

Introduction

Lectures

Supplementary material

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Reading: Glossary

10 min

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Reading: Systems and Synthetic Biology

10 min

Assessment

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Systems and Synthetic Biology

Module 1: Introduction to Synthetic Biology: Visions for Biotechnology 2.0

- Extreme Genetic Engineering: An Introduction to Synthetic Biology. ETC Group. 2007. <http://www.etcgroup.org/content/extreme-genetic-engineering-introduction-synthetic-biology>
- Synthetic Biology Products and Applications Inventory. Synthetic Biology Project. 2015. <http://www.synbioproject.org/cpi/>
- Synthetic Biology based on standard parts. iGEM Foundation. 2016. http://igem.org/Main_Page

Module 2 : Designing biological system: Computational modelling and systems biology

- Genetics: Getting Closer to the Whole Picture. Sauer U, Heinemann M, Zamboni N. Science 2007, 316: 550–551.
- The music of life: Biology beyond the genome. Noble, D. Oxford: Oxford University Press. 2006. ISBN 978-0-19-929573-9.
- What is flux balance analysis? Orth JD, Thiele I, Palsson BØ. Nat Biotechnol. 2010, 28:245-8.
- Computer-aided design for metabolic engineering. Fernández-Castané A, Fehér T, Carbonell P, Pauthenier C, Faulon JL. J Biotechnol. 2014, 192, Pt B:302-13.

Module 3 : Building biological systems I: Genome synthesis and genome editing

Viral genome synthesis

- Cello et al., (2002). Science. 297(5583) :1016-1018
- Smith et al., (2003). PNAS. 100(26): 15440-15445

Bacterial genome synthesis

- Gibson et al., (2008). Science. 319(5867): 1215-1220
- Gibson et al., (2010). Science. 329(5987): 52-6

Yeast genome synthesis

- 1st Yeast chromosome : Annaluru et al., (2014). Science. 344(6179): 55-58
- Synthetic yeast : <http://syntheticyeast.org/>

General review

- Annaluru et al., (2015). Genome Biology. 16(125).

Genome editing

- CRISPR-Cas9 genome editing : Doudna and Charpentier (2014). Science. 346: 1258096
- Multiplex genome engineering : Wang et al., (2009). Nature. 460:894-898
- Reduced bacterial genome : Pósfai et al., (2006). Science. 312(5776):1044-1046

Mark as completed

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