Synthetic Biology Paper Reviews

To provide the IB group with an insight into synthetic biology, we are asking you to work in pairs to produce a short presentation that reviews a synthetic biology paper from the literature. Your review should be 10 minutes in length (so 10-12 slides max).

Your review should;
(I) introduce how synthetic biology is being used in the paper you are reviewing.

(Ii) summarise the paper results and findings for the audience, perhaps, because of the time constraints, focusing on only a subset of the data- the key figures that encapsulate the main findings of the paper.

(Iii) emphasise if, and how, your paper's research makes use of a key concept in synthetic biology, namely orthogonality - the use, in the synthetic gene circuit, of genes from other species that will not cross react with the host biochemistry, ensuring the gene circuit is, where required, insulated from host biochemistry.

(Iv) conclude with an overview of the paper's main message, and your thoughts on the insight it provides into the utility of synthetic biology

Pairs for presentations:

- Pierra and Matt
- Ben and Amy
- Holly C and Holly R

In your pairs please decide on which paper you would like to present and email Holly (r03hc14@abdn.ac.uk) with your chosen paper to avoid duplications.

Papers:

1: Quandt EM, Hammerling MJ, Summers RM, Otoupal PB, Slater B, Alnahhas RN, Dasgupta A, Bachman JL, Subramanian MV, Barrick JE. Decaffeination and measurement of caffeine content by addicted Escherichia coli with a refactored N-demethylation operon from Pseudomonas putida CBB5. ACS Synth Biol. 2013 Jun 21;2(6):301-7. doi: 10.1021/sb4000146. Epub 2013 Mar 22. PubMed PMID: 23654268. http://pubs.acs.org/doi/pdf/10.1021/sb4000146

2: Tabor JJ, Levskaya A, Voigt CA. Multichromatic control of gene expression in Escherichia coli. J Mol Biol. 2011 Jan 14;405(2):315-24. doi: 10.1016/j.jmb.2010.10.038. Epub 2010 Oct 28. PubMed PMID: 21035461; PubMed Central PMCID: PMC3053042. http://www.sciencedirect.com/science/article/pii/S0022283610011575

3: Ro DK, Paradise EM, Ouellet M, Fisher KJ, Newman KL, Ndungu JM, Ho KA, Eachus RA, Ham TS, Kirby J, Chang MC, Withers ST, Shiba Y, Sarpong R, Keasling JD. Production of the antimalarial drug precursor artemisinic acid in engineered yeast. Nature. 2006 Apr 13;440(7086):940-3. PubMed PMID: 16612385. http://www2.lbl.gov/Science-Articles/Archive/sabl/2006/May/Antimalarial-from-Yeast.pdf

4: Elowitz MB, Leibler S. A synthetic oscillatory network of transcriptional regulators. Nature. 2000 Jan 20;403(6767):335-8. PubMed PMID: 10659856. http://www.nature.com/nature/journal/v403/n6767/pdf/403335a0.pdf

5: Basu S, Gerchman Y, Collins CH, Arnold FH, Weiss R. A synthetic multicellular system for programmed pattern formation. Nature. 2005 Apr 28;434(7037):1130-4. PubMed PMID: 15858574. http://www.nature.com/nature/journal/v434/n7037/pdf/nature03461.pdf

6: A synthetic biology paper of your choice.