

Olive oil: new anti-tumoural properties

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Olive oil is the only source of fat that contains phenolic compounds noted for several biological activities.

A study performed in our laboratory showed that some of these phenolic biochemical compounds could prevent the development of cancer by blocking the formation of new blood vessels in the tumours. This is another extraordinary property for this outstanding food.

MEDITERRANEAN OIL

Olive oil is an absolutely essential ingredient in the cuisine of the countries which border the Mediterranean sea. More than simply being known for its unique taste, this oil is distinguished from other oils by the numerous positive effects that it has on health, in particular regarding the risk of cardiovascular disease. This protective effect is in large part due to the high levels in this oil of oleic acid, a mono-unsaturated fat which affects the levels of good and bad cholesterol, and thus decreases damage to the walls of blood vessels and also reduces the formation of clots which can lead to strokes as well as to heart attacks.

Another unique feature of olive oil is its content of phenolic compounds such as tyrosol, hydroxytyrosol, oleuropein and taxifolin, molecules which possess strong antioxidant properties (similar to vitamin E). These antioxidants are believed to participate in the positive effects of olive oil on health, because studies have shown that extra-virgin olive oil, rich in phenolic compounds, has a much greater positive effect on the levels of blood cholesterol than do olive oils which contain low levels.

ANTICANCER OIL

Beyond its cardioprotective role, several observations have given reason to believe that regular consumption of olive oil can contribute to the prevention of cancer. Studies performed with cancer cells derived from human tumours indicated that at least two phenolic compounds present in large quantities in olive oil, hydroxytyrosol and oleuropein, have the ability to interfere with the growth of several types of cancer, notably breast and colon cancer. Related to this, one very large study which was recently performed with more than 300,000 subjects showed that people who adhere to a Mediterranean-style diet, in which olive oil has a predominant position, had 15% less risk of developing cancer⁽¹⁾.

CUT THE CANCER'S NUTRITION

The research work performed in our laboratory over the past few years has shown that several phenolic compounds present in plant-based foods can have an anticancer effect by blocking the formation of new blood vessels in tumours, a phenomenon called angiogenesis.



To examine whether the compounds present in olive oil can exercise similar effects, the scientists in our laboratory have examined their effects on the activation of the protein VEGFR-2, a receptor which is present on the surface of the cells of blood vessels and which is absolutely essential to angiogenesis⁽²⁾. It was observed that two phenolic compounds from olive oil, hydroxytyrosol and taxifolin, strongly inhibited the activation of this receptor, an effect which resulted in a significant reduction in new blood vessels. Since all cancers are absolutely dependent on oxygen and nutrients which are supplied by these blood vessels, one could then consider the phenolic compounds in olive oil as preventive agents on the frontline, capable of braking the development of a wide range of cancers.

VIRGIN OR EXTRA-VIRGIN

These observations suggest that the simple fact of using olive oil as the principal source of fats/oil could contribute to preventing cancer. A very large variety of these oils are available on the shelves of the supermarket, but the most important amongst them are honored with the titles of virgin oil and extra-virgin oil, reflecting their superior taste as well as their effects on health. These oils are prepared by using methods of mechanical extraction under cold conditions, which preserves the taste, aroma, vitamins and particularly the antioxidants that are present in the olives when they are harvested. On the other hand, when the bottle of oil carries only the title "olive oil", then it is an oil of inferior quality, because the antioxidant molecules which are naturally present in the olive have been, for the most part, eliminated during the industrial refining of the oil.

⁽¹⁾ Mitrou PN et al. Mediterranean dietary pattern and prediction of all-cause mortality in a US population: results from the NIH-AARP Diet and Health Study. *Arch. Intern. Med.* 2007; 167:2461-2468.

⁽²⁾ Lamy S et al. Olive oil compounds inhibit vascular endothelial growth factor receptor-2 phosphorylation. *Exp. Cell. Res.* 2014;322:89-98.