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Effect of Germinated Soy Protein on the Growth of HeLa Cervical Cancer Cells in Female Athymic Mice

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Abstract

Previous studies showed that germination could improve the antiproliferative effect of soy protein on cervical cancer cells and that a peptide fraction (MAPF) from germinated soybeans decreases the expression of PTTG1 and TOP2A (2 genes considered as therapeutic targets) causing apoptosis of cancer cells. The aim of this work was to study the effect of feeding germinated soybean protein diets on the tumor growth in nude mice inoculated with cervical cancer cells and identify the bioactive component. Mice were randomly assigned to 1 of the 6 dietary groups based in AIN-93G formulation with 6 protein sources: casein, ungerminated soy protein (SP), and SP from 2 and 6 days of germination, with and without ethanol-soluble phytochemicals (ESPC). Compared with casein-fed controls, the tumor volumes after 5 wk were reduced by 44.6% by ungerminated SP, 98.9% by 2-day-germinated SP, 97.7% by 2-day-germinated SP without ESPC, 94.7% by 6-day-germinated SP, and 92.7% by 6-day-germinated SP without ESPC ($P < 0.05$). Liquid chromatography coupled with tandem mass spectrometry analysis of MAPF showed that the bioactive peptide might be the leginsulin, a peptide involved in signal transduction of soybean cells. Germination is a simple procedure that could help to increase the anticancer activity of soy protein probably through generation of biologically active peptides.

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