Modulation of antimicrobial peptide expression as a novel approach to treating infectious keratitis
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Purpose
- Antimicrobial peptides (AMPs) are naturally occurring antibiotics expressed by epithelial cells and leukocytes
- AMPs can either be constitutively or inducibly expressed by pathogenic or inflammatory stimuli
- A recent study identified andrographolide, a small molecule from natural pharmacopeia, has the ability to upregulate a single AMP, human beta-defensin 3 (hBD3)
- Preliminary data suggests that andrographolide can upregulate hBD3 mRNA expression in human corneal epithelial cells (hTCEpi) by 300-fold
- The current study utilized ELISA to quantify hBD3 peptide levels in the supernatant of hTCEpi cells treated with andrographolide (10-100µM)

Methods & Results

Methods
- hTCEpi cells cultured to near confluence (80-90%)
- hTCEpi cells treated with andrographolide for 48 hours at a range of doses (10-100µM) based on the MTT and qPCR assays from our preliminary data
- Quantified hBD3 peptide expression via ELISA

Results
- With increasing concentrations of andrographolide there is a dose-dependent increase in hBD3 peptide expression
- hBD3 peptide expression was markedly increased at 75 µM and 100 µM of andrographolide at 304 pg/mL and 269 pg/mL, respectively
- This study serves as a proof-of-concept that andrographolide can modulate hBD3 peptide expression
- Provides the basis for translational studies with andrographolide used as a novel approach toward treatment of infectious keratitis

Discussion
- Future Directions & Financial Support
- Perform additional replicates of our in vitro induction experiments
- Determine antimicrobial activity of induction supernatants on clinical bacterial isolates.

Financial support was provided by Students Training in Advanced Research (STAR) and the National Institutes of Health (NIH) Grant T35OD010956-21 (AHS) and K08EY028109 (BCL)

References