

Abstract Submitted
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NIR fluorescent chitosan-based nanoparticles for tracking and delivery of cancer therapeutic molecule in living systems GIULIA SUARATO, AMANDA CHIN, Materials Science and Engineering, Stony Brook University, New York, USA, YIZHI MENG, Materials Science and Engineering, Chemical and Molecular Engineering, Stony Brook University, New York, USA — Tumor metastasis is associated with the epithelial-to-mesenchymal transition (EMT), in which cells lose their polarized phenotype to acquire the asymmetry and motility of mesenchymal cells. Among the many molecular determinants for EMT is bone morphogenetic protein-7 (BMP-7), a critical regulator of skeletal tissue formation and kidney development. Current treatments for metastatic cancer primarily involve surgery and chemotherapy, both with considerable side effects. Therefore the goal of our research is to evaluate the ability of BMP-7 to reverse EMT using a delivery system based on glycol chitosan nanoparticles (GCNP), naturally biodegradable. The GCNP are labeled with Cy5.5, a near infrared (NIR) excitable dye that enables non-invasive imaging in living systems. The chitosan shell provides affinity for the cell surface and protection from intracellular enzymes during transport. Preliminary data show that Cy5.5-GCNP vehicles were successfully delivered to murine preosteoblast (MC3T3-E1), rat osteosarcoma (ROS) 17/2.8 and human embryonic kidney (HEK293) cells. Release kinetics using a model protein (BSA) and BMP-7, and the stability of the protein nano-cargo are currently being evaluated. Cell morphology will be examined with immunofluorescence microscopy.

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