

Team Number:

School Name: Monte del Sol Charter School

Area of Science: Microbiology

Project Title: MRSA and the Population

MRSA (methicillin-resistant *Staphylococcus aureus*) poses a serious health risk in our modern world. It is a strain of *Staph* that is resistant to many antibiotics and thus is hard to treat. Antibiotic resistance has developed as a result of multiple mutations arising in *Staph* populations as they interact with human use of antibiotics.

If an antibiotic that can successfully treat MRSA can be synthesized, then MRSA can effectively be eradicated. 90,000 Americans are affected by MRSA each year and about 22% of those infected die, many of which are children.

We plan to find the mutation rate of MRSA by using the mutation equation:

$$\mu = \frac{r_2}{N_2} - \frac{r_1}{N_1} / \ln(N_2 / N_1)$$

We will then plug it into NetLogo to model the rate of mutation and then extend this to simulate multiple mutations and their interaction with antibiotics, which causes this growing problem of antibiotic resistance in our world today.

Team Members

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