Effects of Antibiotics and FDA-Approved Compounds on *Staphylococcus haemolyticus*

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Introduction

Coagulase-negative staphylococci (CoNS) can play a significant role in nosocomial infections, especially those involving indwelling medical devices or implants. CoNS have been shown to exhibit higher rates of antibiotic resistance than the more well-known coagulase-positive pathogen, *Staphylococcus aureus*.[1] Among the CoNS, strains of *S. haemolyticus* have exhibited high levels of antibiotic resistance[2] and resistance to multiple antibiotics, both of which can have deleterious clinical implications.[3] In addition to genetically encoded resistance mechanisms, CoNS efficiently form biofilms, complex three-dimensional communities of associated bacteria. Bacteria in a biofilm are up to 1,000 times more resistant to antibiotics than planktonic bacteria and provide a source of persistent infection within the human body.[4]

We are interested in exploring the biofilm phenotype in *S. haemolyticus* and quantifying the effect of the biofilm state on *S. haemolyticus* antibiotic tolerance.

Methods

Minimum inhibitory concentrations (MIC) of compounds against *S. haemolyticus* HM-1164 were determined using a standard broth microdilution assay.[5] Assays were performed in triplicate.

Results

Compound	MIC
Ampicillin	4 µg/mL
Cefazolin	< 0.5 µg/mL
Oxacillin	< 0.5 µg/mL
Penicillin G	1 µg/mL
Amoxapine	300 µM
Loxapine	600 µM
Clozapine	600 µM
Cetirizine	> 1200 µM
Chlorpromazine	125 µM

Figure 1. MIC of compounds against *S. haemolyticus* HM-1164.

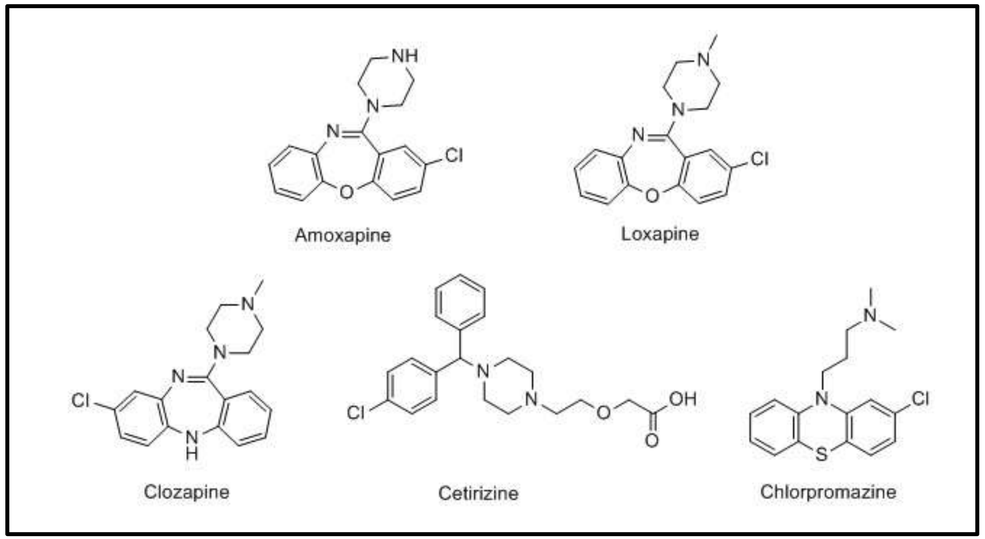

Figure 2. FDA-approved compounds used in the current study.

Discussion & Future Directions

S. haemolyticus HM-1164 is susceptible to cefazolin and oxacillin, and resistant to penicillin G and ampicillin, according to the most recent CLSI breakpoints.[5] MICs of the tested FDA-approved compounds are well above therapeutically relevant doses, indicating that they have little to no antibiotic potential.

We are currently investigating the necessary concentrations of antibiotics needed to disperse pre-formed *S. haemolyticus* biofilms to quantify the antibiotic tolerance due to the biofilm phenotype. Our results will be reported in due course.

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