Systems Biology 204:
Biomolecular Engineering and Synthetic Biology

Synopsis
A course focusing on the rational design, construction, and applications of nucleic acid and protein-based synthetic molecular and cellular machinery and systems. Students are mentored to produce substantial term projects, which are tailored to each student’s strengths and interests.

Instructors
George Church, William Shih, Peng Yin

Guest lecturers
Ed Boyden, Jeremy Gunawardena, Gäel McGill, Johan Paulsson, Jack Szostak, Jeff Way

Logistics
Meeting time: Mon. Wed. 2:30 pm - 3:59 pm
Location: Room 521, Wyss Institute, 3 Blackfan Circle, Boston
Contact: Weidong Xu (Teaching Fellow) wxu@g.harvard.edu
Peng Yin (Professor) py@hms.harvard.edu

Day / Date | Lecturer | Title
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Wed. Aug. 31 | William Shih | Biomolecular primitives
Mon. Sep. 5 | N/A | University Holiday (Labor Day)
Wed. Sep. 7 | William Shih | Software demo: nanoEngineer for nanostructure visualization
Mon. Sep. 12 | William Shih | DNA origami
Wed. Sep. 14 | William Shih | Software demo: caDNAo for DNA origami design
Mon. Sep. 19 | Peng Yin | DNA bricks
Wed. Sep. 21 | Peng Yin | DNA circuits and machines
Mon. Sep. 26 | Peng Yin | Software demo: sequence designer/molecular compiler -- TA
Wed. Sep. 28 | Peng Yin | Barcoding and imaging life with DNA
Mon. Oct. 3 | Peng Yin | Probing and programming life with DNA/RNA
Wed. Oct. 5 | Peng Yin | DNA-based nanofoundries
Mon. Oct. 10 | N/A | University Holiday (Columbus Day)
Wed. Oct. 12 | George Church | Genome engineering
Mon. Oct. 17 | William Shih | DNA-based single molecule tools
Wed. Oct. 19 | Jeff Way | Synthetic circuits in living cells
Mon. Oct. 24 | George Church | Homologous recombination, gene therapy, tissue engineering, evolution
Wed. Oct. 26 | Jeff Way | Engineered Protein Pharmaceuticals
Mon. Oct. 31 | William Shih | In vitro Evolution
Wed. Nov. 2 | Jeremy Gunawardena | Modeling biological systems
Mon. Nov. 7 | Johan Paulsson | Designing synthetic gene circuits for precise and robust dynamics
Wed. Nov. 9 | Jack Szostak | Protocell design (Veteran's day, class in session)
Mon. Nov. 14 | Gäel McGill | Biovisualization Tools & Design: Communication, Data Exploration & Mental Models
Wed. Nov. 16 | Guest lecturer | TBD
Mon. Nov. 21 | Ed Boyden | Tools for Analyzing and Controlling Biological Systems
Wed. Nov. 23 | N/A | Thanksgiving recess begins
Mon. Nov. 28 | Students | Final project presentations
Wed. Nov. 30 | Students | Final project presentations

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