Coming up with a project

Teach the Teachers Workshop
May 16, 2009

Talk to people

Previous iGEM projects

igem.org

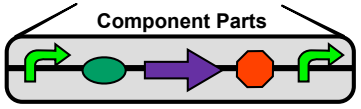
New organisms

New parts and tools for future teams

Most commonly used parts:
B0015 - a terminator
F2620 - an inducible promoter
B0034 - a RBS
R0011 - lac promoter
Plasmid backbones

BBa_F2620

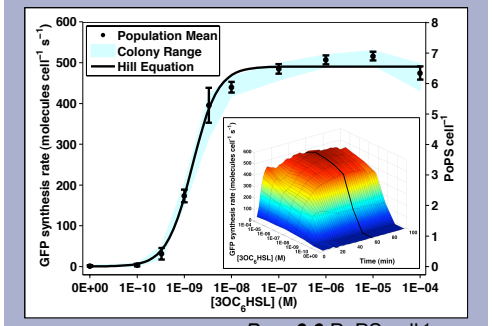
3OC$_6$HSL → PoPS Receiver



R0040 B0034 C0062 B0015 R0062
$P_{LtetO-1}$ RBS luxR Term. $P_{lux,R}$

Mechanism & Function
A transcription factor (LuxR) that is active in the presence of a cell-cell signaling molecule (3OC$_6$HSL) is controlled by a regulated operator ($P_{LtetO-1}$). Device input is 3OC$_6$HSL. Device output is PoPS from a LuxR-regulated operator. If used in a cell containing TetR then a second input such as aTc can be used to produce a Boolean AND function.

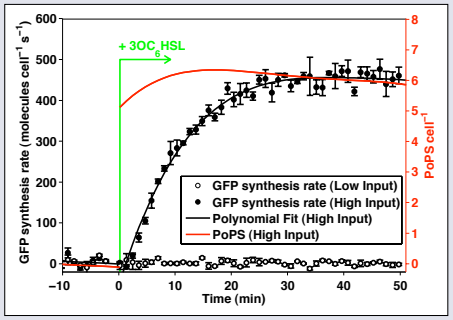
Static Performance*



$$P_{out} = \frac{P_{max}[3OC_6HSL]^n}{K^n + [3OC_6HSL]^n}$$

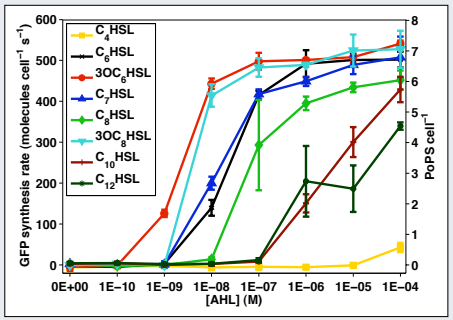
P_{max}: **6.6** PoPS cell^{-1}
K: **1.5E-09** M 3OC$_6$HSL
n: **1.6**

Dynamic Performance*



BBa_F2620 Response Time: ***<1** min*
BBa_T9002 Response Time: ***6±1** min*
Inputs: 0 M (Low), 1E-07 M (High) 3OC$_6$HSL

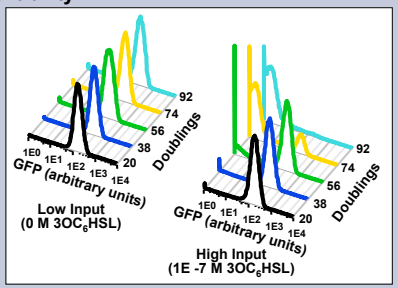
Input Compatibility*



Part Compatibility (qualitative)

Chassis: *MC4100*, *MG1655*, and *DH5α*
Plasmids: *pSB3K3* and *pSB1A2*
Devices: *E0240*, *E0430* and *E0434*

Reliability**



Genetic: **>92/>56** culture doublings
Performance: **>92/>56** culture doublings
(low/high input during propagation)

Transcriptional Output Demand (low/high input)
Nucleotides: **0 / 6xNt** nucleotides cell^{-1} s^{-1}
Polymerases: **0 / 1.5E-1xNt** RNAP cell^{-1}
(**Nt** = downstream transcript length)

Conditions (abridged)
Output: PoPS measured via *BBa_E0240*
Culture: Supplemented M9, 37°C
Plasmid: pSB3K3
Chassis: MG1655
**Equipment:* PE Victor3 multi-well fluorimeter
***Equipment:* BD FACScan cytometer

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Updated: March 2008

Registry of Standard Biological Parts
making life better, one part at a time

Signaling Devices

http://parts.mit.edu/registry/index.php/Part:BBa_F2620

Reuse and existing parts

Let the students choose

Help them make smart choices

- Figure out what's practical: How many assembly stages could the team possibly do over the course of the summer? That sets an upper limit to the size of the system.
- Design the project so that different modules can be done in parallel.
- It doesn't have to be a brand new idea.

Describe your project on your team wiki

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