Confirming the presence of *Staphylococcus aureus* enterotoxin SEB from campus wide swabbing

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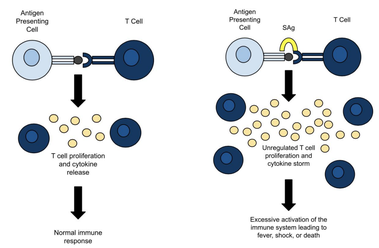
Abstract

Samples taken from the CSP community were previously isolated and characterized as *Staphylococcus aureus*. In this study, the DNA from those positive samples were purified through a genomic prep and ran through a polymerase chain reaction for the SEB toxin gene. A DNA gel electrophoresis was ran and imaged displaying the results.

Staphylococcus aureus

- *S. aureus* is a bacteria that is commonly found in 30% of adult noses.[2]
- It resides harmless until it enters the body system.
- *S. aureus* can cause a variety of skin infections as well as serious bloodstream infections, pneumonia, or bone infections.[1]
- The severity of *S. aureus* is attributed to its toxin production, specifically superantigens.
- Superantigens cause an unregulated activation of T cells leading to large amounts of inflammation and cytokine production.



Staphylococcal Enterotoxin B

- SEB is categorized as a category B select agent as it is extremely potent and can be used as a biological weapon.[2]
- It most commonly associated with toxin-mediated food-borne disease.
- SEB is highly resistant to denaturation, which allows it to remain intact in contaminated food, leading to potential food poisoning.[2]
- Other clinical manifestations include nonmenstrual toxic shock, atopic dermatitis, asthma, or nasal polyps.[2]
- The presence of SEB represents a potential health risk as there is currently no treatment for this toxin.[3] It is essential that further research investigates potential diagnosis and treatments.

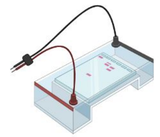
Low prevalence of SEB gene in tested *Staphylococcus aureus* isolates

Figure 1. DNA gel electrophoresis of *S. aureus* samples displaying the presence of the SEB gene. A PCR was ran for 8 samples with primers specific for SEB. The positive control was a sample previously genomically sequenced by the Minnesota Department of Health known to have the SEB gene. The negative control consisted of water. A DNA gel electrophoresis was ran and imaged using a SmartDoc station.

Methods

1. Genomic Prep
   -Extract DNA from sample
2. PCR
   -Amplify target SEB gene
   -Annealing temperature: 52.4°C

3. DNA Gel Electrophoresis
   -Separate amplified DNA based on size to visualize the presence of the SEB gene



Results

Strain	SEB Toxin
s0119	-
s0121	-
s0124	-
s0127	-
s0678	-
s0680	+
s0681	-
s0684	+

2/8
Positive for SEB individual samples

5/55
Positive for SEB class samples

Acknowledgements & References

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