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In Vitro Anti-proliferative and Anti-invasive Effect of Trametes Versicolor and Grifola Frondosa Extracts in Colon Cancer Cells

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Colorectal cancer (CRC) is one of the leading causes of cancer-associated death worldwide and novel and less aggressive therapies are needed to better contend with this disease. Mushrooms have been used for medicinal purposes because of their properties to improve disease treatment outcomes. Polysaccharide-rich extracts obtained from certain medicinal mushroom species have long shown antitumoral effects in different experimental models. Those effects were mainly attributed to a stimulation of the immune response against cancer cells. However, recent evidence suggested a direct antitumoral effect in cancer cells, independently of the immune system. In the present study we developed polysaccharide-rich extracts from *Grifola frondosa* (GF) and *Trametes versicolor* (TV) fruit bodies and aim to evaluate their anticancer effects in human colon cancer. Strong evidences for the antiproliferative action has been reported, however, its role against cell migration and invasiveness in colorectal cancer cells as well as its underlying mechanism of action is unknown. Our results showed that both GF and TV extracts (10 µg/ml) did inhibit human colon cell proliferation while slightly effect was detected in cytotoxicity at the indicated concentration. Furthermore, both fungal extracts significantly inhibited oncogenic potential, cell migration and invasion. In addition, both extracts could partially revert the epithelial-to-mesenchymal transition, accompanied by an increased expression of the epithelial marker E-cadherin. Moreover, it was detected a decrease enzyme activity of MMP-2, a crucial metalloproteinase important for the degradation of the extracellular matrix, a key event for invasion and metastasis. Finally, the combination of 5-fluorouracil, one of the most widely used agents for colorectal cancer, with both polysaccharide rich extracts increase cell cytotoxicity further supporting the potential clinical application for these fungal extracts in adjuvant chemotherapy in colon cancer.

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