Longitudinal Investigation of the Fecal Microbiome in Healthy Dogs

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**Background**

- Most chemotherapy-induced gastrointestinal and hematologic side effects occur 3-4 days and 7 days post-treatment, respectively.
- Patients undergoing chemotherapy are at increased risk of sepsis due to damage of epithelial barrier, decreased white blood cells, and possibly dysbiosis.
- The affect of chemotherapy on the fecal microbiome of dogs is currently unknown, and to study this, we must establish the stability of the healthy dog microbiome over time.
- Studies in humans have shown that rectal swabs provide information similar to fecal samples for assessing the gut microbiome, but no such studies have been done in dogs.

**Methods**

Rectal Swab Collection Time

Entrance Survey

Day 0  Day 4  Day 7  Day 21

Exit Survey

Stool Sample Collection Times

**Results**

(A) Composition of Phyla in Fecal Samples vs Rectal Swabs

(B) Composition of OTUs in Fecal Samples vs Rectal Swabs

Figure 4. Stacked bar charts showing the composition of phyla (A) and OTUs (B) in rectal vs. fecal samples.

**Conclusions**

Rectal swabs reliably yielded poorer coverage than fecal samples and captured a different microbial diversity.

Rectal swabs contained higher percentages of Epsilonbacteraeota and Proteobacteria. The fecal microbiome collected on Day 0 was different than those of Days 4, 7, and 21, possibly due to rectal exams performed on Day 0 or storage.

The fecal microbiome was stable over Days 4, 7 and 21.

**Future Directions**

- This study will serve as the healthy control group in a similar study design for comparison with dogs undergoing chemotherapy treatments.
- These additional investigations will aim to associate symptoms and treatment response with microbiome characteristics.