Modeling the Effect of Hyperglycemia on the Fertility of Caenorhabditis elegans

Browne, Lyla (School: Governor's School at Innovation Park)
Ferrer , Raeanne (School: Governor's School at Innovation Park)
Moussavi, Layla (School: Governor's School at Innovation Park)

Diabetes, characterized by hyperglycemia, affects human fertility. The animal model Caenorhabditis elegans is used to research human diseases due to its molecular-level similarities and ethicality, and was used to model the effects of high glucose concentrations on fertility. C. elegans were transferred onto 15 experimental plates which were seeded with E. coli OP50 containing glucose concentrations in increasing increments of 4 mM from 16 mM to 32 mM, based off glucose levels in human diabetics. After 7 days of growth, the worms were placed into a bleach solution to count their eggs. Data collected partially supported the hypothesis, since a decrease in the number of eggs/worm was observed with a correlation value of -0.93, meaning there was a significant relationship between the egg count and increased concentrations of glucose. A linear decrease was observed in the egg counts (p-value < 0.01): the control (16 mM) had an average of 10.89 eggs/worm, 20 mM had 10.22, 24 mM had 9.44, 28 mM had 7.06, and 32 mM had 4.22. Since C. elegans is an animal model for humans, these results can be applied to diabetics, who display high, uncontrolled levels of blood sugar.