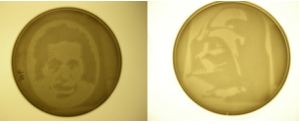


System Engineering

20.109 (F10)
Lecture M2D1

Overview of System Engineering Module

Experimental Context: Bacterial Photography System



Design Goal: Enhance contrast

Approach: Screen a library of mutants


Overarching theme: Programmability of biology
"synthetic biology"

Roadmap for System Engineering Module

Day	Lab	Lecture
1	Testing v1.0	System Eng: Bact. Photography
2	Measuring	Two Component Signaling
3	Tools	Synthetic Biology + Genetics
4	Journal Club	Group Meeting/Journal Club
5	Re-tune	Tools for examining the C-dog
6	v2.0	Analysis at the DNA level
7	v2.0	Analysis at the protein level
8	Journal Club	Group Meeting

PROBLEM SOLVING & UNDERSTANDING

What problems are waiting for data to solve?

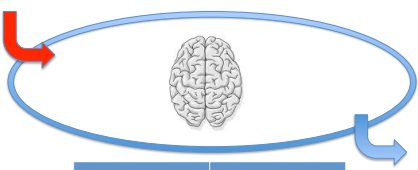


What questions have "RNA tie clubs" today?

ENGINEERING SCIENCE

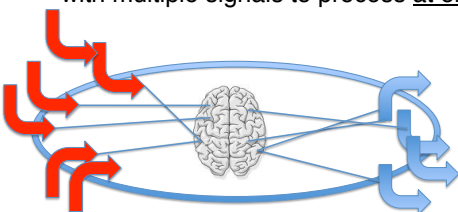
Image from The Economist, 09.09

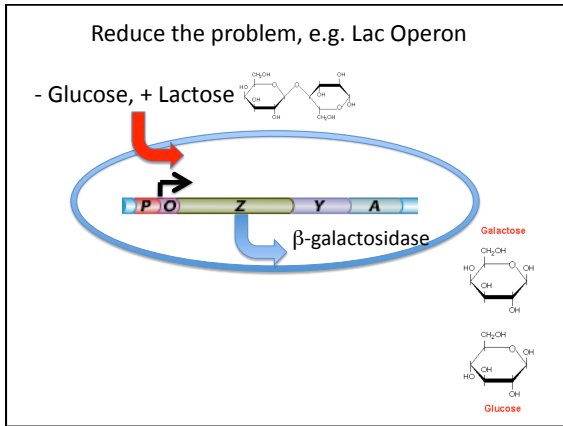
Cells as Input:Output Machines

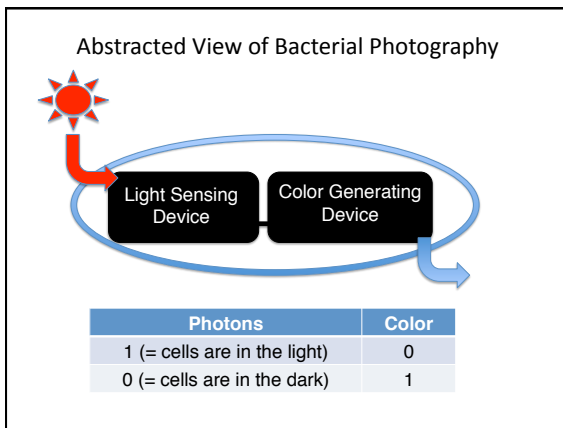


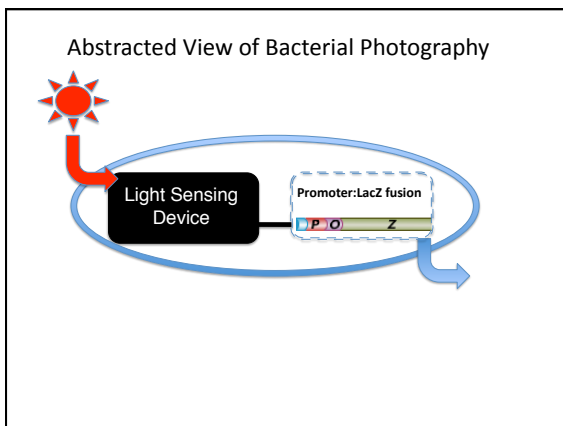
INPUT	OUTPUT

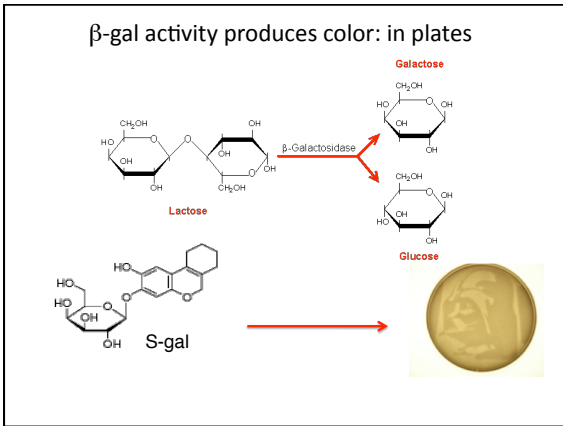
Cells as Input:Output Machines—
with multiple signals to process at once

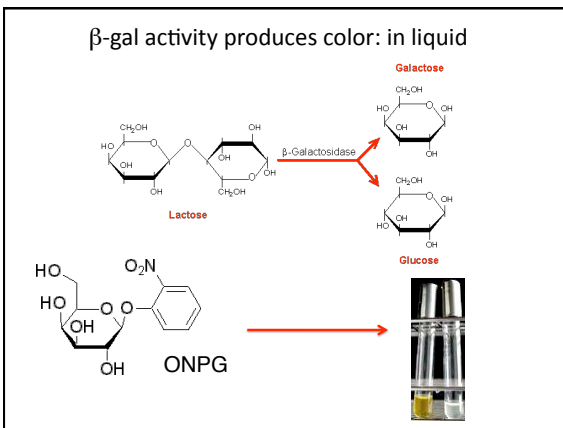












Summary

All problems in science are hard so be sure to be working on an important one
-Marshall Nirenberg

S-gal

Photons	Color
1 (= cells are in the light)	0
0 (= cells are in the dark)	1
