Original Article

In vitro and in silico anticancer evaluation of a medicinal mushroom, *Ganoderma neo-japonicum* Imazeki, against human colonic carcinoma cells

Meng Fei Lau, Kek-Heng Chua, Vithunayary Sabaragamuwa, Umah Rani Kuppusamy


Abstract

*Ganoderma neo-japonicum* is a well-known medicinal mushroom in Asian countries. However, scientific validations on its curative activities are confined to cirrhosis and diabetes. In this study, the anticancer properties of *G. neo-japonicum* were evaluated using cellular and computational models. The ethanolic extract (EtOH) with a promising inhibitory effect was fractionated into four different fractions: hexane (Hex), chloroform (Chl), butanol (Btn), and aqueous (Aq). The active fractions were then subjected to cell apoptosis assessment and phytochemical profiling. Molecular docking was conducted to elucidate the affinity of selected constituents towards antiapoptotic Bcl-2 protein. The butanol fraction showed the highest antioxidant activities as well as total phenolic content. Both hexane and chloroform fractions exerted a potent cytotoxic effect on colonic carcinoma cells through the induction of apoptosis. Phytochemical analysis revealed that the chloroform fraction is terpenoid enriched whereas the hexane fraction comprises predominantly sterol constituents. Stigmasterol and 1,25-dihydroxyvitamin D3 3-glycoside were demonstrated to have a high affinity towards Bcl-2 protein. Overall, *G. neo-japonicum* can be considered as a compelling therapeutic candidate for cancer treatment.