

# System Engineering

20.109 (F09)  
Lecture M2D1

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### 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                 |
| 5   | Re-tune      | Examining the C-dog           |
| 6   | Readout v2.0 | System Eng: revisited         |
| 7   | Journal Club | Group Meeting                 |

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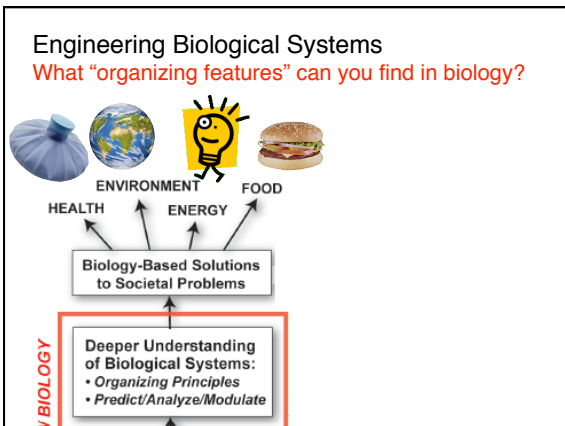
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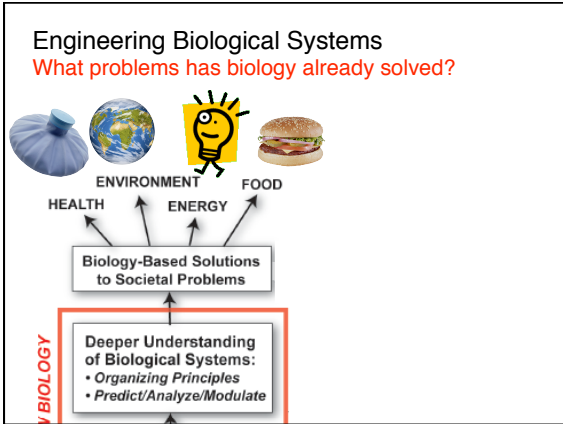
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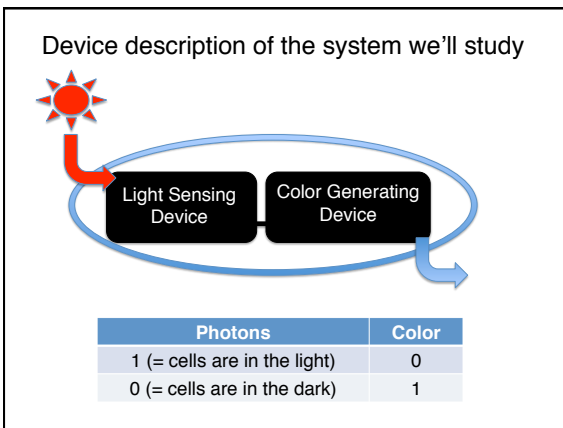
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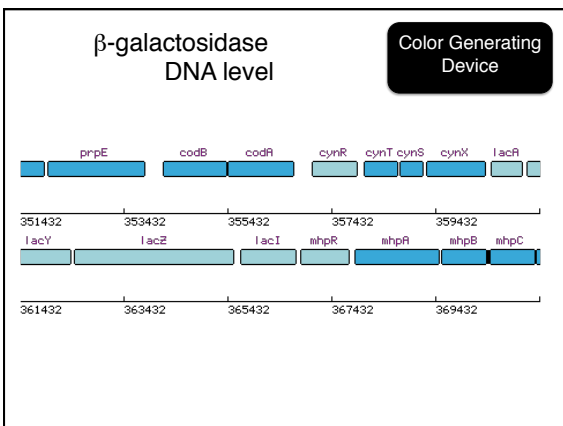
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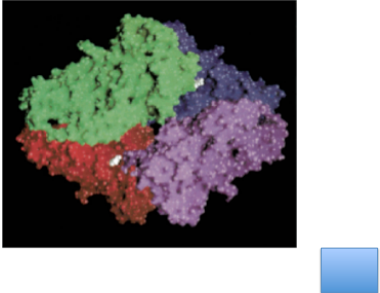
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**$\beta$ -galactosidase Protein level** Color Generating Device




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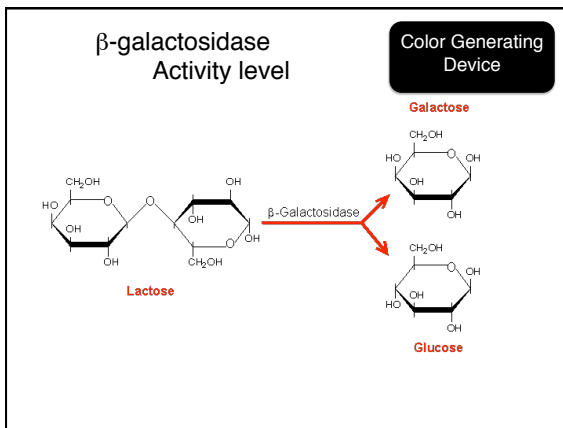
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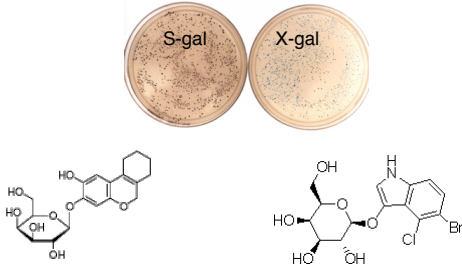
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**$\beta$ -galactosidase Chromogenic indicators** Color Generating Device



<http://www.sigmaldrich.com/life-science/molecular-biology/cloning-and-expression/microbiology-media/s-gal-home.html>

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$\beta$ -galactosidase  
Chromogenic indicators

Color Generating Device

OCC(O)C(O)C(O)C1OC(O)C(O)C1Oc2ccc([N+](=O)[O-])cc2

ONPG




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$\beta$ -galactosidase  
Chromogenic indicators

Color Generating Device

$$1 \text{ Miller Unit} = 1000 * \frac{(Abs_{420} - (1.75 * Abs_{550}))}{(t * v * Abs_{600})}$$



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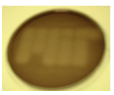
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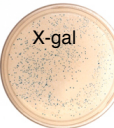
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 Summary 

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



$$1000 * \frac{(Abs_{420} - (1.75 * Abs_{550}))}{(t * v * Abs_{600})}$$


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