



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Cecilia T. Ong	Project Number S1317
Project Title The Use of Potassium Release Electrodes to Detect Bacterial Cell Death	
Abstract	
Objectives/Goals To determine effectiveness of antimicrobial peptide using potassium release during bacterial cell death. Two peptide conformations tested at different concentrations in varying salt levels.	
Methods/Materials synthesis machine resin, residues speed vac HPLC MALDI machine MRSA bacteria trypticase tris-acetate salt bridge potassium electrode	
1) Add residues to resin per sequence of native form. Add cleavage mixture, filter, speedvac 2) Run peptides through HPLC 3) Confirm identity by MALDI analysis 4) Protein quantification using BCA 5) Potassium release- a) incubate MRSA in trypticase overnight b) wash and resuspend in 10 mM tris-acetate buffer with 100 mM NaCl c) set up salt bridge, potassium electrode d) wash electrode with distilled water, detergent e) calibrate electrode f) add bacteria and peptide to chamber, measure voltage with computer.	
Results The SAP29 (native conformation) peptide had better results than synthetic "hi-hi" form. Both worked better in low salt. Native peptide conformation also proved more potent than the synthetic, because at a lower concentration, causing more potassium release than the synthetic at a higher concentration.	
Conclusions/Discussion	
Summary Statement My project tests the effects of protein conformation, protein concentration, and salt concentration in the environment on the lysing of the bacterial cell membrane; bacterial cell death was measured using a potassium release electrode.	
Help Received My parents drove me to the Host Defense Lab in UCLA, where I worked under the guidance and supervision of Tung Nguyen.	