CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
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Project Number
35681

Project Title
Effects of Vitamin B12 on C. elegans Strains: A Representation Concentration of Glucose in Women with Gestational Diabet

Abstract

Objectives/Goals
My mother was diagnosed with gestational diabetes and now is pre-diabetic. Elevated blood glucose with diabetes typically damages endothelial cells, nerve cells, and negatively impacts DNA synthesis. Vitamin B12 is known to help with the nervous system, the formation of blood, and support cell growth.
The purpose of my project is to simulate the conditions of gestational diabetes with diabetic mutated C. elegans to prove that Vitamin B12 helps improve the "health" of C. elegans.

Methods/Materials
1. Prepared age-synochronous worm population
2. Prepared nematode growth media with 4 different concentrations of glucose: 70 mg/dL (control), 95 mg/dL, 140 mg/dL, 180 mg/dL -- Total of 50 petri dishes, 25 for wild type and 25 for mutant C. elegans
3. Incubated for 24 hours for glucose to be absorbed by worm population
4. Added 2.8 mcg of Vitamin B12 to petri dishes
5. Recorded mortality, motility based on observations for all 50 plates

Results
1. Mortality declined -- The 7-day cumulative mortality for wild type C.elegans decreased by 13%, and that for the diabetic mutated worms decreased by 11%
2. Motility increased -- The average motility for wild type C.elegans increased by 25% and that for the diabetic mutated worms increased by 18%
3. Typically, I observed less improvement for both mortality decline and motility improvement for higher glucose concentration
4. Typically, improvement observed after 24-96 hours for mutants
5. Typically, improvement in mutants decreased after 96 hours

Conclusions/Discussion
The results proved my hypothesis that Vitamin B12 decreases mortality and increases motility of both wild type and mutant C. elegans. I conclude;
1. Vitamin B12 will have a positive impact on diabetics, both on lifespan and activity [limb movements].
2. Vitamin B12 may not be effective as soon as applied. The impact may take time because it takes time for body to absorb and process the vitamin.
3. Since the effect of vitamin B12 seems to wears off over time, it needs to be re-applied.
4. Healthy people show more improvement with Vitamin B12 than diabetics, as expected.

Summary Statement
Vitamin B12 can benefit diabetics as it decreases mortality and increases motility of diabetic mutated C. elegans, representing women with gestational diabetes.

Help Received
Used Schmahl Science Workshop lab under supervision of Dr. Sam Khalaf