Investigating the Effect of the Severity of Activity-Based Anorexia in Drosophila melanogaster on the Gut Microbiome

Crest, Peyton (School: Minnetonka High School)

Anorexia Nervosa (AN) is a psychiatric illness characterized by the deliberate restriction of caloric intake, which can result in a slowed metabolic rate, hyperactivity, and dysbiosis of the endocrine system and gut microbiota. In order to model the effects of AN, Activity Based Anorexia (ABA) is a bio-behavioral phenomenon used in model organisms. Previous research has examined the effect of ABA on the gut microbiome in model organisms, yet no research has examined how the severity of ABA affects the gut microbiome. In order to effectively model ABA, the caloric intake of D. melanogaster will be reduced by restricting the amount of yeast and exercise will be induced using a Power Tower, which utilizes geotaxis methods. The severity of ABA will be increased among randomly selected D. melanogaster by increased restriction of caloric intake and induced exercise. The gut microbiome will then be analyzed using 16s rRNA sequencing to determine how the severity of ABA influenced the composition of the gut microbiome in D. melanogaster. If the hypotheses are supported, further research will apply the findings to humans and aid in potential criteria for the diagnosis of the severity AN in humans.

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