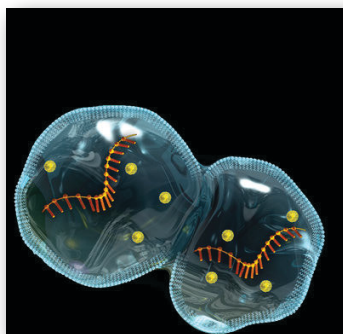
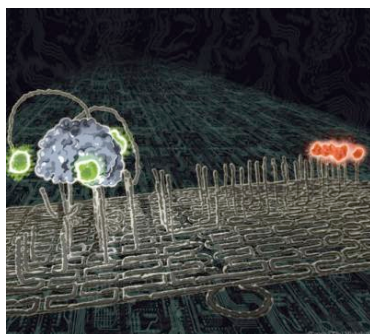
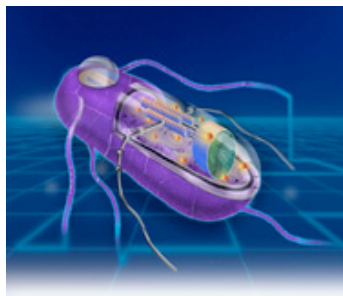


# Biomolecular Engineering and Synthetic Biology

## 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, Gäel McGill,  
Dave Mooney, Srivatsan Raman, Jack Szostak, Jeff Way

## Logistics

Meeting time: Mon. Wed. 2:00 pm -3:30 pm

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

Contact: Evan Daugharthy (Teaching Fellow) [daugharthy@fas.harvard.edu](mailto:daugharthy@fas.harvard.edu)

Peng Yin (Professor) [py@hms.harvard.edu](mailto:py@hms.harvard.edu)

## Syllabus

Day / Date	Lecturer	Title
Wed. Sept. 3	William Shih	Biomolecular primitives
Mon. Sept. 8	William Shih	Software demo: nanoEngineer for nanostructure visualization
Wed. Sept. 10	William Shih	DNA origami
Mon. Sept. 15	William Shih	Software demo: caDNAno for DNA origami design
Wed. Sept. 17	Peng Yin	DNA bricks
Mon. Sept. 22	Peng Yin	DNA circuits and machines
Wed. Sept. 24	Peng Yin	Software demo: Sequence designer / molecular compiler
Mon. Sept. 29	Srivatsan Raman	Computational protein design
Wed. Oct. 1	Srivatsan Raman	Software demo: Scientific discovery games for biomolecular design
Mon. Oct. 6	Peng Yin	DNA based multiplexing and imaging
Wed. Oct. 8	Peng Yin	Programmable molecular instruments
Wed. Oct. 15	Peng Yin	DNA directed nanofabrication and photonics
Mon. Oct. 20	William Shih	Single molecule biophysics tools, drug delivery, and NMR
Wed. Oct. 22	Pam Silver	Synthetic circuits in prokaryotes
Mon. Oct. 27	Pam Silver	Synthetic circuits in eukaryotes
Wed. Oct. 29	Jeff Way	Metabolic engineering
Mon. Nov. 3	George Church	Genome engineering
Wed. Nov. 5	Jeremy Gunawardena	Modeling biological systems
Mon. Nov. 10	George Church	Homologous recombination, gene therapy, tissue engineering and evolution
Wed. Nov. 12	Gäel McGill	Exploring Hollywood's tool for bio-visualization
Mon. Nov. 17	Jack Szostak	Protocell design
Mon. Nov. 24	Dave Mooney	Polymers as therapeutic cancer vaccines
Mon. Dec. 1	Students	Final project presentations