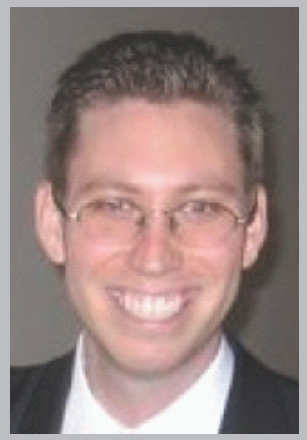

Jordan J. Green, PhD
Postdoctoral Associate
Langer Lab, MIT

The Department of Biomedical Engineering

presents

a Special Seminar

Jordan J. Green, PhD

Enhanced Polymeric Nanoparticles for Gene Delivery

The potential of gene therapy to treat disease and improve human health is tremendous. The failure of viral gene therapy clinical trials due to toxicity, immunogenicity, and carcinogenicity has been tragic and strongly motivates a non-viral approach. Polymeric nanoparticles composed of poly(beta-amino esters) (PBAEs) and DNA can be formulated to be stable in the presence of serum proteins and have high gene delivery without toxicity to human primary cells. In comparison to the previous "gold standard" for polymeric transfection, 25 kDa polyethylenimine, the PBAE nanoparticles presented here have 100x higher efficacy while simultaneously having 100x lower toxicity. Small structural changes to the polymer were found to have dramatic effects on multiple steps of gene delivery including the DNA binding affinity, nanoparticle size, intracellular DNA uptake, final protein expression, and in vivo efficacy. As the enhanced polymeric gene delivery nanoparticles described here have virus-like efficacy and many attractive properties over a virus including high safety, high nucleic acid cargo capacity, ease in manufacture, a coating method for targeted delivery, and flexibility for future design improvements, these nanoparticles may be promising for many therapeutic applications including cancer therapy, genetic vaccines, and regenerative medicine.

Date: June 4, 2008
Time: 1:00 PM - 2:00 PM
Location: Talbot Library, Traylor 709
Host: Jennifer H. Elisseeff, PhD
Videoconferenced to Clark Hall 110