News

Spanish researchers find new anti-cancer compounds in extra-virgin olive oil

[Date: 2008-12-18]

Researchers in Spain have discovered components of extra-virgin olive oil that are protective against both HER2-positive and HER2-negative breast cancers. Their findings, which have implications for the design of new anti-breast-cancer drugs, have been published in the journal BMC cancer.

Extra-virgin olive oil, a major component of the Mediterranean diet, is unique among vegetable oils in that it is relatively unprocessed and therefore retains a high level of polyphenols (common substances in plants). Previous studies have shown beneficial effects of oleic acid and one phenolic compound against certain breast cancers.

Dr Javier Menendez of the Catalan Institute of Oncology and Dr Antonio Segura-Carretero from the University of Granada led a study investigating the effects of other phenolic compounds found in extra-virgin olive oil on human breast-cancer cells. Specifically, they looked at the effect of these substances on HER2, one of the most commonly analysed genes in human cancer studies.

HER2 plays a pivotal role in transforming normal genes into cancerous ones, creating tumours and spreading the disease. According to the study, the gene is abundant in between 20% and 30% of invasive breast cancers and is associated with 'unfavourable prognosis, shorter relapse time and decreased overall survival.' The anti-cancer action of olive oil components, therefore, largely depends on their ability to suppress the expression of HER2.

The researchers separated the oil into fractions and tested the effects of each against breast cancer cells in the laboratory. They found that all of the fractions containing the major extra-virgin-olive-oil polyphenols (e.g. lignans, also found in flax seed, and secoiridoids, also found in jasmine) efficiently inhibited HER2.

'Our findings reveal for the first time that all the major complex phenols present in extra-virgin olive oil drastically suppress over-expression of the cancer gene HER2 in human breast cancer cells,' said Dr Menendez.

It may be too soon, however, to translate these results into dietary advice. The actions of extra-virgin-olive-oil compounds such as secoiridoids and lignans 'should be carefully addressed in animal models and human pilot studies,' the authors caution. The active phytochemicals effectively killed off tumour cells in culture, but only at concentrations that are unlikely to be achieved in real life by consuming olive oil.

The findings provide new insights into the mechanisms by which polyphenol-rich extra-virgin olive oil might contribute to lowering the risk for breast cancer. 'These findings, together with the fact that humans have safely been ingesting significant amounts of lignans and secoiridoids as long as they have been consuming olives and extra-virgin oil, strongly suggest that these polyphenols might provide an excellent and safe platform for the design of new anti breast-cancer drugs,' the study concludes.

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Data Source Provider: BMC Cancer; Biomed Central
Document Reference: Menendez J.A., et al. (2008) Anti-HER2 (erbB-2) oncogene effects of phenolic compounds directly isolated from commercial extra-virgin olive oil. BMC Cancer. Published online 17 December; DOI:
Subject Index: Life Sciences; Medicine, Health; Scientific Research

RCN: 30265