Effect of Urolithin-A on Colorectal Cancer

Paladugu, Praharshasai

Urolithin-A is a metabolite synthesized by the gut microbiota from compounds of fruits such as pomegranates and raspberries. Its therapeutic effects have been documented in prostate cancer and other diseases. However, there has not been significant research conducted to determine its role as a therapeutic agent in colorectal cancer. Therefore, the purpose of this study was to determine the effects of Urolithin-A concentration on colorectal cancer. It was hypothesized that Urolithin-A would exert an anti-carcinogenic effect on the colorectal cancer cell lines. HCT-116, HT-29, SW-480, and SW-620 cells were exposed to varying concentrations of Urolithin-A (1 μM, 10 μM, 25 μM, 50 μM, 100 μM) for 48 hours, and an MTS assay was used to measure cell proliferation. Exposure of the cells to Urolithin-A significantly reduced cell proliferation in a dose-dependent manner, comparable to current chemopreventive drugs for colorectal cancer. To validify the results of the cell proliferation assay, an Annexin-V staining confirmed that Urolithin-A induced apoptosis in a dose-dependent manner on HCT-116 cells. The pathway by which Urolithin-A acts upon has not been determined. Increasing Urolithin-A concentration selectively decreased COX-2 expression in HCT-116 cells, which was documented via quantitative RT-PCR. These results therefore imply the importance of the COX-2 pathway in the chemopreventive role of Urolithin-A. Thus, this study has identified Urolithin-A as a potential chemopreventive agent for the treatment of colorectal cancer. Research needs to be conducted to further clarify the mechanism by which Urolithin-A induces apoptosis and determine the effects of Urolithin-A in an in vivo model.

Awards Won: