Investigating the Potential for Vitamin D3 to Serve as a Therapeutic Against the Degenerative Effects of Diabetes Using Drosophila melanogaster as a Model Organism

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Type two Diabetes is an epidemic. Because there is no cure for diabetes and the current treatments can be expensive and inaccessible, exploration for more affordable management tools for the disease is needed. Found in many places like food, sunlight, and supplements, with more conclusive research, Vitamin D3 could serve this purpose. This experiment tests the potential for Vitamin D3 to serve as a potential management tool for T2 diabetes using the model organism Drosophila melanogaster. Wild-Type Drosophila melanogaster were sorted into three experimental medium groups per sex, Control (15% sucrose), High Sugar Diet (18% sucrose), and High Sugar Diet with Vitamin D3 supplementation (18% sucrose and a VD3 concentration of 0.50 mcg/mL The flies were tested for locomotor, retinal, and survival degeneration through negative geotaxis, positive phototaxis, and survivorship assays at the beginning, middle, and end of five days of feeding. Based on the testing, the effects of VD3 supplementation on the diabetic flies caused them to mirror the survivorship, light responsiveness, and locomotor ability of the control flies, while the purely HSD flies suffered degenerative effects. The significance of the assay results from a one-way ANOVA test forced the nulls for male negative geotaxis and both sexes' positive phototaxis data to be rejected, and alternatives were accepted. However, neither results for longevity nor female negative geotaxis assays were significant, and their nulls were accepted. More conclusive research is necessary to determine the application of Vitamin supplementation in cheaper and more accessible diabetes medication, but these results show potential for VD3 to serve as a more accessible tool to manage type two diabetes.

Awards Won:
Fourth Award of $500