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Title: Pathogenesis and Outcomes of Invasive *S. Aureus* Infections

#### **ABSTRACT**

The epidemic of invasive *Staphylococcus aureus* infections poses a significant public health and economic burden. Invasive *S. aureus* infections may result in a spectrum of disease including uncomplicated bacteremia, osteoarticular infections, and often deadly endovascular infections. To date, data on origin of isolates causing invasive infections among people who use drugs is lacking, and it is unknown if these strains originate from skin colonization or the drugs themselves. Additionally, there is no reliable way to prognosticate which individuals will have mild disease courses or who will succumb to more devastating and often fatal outcomes.

In this research, we will leverage prior work funded by the Longer Life Foundation which has resulted in the accrual of a rich biospecimen bank including staphylococcal isolates from 100 patients, and associated patient sera, to investigate both pathogen and patient factors related to disease severity and outcomes.

#### **LAY SUMMARY**

The bacterium *Staphylococcus aureus* causes a wide range of infections with varying disease. While some patients may develop few to no symptoms as a result of infection, others have rapid often fatal disease courses. We propose to use previously collected patient samples to determine if bacterial genetics and/or patient metabolites produced as a result of infection can predict who will have a mild illness vs. who might have a fatal infection.