1. **The popular vegetable asparagus’s surprising pro-tumor effect on pancreatic cancer**

**Global Integrative Oncology: Use in Cancer Treatment & Patient Management**

**Background**: Pancreatic cancer is the most lethal digestive cancer and the fourth overall cause of cancer death in the US. Asparagus, a widely consumed savory vegetable, is a rich source of antioxidants, saponins, vitamins, and minerals. Traditionally it has been used as a diuretic and laxative agent. In fact, it has been shown that asparagus contains many benefits such as anti-infectious and anti-diabetic properties. In recent years, it has been shown that asparagus has anti-cancer effects on endometrial adenocarcinoma, prostate cancer, breast cancer, and colon cancer. In pancreatic cancer, it has been shown to have an anti-cancer effect on the KLM1-R cell line. However, little is known about its role in the MDAPanc-28 pancreatic cancer cell line. This study was designed to investigate if asparagus extract (AE) has any effect on the growth of MDAPanc-28 pancreatic cancer cells and elucidate possible molecular mechanisms behind it.

**Methods**: Clonogenic survival assay, proliferation, and caspase-3 activity kits were used to evaluate the effects of AE on cell survival, proliferation, and apoptosis of a widely used pancreatic cancer cell line, MDAPanc-28. We further investigated the possible molecular mechanisms by using RT-PCR.

**Results**: The percentage of colonies and the OD value of MDAPanc-28 cells were all surprisingly increased when treated with AE. The relative caspase-3 activity in cancer cells decreased when treated with AE. The pro-proliferative effect of AE on MDAPanc-28 cells correlated with downregulation of anti-proliferative molecules P21 and P53. The anti-apoptotic effect of AE correlated with downregulation of pro-apoptotic molecule Fas.

**Conclusions**: AE exhibits a pro-tumor effect in MDAPanc-28 pancreatic cancer cells by downregulation of P21, P53, and Fas. Such a study might be helpful when managing patients with pancreatic cancer.

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