Targeting the Cell II

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Carbon nanotubes (CNTs) have been shown to improve drug delivery methods. However, invasive methods are currently needed for patients to benefit from CNT delivery methods. The purpose of this project was to see if CNTs could deliver fluids by magnetic manipulation within biological organisms. It was hypothesized that if CNTs were directed by use of a paramagnetic field, then medications could be efficiently transported to specific locations inside of biological organisms. In the first portion of testing glycerol and CNTs filled with red dye were sent down tubing and were then manipulated by a set of magnets. The second portion of testing mimicked the human body through use of a ballistics gel torso and arm, in addition to simulating blood flow through the use of a fountain pump and glycerol. The third portion of testing was performed by injecting CNTs loaded with florouscien into Helianthus annuus stems and then translating a magnet upward towards a designated position along the stem. The fourth stage of testing was performed by injecting CNTs into the posterior of Lumbricus terrestris and then translating a magnet towards the anterior of the specimen. Results from these portions of testing demonstrated the ability of CNTs to deliver drugs through magnetic manipulation within living organisms. This study has applications that can serve to better develop and improve targeted drug delivery systems.

Awards Won: