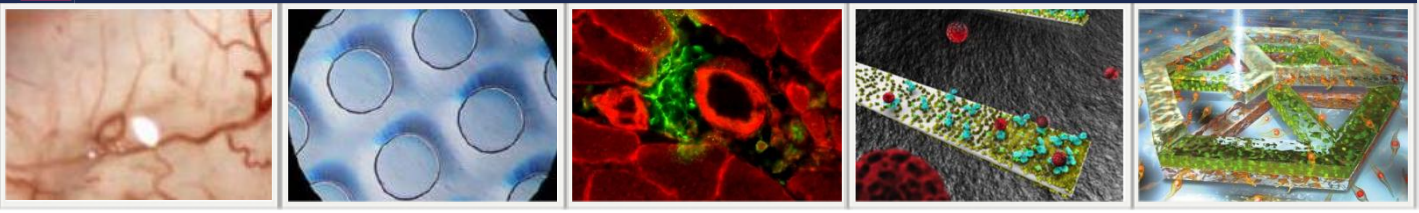
BioNanotechnology Seminar Series

Fall 2012



Towards the Development of Click Chemistry-Mediated Nanomedicine for Cancer Cell Targeting

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Date: **Tuesday, October 23, 2012**

Time: **12:30 – 1:00 p.m. CST (10:30 – 11:00 a.m. PST)**

Location: **1000 MNTL at Illinois (SSM 150 at UC Merced)**

Abstract:

Nanoparticulate delivery vehicles for cancer targeting and therapy are routinely prepared by incorporating a targeting ligand, such as an antibody or aptamer, to the surface of nanoparticles. The interaction between the targeting ligand and specific receptor on the cell membrane is anticipated to drive the nanoparticles to preferentially accumulate in tumor tissues, which enhances antitumor efficacy. However, this design has one major drawback; nanoparticles containing targeting ligands usually have substantially enhanced, undesirable retention in the spleen and liver as compared to unmodified nanoparticles. This undesirable biodistribution of the modified nanoparticles prohibits their in vivo targeting, resulting in increased immune response and reduced anticancer efficacy. To address this problem, we are investigating the use of click chemistry for targeted drug delivery.

We have developed nanoparticles that are functionalized with highly-strained and highly-reactive cycloalkynes. These functionalized nanoparticles undergo spontaneous, reagent-free covalent reaction with metabolically incorporated azido-sugars on the cell surface, which is anticipated to promote nanoparticles internalization through endocytosis. This approach is expected to allow high cellular uptake of the nanoparticles while triggering a lower immune response than nanoparticles functionalized with protein- or aptamer-based targeting ligands. Here we report our progress towards achieving these goals.

Seminar Presented by:

Center for Cellular Mechanics
University of Illinois at Urbana-Champaign

IGERT Integrative Graduate Education and Research Traineeship
Cellular and Molecular Mechanics and BioNanotechnology

M-CNTC NCI Alliance for Nanotechnology in Cancer
Midwest Cancer Nanotechnology Training Center

CNST University of Illinois Center for Nanoscale Science and Technology