SEED Academy, Spring 2009
Synthetic Biology Module

Pre-Lab #5
Due April 3, 2009

1) Read the background and protocol for Saturday's experiments:
   http://openwetware.org/wiki/Beta-Galactosidase_Assay_(A_better_Miller)

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

i.   Explain the purpose of each term in the equation above (not just what the variable stands for but why it is in the equation). Include: Miller Unit, Abs_{420}, Abs_{550}, Abs_{600}, t, and v.

ii. What chemical is responsible for the color in the Miller assay? How does this work?

iii. Why is it important to keep careful track of the time?

iv. Complete the following table & indicate the rank of the various cultures in the per cell Beta-galactosidase activity (1 having the most activity per cell).

Sample #	Abs420	Abs550	Abs600	t (min)	v (uL)	Miller Units	Activity Rank
1	0.5	0.1	0.2	50	0.02		
2	0.75	0.1	0.2	50	0.02		
3	0.75	0.1	1	50	0.02		
4	1	0.2	0.1	10	0.02		
5	1	0.2	0.1	50	0.02		
6	1.5	0.5	1	100	0.02		
7	1.5	0.2	1	100	0.04		
8	1.75	1	1	20	0.04		