# Opportunities for Engineered Biological Simplicity 

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"There are only two ways we know of to make extremely complicated things.

One is by engineering, and the other is evolution."

Danny Hillis according to Kevin Kelly

## indole deficient tnaA5 ${ }^{-}$chassis

methyl salicylate


## 2006 MIT iGEM team

GCal EG@OWW MIT WM@MIT Parts iGEM PubMed Weather iK
jump to part BBa_

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Registry of Standard Biological Parts



Browse Parts by Type


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Registry Toolbox


- [8/01/06] We have contact information for the creators of parts. You can access this information when you access "Hard Information" of a part.
- [8/01/06] A table made for yeast parts is now available on the Part Types page

Report any bugs here I Request new features here I See new features here
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## Transcriptional Terminators

## Available Transcriptional Terminators

Edit

| -?- | Name | Description | Direction | Reversed Version | Biology | Efficiency * Fwd. Rev. |  | Length |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A W | BBa_B0011 | Terminator (luxICDABEG, +/-) | Bidirectional | BBa_B0021 | LuxiA | 0.419 | 0.636 | 46 |
| A W | BBa_B0014 | Terminator (B0012, B0011) | Forward | BBa_B0024 | B0012, B0011 | 0.604 |  | 95 |
| A W | BBa_B0015 | Terminator (B0010, B0012) | Forward | BBa_B0025 | (B0010, B0012) | 0.984 | 0.295 | 129 |
| A W | BBa_B0021 | Terminator (luxICDABEG, +/-) | Bidirectional | BBa_B0011 | LuxlA (reversed) | 0.639 | 0.419 | 46 |
| A W | BBa_B0025 | Terminator (Reverse B0015) | Reverse | BBa_B0015 | (B0010, B0012) reversed | 0.295 | 0.984 | 129 |
| A W | BBa_J52016 | Eukaryotic terminator |  |  |  |  |  | 238 |
| A | BBa_ B0010 | Terminator (T1) | Forward | BBa_B0020 | T1 |  |  | 80 |
| AX | BBa_B0012 | Terminator (T7 TE) | Forward | BBa_B0022 | T7 TE | 0.309 | -0.368 | 41 |
| AX | BBa_B0013 | Terminator ( 77 TE, +/-) | Bidirectional | BBa_B0023 | T7 TE | 0.6 | -1.09 | 47 |
| A | BBa_B0017 | Terminator (B0010, B0010) | Forward |  | B0010.B0010 |  |  | 168 |
| AX | BBa_B0022 | Terminator (Reverse B0012) | Reverse | BBa_B0012 | T7 TE (reversed) | -0.368 | 0.309 | 41 |
| AX | BBa_B0023 | Terminator (Reverse B0013) | Bidirectional | BBa_B0013 | T7 TE (reversed) | -1.09 | 0.6 | 47 |
| A | BBa_B0024 | Terminator (Reverse B0014) | Reverse | BBa_B0014 | (B0012.B0011) reversed |  | 0.604 | 95 |
| A | BBa_B1004 | Terminator (artificial, small, \%T~=55) |  |  |  |  |  | 34 |
| A | BBa_J63002 | yeast ADH1 terminator |  |  |  |  |  | 225 |

> * Click here for terminator measurement information.

Other Transcriptional Terminators Edit

| -?- | Name | Description | Direction | Reversed Version | Biology | Efficiency * Fwd. Rev. | Length |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| M | BBa_B0016 | Terminator (T7 RNAP specific, T_Phi) | Forward |  | T7 RNAP, T_Phi |  | 48 |
|  | BBa B0020 | Terminator (Reverse B0010) | Reverse | BBa B0010 | T1 (reversed) |  | 82 |
|  | BBa_B0050 | Terminator (pBR322, +/-) | Bidirectional | BBa_B0060 | pBR322 |  | 33 |
|  | BBa_B0051 | Terminator (yciAltonA, +/-) | Bidirectional | BBa_B0061 | yciAltonA |  | 35 |
|  | BBa_B0052 | Terminator (rrnC) | Forward | BBa_B0062 | rrnC |  | 41 |
|  | BBa_B0053 | Terminator (His) | Forward | BBa_B0063 | His |  | 72 |
|  | BBa_B0054 | -- No description -- |  |  |  |  | 69 |
|  | BBa_B0055 | -- No description -- |  |  |  |  | 78 |
|  | BBa_B0060 | Terminator (Reverse B0050) | Bidirectional | BBa_B0050 | pBR322 (reversed) |  | 33 |
|  | BBa_B0061 | Terminator (Reverse B0051) | Bidirectional | BBa_B0051 | yciAltonA (reversed) |  | 35 |
|  | BBa_B0062 | Terminator (Reverse B0052) | Reverse | BBa_B0052 | rrnC (reversed) |  | 41 |
|  | BBa_B0063 | Terminator (Reverse B0053) | Reverse | BBa_B0053 | His (reversed) |  | 72 |
|  | BBa_B1001 | Terminator (artifical, small, \%T~=90) | Bidirectional |  |  |  | 34 |
|  | BBa_B1002 | Terminator (artificial, small, \%T $\sim=85 \%$ ) | Bidirectional |  |  |  | 34 |
|  | BBa_B1003 | Terminator (artificial, small, \%T~=80) |  |  |  |  | 34 |
|  | BBa_B1005 | Terminator (artificial, small, \%T~=25\% |  |  |  |  | 34 |
|  | BBa_B1006 | Terminator (artificial, large, \%T~>90) |  |  |  |  | 39 |
|  | BBa_B1007 | Terminator (artificial, large, \%T~=80) |  |  |  |  | 40 |
|  | BBa_B1008 | Terminator (artificial, large, \%T~=70) |  |  |  |  | 40 |
|  | BBa_B1009 | Terminator (artificial, large, \%T~=40\%) |  |  |  |  | 40 |

## Description

A transcription factor (LuxR, BBa_C0062) that is active in the presence of cell-cell signaling molecule
$30 C_{6} \mathrm{HSL}$ is controlled by a TetR-regulated operator (BBa R0040). 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 signal such as aTc can be used to produce a Boolean AND function

## Characteristics

Input Swing: Output Swing: $\quad 0 \pm 1$ to $\mathbf{5 0 3} \pm 1$ GFP molecules $\mathrm{cfu}^{-1} \mathrm{~s}^{-1}$ Switch Point: $\quad \mathbf{7 \pm 1} \mathbf{n M} 30 \mathrm{C}_{6} \mathrm{HSL}$, exogenous LH Response: 9 min ( $\mathrm{t}_{50 \%}$ ), $27 \mathrm{~min}\left(\mathrm{t}_{90 \%}\right)$



Demand (low/high input)
Translational:
256/8048 ribosomes cfu-1
$3.8 \mathrm{E} 3 / 1.2 \mathrm{E} 5$ charged tRNA cfu-1 $\mathrm{s}^{-1}$

## Compatibility

Chassis: Compatible with MC4100, MG1655, and DH5 $\alpha$
Plasmids: Compatible with pSB3K3 and pSB1A2
Devices: Compatible with E0240, E0430 and E0434
Crosstalk with systems containing TetR (C0040)
Signaling: Crosstalk with input molecules similar to $3 \mathrm{OC}_{6} \mathrm{HSL}$

## Key Parts

BBa_R0040:
BBa_C0062:
BBa_R0062:

TetR-regulated operator luxR ORF LuxR-regulated operator

Response Time*



Stability (low/high input)
Genetic: $\quad>92 / 74$ replication events**
Performance: >92/74 replication events**
Conditions (abridged)
Output: Indirect via BBa_E0240
Vector:
Chassis:
Culture:
*Equipment:
**Equipment:
pSB3K3
MG1655
Supplemented M9, $37^{\circ} \mathrm{C}$ PE Victor3 plate reader
BD FACScan cytometer


Jason Kelly et al.


Jason Kelly et al.

Round 1 (LOW input)


Round 2 (HIGH input)


Jason Kelly et al.


Jason Kelly et al.



Jason Kelly (via Balagadde \& Quake)


Jason Kelly

