

Siemens Competition

Math : Science : Technology

Regional Finalist

Name: Carly Crump

High School: Episcopal School of Jacksonville

Mentor: Dr. Rhoel Dinglasan

Project Title: *Proteomic Characterization of Mosquito Host Cell Glycoproteins During Dengue Virus Egress* (Biology; Microbiology)

Every year, over 2.5 billion people are at risk of dengue virus infection, killing 0.1% of the people infected. Currently, the mechanism by which dengue virus infects cells is unknown. It is speculated that the proteins on the surface of the virion are utilized during binding and transmission. These proteins have not been identified or characterized. It was proposed that DENV-2 incorporates proteins originating from the mosquito host cell before viral egress. To test this hypothesis, innovative methods, using Click-iT chemistry, created a label on significant proteins, which were then detected by performing SDS-PAGEs, a western blot, mass spectrometry and an immunofluorescent assay. From the gathered data, 97 PAA labeled proteins were identified and characterized on uninfected C6/36 cells, all of which may be involved in the transmission process. On the dengue virus samples, 564 proteins were discovered. The identified proteins were then connected, 28 of the 97 proteins were labeled as significant. Of those 28 proteins, 11 were shown to be significant, as they also appeared on the dengue virus. Experimentation is continuing, but the data gather at this point, indicate that the hypothesis is strongly supported— proteins bud off onto DENV-2 virions from the host cell.