DNA is genetic material.

TAATACGACTCACTATAGGGAGA

Parts are basic biological f(x)'s encoded via genetic material.

R0083

Type: **Promoter**
Family: **Protein:DNA**
Activity: **2 PoPS (max.)**
Cell Type: **Any**
Requires: **C0083**
Temp: **< Tm**
Issues: **None**
License: **Public**

Devices provide human-defined f(x)'s using one or more parts.

Q005 I
(INVERTER)

Systems provide human-defined f(x)'s using one or more devices.

Systems

Devices

Parts

DNA

Standards

Construction

BBa_F2620

3OC$_6$HSL → PoPS Receiver

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

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Last Update: 15 January 2007

Description

A transcription factor (LuxR, BBa_C0062) that is active in the presence of cell-cell signaling molecule 3OC$_6$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.

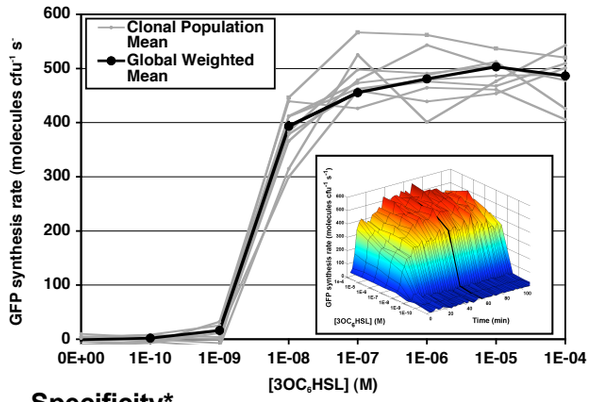
Characteristics

Input Swing: **1E-9 to 1E-6** M 3OC$_6$HSL, exogenous
Output Swing: **0±1 to 503±1** GFP molecules cfu^{-1} s^{-1}
Switch Point: **7±1 nM** 3OC$_6$HSL, exogenous
LH Response: **9 min** ($t_{50\%}$), **27 min** ($t_{90\%}$)

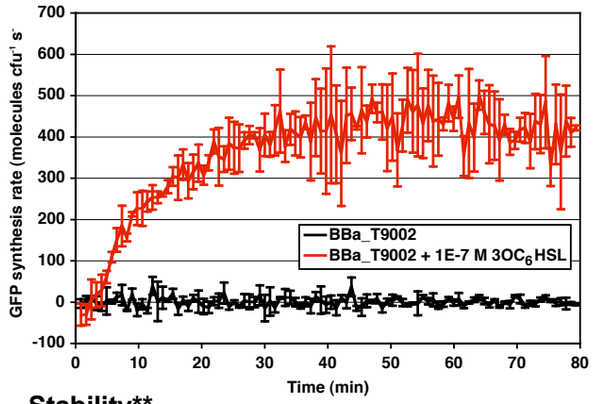
Key Parts

BBa_R0040: TetR-regulated operator
BBa_C0062: luxR ORF
BBa_R0062: LuxR-regulated operator

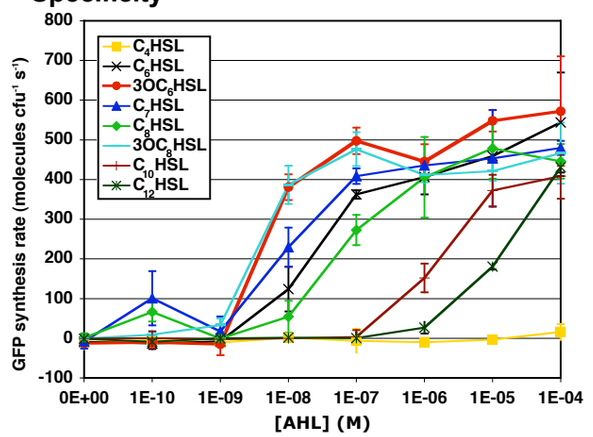
Transfer Function*



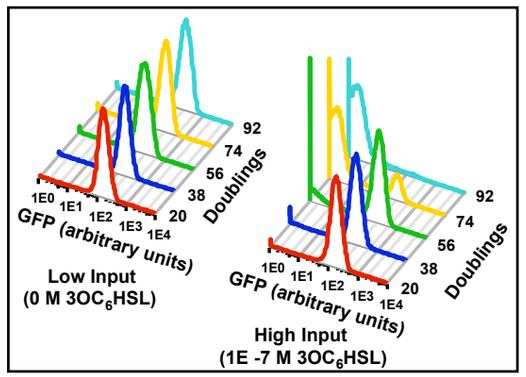
Response Time*



Specificity*



Stability**



Demand (low/high input)

Translational: **256/8048** ribosomes cfu^{-1}
3.8E3/1.2E5 charged tRNA cfu^{-1} s^{-1}

Compatibility

Chassis: Compatible with *MC4100*, *MG1655*, and *DH5α*
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 3OC$_6$HSL

Stability (low/high input)

Genetic: >**92/74** replication events**
Performance: >**92/74** replication events**

Conditions (abridged)

Output: Indirect via *BBa_E0240*
Vector: pSB3K3
Chassis: MG1655
Culture: Supplemented M9, 37ºC
**Equipment:* PE Victor3 plate reader
***Equipment:* BD FACScan cytometer

Signaling Devices

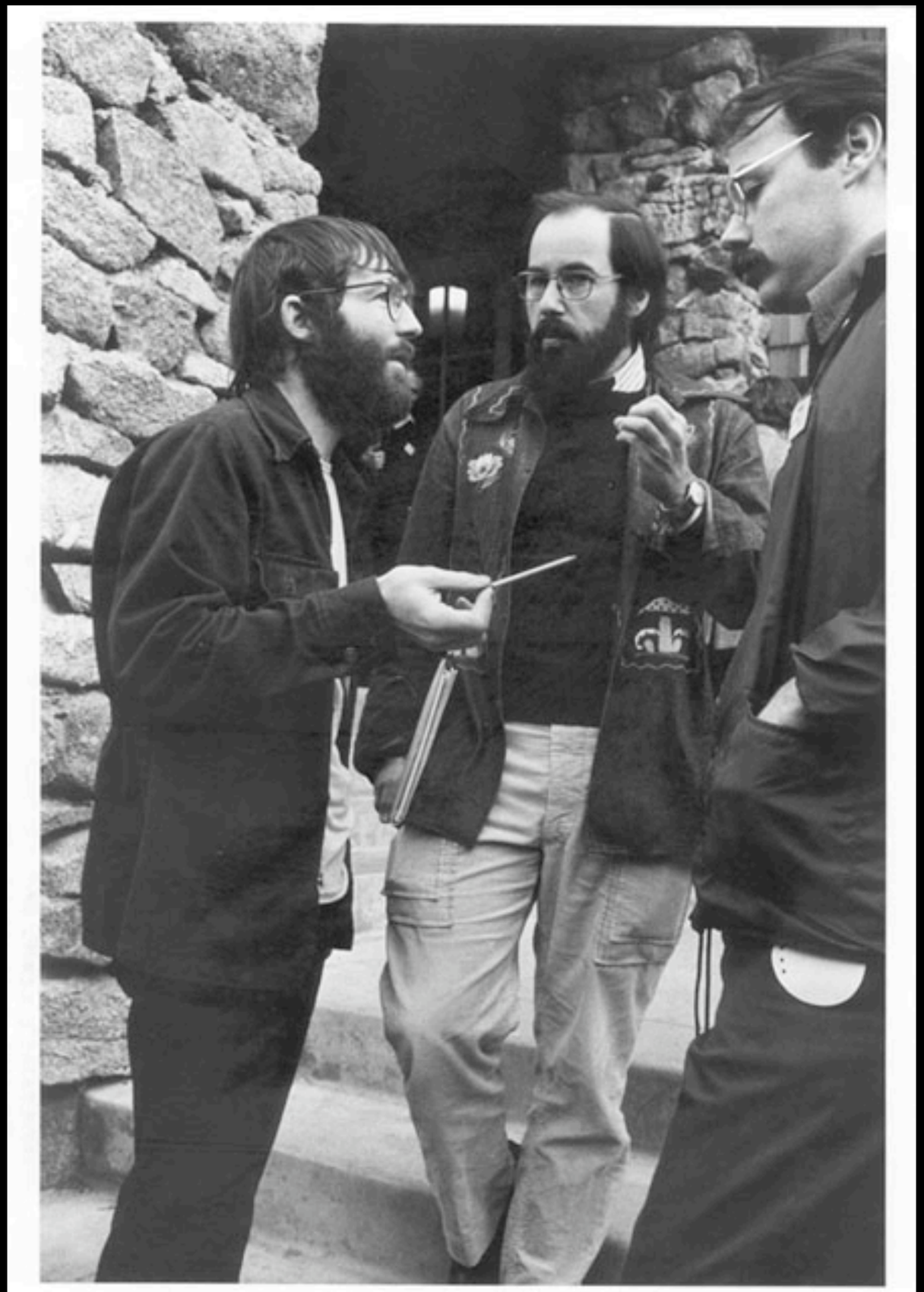
Biosafety Level 1 practices, safety equipment, and facility design and construction are appropriate for undergraduate and secondary educational training and teaching laboratories, and for other laboratories in which work is done with defined and characterized strains of viable microorganisms not known to consistently cause disease in healthy adult humans. Biosafety Level 1 represents a basic level of containment that relies on standard microbiological practices with no special primary or secondary barriers recommended, other than a sink for handwashing.

Biosafety Level 2 practices, equipment, and facility design and construction are applicable to clinical, diagnostic, teaching, and other laboratories in which work is done with the broad spectrum of indigenous moderate-risk agents that are present in the community and associated with human disease of varying severity. With good microbiological techniques, these agents can be used safely in activities conducted on the open bench, provided the potential for producing splashes or aerosols is low. Hepatitis B virus, HIV, the salmonellae, and Toxoplasma spp. are representative of microorganisms assigned to this containment level.

Biosafety Level 3 practices, safety equipment, and facility design and construction are applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents with a potential for respiratory transmission, and which may cause serious and potentially lethal infection. Mycobacterium tuberculosis, St. Louis encephalitis virus, and Coxiella burnetii are representative of the microorganisms assigned to this level. Primary hazards to personnel working with these agents relate to autoinoculation, ingestion, and exposure to infectious aerosols. At Biosafety Level 3, more emphasis is placed on primary and secondary barriers to protect personnel in contiguous areas, the community, and the environment from exposure to potentially infectious aerosols.

Biosafety Level 4 practices, safety equipment, and facility design and construction are applicable for work with dangerous and exotic agents that pose a high individual risk of life-threatening disease, which may be transmitted via the aerosol route and for which there is no available vaccine or therapy. Agents with a close or identical antigenic relationship to Biosafety Level 4 agents also should be handled at this level. When sufficient data are obtained, work with these agents may continue at this level or at a lower level. Viruses such as Marburg or Congo-Crimean hemorrhagic fever are manipulated at Biosafety Level 4. The primary hazards to personnel working with Biosafety Level 4 agents are respiratory exposure to infectious aerosols, mucous membrane or broken skin exposure to infectious droplets, and autoinoculation. All manipulations of potentially infectious diagnostic materials, isolates, and naturally or experimentally infected animals, pose a high risk of exposure and infection to laboratory personnel, the community, and the environment.

http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm



Left to right: Philip Sharp, David Baltimore, unidentified

(c/o US NAS Archives)

Two Sections

The Real Paper

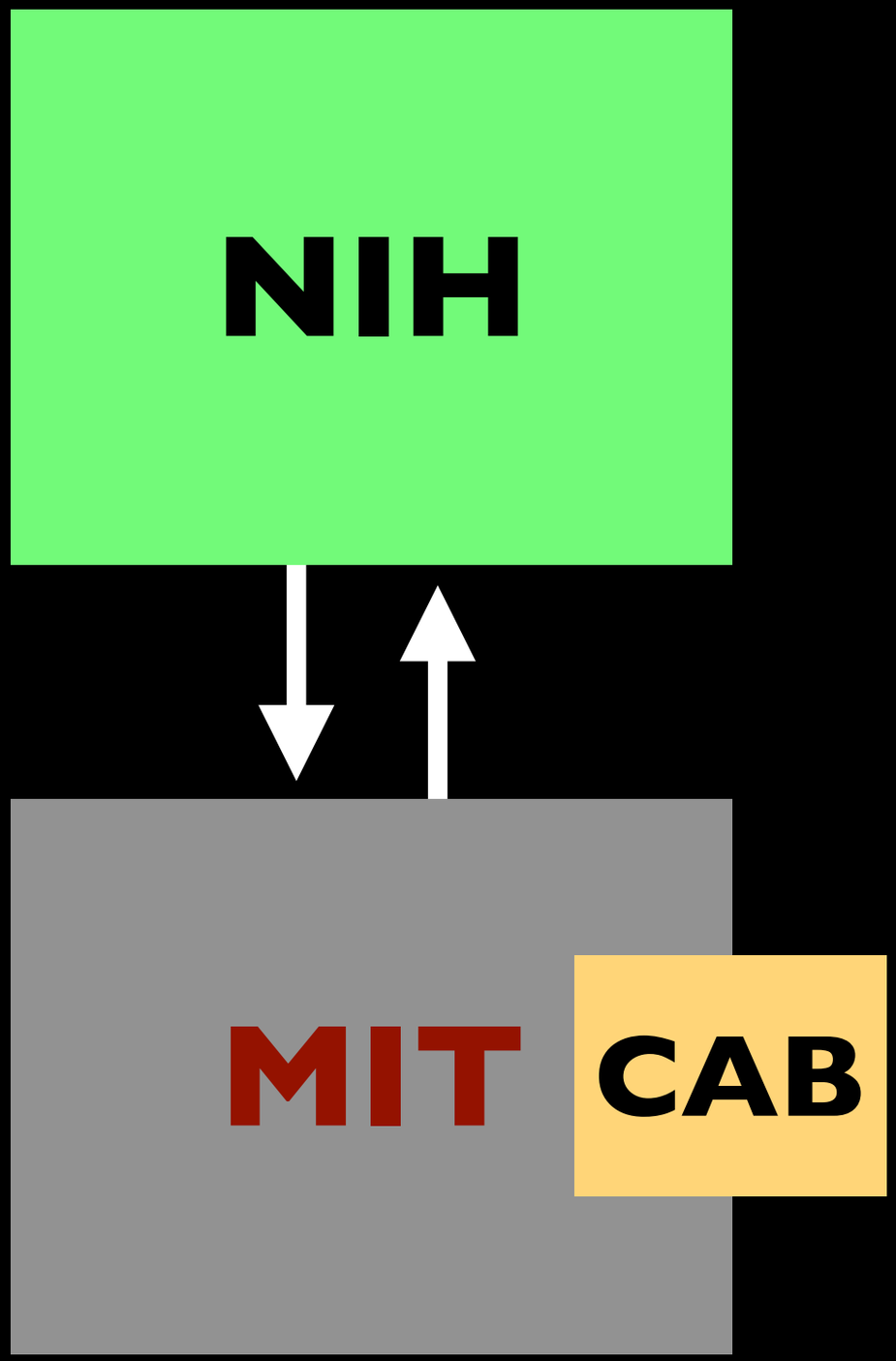
...ly newspaper July 16, 1977 35¢

DOING DNA AT HOME: A RECIPE FOR BOTULISM

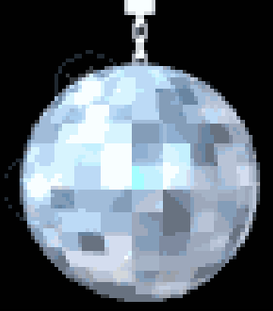
PAT CADDELL: CARTER'S GREASY POLLSTER

SHAPIRO: THEY'RE BANNING ABORTIONS AGAIN

Mark Fisher

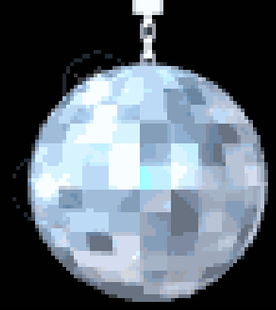


http://mit.edu/cab/



What's changed since the 70s?

http://en.wikipedia.org/wiki/Phillip_Allen_Sharp



What's changed since the 70s?

1. Databases populated with sequence information.
2. The internet.
3. Early returns on pilot investments in DNA construction technology.
4. Overnight shipping.
5. Expanded concern re: active misapplication of biotech.