Published Studies on French Grape Seed Extract

With Research Results Summary

1. **Oligomeric proanthocyanidins (OPCs) target cancer stem-like cells and suppress tumor organoid formation in colorectal cancer.**

   Proanthocyanidins are a heterogeneous group of flavan-3-ol or flavan-3,4-diol oligomers present in various fruits and vegetables. In particular, the smaller oligomeric subset of proanthocyanidins, termed the oligomeric proanthocyanidins (OPCs) appear to have potent anti-tumorigenic properties, but the underlying mechanisms for their effectiveness remain unclear. Herein, we utilized a series of *in vitro, in viv*o and patient-derived organoid approaches to systematically investigate the chemoprotective role of OPCs in colorectal cancer. OPCs exerted anti-tumorigenic effects through inhibition of cellular proliferation, and induced apoptosis and cell cycle arrest. Intriguingly, OPCs suppressed spheroid derived cancer stem-like cell formation and decreased the expression of intestinal cancer stem cell markers including LGR5, CD44 and CD133. Mechanistically, RNA-sequencing results confirmed that OPCs prominently interfered with developmental and self-renewal pathways and identified several self-renewal associated oncogenes targeted by OPCs. Furthermore, OPCs inhibited Hippo pathway through downregulation of its key transcriptional regulators, YAP and TAZ. Finally, we confirmed antitumorigenic effects of OPCs using multiple xenograft experiments and recapitulated its protective effects using patient-derived colorectal tumor organoids. Collectively, we have comprehensively assessed anti-tumorigenic properties of OPCs and our data throws light on previously unrecognized chemopreventive mechanisms of OPCs highlighting its therapeutic potential. [Toden S, Ravindranathan P, Gu J, Cardenas J, Yuchang M, Goel A. Oligomeric proanthocyanidins (OPCs) target cancer stem-like cells and suppress tumor organoid formation in colorectal cancer. *Sci Rep*. 2018;8(1):3335. Data also presented as: Toden S, Goel, A. Oligomeric proanthocyanidins inhibit Hippo-YAP pathway and prevent colorectal cancer stem cell formation. Poster presentation at the American Association for Cancer research (AACR) annual meeting. New Orleans, LA. April 16-20, 2016.]