TSST-1 & SEA superantigens are present in the same *Staphylococcus aureus* strains

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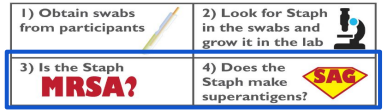
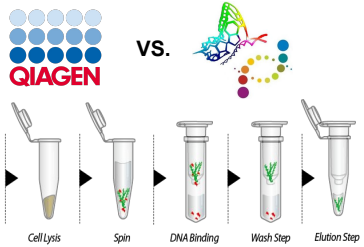
Abstract Isolates were previously classified as *Staphylococcus aureus* from a previous study. In this study *S. aureus* is tested for the presence of MRSA and for the presence of superantigens



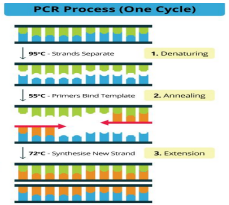
Methods

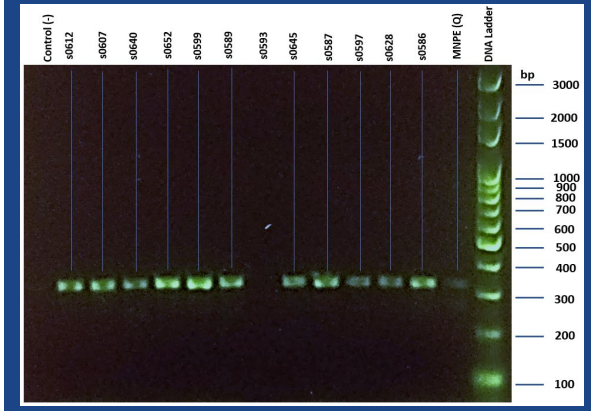
Kirby Bauer Assay: To detect antibiotic resistance of 12 strains using Mueller-Hinton plates and oxacillin discs. MSSA (-) and MRSA (+)

Genomic Prep Kits: Compared genomic prep kits, Qiagen's QIAamp DNA Mini Kit and DNAland's Geno Plus Genomic DNA Extraction Miniprep Kit on MNPE.



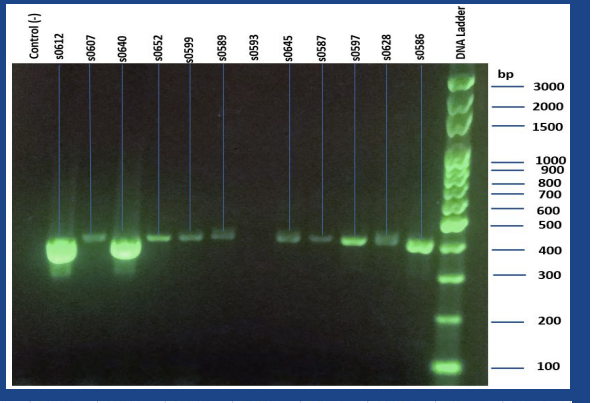
Polymerase Chain Reaction (PCR): Genomic preps were used and it's DNA was introduced to specific primers to amplify a specific DNA strain during PCR.





TSST-1 expected bp: 325

SEA expected bp: 425

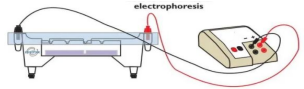


De Boer, M. L., Kum, W. W., Pang, L. T., & Chow, A. W. (1999). Co-production of staphylococcal enterotoxin A with toxic shock syndrome toxin-1 (TSST-1) enhances TSST-1 mediated mortality in a D-galactosamine sensitized mouse model of lethal shock. *Microbial pathogenesis*, *27*(2), 61–70. https://doi.org/10.1006/mpat.1999.0282

	s0586	s0628	s0597	s0587	s0645	s0593	s0589	s0599	s0652	s0640	s0607	s0612
SEL-X		+	+		+	+		+	+	+	+	+
SEA	+	+	+	+	+		+	+	+	+	+	+
TSST-1	+	+	+	+	+		+	+	+	+	+	+

Results

Gel Electrophoresis: For each run twelve *S. aureus* genomic preps from the Qiagen kit were tested for the presence or absences of superantigens. 2% agarose gel was used for each run.

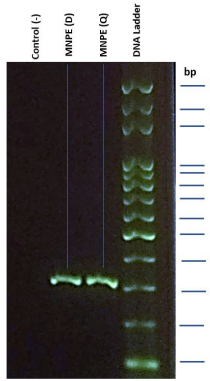


Kirby Bauer Assay:

Strain	S0586	S0628	S0597	S0587	S0645	S0593	S0589	S0599	S0652	S0640	S0607	S0612
MSSA (-) / MRSA (+)	–	–	–	–	–	–	–	–	–	–	–	+

Nanodrop: The Qiagen and DNAland genomic prep kits showed lots of molecules from the wash buffers from each kit at 230nm. Concluded that the Qiagen Kit was better because at A260/A280 it was the closest to 2.

	A260/A280	A260/A230
Qiagen	1.35	0.77
DNAland	0.06	-0.1



Qiagen:

- Is a blue chip company (global business).
- Extra incubation at 95°C was required
- Two solutions were used to wash the columns out

DNALand:

- Smaller business
- Focuses on creating affordable reagents and kits for research
- Requires one solution for washing out columns

Superantigens present in *S. aureus* strains: 8/ 12 *S. aureus* strains (s0628, s0597, s0645, s0599, s0652, s0640, s0607, s0612) all contained the SEL-X, SEA, and TSST-1 superantigen.
SEA and TSST-1 are positive within the same *S. aureus* strains,indicating a possible partnership between the two superantigens..

Conclusion

The expected bp for both TSST-1 and SEA showed 11/12 bands for there superantigen. Indicating that the superantigen is present within a *S..aureus* strain. Within the results the negative control rules out false positive and contamination.

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