ENGINEERED LACTOBACILLUS AGAINST S. AUREUS INFECTION

HKUST @ iGEM 2010
Outline

+ Background
+ Experimental Design
+ Results and Future Work
+ Applications, BioBricks & Human Practice
Goal:

- An interspecies quorum sensing system
- *Lactobacillus* against *Staphylococcus aureus*
Two Key Questions

S. aureus

L. plantarum

AIP

RIP
Inhibitor Production

- RIP
- DD13

S. aureus

AIP

L. plantarum
Experimental Design

Module 1
- Chimeric AIP Sensor
  - Localization
  - Functionality

Module 2
- RIP Synthesis and Secretion
  - Synthesis and Secretion
  - Inhibition Efficiency
MODULE 1
1. Fusion AIP Receptor Localization Test

Diagram:
- P32 Promoter
- RBS
- agrC
- plnB
- mCherry
- Terminator

Overview Background Experimental Design
MODULE 1

2. Fusion AIP Receptor Functionality Test
MODULE 2
3. DD13-RIP Synthesis and Secretion Test

P32 Promoter

RBS
Signal Peptide
FLAG-Tag
DD13
RIP

Terminator

S. aureus

L. plantarum
MODULE 2

4. DD13-RIP Inhibition Efficiency Test
Overview

*S. aureus*

*L. plantarum*
Constructs for AIP Sensing

- P32 Promoter
  - RBS
  - agrC
  - plnB
  - mCherry
  - Terminator

- PlnA Promoter
  - RBS
  - GusA
  - Terminator
  - P32 Promoter
  - RBS
  - agrC
  - plnB
  - Terminator
Constructs for RIP Synthesis and Secretion

P32 Promoter

RBS

Signal Peptide

FLAG-Tag

DD13 RIP

Terminator

Promoter

Reporter

Overview  Background  Experimental Design  Results
+ Novel interspecies quorum sensing system
Between *S. aureus* and *L. plantarum*

+ Medical Treatment
  Toxic Shock Syndrome (TSS)
  Diarrhea
BBa_K330000
FLAG-tag

BBa_K330001
Protein secretor in *Lactobacillus plantarum*

BBa_K330002
gusA reporter gene
Synthetic biology workshop

Lab open day
Accomplishment

- Register the team
- Team Wiki
- Poster
- Judging form
- Talk at the Jamboree
- Submit DNA for new BioBricks -BBa_K33000 -BBa_K33001 -BBa_K33002
- Characterization of new Biobricks -BBa_K33000 -BBa_K33002
- Enter new Biobricks into Standard Registry
- Synthetic biology workshop
- Lab opening sessions
- On-campus road show exhibition

Sponsor

invitrogen

Lee Hysan Foundation
ENGINEERED LACTOBACILLUS AGAINST S. AUREUS INFECTION

HKUST @ iGEM 2010