

Fall 2012

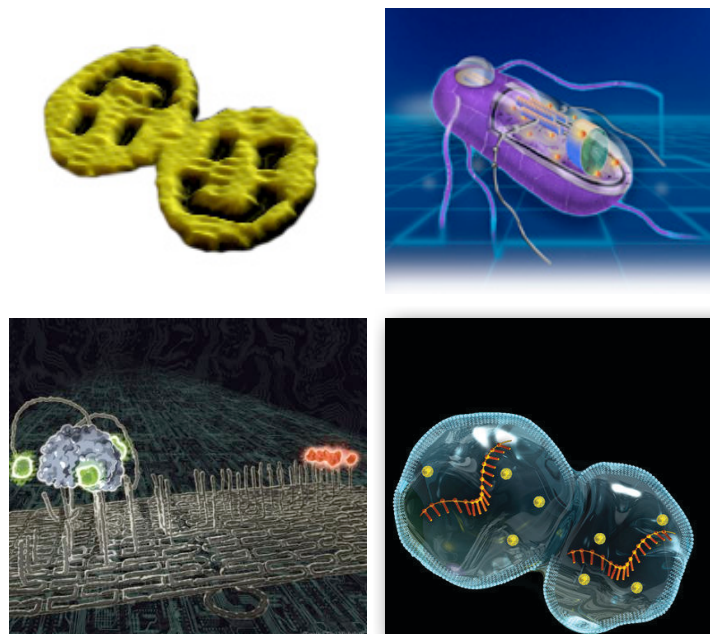
Systems Biology 204:



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, Pamela Silver, Peng Yin

Guest lecturers

Jeremy Gunawardena, Neel Joshi, Gäel McGill
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: Mingjie Dai (Teaching Fellow) mingjie.dai@wyss.harvard.edu

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

Syllabus

Day / Date	Lecturer	Title
Wed. Sep. 5	William Shih, Peng Yin	Course overview
Mon. Sep. 10	William Shih	Biomolecular primitives
Wed. Sep. 12	William Shih	Software demo: nanoEngineer for nanostructure visualization
Mon. Sep. 17	William Shih	DNA origami
Wed. Sep. 19	William Shih	Software demo: caDNAo for DNA origami design
Mon. Sep. 24	Peng Yin	Synthetic DNA circuits
Wed. Sep. 26	Peng Yin	Dynamic DNA machines
Mon. Oct. 1	Peng Yin	Software demo: Sequence designer / molecular compiler
Wed. Oct. 3	Peng Yin	Applications of nucleic acid nanotechnology
Wed. Oct. 10	Srivatsan Raman	Computational protein design
Mon. Oct. 15	Srivatsan Raman	Software demo: Scientific discovery games for biomolecular design
Wed. Oct. 17	Pam Silver	Synthetic circuits in prokaryotes
Mon. Oct. 22	Pam Silver	Synthetic circuits in eukaryotes
Wed. Oct. 24	Jeff Way	Metabolic engineering
Mon. Oct. 29	Neel Joshi	Principles and applications of protein and peptide self-assembly
Wed. Oct. 31	Jack Szostak	Protocell design
Mon. Nov. 5	Jeremy Gunawardena	Modeling biological systems
Wed. Nov. 7	George Church	Homologous recombination, gene therapy, tissue engineering, evolution
Mon. Nov. 12	William Shih	Directed molecular evolution
Wed. Nov. 14	Gäel McGill	Exploring Hollywood's tools for biovisualization
Mon. Nov. 26	George Church	Genome engineering: new codes, new amino acids, multi-virus resistance
Wed. Nov. 28	Students	Final project presentation
Mon. Dec. 3	Students	Final project presentations

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