

Title – Genetic Evaluation of Methicillin Resistant *Staphylococcus aureus*

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Abstract

Staphylococcus aureus is a type of bacteria that is commonly found on human skin. It typically serves as a competitive inhibitor to numerous pathogens that may cause harm to the host. Through mutation and selective conditions, however, this bacteria can develop an active *mecA* gene leading to antibiotic resistance. This resistance can lead to serious infections that are difficult to treat. When *Staphylococcus aureus* develops a resistance to beta-lactams (such as methicillin and its derivatives) then it is referred to as Methicillin Resistant *Staphylococcus aureus* (MRSA). MRSA poses serious threats especially in clinical settings. Throughout this research project, we have submitted 40 known samples of MRSA to rigorous antibiotic testing. These tests have revealed that all the tested samples are susceptible to three specific antibiotics. This data shows a potential genetic cause for this susceptibility. To gather more information, each MRSA sample must be genetically analyzed through pulsed-field gel electrophoresis (PFGE) to produce a DNA fingerprint. After the PFGE was performed, select samples that show variance will be genetically sequenced along with a positive and negative control. This will allow for genetic comparisons between strains.

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