

## **Project Summary**

### **John Hansen Research Grant 2023**

#### **Developing a novel synbiotic strategy with *Bacteroides ovatus* for intestinal graft-versus-host disease**

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In allogeneic hematopoietic stem cell transplantation (allo-HSCT), graft-versus-host disease (GVHD) continues to limit the success of allo-HSCT. The intestine is often targeted by GVHD and the intestinal microbiota is an important modulator of intestinal GVHD. It has been known that disrupted microbiota induce intestinal GVHD. Treatment strategies for disrupted microbiota-induced GVHD, however, have not been fully developed. Recently, our retrospective clinical analysis of intestinal GVHD patients showed that a history of use of carbapenems during allo-HSCT and microbiota disruption at the onset of intestinal GVHD were significantly associated with steroid treatment failure for GVHD whereas higher abundances of *Bacteroides ovatus* (*B. ovatus*) were significantly associated with improved treatment responses of GVHD. We have found that administration of *B. ovatus* significantly improved survival in a murine GVHD model. We hypothesize that *B. ovatus* regulates intestinal GVHD through its ability to degrade dietary polysaccharides. This application aims to establish novel treatment strategies for preventing intestinal GVHD using *B. ovatus* and specific dietary polysaccharides. *B. ovatus* is a novel beneficial bacterium in intestinal GVHD and not generally known as a probiotic thus far. The use of a single bacterial strain, *B. ovatus*, in combination with dietary polysaccharides for intestinal GVHD patients may prevent intestinal GVHD.