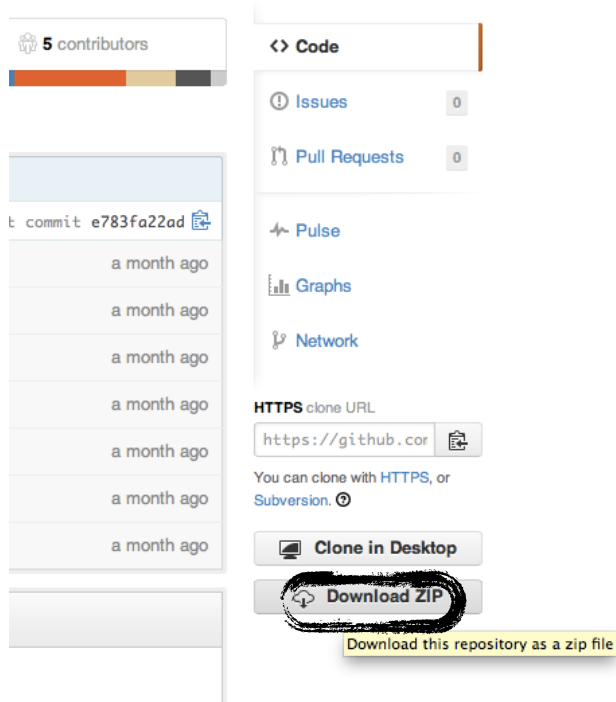


## Instruction

CAST (computer aided synbio tool) combines the **design automation, innovative models and algorithms**, and **wetlab validation**, making complex biological systems accessible to researchers who want rapid, intuitive, and high-quality accomplish their designs.

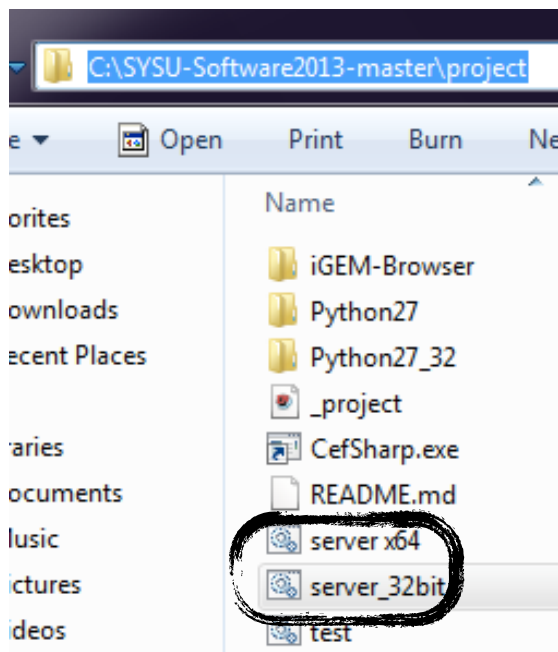
## Get started in CAST

I. Download CAST from <https://github.com/igemsoftware/SYSU-Software2013>



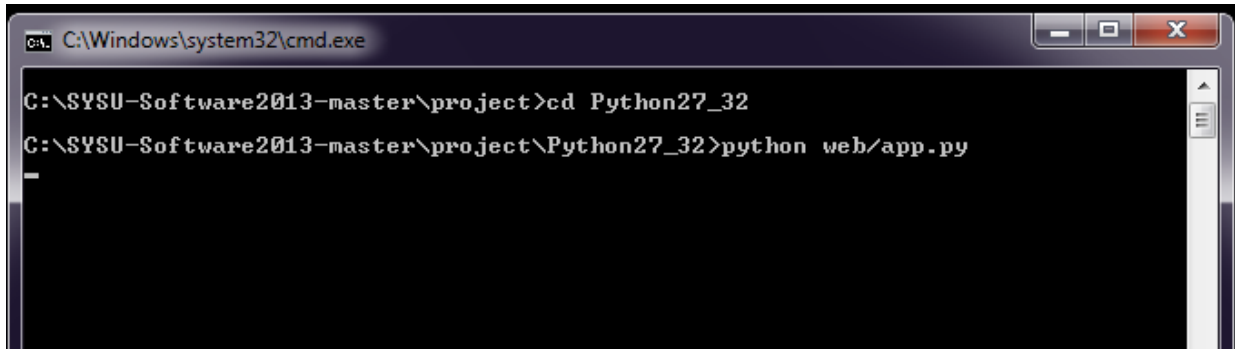
## II. Open CAST

1. Open 'project' folder in 'SYSU-Software2013-master'. Then click on one of sever\_.bat (choose x64 if your system is 64-bit; otherwise, 32bit is your best choice)



## Instruction

2. It will occur something like this. Just minimize the window.



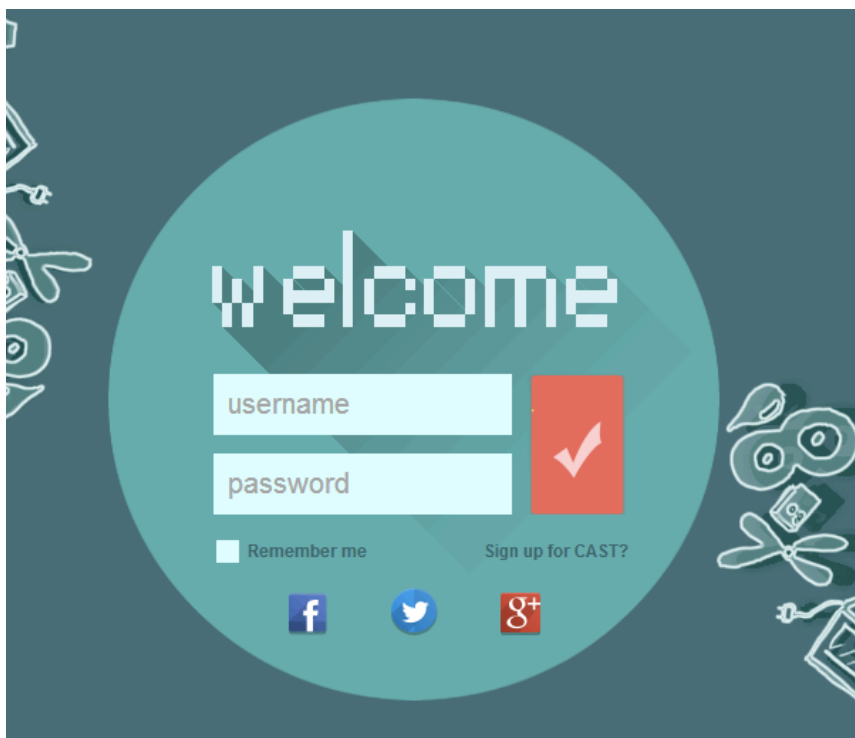
```
C:\Windows\system32\cmd.exe

C:\SYSU-Software2013-master\project>cd Python27_32
C:\SYSU-Software2013-master\project\Python27_32>python web/app.py
```

3. Open your browser(such as chrome) and input 127.0.0.1:5000 in the address bar.



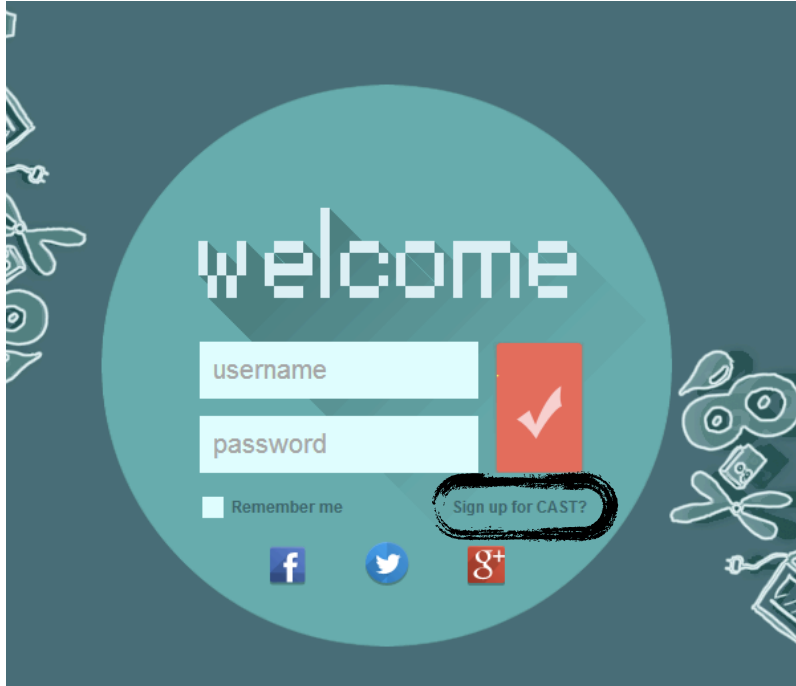
4. Success!



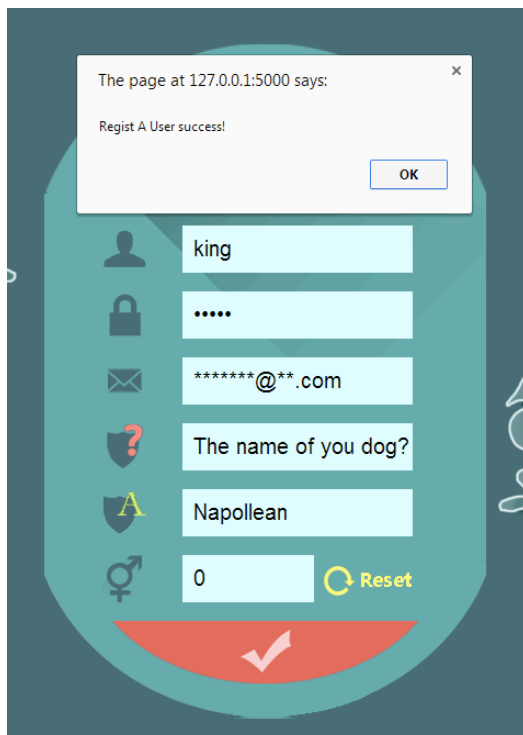
## Instruction

### III. Register & Sign in

#### 1. Register if you don't have an account.

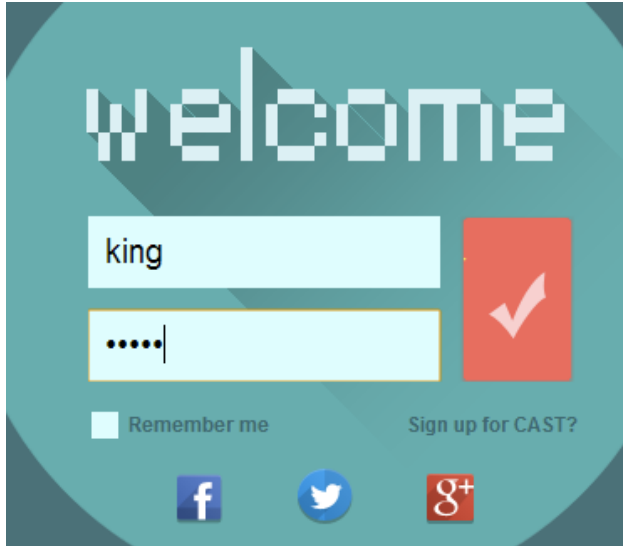


#### 2. Fill in the form and finish signing up. Attention! Gender must be 0(male) or 1(female).

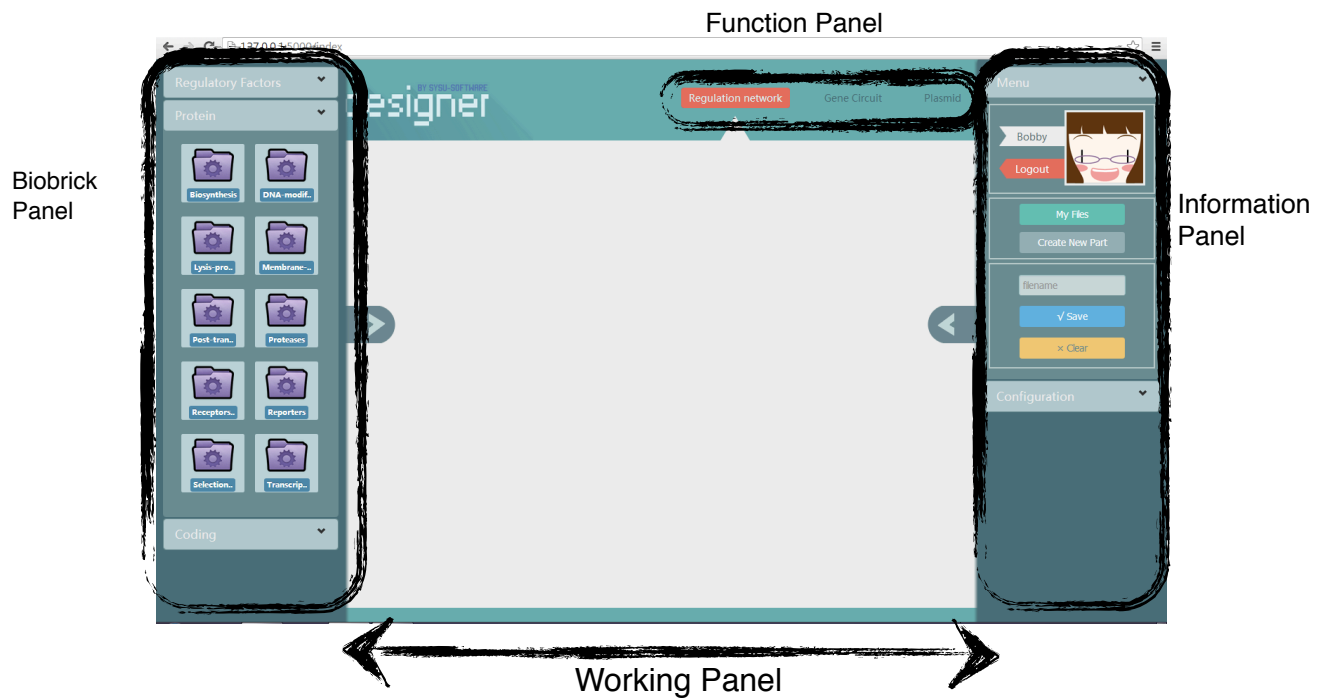


## Instruction

3. Sign in with your username and password.



IV. CAST at a glance



Biobrick Panel: You can choose any biobricks from iGEM registry in 'Protein' or your own biobricks in 'Coding. Apart, regulation factors are available in 'Regulation Factors'.


Information Panel: You can view your account information in 'Menu' as well as details of the biobrick chosen by you.

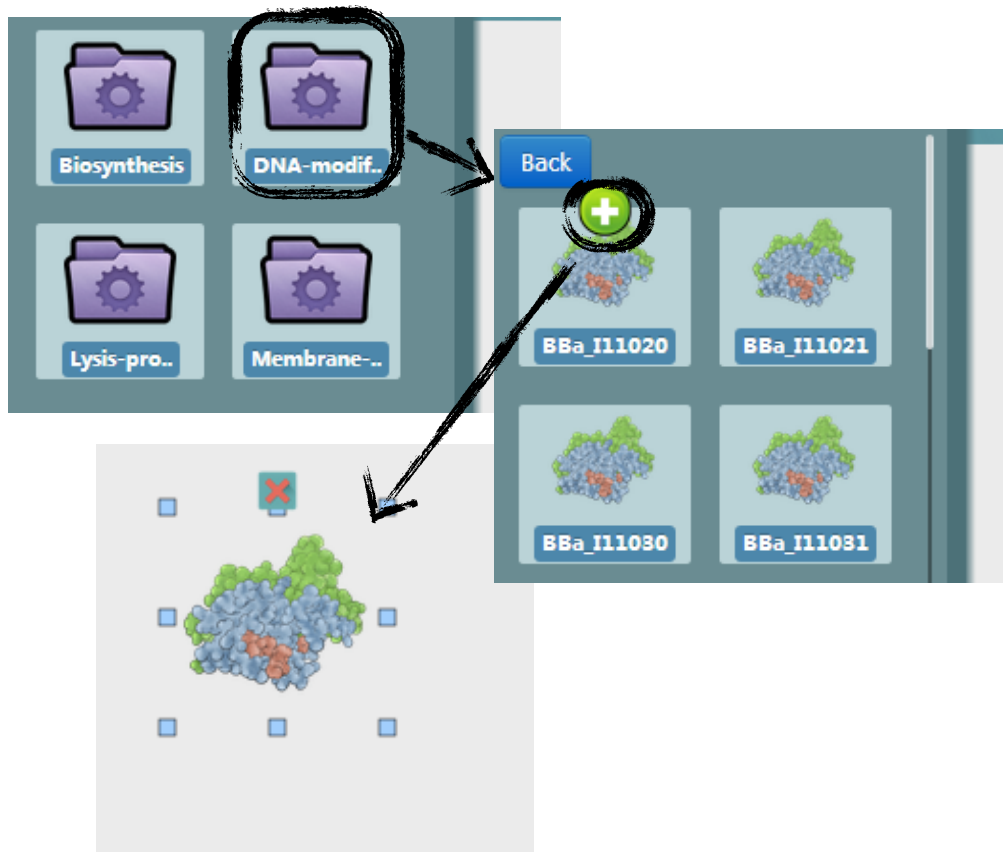
Function Panel: Select one of the functions and go to next step.

Working Panel: It's a white paper on which you can draw a regulation network.

## Plan Your Experiment

### I. Add biobricks.

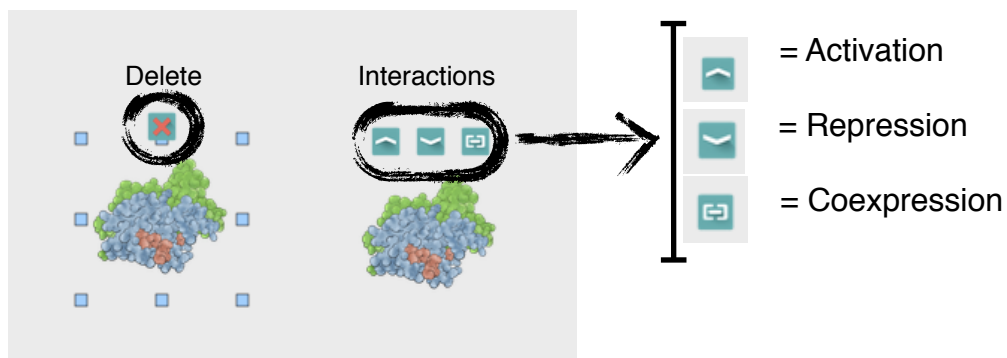
Choose one folder and select the biobrick you need and click on  to add.  
(For instance, choose 'DNA-modification' -> 'BBa\_I11020')



### II. Work on your biobricks.

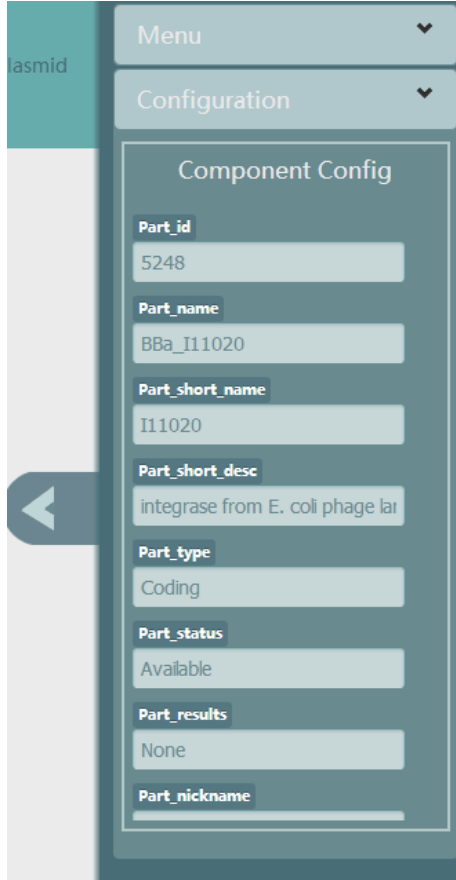
On the working panel, you are able to design regulation networks and manage them.

When clicking on one of the biobricks on the working panel,



## Instruction

configuration of this biobrick can be review on the Information Panel.(Right-hand side)

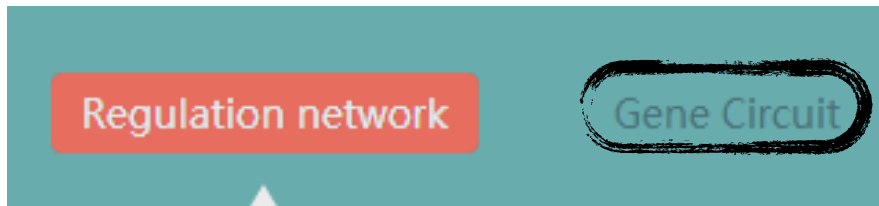


The screenshot shows a software interface with a teal header and a light grey sidebar. The main content area is titled 'Component Config' and contains several input fields with labels and values:

Field Label	Value
Part_id	5248
Part_name	BBa_I11020
Part_short_name	I11020
Part_short_desc	integrase from E. coli phage lai
Part_type	Coding
Part_status	Available
Part_results	None
Part_nickname	

### III. Generate gene circuit.

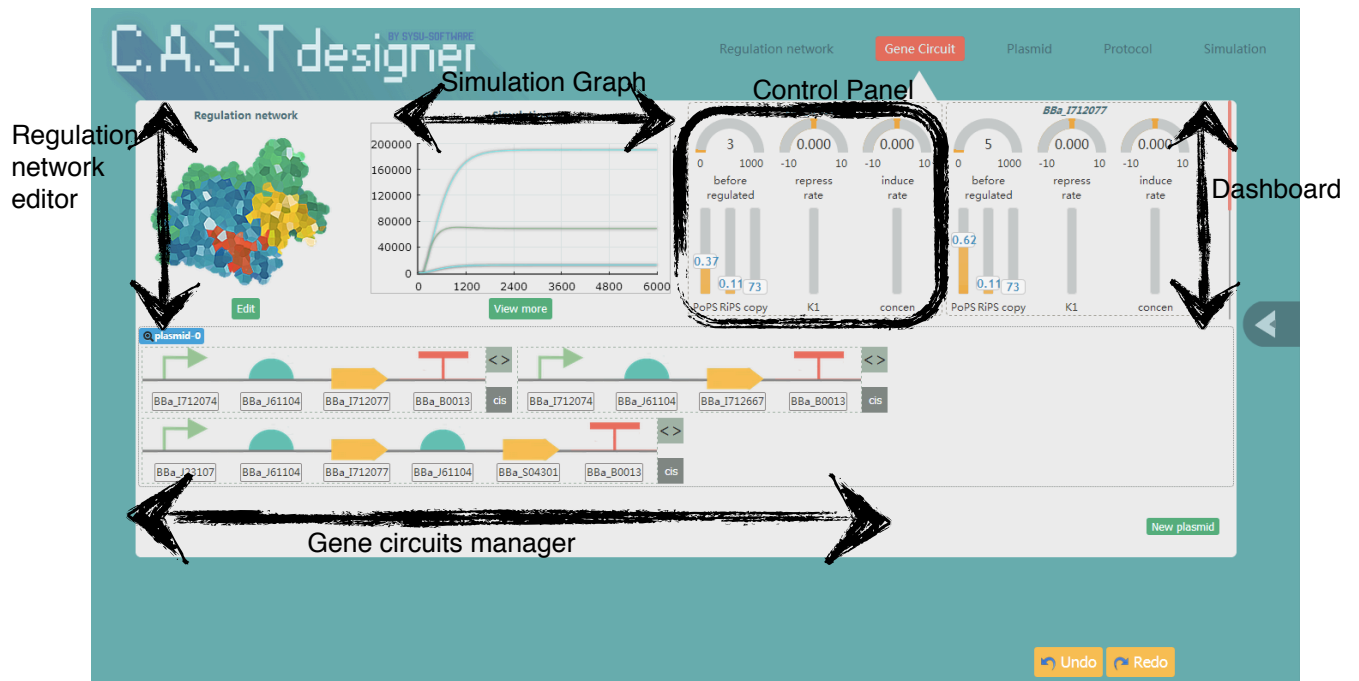
Click on 'gene circuit' after building regulation networks.



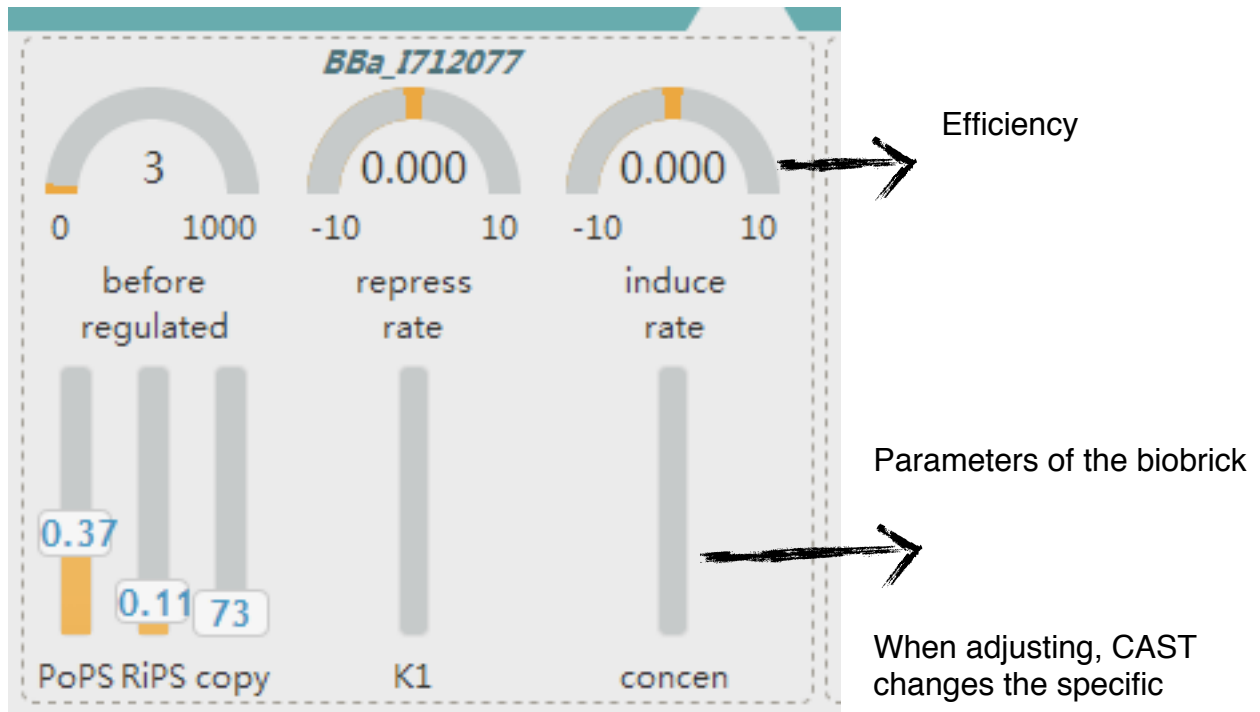
# Instruction

'Gene circuit' interface at a glance.

1. **Dashboard:** On the dashboard, each biobrick in the regulation network has a control

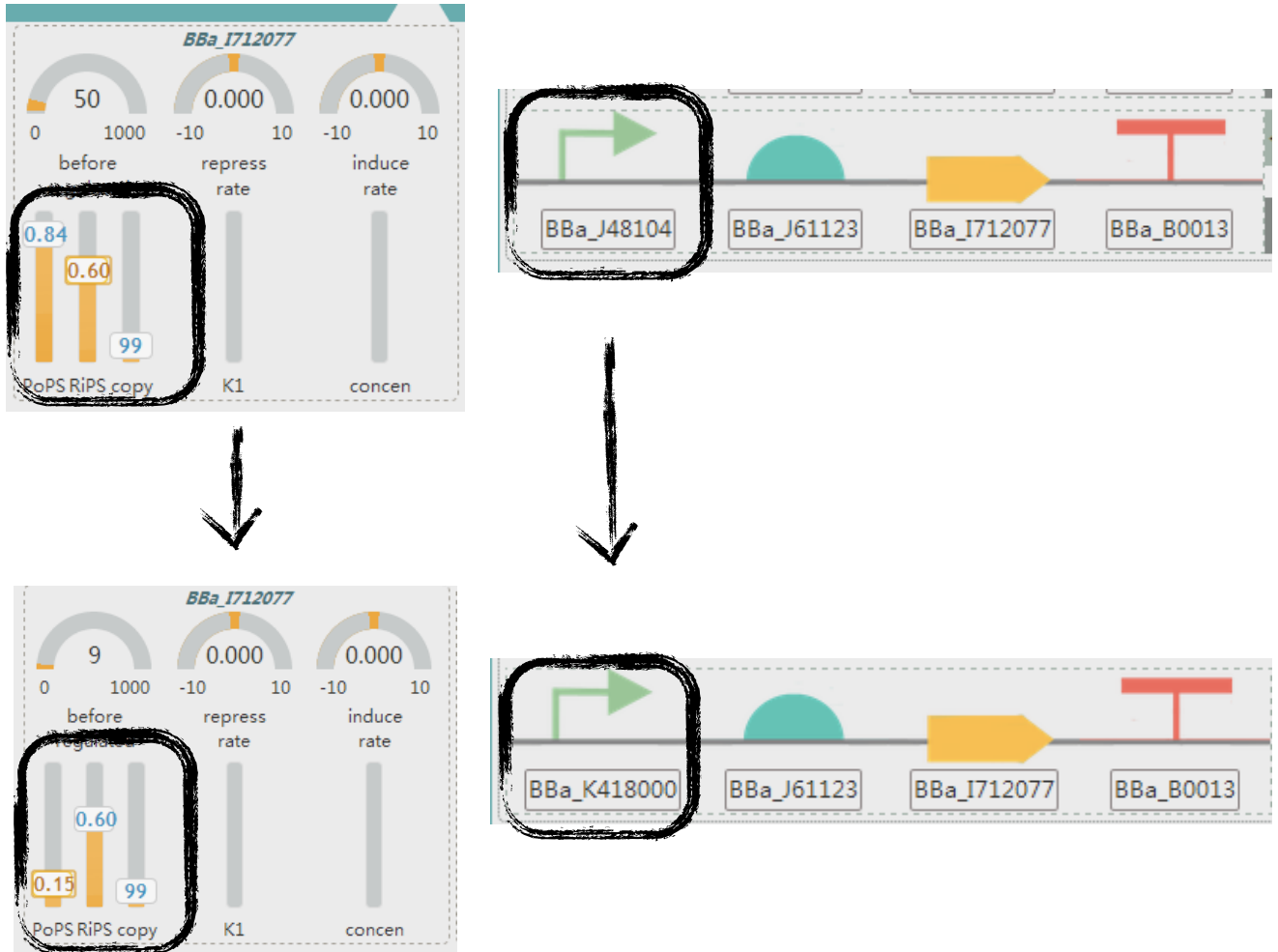


panel, which allows users to adjust its configurations, such as PoPS, RiPS and so on. After setting, the rate calculated is showed on the upper panel.

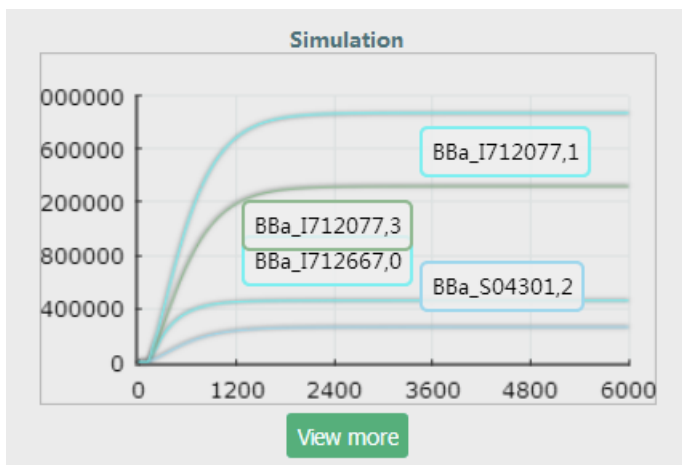


## Instruction

biobricks in the circuit(promoter, RBS, etc.) automatically, according to the value you set.



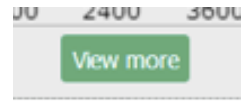
2. **Simulation graph:** According to the configuration, CAST calculates the expression efficiency of each biobrick and show it as curves.





## Instruction

If you need more information or more complex simulation, you can click to enter 'Simulation' interface.

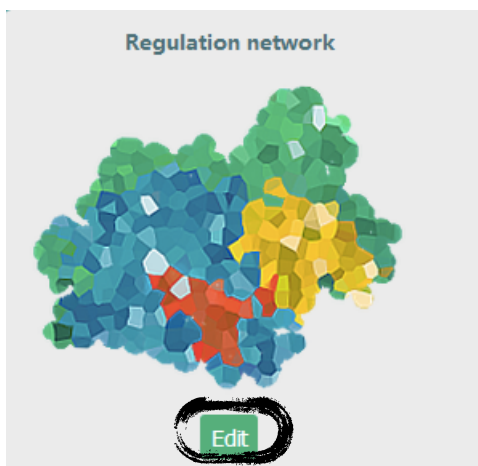
A screenshot of the simulation interface. It is divided into four sections: "Curve" with four checked checkboxes (BbA\_I712667,0; BbA\_I712077,3; BbA\_S04301,2; BbA\_I712077,1); "Option" with two unchecked checkboxes (stochastic; time delay); "Inducer" which is empty; and a bottom section with "back" and "Save Graph" buttons.

Choose the curve you want to view

Add conditions for intricate simulation

Save the graph or return to 'Gene Circuit' interface

**3. Regulation network editor:** You can return to 'Regulation Network' interface for further edition.



Click and go back to 'Regulation Network'

## Instruction

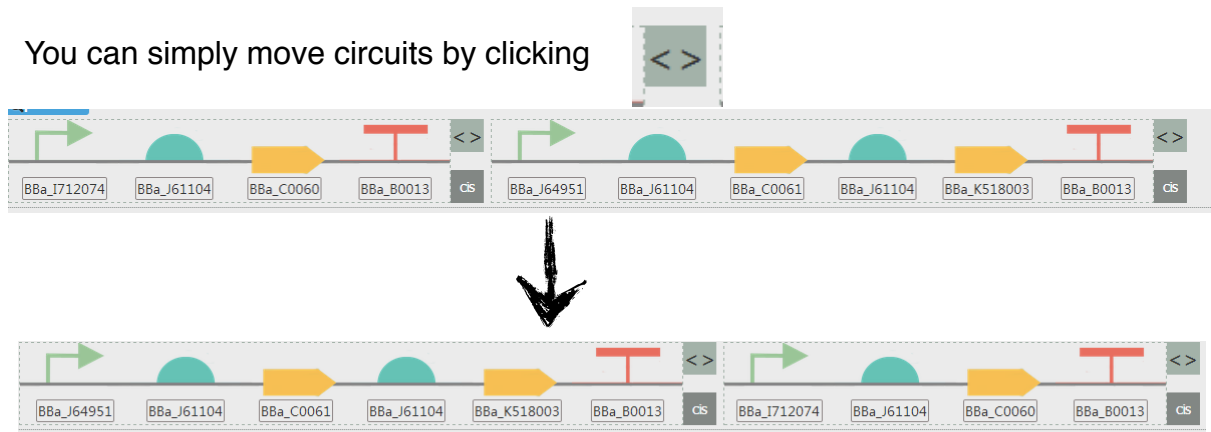
4. **Gene circuits manager:** The information of Gene circuits on the plasmid is displayed on this panel.

You can add one more plasmid if you want

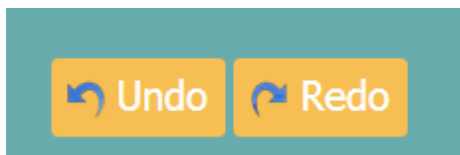


Add a new plasmid

You can simply move circuits by clicking

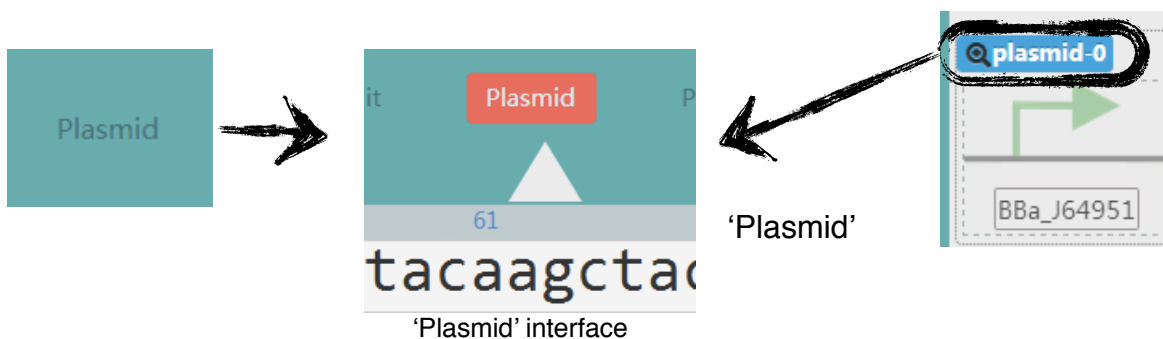


At last, if you think you have done something wrong, you can click



### III. View the plasmid

To see check the plasmid, just click 'Plasmid' on the Function panel, or 'plasmid' button in the Gene circuit manager.



## Instruction

interface at the glance

Current sequence

Plasmid viewer

Assembly Standard

Save Plasmid Graph

Sequence

downloadSeq

Plasmid sequence

In the plasmid viewer, users can drag their mouses and rotate the plasmid, in order to check each part of it. In the meanwhile, the sequence of the part your are viewing is displayed on the upper side. You can also see the whole sequence of this plasmid.

On the console, you can choose different types of plasmid

Assembly Standard

Assembly Standard

RFC 10

RFC 20

RFC 21

RFC 23

You can download the sequence or save the plasmid graph if you like.

Save Plasmid Graph

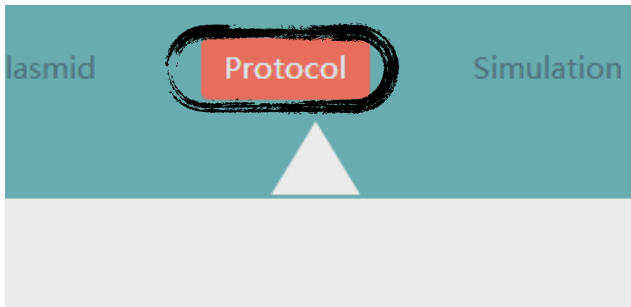
Sequence

downloadSeq

## IV. Design the experiments

1. Click 'Protocol' button to enter next interface.

## Instruction



2. On 'Protocol' interface, you can find standard experiment methods that give you guidance in wetlab.



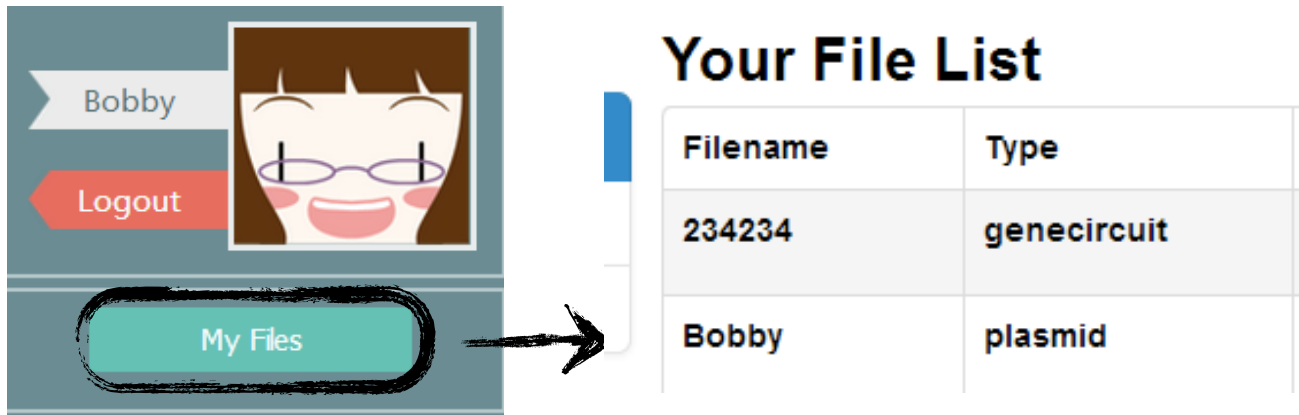
## V. Manage your files

1. Return to 'Gene circuit' or 'Plasmid'. Open information panel and click 'Save' after naming this file.



2. You can find your file by clicking on 'My Files'.

Instruction



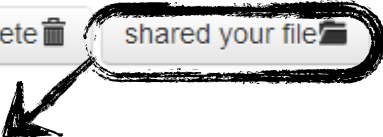
The image shows a user profile for 'Bobby' with a 'Logout' button and a 'My Files' button circled in black. An arrow points from 'My Files' to a 'Your File List' table.

Filename	Type
234234	genecircuit
Bobby	plasmid

3. You can manage your files. (Share, for example)

## Your File List

Filename	Type	operation
234234	genecircuit	<input type="button" value="open"/> <input type="button" value="delete"/> <input type="button" value="shared your file"/>
Bobby	plasmid	<input type="button" value="open"/> <input type="button" value="delete"/> <input type="button" value="shared your file"/>
abcd	plasmid	<input type="button" value="open"/> <input type="button" value="delete"/> <input type="button" value="shared your file"/>

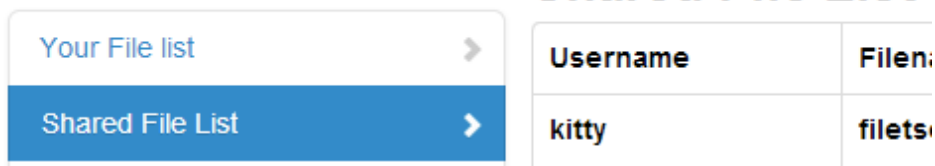


## Your file extract code

72d0a666a3fa0e063a218763dd4628d12feb2c27

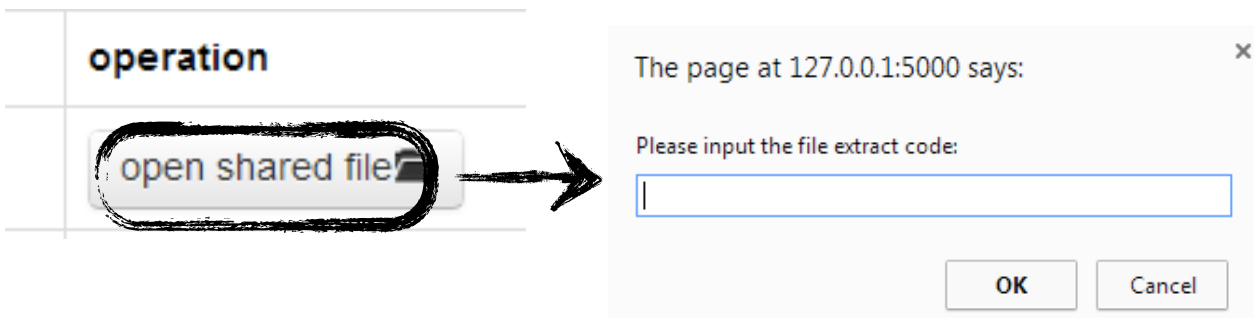
You can acquire others' shared files by inputing extract code. It's the same to others.

## Shared File List



The image shows a navigation menu with 'Your File list' and 'Shared File List' (highlighted in blue). To the right is a table for shared files.

Username	File:
kitty	filets

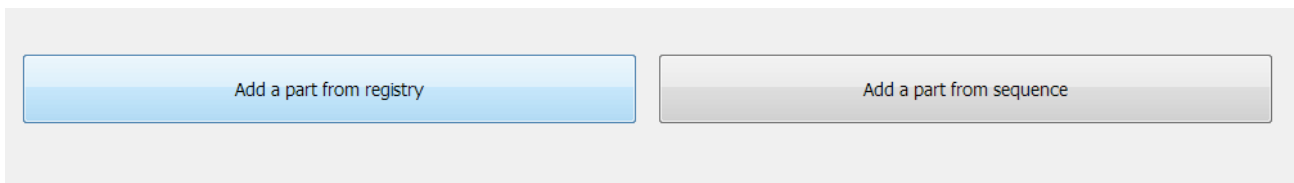
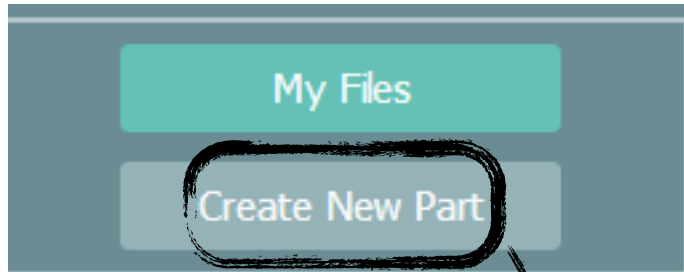


The image shows a table with an 'operation' column. A button labeled 'open shared file' is circled in black. An arrow points from this button to a dialog box.

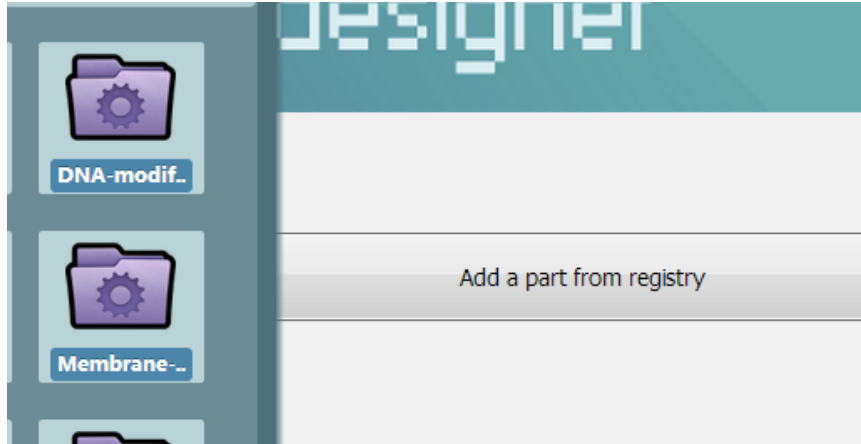
The dialog box contains the text: 'The page at 127.0.0.1:5000 says: Please input the file extract code:' followed by an input field and 'OK' and 'Cancel' buttons.

## VI. Add your own biobricks

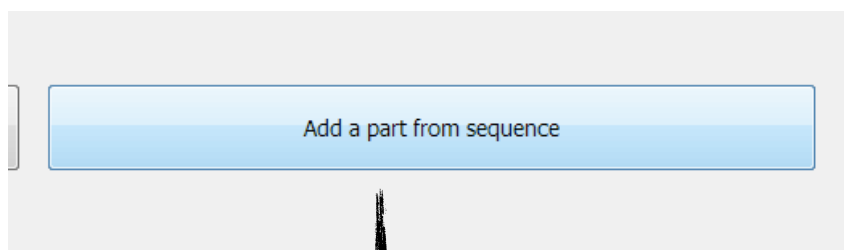
1. Open information panel on 'Regulation Network' interface. Click on 'Create New Part' to add your own biobricks.



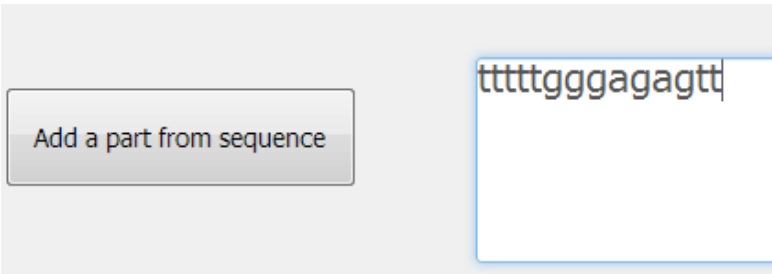
2. If you want to add a part based on registry, you can choose one biobrick from biobrick panel.



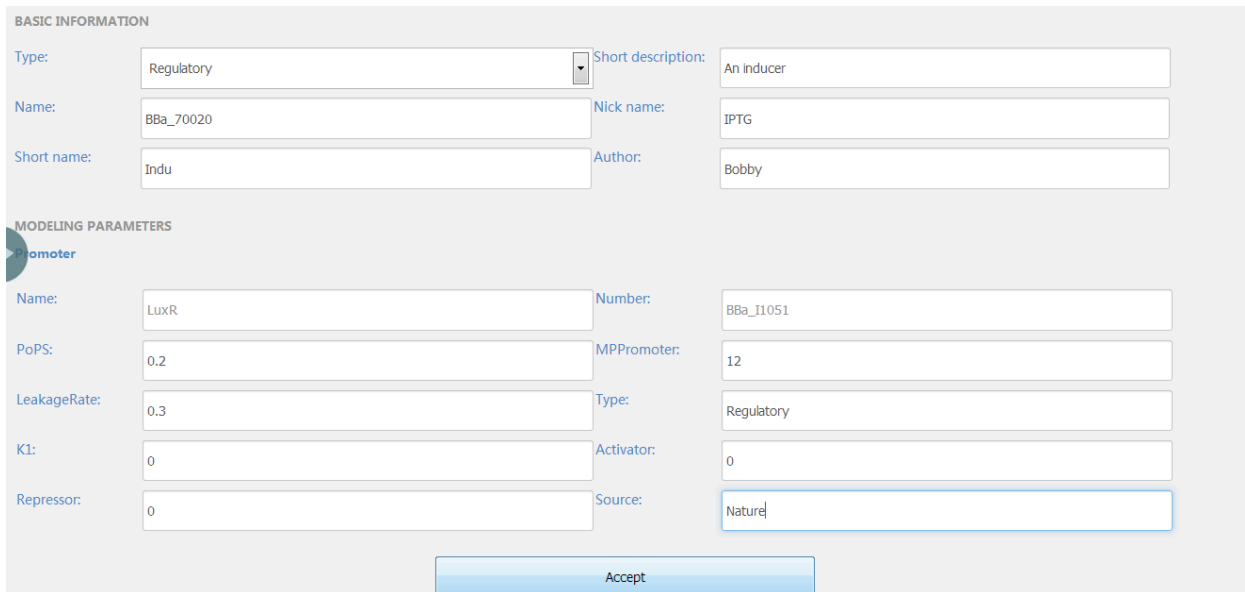
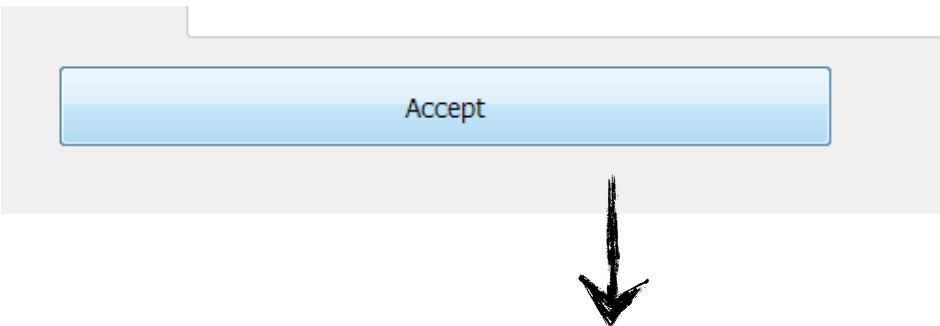
3. If you want to add a part from sequence, you can input the sequence in this blank.



## Instruction



4. Click 'Accept' after finishing. Then provide the entire information of the new biobrick.



**BASIC INFORMATION**

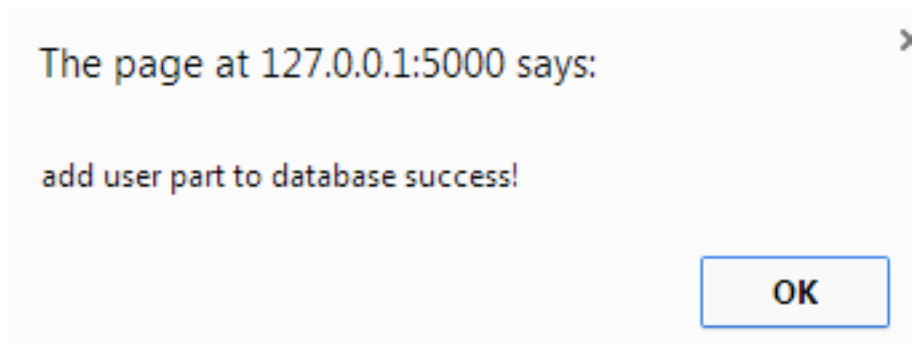
Type:	Regulatory	Short description:	An inducer
Name:	BBa_70020	Nick name:	IPTG
Short name:	Indu	Author:	Bobby

**MODELING PARAMETERS**

Name:	LuxR	Number:	BBa_I1051
PoPS:	0.2	MPPromoter:	12
LeakageRate:	0.3	Type:	Regulatory
K1:	0	Activator:	0
Repressor:	0	Source:	Nature

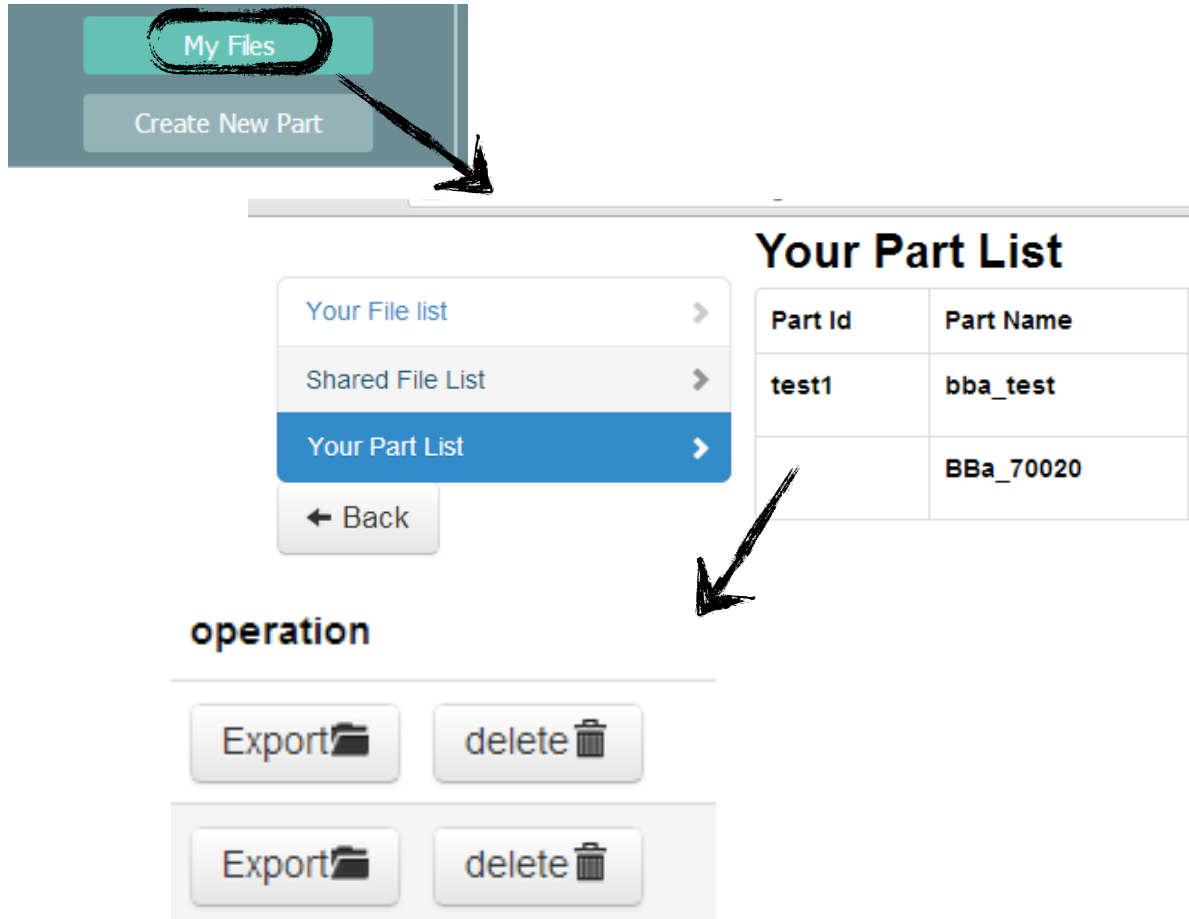
Accept

Click 'Accept' to finish.



## Instruction

5. You can find you own parts enter 'Your Part List' from 'My Files' and manage them.



The image shows a navigation menu on the left with 'My Files' highlighted. An arrow points from 'My Files' to the 'Your Part List' page. The 'Your Part List' page features a sidebar with 'Your Part List' selected, a table of parts, and an 'operation' section with 'Export' and 'delete' buttons.

Part Id	Part Name
test1	bba_test
	BBa_70020

operation

Export delete

Export delete

## VII. Finish & Log out

When you finish all your work, just log out and exit for relaxation. You files will be saved well.

Click 'Log out', then close the window and exit CAST.




The image shows a user profile card on the left with the name 'Bobby' and a 'Logout' button. An arrow points to the right, showing a login page with a 'welcome' message, input fields for 'username' and 'password', a 'Remember me' checkbox, and social media icons for Facebook, Twitter, and Google+.



## VIII. Other functions

### 1. Change your account information

Click your name or photo to enter your account profile, where you can change your information.



The profile card shows a name 'Bobby' in a grey banner, a red 'Logout' button, and a cartoon avatar of a girl with glasses. A black arrow points from the avatar to the account information form below.

profile >

password >

### Bobby

---

Username:

Gender:

Male  Female

Email:

Submit