Impact of the Total Western Diet and supplementation on TNF, IBA1, and PAX5, biomarkers of inflammation

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Western Dietary Pattern

- Western dietary pattern
- Void of fiber and micronutrients
- Microbial community
- Inflammation
- Colorectal Cancer

Rich in bioactive anthocyanins

Polyphenols

Flavonoids

DNA damage and repair

Reduce the presence of inflammatory biomarkers in the body

Reduce risk against diseases such as colorectal cancer (CRC)
Hypotheses

Consumption of a TWD will increase the expression of inflammatory biomarkers in mouse tissues.

Supplementation with TC or BRB will decrease the presence of inflammatory biomarkers in mouse tissues.
Study Design

Pos/Neg Controls for all experiments
- AIN93G
- TWD

Dietary intervention with functional foods
- AIN93G
  - Tart Cherries
- TWD
  - Tart Cherries
  - Low BRB
  - High BRB

AOM – azoxymethane (10mg/kg)
DSS – dextran sodium sulfate @ 1% (w/v)
1. Tissue preparation
2. Antigen retrieval and blocking performed.
3. Addition of primary antibody.
4. Secondary antibody added followed by streptavidin HRP.
5. Addition of chromagen produces a red pigment.
6. Tissue is counterstained with hematoxylin.
Expected Results

Negative Control – Mouse Spleen (no primary antibody)

Positive Control – Mouse Spleen (1/200 primary IBA1 antibody)

Positive Control – Mouse Spleen (1/5000 primary PAX5 antibody)
Normal colon

β-catenin, normal colon

AOM/DSS; β-catenin, adenoma

Normal

GIN

AOM/DSS

GIN

AOM/DSS, Ki67

AOM/DSS; Ki67, adenoma

B-catenin → transcriptional factor in signaling
Ki67 → associated with cell proliferation
TBD

Increased presence of inflammatory and immune response biomarkers from mice fed a TWD.