

Characterization of Nasal Isolates of *Staphylococcus aureus* from Concordia's Campus

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Introduction

- Collected 1,632 nasal swabs over the past 5 years in an attempt to characterize nasal isolates of *Staphylococcus aureus* from healthy individuals
- 1,407 nasal swabs processed, with 371 characterized as *S. aureus*
- 26.4% Carriage Rate
- **Current study is to characterize toxin production of *S. aureus* isolates.**
- ***S. aureus*' infectious capacity and its success as a pathogen is related to expression of virulence factors, among which is the production of toxins. For this reason, a better understanding of *S. aureus* toxins is needed to enable the development of new strategies to reduce their production and consequently improve therapeutic approaches.**

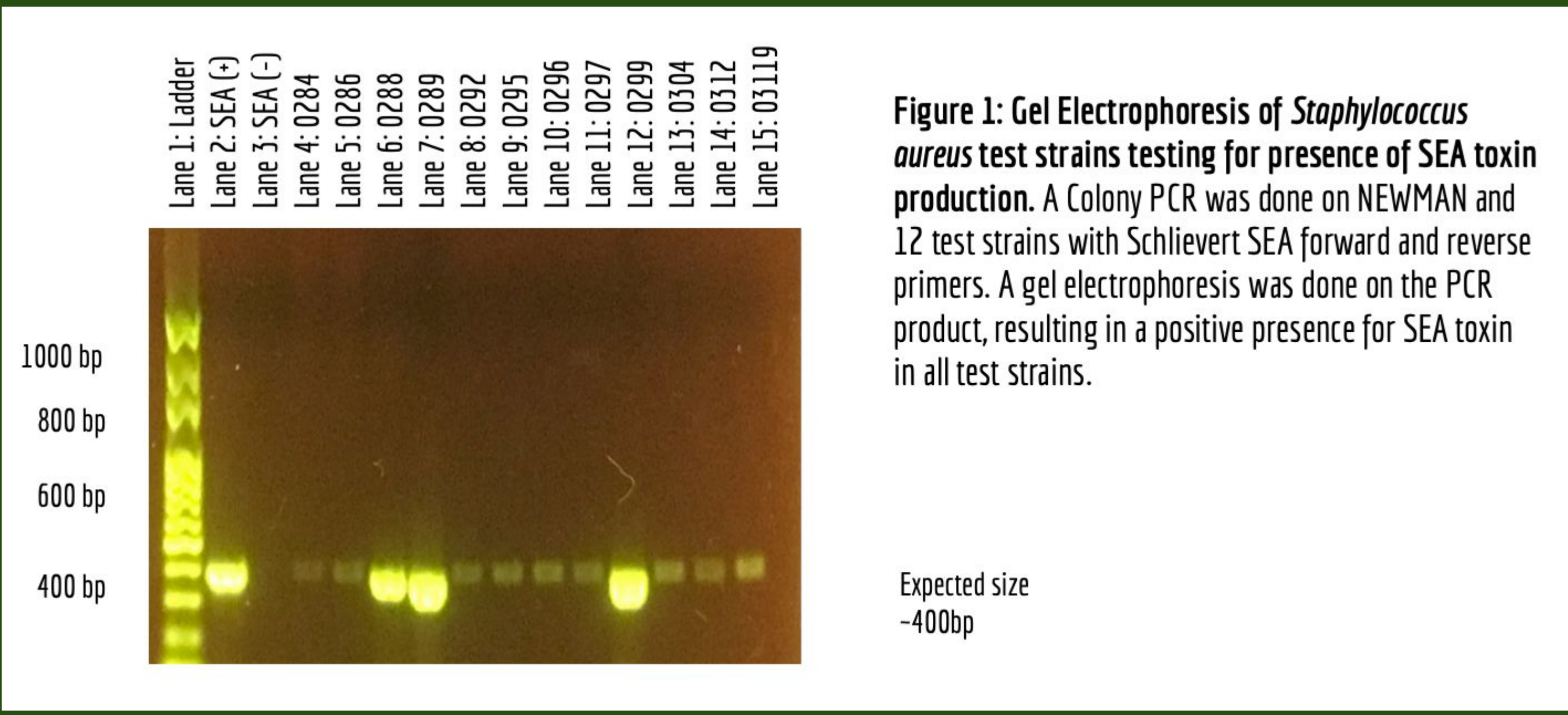
Methods

- Make Template DNA Stocks from 12 *S. aureus* isolates
- Polymerase Chain Reaction (PCR)
 - Colony PCR based on DNA primers to get DNA from the 12 *S. aureus* isolates
- DNA Gel Electrophoresis
 - GelGreen Gel Imager

Results

- Tested 12 *S. aureus* isolates for toxins:
 - Alpha Toxin
 - Staphylococcus Enterotoxin A
 - Toxic Shock Syndrome Toxin-1 (TSST-1)
- All 12 *S. aureus* isolates tested positive for alpha toxin and SEA toxin
- Only 2 isolates tested positive for TSST-1

Staphylococcus aureus isolates from healthy individuals from Concordia University St. Paul express α -toxin and SEA toxin production, and very little TSST-1 production.



α	SEA	TSST-1	
X	X		0284
X	X		0286
X	X		0288
X	X	X	0289
X	X		0292
X	X		0295
X	X		0296
X	X		0297
X	X	X	0299
X	X		0304
X	X		0312
X	X		0319

TSST-1: Toxic Shock Syndrome Toxin-1

- Causes majority of menstrual TSS and half of non-menstrual TSS
- 5% of menstruating women carry TSST-1 producing *S. aureus* vaginally

Alpha: Pore-forming toxin

- 7 subunits come together to form a pore in the host cell membrane
- Causes cell lysis (hemolysis)
 - Through cell membrane
- Can cause pulmonary edema (excess of fluid) and promotion of coagulase

SEA: Staphylococcal Enterotoxin A

- Most common in food poisoning
- Ability to bind to class II MHC molecules on antigen presenting cells and stimulate large populations of T cells that share variable regions on the β chain of the T cell receptor. The result of this massive T cell activation is a cytokine bolus leading to an acute toxic shock
- Highly resistant to denaturation

Acknowledgements & References

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