, in this study we tested four isorhamnetin glycosides to validate the apoptotic effect on colon cancer cellsusing annexin V and propidium iodide staining for flow cytometry. Significant differences between glycosides were evidentin a dose-dependent manner and the greatest induction of apoptosis was observed for isorhamnetin-3-O-glucosyl-pentosideat 100 µg/mL. Afterwards, mitochondrial membrane potential and reactive oxygen species (ROS)were determined via tetramethylrhodamine ethyl ester (TMRE) and 2,7-dichlorofluorescin diacetate (DCFDA), respectively. It was found that the highest membrane potential loss was generated by the same isorhamnetin glycoside with the strongest apoptotic effect while isorhamnetin-3-O-glucosyl-rhamnsoyl-rhamnoside and isorhamnetin showed the lowest. In contrast with this, the highest ROS concentration was obtained with isorhamnetin. Results demonstrated that differences in the profile of sugars moieties of isorhmanetin affected apoptosis induction.

Biography

Annia Hernandez–Reyes is currently studying her masters in Biotechnology at Instituto Tecnológico y de Estudios Superiores de Monterrey in Monterrey. She majored in Biotechnology Engineering.

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