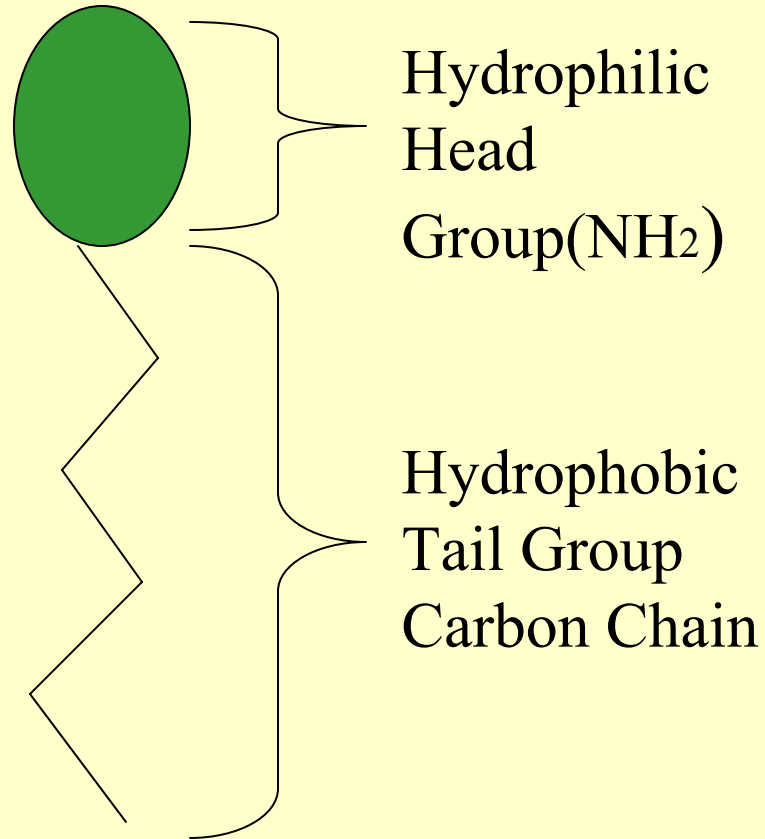


Designing Surfaces With Antimicrobial Peptides

- **By :** Elizabeth Matthews, INSET intern
- **Major:** Biology
- **College:** Allan Hancock College
- **Lab Mentor:** Alexander Chu-Kung
- **Faculty Advisor:** Dr Matthew Tirrell
- **Laboratory :**UCSB Biomolecular Surfaces Lab
(MRL)
- **Funded By :** National Institute Of Health (NIH)
National Science Foundation(NSF)

Why Antimicrobial Peptides?

- Innate to Many Eukaryotic Organisms
- Attacks Cell Membrane of Bacteria
- More Effective and Less Resistance from Bacteria



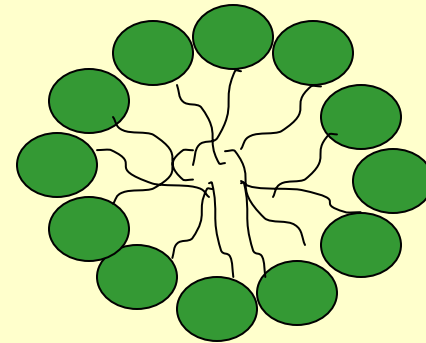
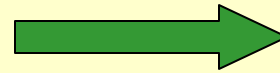
Peptide-Amphiphiles
(Fatty Acid/Lipid Tail Attached to Peptide)

Research Goal

- Design Assays to Determine if a Surface is Antimicrobial

Preparation of Peptides and Lipids

- Separation of Peptides by HPLC (High Performance Liquid Chromatography)
- Extrusion Of PC Lipids ~ 0.1um in diameter



Self assembly of peptides into micelle

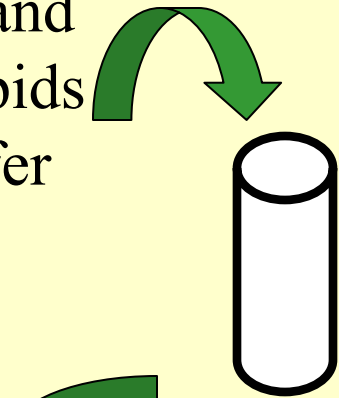
Preparation Of Surfaces

- Preparation Of Hydrophobic Surfaces(Silica and Glass) by Using OTS.
- UV Analysis Of Bacteria Concentration



UV Analysis Of Bacteria Concentration

Add Peptide and
deposit PC lipids
in NaPO_4 buffer

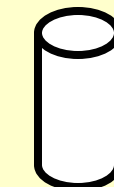


Add
Indicator

Add bacteria

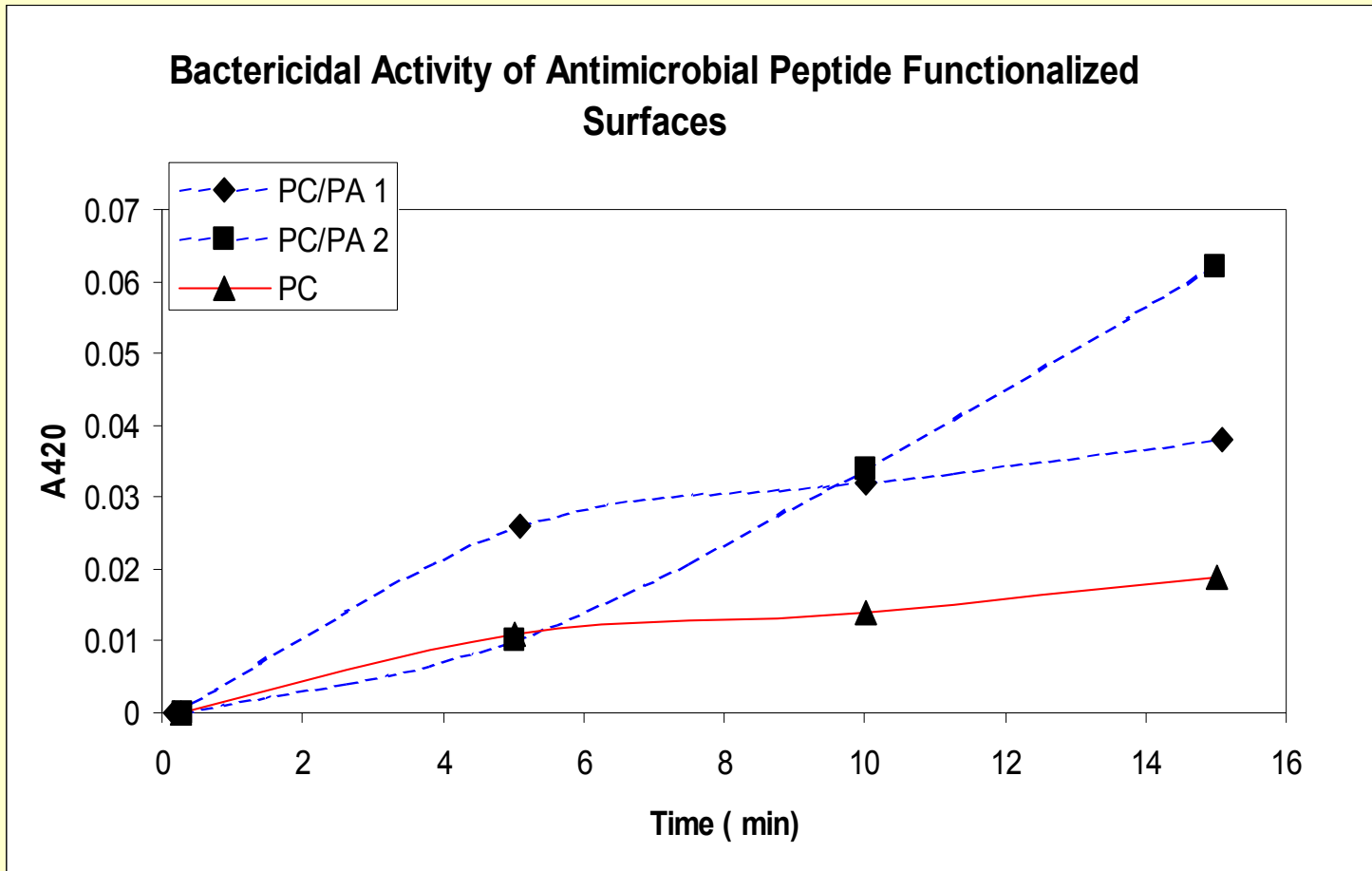
UV Analysis

O-nitrophenol-
Cell permeability



No cell
permeability

Results



Accomplishments

- Antimicrobial Peptides Showed some degree of activity to bacteria (E.coli ML35)
- Successful deposition of PC vesicles onto Hydrophobic Surface (Silicon Wafer and Glass)

Future Plans

- More experimentation with other Antimicrobial Peptides
- Developing Different Assays to show Antimicrobial Activity
- **Larger Objective** : Develop a Surface Present Out of Solution That Can be Applied to Sterile Environments, Surgical Instruments, Implants and Water Purity.

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