SUSTC-Shenzhen B
Asia Regional Jamboree
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BioMiao
Sharing your genetic circuits!
How to visit our software
Problem 1: Synthetic Biology calls for more sharing

What’s next? Sharing genetic circuits!
Problem 2: Genetic circuit is not well defined, not standard

Four categories in partsregistry:
- Promoter
- RBS
- Coding sequence
- Terminator

But genetic circuits are not defined in partsregistry!
Problem 2: Genetic circuit is not well defined, not standard

PARTS DISTRIBUTION

- Composite Parts: 35%
- Promoter: 18%
- RBS: 3%
- Protein Domain: 2%
- Transcriptional Terminators: 3%
- Protein Coding Regions: 39%

Data from parts.iGEM.org
Problem 3: Genetic circuit data is scattered

- iGEM teams’ wiki
- Synthetic Biology website
- Papers
- Others

Genetic Circuit
Our solution

Circuit Standard Form

Central database

A registry of standard genetic circuit

Sharing platform

Logical Genetic Designer

More sharing

Central database

An online software for sharing
Feature 1: Sharing platform —— Mind Road

A novel approach to show the Synthetic Biology projects

- Online platform
- Systematic Category
- Brainstorming Mode
Feature 1: Sharing platform —— Mind Road

- The standard project information
  - Description
  - Protocol
  - Circuit
  - Reference
  - Comment

Feature 1: Sharing platform —— Mind Road

- The standard project information
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Feature 2: Central Database—— Circuit Registry

- BBF RFC 97 Genetic Circuit Standard (version 1.0)

- A genetic circuit is composed of genetic Coding-frame(s)
- A Coding-frame is composed of four types of Biobrick™: Promoter, RBS, coding sequence, terminator
- Different coding frame can set up a logical regular system.
- A genetic circuit should be given some labels in order to sort into the Mind Road.
Feature 2: Central Database— Circuit Registry

- Evaluation system

⭐⭐⭐⭐ The circuit is reported to be functional in peer-reviewed journals.

⭐⭐ The circuit is reported by one iGEM team and independently successfully reproduced by another iGEM team.

⭐ The circuit is reported by one iGEM team.
Feature 3: Logical Genetic Designer (LGD)

- LGD is a computer aided designer for synthetic biology
- The Structure of a Genetic Circuit in the standard significance.

- Genetic Circuit
- Coding-frame
- Biobrick™
Feature 3: Logical Genetic Designer (LGD)

- preliminarily redesign the existing circuit in BioMiao.

  - The LacI is at a highly expression restraining all the promoters and the GFP is at a low level.
  - for araC is lowered by LacI the expressivity of LacI is becoming lower. So arac increase with GFP.
  - While araC increasing the expression of LacI is increasing to. Then it came back to the first stem and the GFP is at a low expression.
How to upload a project and run it

Sharing your circuit by submitting!

Submit

Validation

Display & share

Comment & Exchange
Result

- 70+ previous iGEM projects
- 5 projects which were published in papers like CELL, etc.
- **ALL the iGEM 2013 Asian wetware projects.**
FEEDBACK from Prof. King Chow of 2013 HKUST iGEM team
The idea of sharing the projects is good. But pay attention to the verification of the submitted projects, it’s a rough work and need some professional volunteers to help you.

FEEDBACK from 2013 iGEM team Peking:
“The surface of the page is great! The most impressive part is the animation of the mind road. This summary is highly significant because the iGEM community desperately need a sorting software. We will upload our information when this software is complete.”
Human practice
Team
Acknowledgement
BioMiao

A registry of standard genetic circuit


Thank You!