

1. Create an organism that is kan resistant (strong/weak)

**Answer:**

- Promoter: BBa\_J23117 (162 output) *or strong*
- RBS: BBa\_B0033 (weak) *or strong*
- BBa\_J31003 (kan resistance)
- Terminator: Ba\_B0014

2.

Use BioBricks to design an E. Coli which smells weakly of flowers, and is kan resistant

**Answer:**

- Promoter: BBa\_J23117 (162 output),
- RBS: BBa\_B0033 (weak)
- BBa\_J45002 (flower smell)
- BBa\_J31003 (kan resistance)

3.

Create a protein that will give "Gain" detergent a run for it's money, making it smell amazing!

**Answer:**

- Promoter: BBa\_J23106 (strong)
- RBS: BBa\_B0030 (strong)
- Protein Coding Sequence: [BBa\\_J45002](#) (SAM:benzoic acid carboxyl methyltransferase; converts benzoic acid to methyl benzoate (floral odor))
- Transcription Terminator: Ba\_B0014

4.

Create a weakly toxic organism.

**Answer:**

- Promoter: BBa\_J23117 (162)
- RBS: BBa\_B0033 (weak)
- Protein: BBa\_J07009 (toxicity-gene activator from *Vibrio cholerae*)
- Transcription Terminator: Ba\_B0014/BBa\_B1007

*\*BONUS\* +2 points*

Find a sequence to cleave proteins to further the life of HIV. The protein sequence is only compatible with a RFP promoter that is paired to an Anderson RBS. To terminate the coding mnpB terminator is used.

**Answer:**

- Promoter: BBa\_J23100 (RFP Promoter)

-RBS: BBa\_J61106 (Anderson RBS)

-Protein: BBa\_I712667 (HIV-1 aspartyl protease). HIV-1 aspartyl protease is a protease that is essential for the life-cycle of HIV and cleaves proteins at specific aminoacid sequence.

-Terminator: BBa\_J61048 (rnpB terminator)

Create a protein that is involved in cell lysis and death.

**Answer:**

Promoter:

- BBa\_J23103 strength weak-17 units

-Ribosome Binding Site: J61107 strength - weak

-Protein Coding Sequence:

BBa\_K112300 - lambda lysozyme – lysis and cell death protein only compatible with J23103 promoters and J61107 ribosome binding sites.

-Terminator: J61107 – Terminates 90% of all sequence that is being transcribed