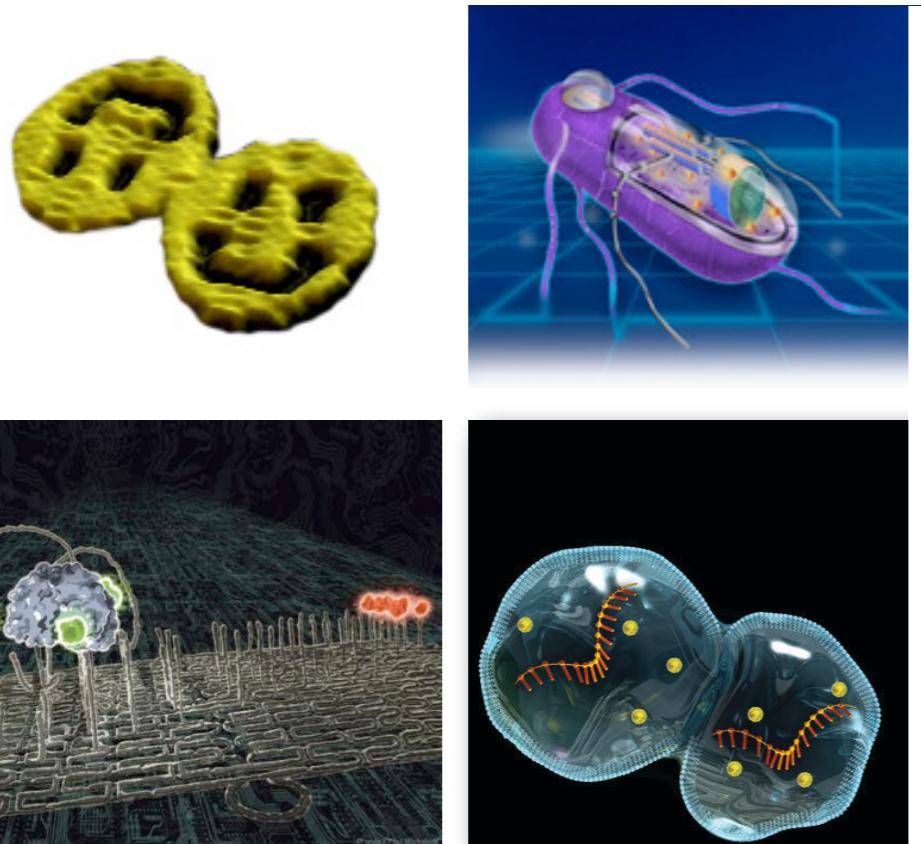


Biomolecular Engineering and Synthetic Biology

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, Pamela Silver, Peng Yin

Guest lecturers

Jeremy Gunawardena, G  el McGill
Dave Mooney, Jack Szostak, Jeff Way

Logistics

Meeting time: Mon. Wed. 2:30 pm - 4:00 pm

Location: Room 521, Wyss Institute, 3 Blackfan Circle, Boston

Contact: Josie Kishi (Teaching Fellow) jkishi@g.harvard.edu

Peng Yin (Professor) py@hms.harvard.edu

Syllabus

Day / Date	Lecturer	Title
Wed. Sept. 2	William Shih	Biomolecular primitives
Wed. Sept. 9	William Shih	Software demo: nanoEngineer for nanostructure visualization
Mon. Sept. 14	William Shih	DNA origami
Wed. Sept. 16	William Shih	Software demo: caDNAno for DNA origami
Mon. Sept. 21	Peng Yin	DNA bricks
Wed. Sept. 23	Peng Yin	DNA circuits and machines
Mon. Sept. 28	Peng Yin	Software demo: sequence designer/molecular compiler
Wed. Sep. 30	Peng Yin	Application 1: Barcoding and imaging life with DNA
Mon. Oct. 5	Peng Yin	Application 2: Probing and programming life with DNA/RNA
Wed. Oct. 7	Peng Yin	Application 3: DNA-based nanofoundries
Wed. Oct. 14	William Shih	Application 4: Single molecule biophysics tools, drug delivery, NMR
Mon. Oct. 19	William Shih	In vitro evolution
Wed. Oct. 21	Pam Silver	Synthetic circuits in prokaryotes
Mon. Oct. 26	Pam Silver	Synthetic circuits in eukaryotes
Wed. Oct. 28	Jeff Way	Metabolic engineering
Mon. Nov. 2	George Church	Genome engineering
Wed. Nov. 4	George Church	Homologous recombination, gene therapy, tissue engineering, evolution
Mon. Nov. 9	Jack Szostak	Protocell design
Wed. Nov. 11	Jeremy Gunawardena	Modeling biological systems
Mon. Nov. 16	Gäel McGill	Exploring Hollywood's tool for bio-visualization
Wed. Nov. 18	Jeff Way	Quantitative and spatial optimization of engineered therapeutic fusion proteins
Mon. Nov. 23	Dave Mooney	Polymers as therapeutic cancer vaccines
Mon. Nov. 30	Students	Final project presentations
Wed. Dec. 2	Students	Final project presentations