

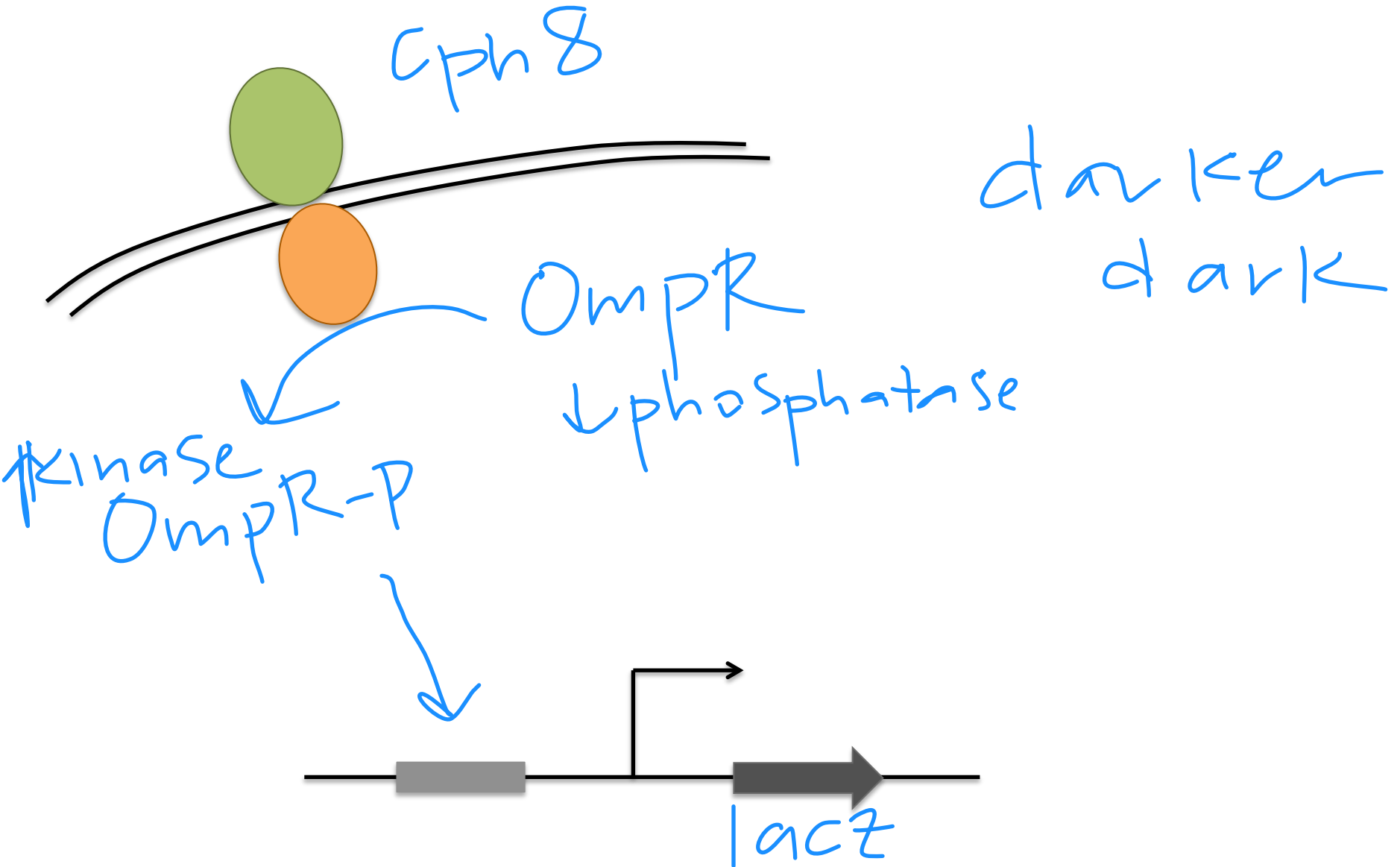
# M2D3: Tools for system engineering

10/16/14

# Lab business

- Journal club presentations...
  - Sign up for papers!
  - Upload slides for M2D4 presentations on Stellar
  - Extra Office Hours
    - Shannon: Sunday, October 19 3-5p in Simmons 528
    - Noreen: Monday, October 20 10-12p in 16-429b
- For next week...
  - Prepare an outline for the research article that you will write for this module
  - Extra credit available for visiting the BE writing lab and summarizing the feedback
- Module 2 report due Wednesday, November 12 at 12p

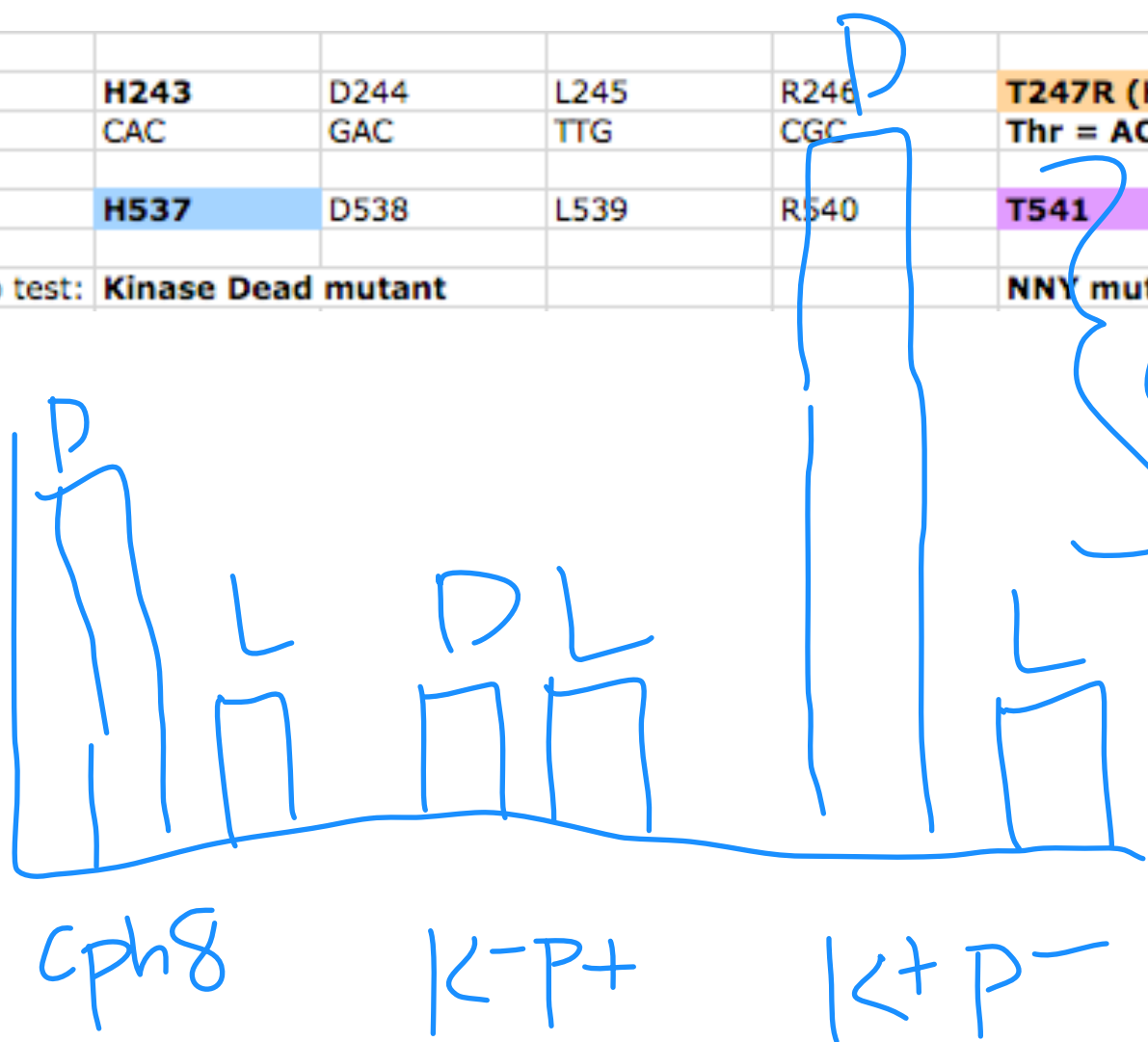
# How can we enhance contrast?



# Altering Cph8 kinase/phosphatase activity

<u>EnvZ</u>	<b>H243</b>	D244	L245	R246	<b>T247R (K+P-)</b>	P248
wt seq	CAC	GAC	TTG	CGC	Thr = <b>ACG</b>	CCG
<u>Cph8</u>	<b>H537</b>	D538	L539	R540	<b>T541</b>	P542
to test:	<b>Kinase Dead mutant</b>				<b>NNY mutagenesis</b>	

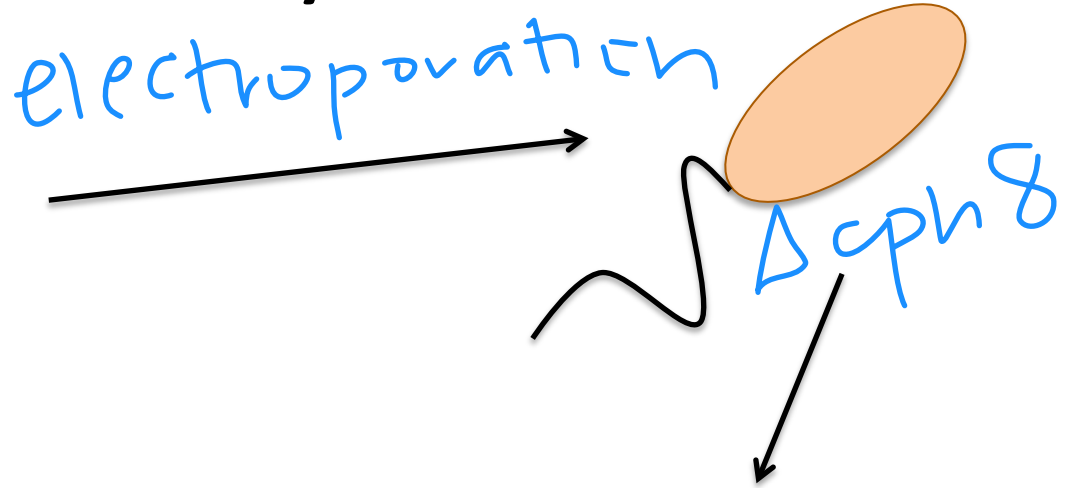
MU



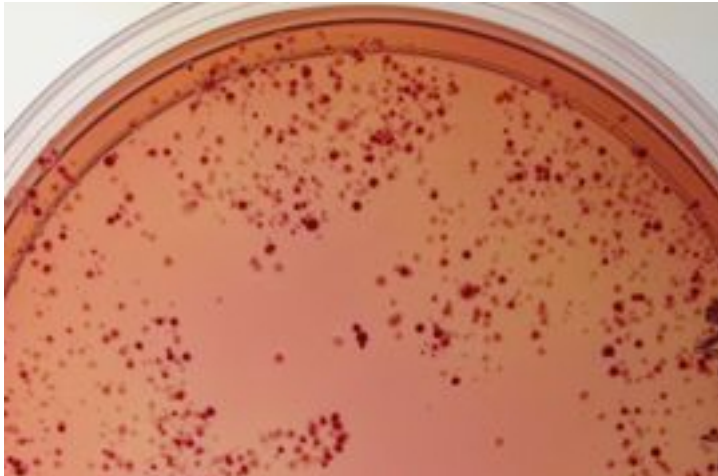
Contrast

# Mutant library screen

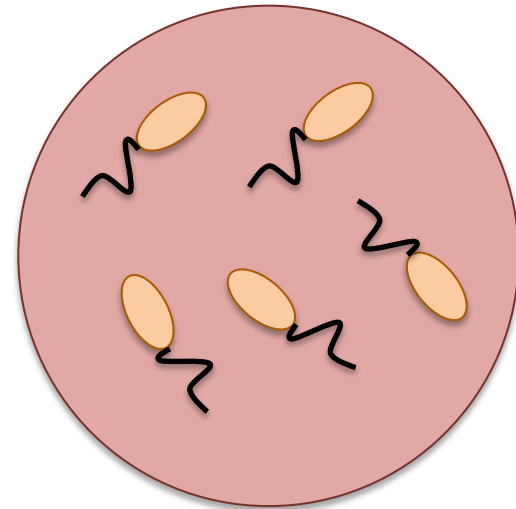
Constructed mutant library



MacConkey MUG Agar



neutral red  
lactose



# Registry of standard biological parts

- Build a protein generating device for *E. coli*

## Browse parts by type

Catalog

List



**Promoters (?)**: A promoter is a DNA of the downstream DNA sequence.



**Ribosome Binding Site/about (?)**: A ribosomes can bind and initiate transl



**Protein domains (?)**: Protein domain a protein coding sequence. Some pro the protein for cleavage, or enable it t



**Protein coding sequences (?)**: Proti Note that some protein coding sequer protein from start codon to stop codor also included here.

chassis

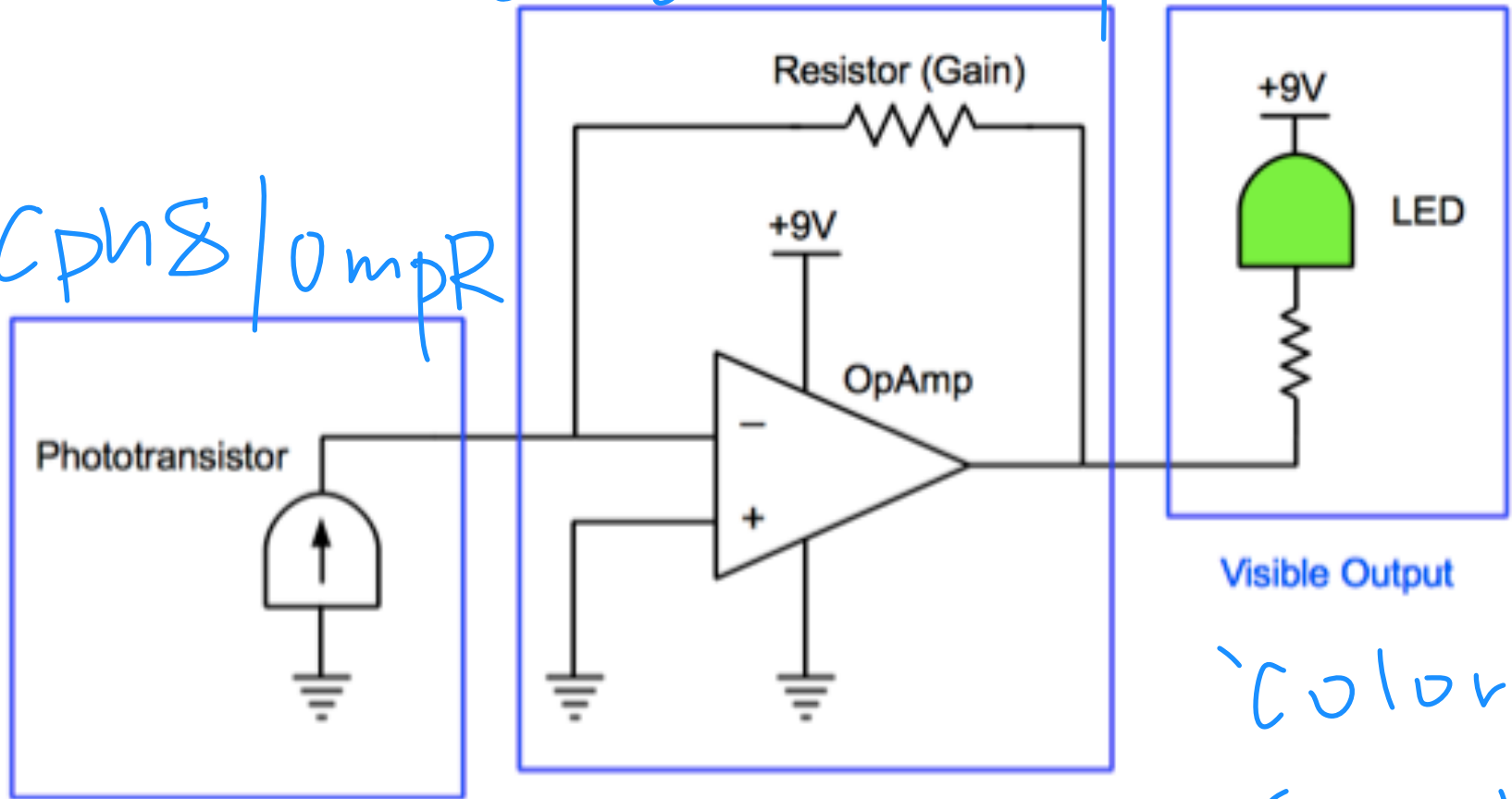
promoter  
GRF

RBS

# Circuits to study biological reactions

Lact transcription

CPS/OmpR



Light Sensor

Signal Propagator

Visible Output

'color'

Signal cleavage

breadboard = E coli  
wires = signals

# Today

- From last time...
  1. Examine/document your 'coliroid'
  2. Finish Tinkercell simulations
  3. Share  $\beta$ -galactosidase assay data with class
- Today...
  1. Begin mutant screen
  2. Use registry of standard biological parts to build protein generating system
  3. Build bacterial photography system using circuit



# Bacterial photography performance

Team	'Light' MU	'Dark' MU
PURPLE	48.4	1570.8
Cherries	227.2	765.2
green	365.2	618.4
Mustard	327.8	913.0
Tiger	424	1224
Pink	457	1163
blue	295	962