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**1: Nutrition and Basic Science**  
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**Session Introduction**

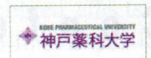
**Title: Antiproliferative effect of main dietary phytosterols and/or  $\beta$ -cryptoxanthin in human colon cancer Caco-2 cells through cytosolic  $Ca^{2+}$  - and oxidative stress-induced apoptosis**

Antonio Cilla, University of Valencia, Spain



**Title: Recent advances in Vitamin K metabolism**

Toshio Okano, Kobe Pharmaceutical University, Japan



**Title: Grape juice: Its compounds and health benefits**

Caroline Dani, Methodist University IPA, Brazil



**Title: The influence of magnesium deficiency on bone remodeling cells**

Marina M Belluci, University Estadual Paulista, Brazil



**Title: Antioxidant supplementation of subfertile men improves top blastocyst rate in couples undergoing IVF/ICSI**

Johannes Wogatzky, IVF Centers Prof Zech, Austria



**Title: Effect of a plant-based low-carbohydrate diet on body weight and blood lipids in Hyperlipidemic adults**

Julia M W Wong, St. Michael's Hospital, Canada



**Title: Computational discovery of bioactive compounds binding to hepatic HMGCR**

Horacio Pérez-Sánchez, Universidad Católica San Antonio de Murcia (UCAM), Spain



**Title: Baking and storage stability of Vitamin A in wheat flour**

Z O Apotiola, Lagos State Polytechnic, Nigeria



**Title: Improving food safety culture with a right communication**

Massimo Cecaro, Italian Medical Press Association, Italy



**Title: Cyanidin-3-O-glucoside ameliorates lipid and glucose accumulation in C57BL/6J mice via activation of PPAR- $\alpha$  and AMPK?**

Yaoyao Jia, Korea University, Republic of Korea



**Title: Should parenteral nutrition solutions for preterm infants be photoprotected?**

Sophie Laborie, Hôpital Femme Mere Enfant, France



**Title: The food origin of migraine as a result of Diamine Oxidase (DAO) enzyme deficiency**

Adriana Duelo, International Society of DAO Deficiency, Spain





**Antiproliferative effect of main dietary phytochemicals and/or  $\beta$ -cryptoxanthin in human colon cancer Caco-2 cells through cytosolic  $Ca^{2+}$  - and oxidative stress-induced apoptosis**

Antonio Cilla<sup>1</sup>, Alessandro Attanzio<sup>2</sup>, Luisa Tesoriere<sup>2</sup>, Maria A Livrea<sup>2</sup> and Reyes Barberá<sup>1</sup>

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**Scope:** Phytochemicals such as  $\beta$ -cryptoxanthin ( $\beta$ -Cx) and phytoosterols (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  $Ca^{2+}$  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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