

Glucosinolates and their effect against colon cells cancer for functional food formulation.

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This work is part of the Food NET project (<http://www.food-net.it/>) aimed at improving nutrition lifestyle of senior people (over-65) through the development of new plant-based ingredients with high added value and nutraceutical properties. In a bioprospecting view, the project is focused on the analyses of agro-food waste for extraction of phytocomplexes that will be tested for their biological activity *in vitro* and later for their effect on human body. According to this, a superior plant *Camelina sativa*, an oilseed crop from the *Brassicaceae* family was used. We revalorised the solid residue obtained from the seeds after oil extraction: the press-cake. Recently press-cakes have become an attractive source for their glucosinolates (GLs) content due to their anticarcinogenic properties.

In order to study the effect of these molecules against colon cells cancer we performed a protocol of extraction and purification. Two different extraction strategies (aqueous and solvent extractions) were developed, followed by a purification phase through Solid Phase Extraction (SPE) and quantification with HPLC analysis. Three different GLs from *C. sativa* were found: glucoarabinin, glucocamelinin and homoglucoamelinin. NMR analysis confirm that GLs were the most abundant molecules, with small traces of unknown residues. The aqueous extraction reported lower yields than the methanolic extract, therefore methanolic extract was chosen to test the cell viability by MTT tests on colon cell lines (tumor lines: Caco2 and E705; healthy line CCD841). After treatment with high concentrations of extract (800 µg/mL), a 40% decrease in vitality was shown in Caco2 cell line and 50% in the E705 cell line. No significant difference is found in the CCD841 healthy line compared to the untreated control at the same concentration. Further investigations in molecular mechanisms triggered by these stress events (glutathione role) may contribute to understanding the action mechanism of the molecules in exam.

According to the aim of the project these preliminary results are promising for future food applications since no toxic effect against healthy cells line was showed, only against cancer ones. Therefore, this may suggest that *Camelina sativa* glucosinolates extract can be used as an integration in colon cancer treatment.

