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Dietary supplementation with tart cherries for prevention of inflammation-associated colorectal cancer in mice

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Introduction

- Approx. 25% of deaths in Westernized countries are attributed to cancer.1
- The typical Western diet is associated with higher risks of colorectal cancer (CRC) compared to a balanced diet.
- Tart cherries are rich in anthocyanins (a group of antioxidants) and have many benefits including prevention of cancer and inflammatory diseases.

Methods

- Mice were fed a standard diet (AIN93G) or the total Western diet (TWD) with or without tart cherry supplementation (anthocyanin content at 188 ppm).
- Mice were injected with the carcinogen azoxymethane (AOM) and provided 1% dextran sodium sulfate (DSS) for 10 days.
- Mice from each dietary group were randomly selected to be necropsied at 1, 7, 9, and 15 weeks.
- Endpoints included food and water consumption, body weight and composition, feces, and tissues including the colon, liver, and cecum.

Results

Figure 1 – Colonic Inflammation and Mucosal Injury

Design of pre-clinical study to test efficacy of tart cherry supplementation in mouse model of inflammation-associated CRC.

Conclusions

- Consumption of TWD markedly enhanced colitis, inflammation, mucosal injury and tumor burden in comparison to AIN93G.
- Consumption of AIN93G with tart cherries reduced tumor incidence, but did not affect other parameters measured.
- Careful consideration must be given to the role of basal diet in dietary chemoprevention studies in rodents.

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Figure 2 – Cancer outcome

Data shown are incidence (percentage of mice with colon tumors) and the mean + SEM tumor burden (total volume of tumor tissue per mouse) (n = 21 to 24 mice per group). Bars with different letters are statistically different.