Pneumosensor

A device equipped with a new promoter that detects CSP molecules and reacts *Streptococcus pneumoniae*.

Adopted the quorum sensing pathway components to detect populations of S. pneumoniae

involves a highly specific reporting system

We provide exhaustive characterization of the parts submitted

Registry of Standard Biological Parts

main page | design | experience | information | part tools | edit

Part:BBa_K1379007

Designed by: Ng Siu Wang Edward, Jason Jang, Joe Min Jung. Group: iGEM14_Hong_Kong_HKUST (2014-09-23)

Not Released | Sample Not in stock | Experience: None | -1 Uses | Get This Part

σ^X Generator + P_{comFA}-E0240

This is P_{comFA} Measurement Kit BBa_K1379003 assembled with σ^X generator BBa_K1379006.

Usage and Biology

P_{comFA} (or comFA(p)) is a σ^X regulated promoter from Streptococcus pneumoniae. It is a member of the C pair consensus sequence of TACGAATA, where the sigma factor of σ^X BBa_K1379004 (or ComX) binds to Morrison, 2009) During the exponential growth of S. pneumoniae. Competence Stimulating Peptide (CSP as a global regulator then directs S. pneumoniae to enter a transient competent cell state. P_{comFA}, along and drives expression of the competence protein comFA. (BioCyc)

Voigt and his colleagues have demonstrated that orthogonal gene expression could be achieved through al., 2013). This principle has been demonstrated to work in E. coli (see characterization below), in which f

iGEM 2014 Hong_Kong_HKUST Team has cloned P_{comFA} from S. pneumoniae strain NCTC7465 and cl and absence of a σ^X generator BBa_K1379006. Promoter P_{celA} (BBa_K1379000), which is another Com characterized.

The transcription start site of this promoter has yet to be experimentally located

Characterization

For characterization, **BBa_K1379007** which contain P_{comFA} Measurement Kit BBa_K1379003 assemble was used

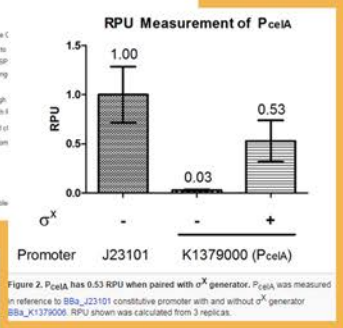
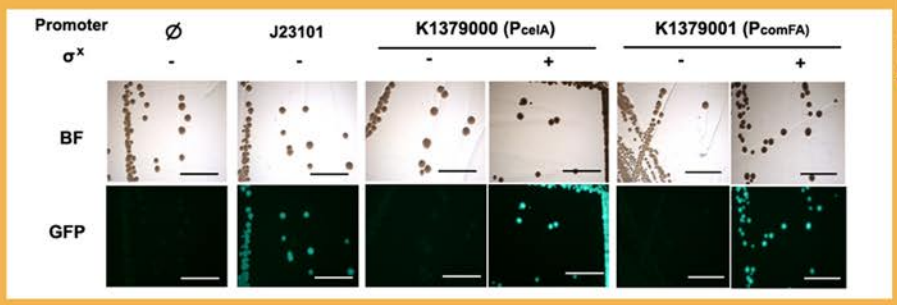


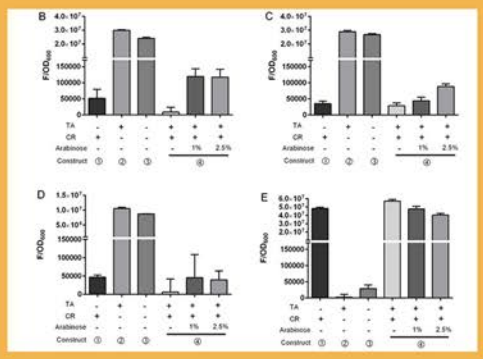
Figure 2. P_{celA} has 0.53 RPU when paired with σ^X generator. P_{celA} was measured in reference to BBa_J23101 constitutive promoter with and without σ^X generator BBa_K1379006. RPU shown was calculated from 3 replicas.

We constructed, characterized and verified the function of σ^X and combox promoter



Riboregulator

We are characterizing riboregulators that already exist in Part Registry.



We are cataloging existing regulatory RNAs in the Part Registry

Riboregulator

Riboregulators regulate translation by having two elements, a cis-repressive sequence upstream of RBS in mRNA, and a non-coding RNA device, called trans-activating RNA. The cis-repressive sequence will binds to the 5'UTR, including the RBS by Watson-Crick base pairing, the sequestration of RBS represses translation. While trans-activating RNA will form complementary bases to cis-recessive sequence and exposing RBS for ribosomal binding and allow translation.

Proposed Categories: /RNA/non_coding/post_transcriptional/Riboregulator

Designer	Part Number	Description
Delft 2009	BBa_K175029	Weak lock
Delft 2009	BBa_K175030	Key for lock of weak RBS
Delft 2009	BBa_K175030	Medium lock
Delft 2009	BBa_K175030	Key for Medium lock
Delft 2009	BBa_K175034	/Constitutive expression of GFP with weak RBS lock and inducible production of key for the lock Composite of K175029 + K175030
Delft 2009	BBa_K175034	Constitutive expression of GFP with medium RBS lock and inducible production of key for the lock Composite of K175031 + K175032
Caltech 2007	BBa_I759015	cis3-repressed, tet-regulated YFP
Caltech 2007	BBa_I759016	cis4-repressed, tet-regulated YFP
Caltech 2007	BBa_I759020	cis8-repressed, tet-regulated YFP
Caltech 2007	BBa_I759027	cis3-repressed, tet-regulated Q
Caltech 2007	BBa_I759028	cis4-repressed, tet-regulated Q
Caltech 2007	BBa_I759014	cis2-repressed, tet-regulated YFP
Caltech 2007	BBa_I759017	cis5-repressed, tet-regulated YFP
Caltech 2007	BBa_I759018	cis6-repressed, tet-regulated YFP
Caltech 2007	BBa_I759019	cis7-repressed, tet-regulated YFP
Caltech 2007	BBa_I759013	cis1-repressed, tet-regulated YFP
Caltech 2007	BBa_I759032	Ptet_cis1_YFP
Caltech 2007	BBa_I759034	Ptet_cis2_YFP
Caltech 2007	BBa_I759036	Ptet_cis3_YFP
Caltech 2007	BBa_I759038	Ptet_cis4_YFP
Caltech 2007	BBa_I759040	Ptet_cis5_YFP

We summarized existing riboregulators in a feature page

RIBOREGULATOR FEATURE PAGE

(The page was created as part of our effort in Project Riboregulator to summarize identifiable riboregulators in the Part Registry and promote their uses. It was written in compliance with Part Registry's format for Feature Pages. We welcome and encourage constant update and adoption of this page.)

Introduction to riboregulators

Regulatory RNAs are small RNA that regulates biological processes such as transcription or translation. The use of regulatory RNAs has been a great interest in the field of synthetic biology because it provides an additional level of regulation for biological circuits and systems. Regulatory RNAs have also used by many iGEM teams. We have identified 7 teams that have used cis-repressing (CR) and trans-activating (TA) riboregulator system and more teams that have used riboswitches. For example, Isaacs 2005, UC Berkeley 2006 and Caltech 2007 contributed many CR and TA devices to the Registry.

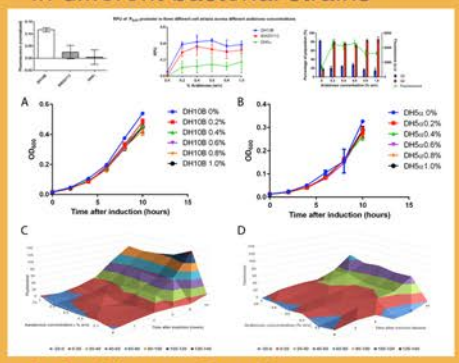
Artificial cis-repressing and trans-activating riboregulator system was introduced to the iGEM community by the UC Berkeley iGEM 2005 team. The riboregulator system as a whole acts to regulate translation at the RNA level. One component of the system, crRNA, which contains a cis-repressing sequence 5' of the RBS, RBS, and gene of interest. The cis-repressing sequence can form a loop form complementary base pairs with the RBS to prevent the recognition of RBS by ribosomes. The translator-crRNA is also commonly described as a "lock" because it "locks" the RBS and prevent translation. The "key" to this system is the taRNA. taRNA can interact (in trans) with the cis-repressing sequence to unlock the RBS and therefore to activate translation (Figure 1).

The benefits of this system, as described in Isaacs et al.'s paper, are leakage minimization, fast response time, tunability, independent regulation of multiple genes etc.[1]

Figure 1. Artificial riboregulator system used to control post-transcriptional regulation (Isaacs et al., 2004).

Team	Track	Chassis
Berkeley 2006	This team has not been assigned to a track.	E. coli
Caltech 2007	Foundational Research	E. coli
Delft 2009	Information Processing	E. coli
Groningen 2011	Information Processing	E. coli
K.U. Leuven 2008	This team has not been assigned to a track.	E. coli
K.U. Leuven 2009	Manufacturing	E. coli

We measured performance P_{bad} in different bacterial strains



Human Practice

We analysed past Human Practice projects from 2008-2013 and wrote a report to give an insight on how projects were done in the past.

We interviewed past Human Practice judges to understand deeper its objectives and impacts

DATA ANALYSIS REPORT OF PAST HUMAN PRACTICE PROJECTS

Synthetic biology is a newly emerging field that has not yet been sufficiently known to the general public. Therefore, over the course of years, numerous iGEM teams have put in tremendous efforts in human practice projects to promote synthetic biology in the society. This report aims to take the human practice projects of over 700 teams in the years 2008 to 2013, thus to spotlight the change in possible trends and correlations in human practice, in terms of types of projects done, and the regions in which they are distributed. Hopefully, this report can help form an insight into how human practice has been used to as a tool to introduce synthetic biology to the society. Read on to have a look at the report, or download the complete PDF version here.

Introduction

As the iGEM headquarters put effort to bring the topic of synthetic biology close to the society, more and more attention was given to human practice. In year 2008 to 2013, there was a total of 707 teams who joined the iGEM jamboree and received medal projects were conduc

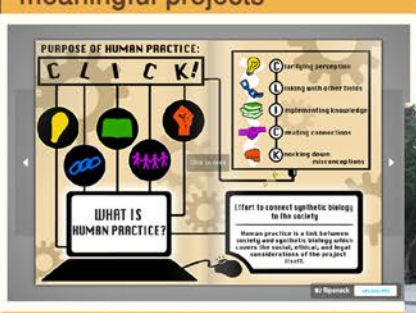
But how well exactly has human practice developed over the years? How much attribution was made in each region? Are some types more commonly done than others? To answer these questions, HKUST iGEM 2014 team gathered all the information since the year 2008, hoping to see some

Click for Advanced Search >> Matched 29 of 3148 records

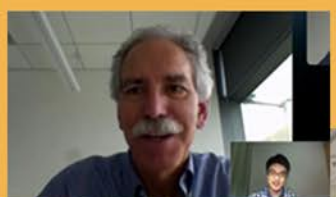
HKUST

Type	Name	Description	Medals	Advancements
"Talk"	"Hong Kong HKUST"	"Shared their project and iGEM to other people"	"Gold"	"championship"
"Investigation"	"Hong Kong HKUST"	"Did an investigation into research achievements, public perception, regulations and funding of iGEM teams in different countries"	"Gold"	"championship"
"Article"	"Hong Kong HKUST"	"Wrote an article about applications of their project"	"Gold"	"championship"
"Video"	"Hong Kong HKUST"	"Made a video to introduce their project and iGEM"	"Gold"	"championship"
"(Social) Media"	"Hong Kong HKUST"	"Made a blog to update people about synthetic biology for Hong Kong viewers"	"Gold"	"championship"
"Interview"	"Hong Kong HKUST"	"Discussed the possible safe applications of their project"	"Gold"	"championship"
"Interview"	"HKUST-Hong Kong"	"Interviewed a journalist, politician and a university student about synthetic biology to understand people's attitudes towards synthetic biology"	"Gold"	"Championship"
"Visit"	"HKUST-Hong Kong"	"Visited a cancer centre to give talks to the nurses and administrative staff about iGEM, synthetic biology, the project and future cancer treatment"	"Gold"	"Championship"

Start-up kit handbook for Human Practice to help future iGEM teams create meaningful projects



We also promote synthetic biology by helding talks and workshops



We even made a search engine to facilitate search of human practice projects we analyzed.