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.

Logistics

Meeting time: Mon. Wed. 2:00 pm - 3:30 pm
Location: Room 521, Wyss Institute, 3 Blackfan Circle, Boston
Contact: Adam Marblestone (Teaching Fellow) adam.h.marblestone@gmail.com
Peng Yin (Professor) py@hms.harvard.edu

Instructors
William Shih          Pamela Silver          Peng Yin

Guest lecturers
Irene Chen, George Church, Jeremy Gunawardena, Neel Joshi, Gael McGill
Srivatsan Raman, Jack Szostak, Jeff Way, David Zhang

Day / Date | Lecturer | Title
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Wed. Aug. 31 | William Shih / Peng Yin | Course overview
Wed. Sep. 7 | William Shih | Biomolecular primitives
Mon. Sep. 12 | William Shih | DNA origami
Wed. Sep. 14 | David Zhang | Synthetic DNA circuits
Mon. Sep. 19 | Peng Yin | Dynamic DNA machines
Wed. Sep. 21 | Peng Yin | Applications of nucleic acid nanotechnology
Mon. Sep. 26 | William Shih | Software demo: nanoEngineer for nanostructure visualization
Mon. Sep. 28 | William Shih | Software demo: caDNAno for DNA origami design
Mon. Oct. 3 | Peng Yin | Software demo: Sequence designer / molecular compiler
Wed. Oct. 5 | Srivatsan Raman | Computational protein design
Wed. Oct. 12 | Srivatsan Raman | Software demo: Scientific discovery games for biomolecular design
Mon. Oct. 17 | Pam Silver | Synthetic circuits in prokaryotes
Wed. Oct. 19 | Pam Silver | Synthetic circuits in eukaryotes
Mon. Oct. 24 | Jeff Way | Metabolic engineering
Wed. Oct. 26 | Neel Joshi | Principles and applications of protein and peptide self-assembly
Mon. Oct. 31 | George Church | Genome engineering: new codes, new amino acids, multi-virus resistance
Wed. Nov. 2 | George Church | Homologous recombination, gene therapy, tissue engineering, evolution
Mon. Nov. 7 | Irene Chen | Information in prebiotic replicating systems
Wed. Nov. 9 | William Shih | Directed molecular evolution
Mon. Nov. 14 | Jack Szostak | Protocell design
Wed. Nov. 16 | Jeremy Gunawardena | Modeling biological systems
Mon. Nov. 28 | Gael McGill | Exploring Hollywood’s tools for biovisualization
Wed. Nov. 30 | Peng Yin | Outlook: Opportunities and challenges
Mon. Dec. 5 | Students | Term project presentations
Wed. Dec. 7 | Students | Term project presentations

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