Evaluating antimicrobial peptides for animal pathogens and forecasting resistance

DEVELOPMENT OF NEW TREATMENT OPTIONS?

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Background: The last new class of antibiotics was discovered in 1987. While new antibiotics have been commercialized and sold for both humans and livestock, for over 30 years, these new antibiotics have just been variations of the same drug. For example, both Draxxin and Zuprevo belong to the macrolide class of antibiotics. This is important because bacteria tend to develop resistance to a class of antibiotics – in the example above, bacteria that develop resistance to Draxxin would also be resistant to Zuprevo.

Antimicrobial peptides (AMPs) are found nature and have a wide range of antimicrobial effects on bacteria and other pathogens. They have been proposed as alternatives to current antibiotics. Previous work led to the discovery of a set of broad-spectrum (AMPs), that may be able to be altered to have a very specific targeted effect on certain bacterial pathogens. Resistance to AMPs may also develop more slowly due to their mode of action.

Objectives:

1. Optimize AMPs to specifically target and kill *Mannheimia heemoloytica*

2. Predict potential targets for drug development

3. Examine the potential development of antimicrobial resistance to AMPs

Implications of the Research: This project is early-stage research, which if successful, outlines a methodology to discover and optimize AMPs to specific bacteria or pathogens of concern to the beef industry. Eventually, this work may lead to the development of new treatment options for diseases like bovine respiratory disease.

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