Nano-/Bio-materials **Fall 2014**

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Office Hours: By appointment
Lecture: W2W3W4

Course Goals: This course will provide students with an introduction to nanomaterials and biomaterials used in different kinds of applications. We will survey important classes of nanomaterials (e.g., carbon-based nanomaterials and quantum dots) and biomaterials (e.g., naturally-derived biomaterials and polymeric biomaterials), discussing material preparation, processing, properties and applications. We will also offer an experimental section about the preparation and micropatterning of actin filaments.

Textbook: N/A; class notes/journal papers/magazine articles

Grade:
Report (assignment) (4) 30%; 250 words (in English)
Report (experiment) (2) 20%; 250 words (in English)
Exam 20%
Final Report & Presentation 30%; 1000 words (in English)

Tentative Schedule:
Week 1 (9/17): Introduction to nanomaterials
Week 2 (9/24): Quantum dots/nanoparticles (e.g., CdSe)
Week 3 (10/1): Preparation of nanomaterials (e.g., self-assembly) [Report]

Week 4 (10/8 10/9): Lecture given by Dr. Philip LeDuc (CMU) [Report]
Week 5 (10/15): Introduction to biomaterials
Week 6 (10/22): Experimental (cell culture) [Report]
Week 7 (10/29): Naturally-derived biomaterials (e.g., collagen)
Week 8 (11/5): Polymeric biomaterials (e.g., PE/PDMS) [Report]

Week 9 (11/12): Experimental (paper diagnostic devices) [Report]
Week 10 (11/26): Midterm

Week 11 (12/3): Application (1) Tissue Engineering
Week 12 (12/10): Application (2) Chemical-/Biological-sensing
Week 13 (12/17): Application (3) Nano-/Micro-fluidics
Week 14 (12/24): Application (4) Point-of-Care Diagnostics [Report]

Week 15 (12/31): adjustment
Week 16 (1/7): Project presentation [Report]