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## Antiproliferative effect of main dietary phytosterols and/or β-cryptoxanthin in human colon cancer Caco-2 cells through cytosolic Ca<sup>2+</sup> - and oxidative stress-induced apoptosis

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**Scope:** Phytochemicals such as  $\beta$ -cryptoxanthin ( $\beta$ -Cx) and phytosterols (Ps) have been known for possessing beneficial effects related to bone health and cholesterol disorders, respectively. More recently, these bioactive compounds have gained attention for their potential role against different types of cancer, including colon cancer. However, their combined action has not been reported so far.

**Methods and results:** Human colon cancer Caco-2 cells were treated 24 h with  $\beta$ -Cx and/or major dietary Ps ( $\beta$ -sitosterol, campesterol and stigmasterol), alone or in combination, at concentrations compatible with physiological human serum levels. A decrease in cell viability due to apoptosis (rise in sub-G1 population and exposure of membrane phosphatidylserine) was accompanied with dephosphorylation of BAD, mitochondrial depolarization and caspase 3-dependent PARP cleavage, with intracellular Ca<sup>2+</sup> influx and increase of ROS levels as initial triggers.

**Conclusion:** Ps and  $\beta$ -Cx, alone or in combination have shown anti-proliferative activity against human colon adenocarcinoma Caco-2 cells through the mitochondrial pathway of apoptosis. No additive or synergistic effects have been observed. It is stressed the importance of bioactivity-guided assays with mixtures of dietary compounds to determine their eventual interactions in the food context.

## Biography

Antonio Cilla obtained his PhD in Food Science in 2010 at the University of Valencia. He performed predoctoral research stays in CEBAS-CSIC (Murcia-Spain) with Dr. Francisco Tomas-Barberan and Juan Carlos Espin (2007) and in ICTAN-CSIC (Madrid-Spain) with Dr. Laura Bravo (2009), and a postdoctoral stay in STEBICEF lab (Palermo-Italy) with Dr. Maria Antonia Livrea and Luisa Tesoriere (2014). He is now Senior Research Technician at the University of Valencia and Assistant Professor of Nutrition at the University Cardenal Herrera-CEU. He has authored 22 journal manuscripts, 7 book chapters and a number of conference publications in Food Science and Nutrition area. He is an active reviewer and editorial board member for a number of prestigious international journals.

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