**BACKGROUND**

- Colon cancer affects men at an earlier age and higher rate compared to women
- The Pirc (polyposis in the rat colon) rat model recapitulates this sex disparity
- Orchidectomy significantly protects male Pirc rats from tumor development while replacement of testosterone through supplementation reverses the effect
- Complex gut microbiota modules disease susceptibility of familial colon cancer
- When male Pirc rats were co-housed, some had higher tumor burdens while others had lower tumor burdens

**HYPOTHESIS / OBJECTIVES**

The increased tumor burden in co-housed male rats is due to changes in the microbiome that is affected by differential levels of the stress hormone corticosterone

Female rats supplemented with DHT (dihydrotestosterone) would have a higher tumor burden mediated through changes in the microbiome

**METHODS**

Co-housing Study: 2 weeks 6 months

- Pre-housing
- Males
- Female and male pairs housed
- Fecal and serum samples collected

Ovariectomy Study: 1 month 6 months

- Pre-ovariectomy
- Females
- Ovariectomy
- Fecal and serum samples collected

Longitudinal characterization of the gut microbiota

- Extract and purify fecal DNA
- Amplify V3 region of microbial 16S rRNA gene via polymerase chain reaction
- Sequence 90-120,000 reads per sample using Illumina MiSeq platform
- Amine sequence data using database of 16S rRNA gene sequences

**CO-HOUSING RESULTS**

Microbiomes were not significantly different before co-housing

**LONGITUDINAL MICRBIOME COMPOSITION**

Co-housing results:

- Microbiomes were not significantly different before co-housing

**LONGITUDINAL MICRBIOME COMPOSITION**

Co-housing results:

- Microbiomes were not significantly different before co-housing

**Fecal vs Serum Corticosterone**

- Low tumor (10-15)
- High tumor (150-150)

**OVARIECTOMY RESULTS**

There are no significant microbiome changes at one month post ovariectomy

**CONCLUSIONS**

- Fecal corticosterone shows similar trends to serum samples
- Corticosterone levels did not correlate with tumor burdens in co-housed male Pirc rats
- The microbiome did significantly change over the 6 month investigation
- Certain bacteria positively or negatively correlate at early time points indicating their potential role in tumor development

**Ovariectomy Study**

- There are no significant microbiome changes at one month post ovariectomy
- The ovariectomy investigation is ongoing

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**REFERENCES**
