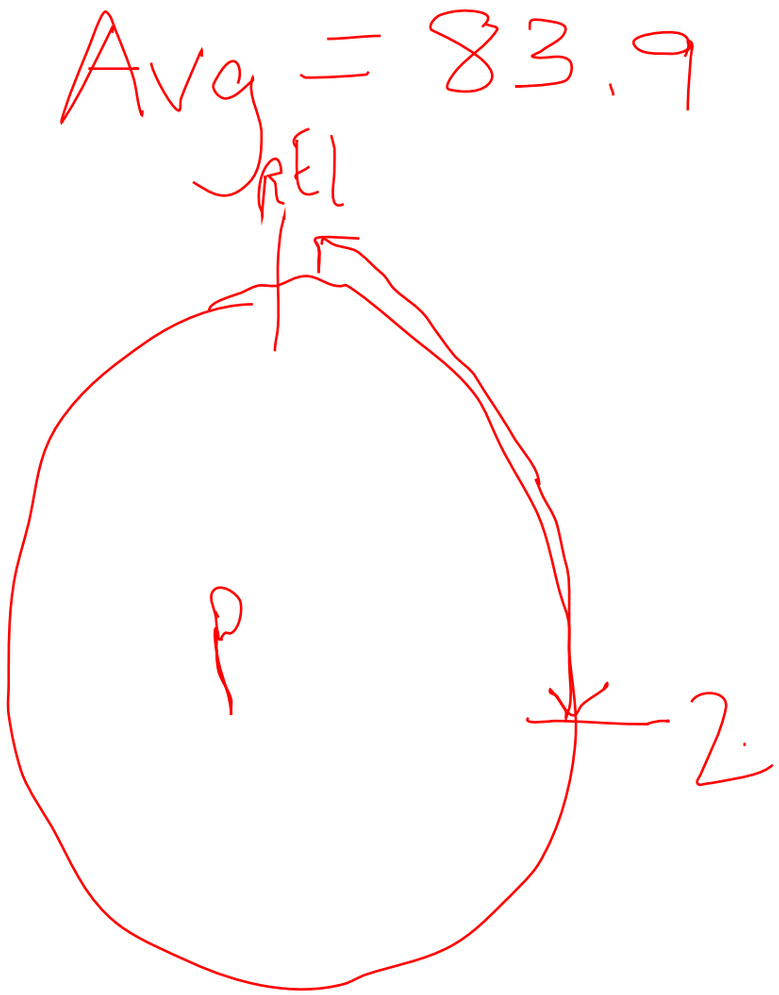
A little about the lab certification...



No DNA = No Ab

Unknown DNA = other cells

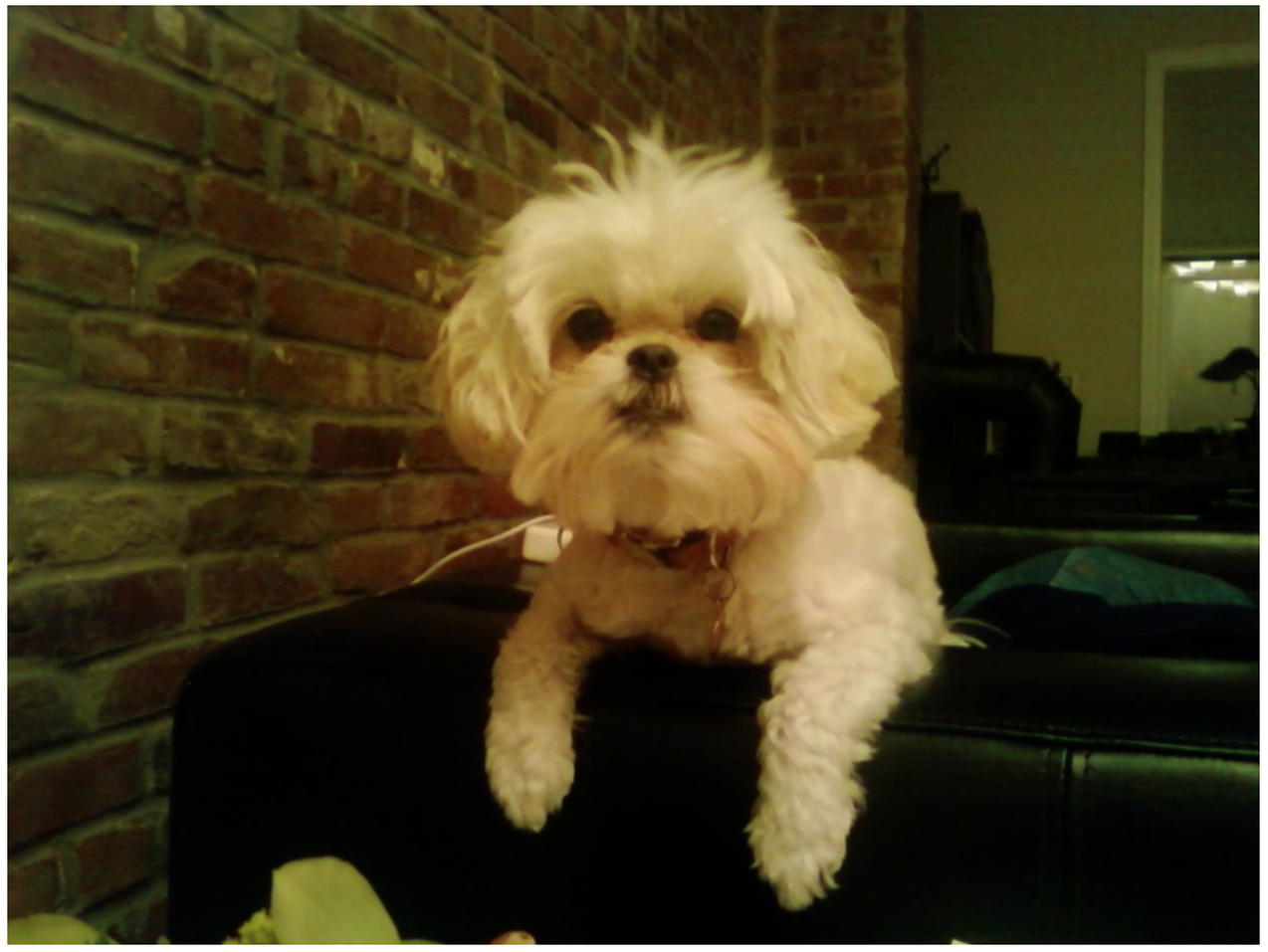
M2D1: Testing an engineered biological system

10/11/12 13:14:15 pm

Mod2: System Engineering
Bacterial Photography

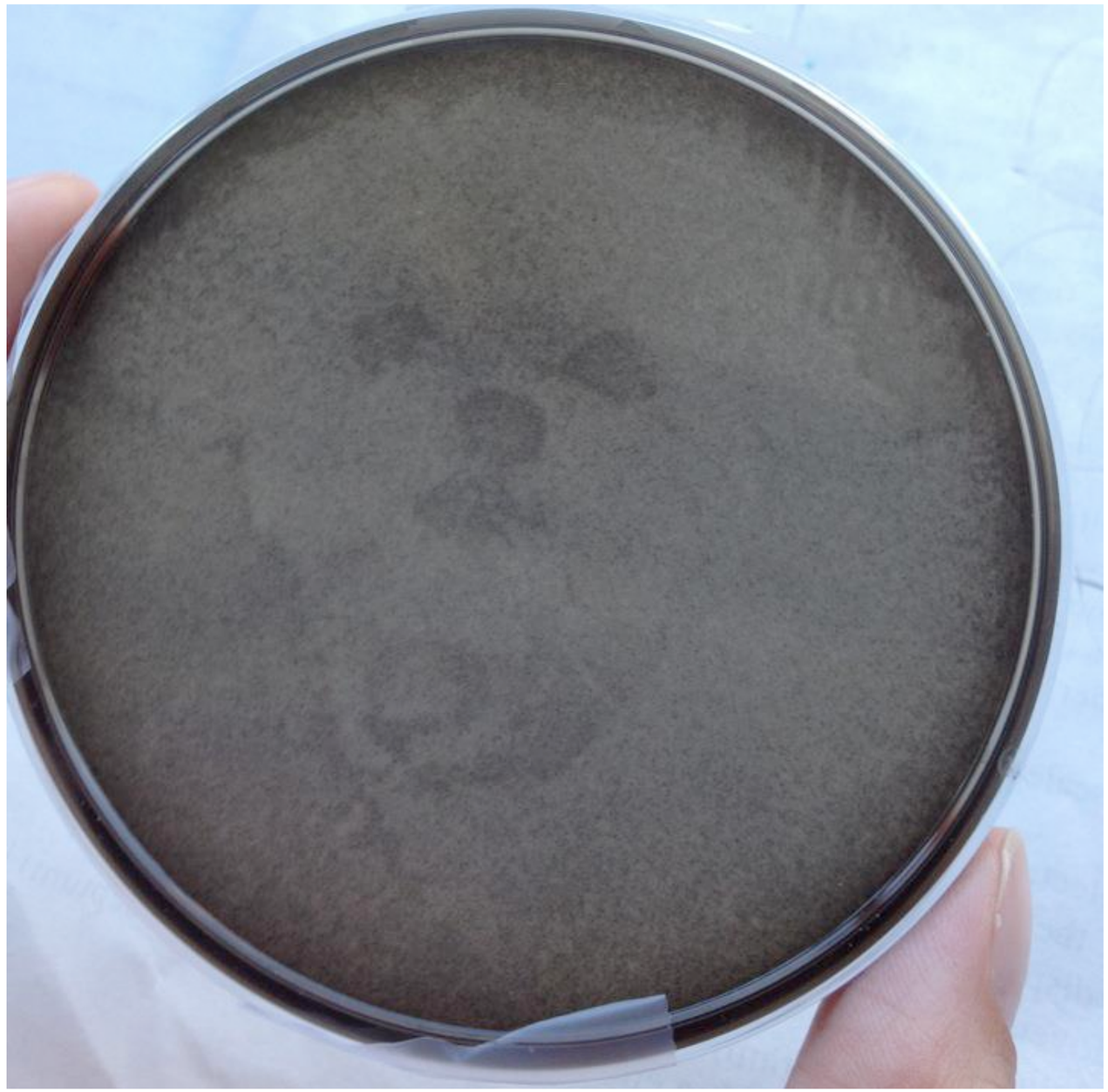
56-389

Butterstick



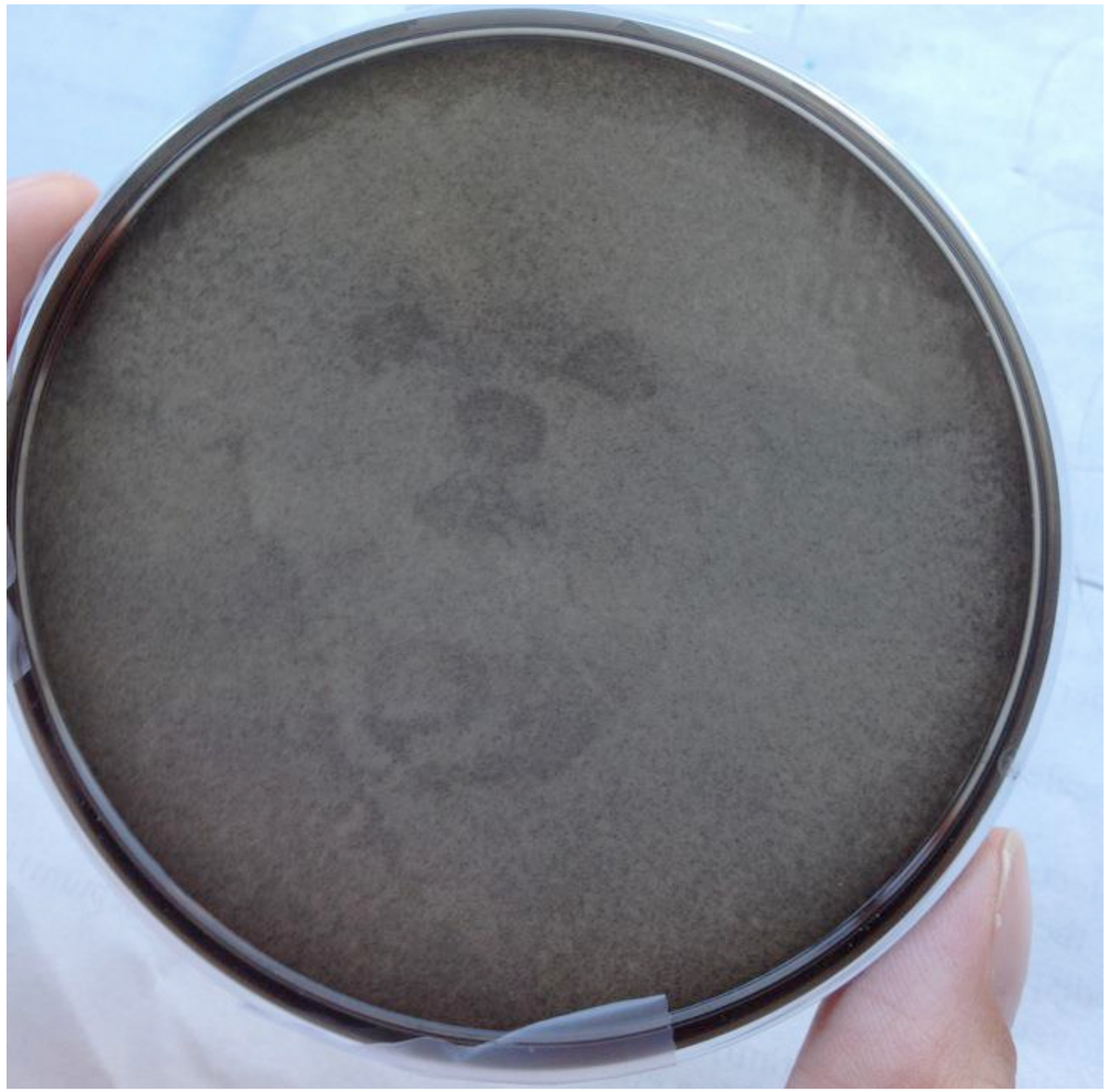
Mod2: System Engineering
Bacterial Photography

Butterstick



Mod2: System Engineering
Bacterial Photography

Butterstick



"What manner of sorcery is this?"

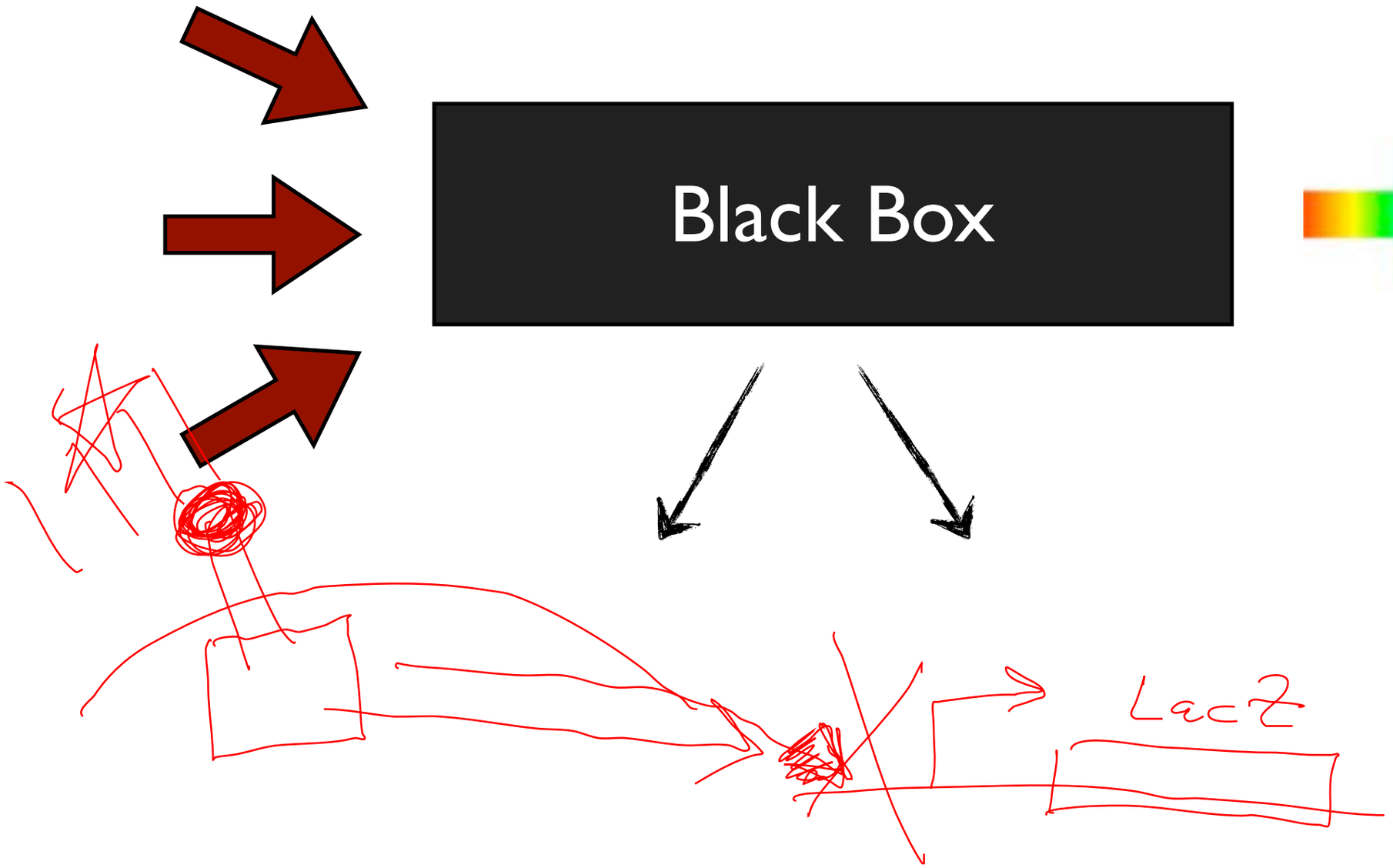
"wow! there is just so much awesome all over this!"

What *is* the manner of sorcery involved?

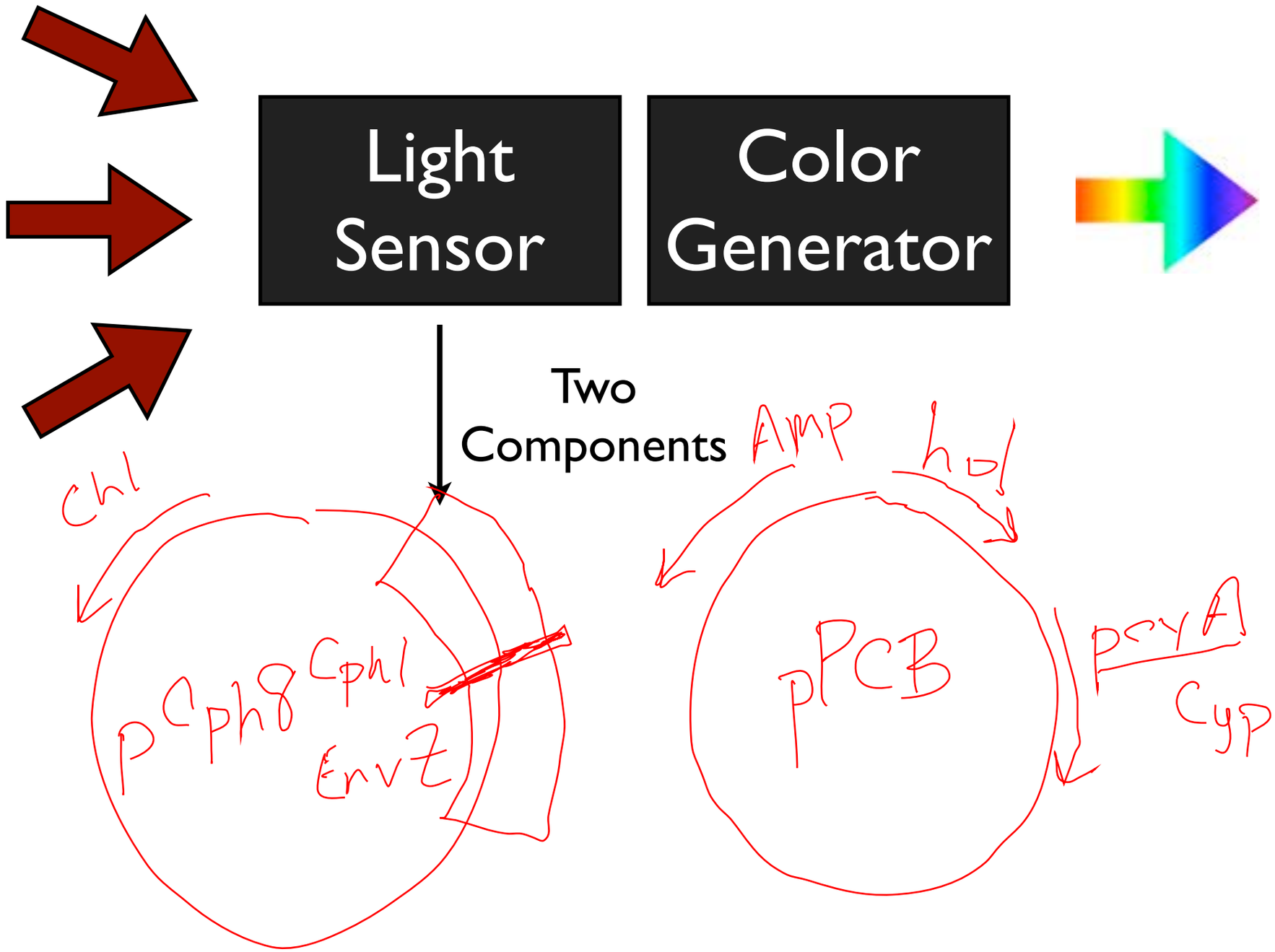
An engineered biological light sensing device.

Input: Light

Output: Color change



A little deeper into our black box:

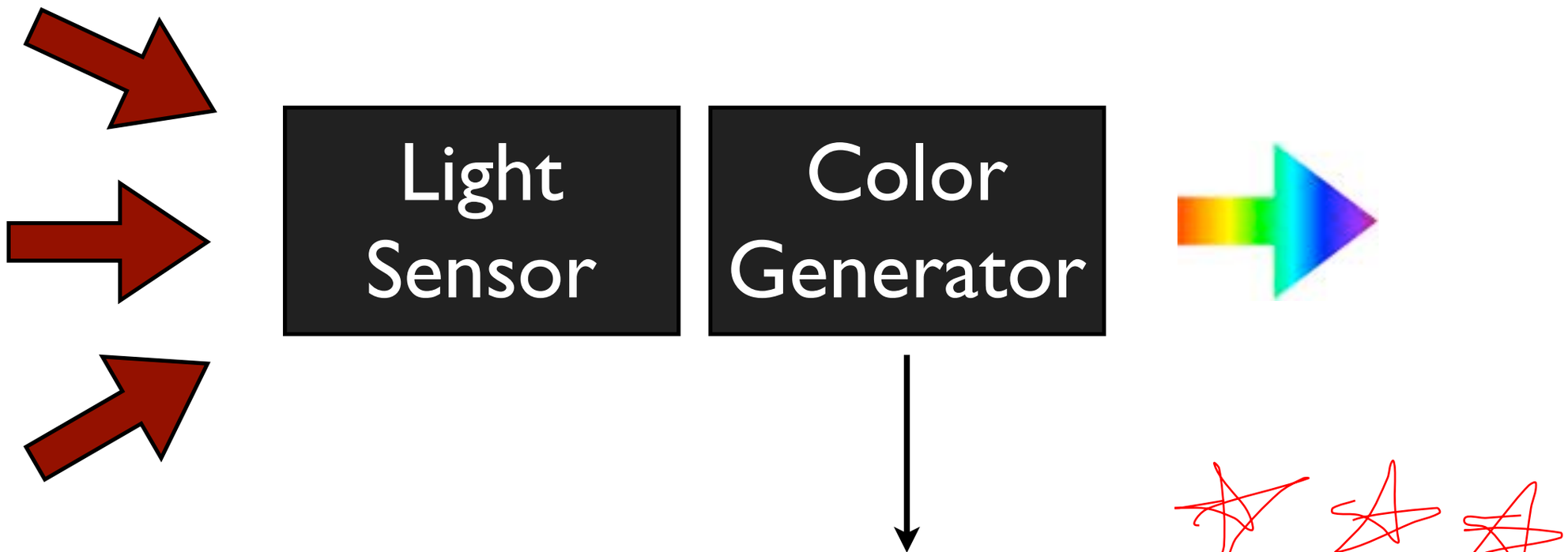


Cph1 = bacterial photoreceptor
EnvZ = cytoplasmic responder (gene regulation!)

PCB = photoresponsive protein from *Synechocystis*

Yuri Gorby, J .C. Venter Institute

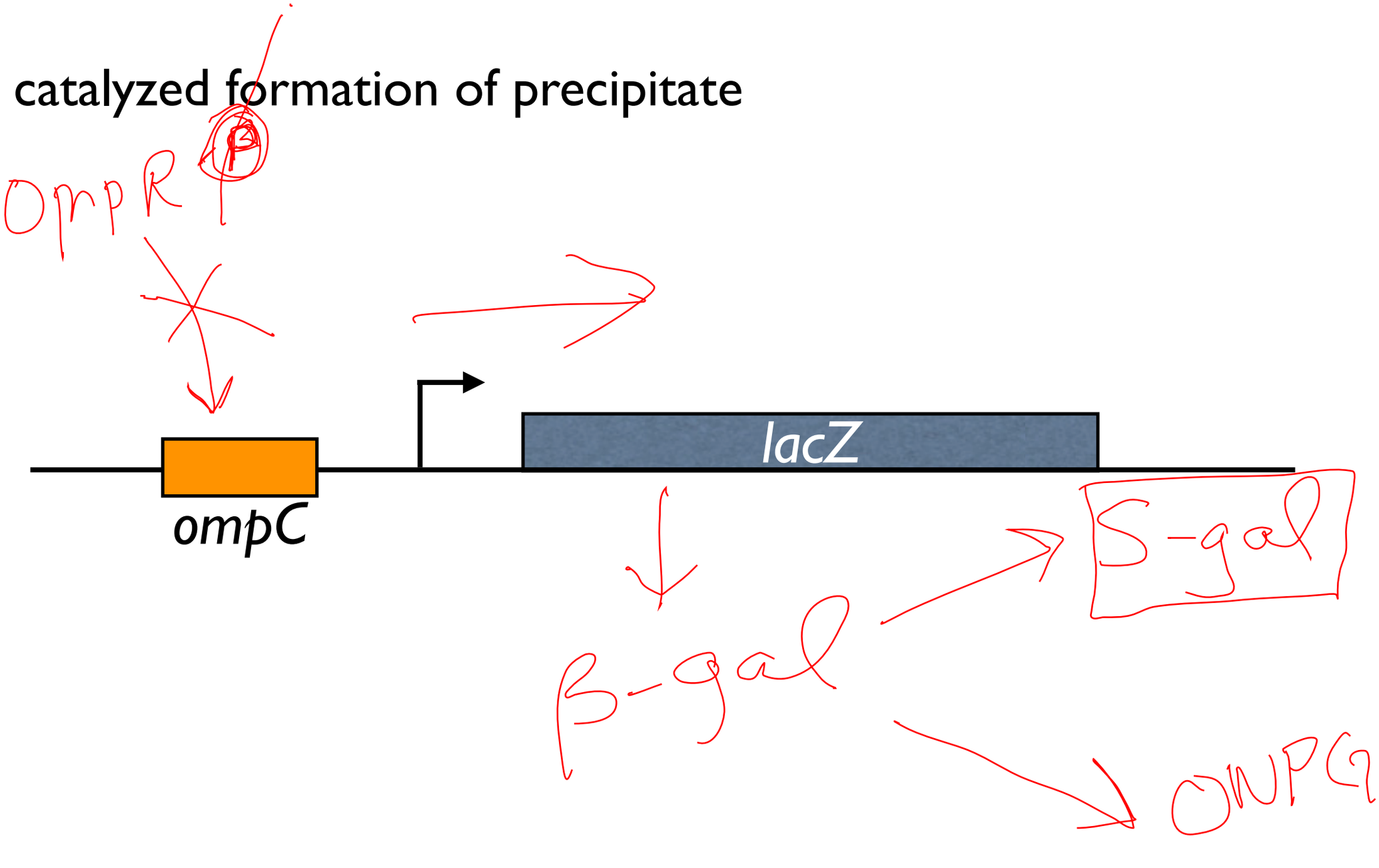
A little deeper into our black box:



	"Wild Type"	20.109
Sensor ~~HK~~	EnvZ	Cph 8
Responder	OmpR	OmpR
	Osmolarity	Light

How do we measure the efficiency of our engineered system?

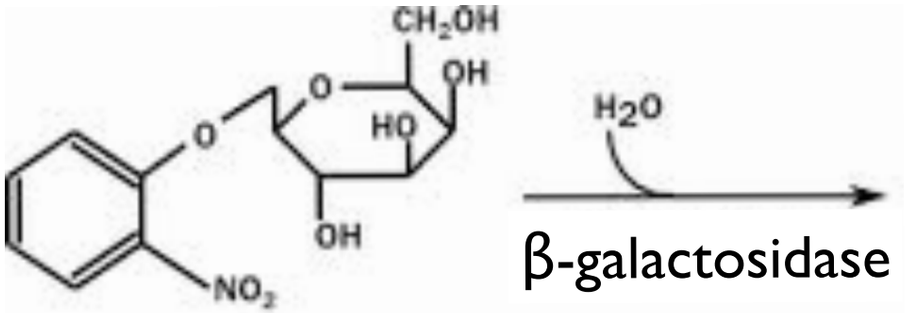
LacZ catalyzed formation of precipitate

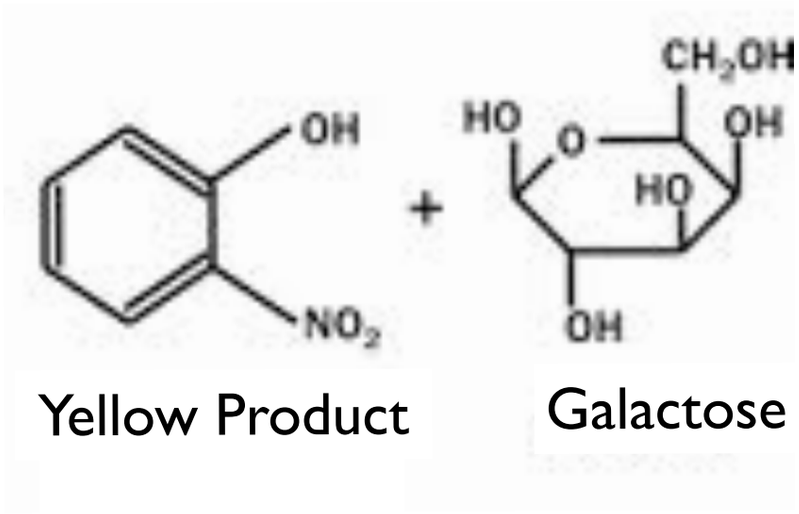


How do we measure the efficiency of our engineered system?

Limitations of our equipment and our assay:

ONPG

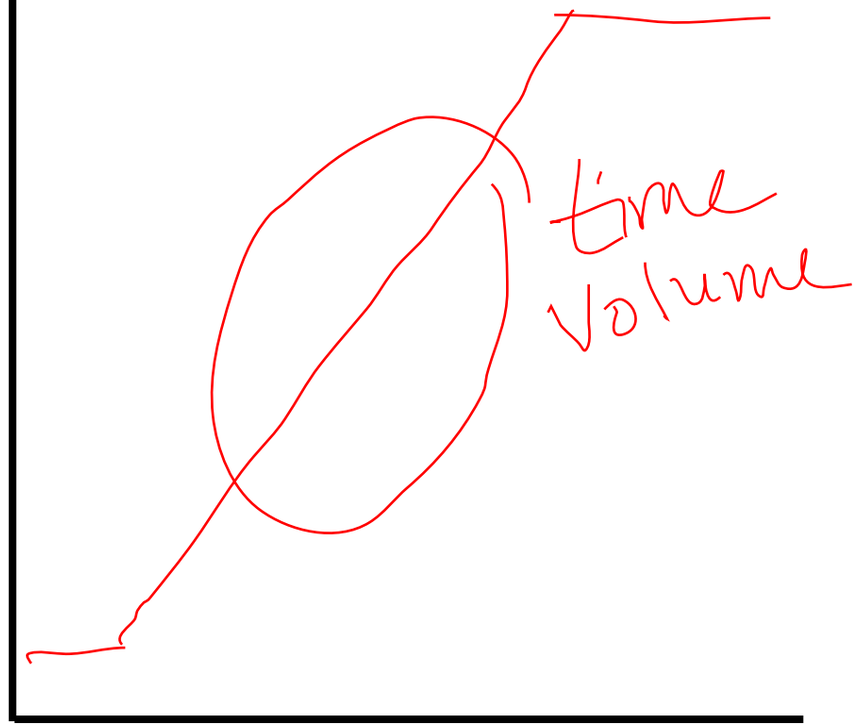




Yellow Product

Galactose

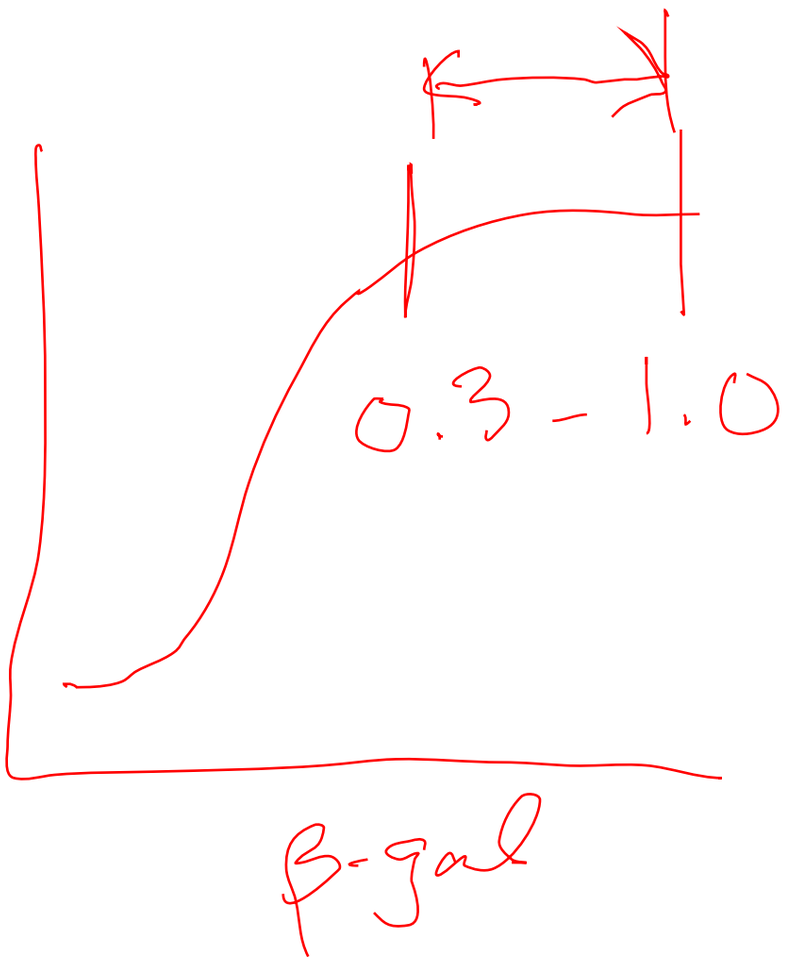
Yellow Color
Abs = 420 nM



How do we measure the efficiency of our engineered system?

β-Gal Assay:

1. Measure [cell]
2. Lyse cells
3. Start Reaction
4. Stop Reaction
5. Get rid of debris
6. Measure yellow product
7. Calculate activity



$$1 \text{ Miller Unit} = 1000 * \frac{(Abs420 - (1.75 * Abs550))}{(t * v * Abs600)}$$

Plan for today & Mod2 Assignment #1

(1) small liquid cultures of NB466 - quantificato
(2) plates - visual ↑ 3Ab

(3) β-gal - NB5

Pick your paper!