

Investigation of the antimicrobial activity of coagulase negative *Staphylococci* of human origin

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Coagulase Negative *Staphylococci* (CoNS) are significant members of the human microbiome and have been identified as a source of bacteriocins, small bioactive substances recognised for their antimicrobial properties. In this study we screened a bank of 37 human derived CoNS for the production of these peptides with emphasis on identifying those with the ability to inhibit the growth of Methicillin Resistant *Staphylococcus aureus* (MRSA). Deferred antagonism assays confirmed potential antimicrobial activity in all 37 isolates against sensitive indicator *M. luteus*, with nine inhibiting the growth of at least one MRSA strain they were overlaid against. Tests performed with the acid-neutralised cell free supernatant of each isolate found that a large portion of the bank could interfere with the growth rate and biofilm forming capabilities of several representative MRSA strains. 15 shortlisted CoNS underwent whole genome sequencing, resulting in the identification four strains possessing complete putative bacteriocin operons. Strain *Staphylococcus hominis* C14 became the focus of this study and through HPLC, the bacteriocin nukacin KQU-131 was isolated from the culture. The presence of the peptide in the purified solution was confirmed using mass spectrometry. Well diffusion assays confirmed the peptide's activity against MRSA, an observation not previously reported in the literature. As three other bacteriocin operons were identified, future work will entail purifying them and characterising their activity. The identification of natural products with clinically relevant activity is also an important feature to note given the climbing rates of resistance in nosocomial pathogens and a depleting antibiotic pipeline.