

OFFICIAL ABSTRACT and CERTIFICATION

The Effect of Diet on IBD Microbiomes

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Inflammatory bowel disease (IBD) affects 3.1 million people in the United States and costs the healthcare industry 15 billion dollars annually (CDC, 2019; Mehta, 2016). It is a chronic immune-mediated disease that affects the digestive tract. IBD has been shown to change the structure in the gut microbiome, the commensal bacteria of the gut, and is impacted by dietary treatments. However, it remained unknown how the microbiome type affected the impact of diet on inflammation. In this study, mice were colonized with IBD and non-IBD microbiomes and fed two experimental diets by the mentor. The tissue from the mice was prepared, digested, stained, and analyzed by flow cytometry to isolate inflammatory immune markers in the colon, small intestine, and mesenteric lymph node tissue. The results showed that the microbiome type (IBD or non-IBD) decreased the effectiveness of the diets because the predicted effects of the diets were not seen. These results explain why diets do not function with equal success for everyone due to the differences between their microbiomes. This research could be potentially applied to the creation of new treatments for IBD and other diseases that affect the microbiome. Future research will focus on the sub-diseases of IBD, Crohn's Disease, and Ulcerative Colitis, and how their microbiomes affect the diets. By researching this area further, knowledge can be gained toward treating not only IBD but all diseases that are linked to the microbiome.

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