VIRGINIA COMMONWEALTH UNIVERSITY

"A New Antibiotic Target for Gram-Positive Bacteria" VCU #13-34

Applications

- Antibiotics for Staphylococcus and other Gram-positive bacterial infections
- Assay to detect presence of specific protease

Advantages

- Novel target for antibiotics needed to fight Gram positive bacteria
- Highly specific
- Assay developed for high throughput screening

Inventors

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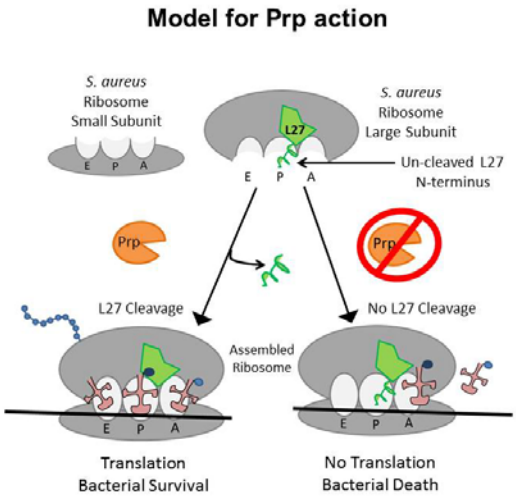
Clinical treatment of *S. aureus* infections has been compromised by the rapid resistance to multiple antibiotics. Methicillin-resistant *S. aureus* (MRSA) is one such strain which can cause severe complications and death. Identification of novel molecular targets is seen as a major obstacle to the development of new antibiotics for MRSA infections. There is a clinical need for a treatment of infection that targets *S. aureus* which have acquired resistance to other medications.

Technology Summary

VCU researchers have identified and performed the initial characterization of an essential, highly conserved protease unique to *S. aureus* and other Gram-positive pathogens such as *Bacillus, Clostridium,* and *Streptococcus*. This protease, Prp, performs a novel site-specific cleavage of ribosomal protein L27 that is essential for bacterial survival. Lack of cleavage by this protease either prevents proper ribosome assembly or blocks peptidyl transferase activity. An assay has been developed that is suitable for high throughput screening of compounds that inhibit the activity of this enzyme. Thus, this protease could be a prime target for novel antibiotics specific to *Staphylococcus* and other Gram-positive bacteria.



Technology Status

Edman degradation has been performed to confirm cleavage by the protease and the crystal structure of the protease has been reported. Molecular modeling for the purposes of drug design has been performed.
Patent Pending: US and Foreign Rights available.

Michael S. Spilman et al. "Assembly of bacteriophage 80α capsids in a Staphylococcus aureus expression system". *Virology*, **2012**, 434(2), 242-250.
Erin A. Wall et al. "Specific N-terminal cleavage of ribosomal protein L27 in Staphylococcus aureus and related bacteria". *Molecular Biology*, **2014**, 95(2), 258-269

This technology is available for licensing to industry for further development and commercialization.