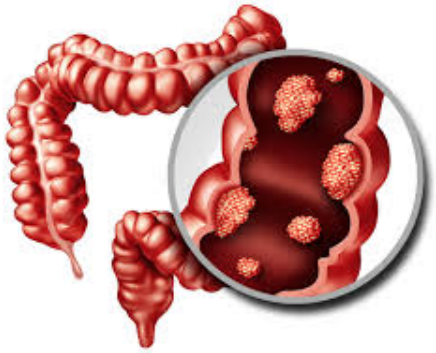
Impact of the introduction of black raspberries in a standard diet and a western-style diet on colitis and colorectal cancer risk in mice

Daphne Rodriguez, Korry Hintze, Abby Benninghoff

Colorectal Cancer (CAC)



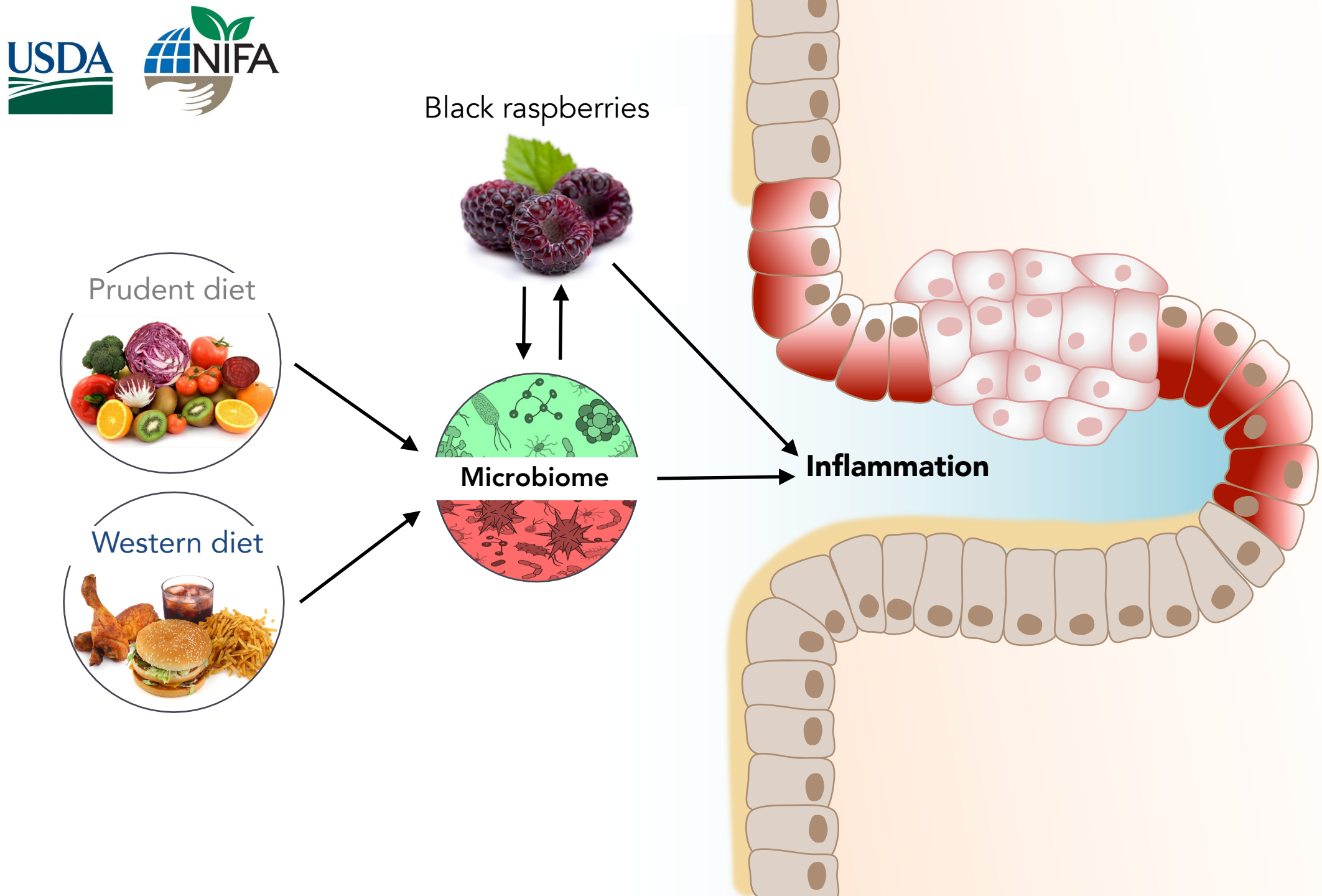
- 1. 4 Million people suffer from inflammatory bowel disease (IBD).
- IBD is the primary risk of CAC.
- CAC is predicted to be responsible for 51,000 deaths in 2019.

Key Statistics for Colorectal Cancer, The American Cancer Society

Inflammatory Bowel Disease

- Patients diagnosed with colitis and Crohn's Disease with prolonged colitis are at high risk.
- Overall health cost of more than $1.7 billion.
- Treatment include anti-inflammatory drugs.
- Intervention studies to reduce colonic inflammation could reduce the progression of CRC including diet.

American Cancer Society, Cancer facts and figures 2016


USDA
NIFA
Black raspberries
Prudent diet
Western diet
Microbiome
Inflammation

Total Western Diet for Rodents

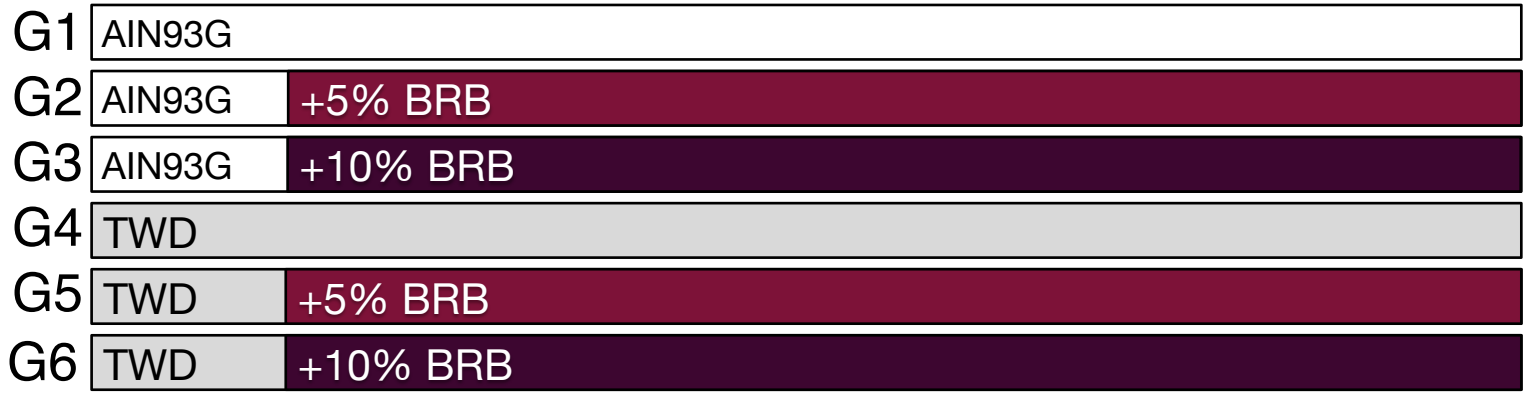
- Based on energy density macro and micro nutrient of the 50th percentile intakes reported in NHANES.
- Past studies showed a 2.8-fold increase in tumor outcome in mice fed the TWD.
- Reduce inflammation by supplementation of different foods such as black raspberries

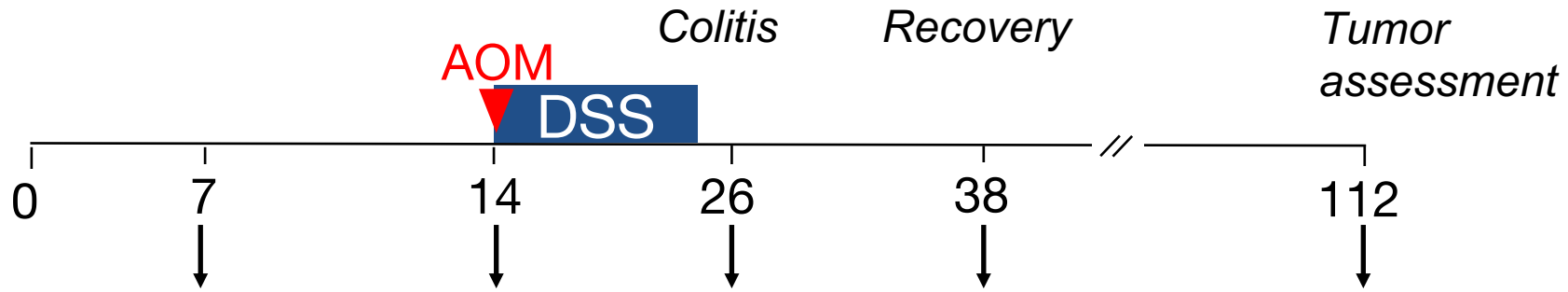
Ward, R.E., et al. Mol Nutr Food Res (2017) 61:4.

OBJECTIVE

The goal of this study was to compare the efficacy of dietary intervention with whole, freeze-dried black raspberries on colitis and colon tumorigenesis in mice consuming either a standard diet or a Western type diet that emulates typical U.S. nutrient intakes.

Study design



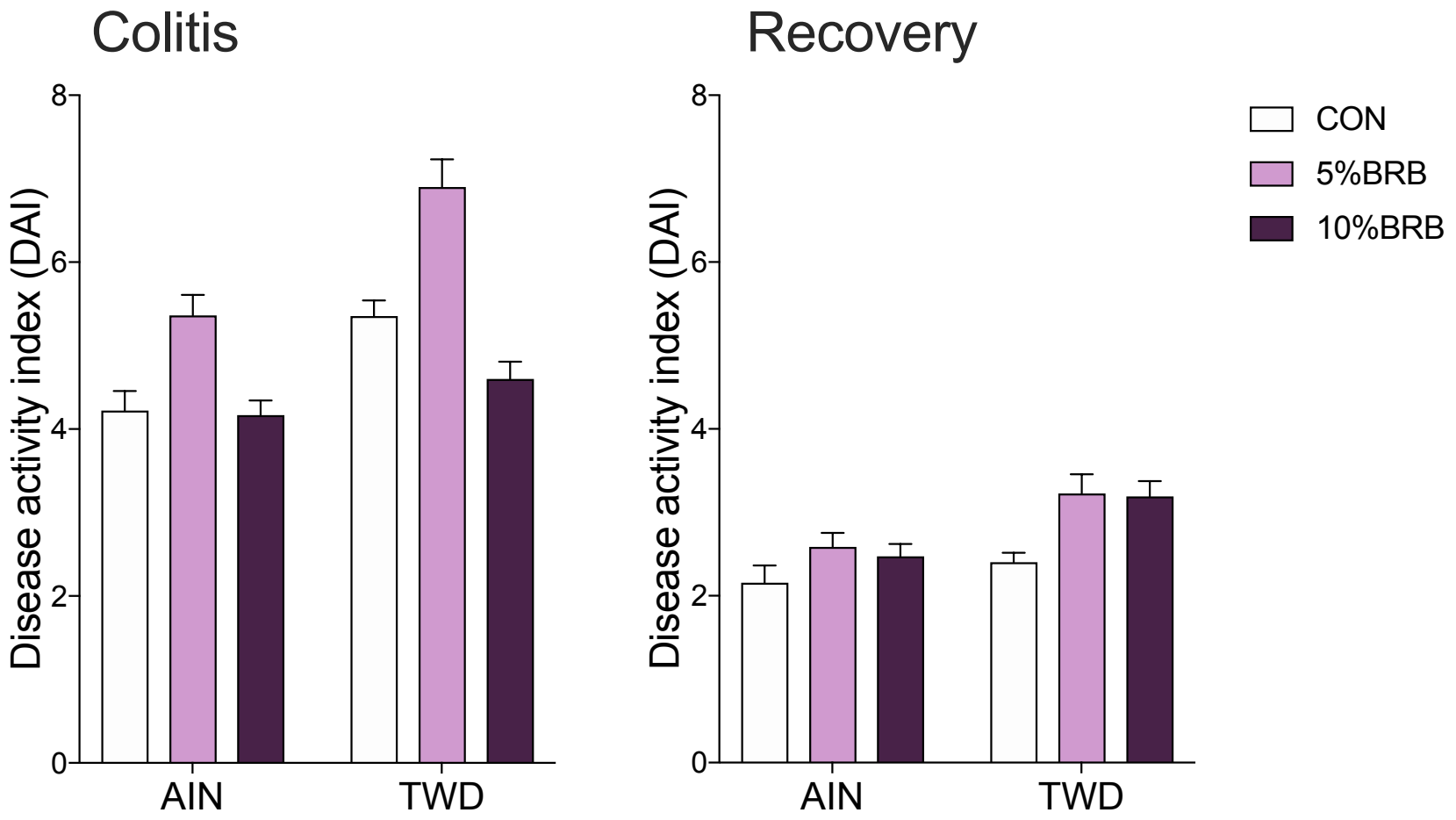


Endpoints (G1, G4)
- Mucosa (8 mice)
- Fecal microbiome (8 cages)

Endpoints (all groups)
- HP/IHC (6 mice)
- Mucosa (8 mice)
- Fecal microbiome (10 cages)

Endpoints (all groups)
- MRI (12 mice)
- HP/IHC (6 mice)
- Mucosa (8 mice)
- Fecal microbiome (8 cages)
- Tumor assessment (24 mice)

Early results – colitis symptoms

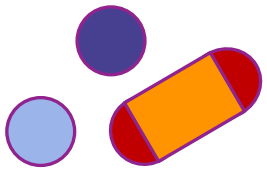


Statistical analysis pending curation of remaining data

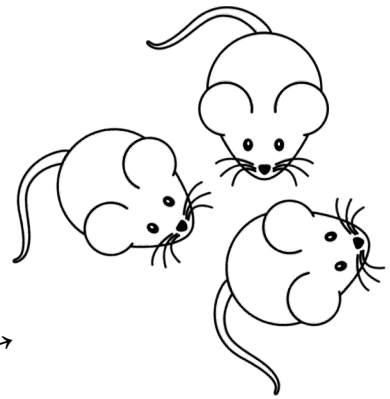
Ongoing Data Analysis

- Body weight gain
- Food intake
- Organ weights
- Tumor outcome
- Microbiome analysis
- Inflammatory Biomarkers
- Gene expression

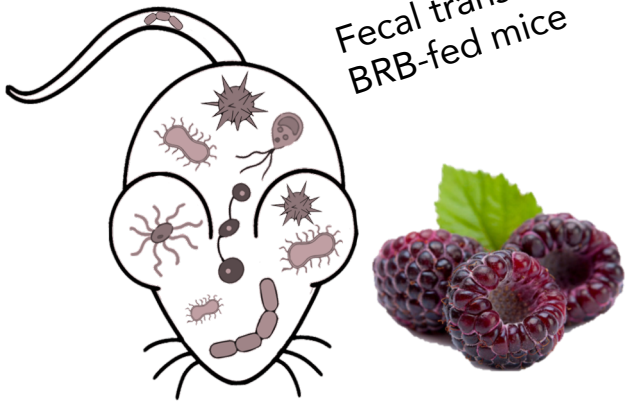
Future work



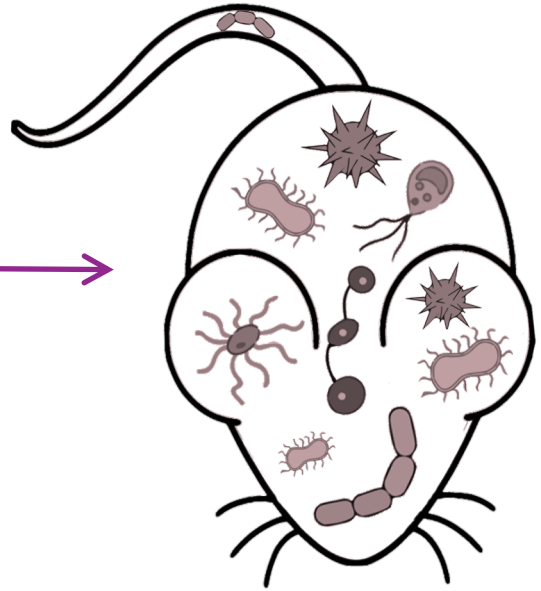
Antibiotics →



Fecal transfer from BRB-fed mice →



Mouse with BRB-conditioned gut microbiome



Is the protection by BRB against colitis conferred to recipient mice when the microbiome is transferred?

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