The Transgenerational Effects of the Synergy of Nicotine, Atomoxetine, and Buspirone on Egg Laying Habits, Gene Expression, and Oxidative Stress Levels in C. elegans

Owusu, Malcolm (School: American Heritage School)

Vaping runs rampant among adolescents, the so-called" vaping epidemic is a pertinent issue for today's youth. Vaping delivers high levels of nicotine into the body of our children. This can often lead to nicotine addiction in adolescents which comes with its own myriad of problems. Mainly withdrawal symptoms, a major withdrawal symptom is anxiety. Anxiety rates have spiked in adolescents due to the recent pandemic. Moreover, ADHD diagnosis rates are steadily increasing over the years as more awarneness is brought to it. Increasing rates of ADHD and anxiety among adolescents mean that more children are being medicated for these conditions. Atomoxetine and Buspirone are commonly prescribed to teens with ADHD and Anxiety respectively. The purpose of this experiment was to identify the synergistic effects of buspirone and atomoxetine on the already observed transgenerational effects of nicotine. In order to simulate the intake of nicotine and/or atomoxetine and buspirone in adolescents. The researcher used the egg laying, gene expression and oxidative stress levels of C. Elegans to collect data for the experiment. Homologous genes were chosen to ensure that results could be applied to humans. Age synchronized C. Elegans were placed on agar plates with varying drug concentrations. The eggs were then taken and placed onto NGM agar plates with no drugs and were grown to the L4 stage for assaying. The results showed that the drugs had transgenerational effects on gene expression and egg laying but not oxidative stress levels. These results can be applied to the child psychiatric industry to influence prescription choices, especially if it is known that the patient is vaping.

Awards Won:
American Psychological Association: Third Award of $500