Study shows potential for nanotechnology-based therapy for ovarian cancer

31 August 2011

(PhysOrg.com) -- A UNC-led study has shown the potential for nanotechnology therapy for ovarian cancer. Scientists at UNC Lineberger Comprehensive Cancer Center and Duke University Medical Center conducted a preclinical study using nanoparticle technology to deliver doses of chemo- and radiotherapy that specifically targeted metastasized ovarian cancer cells, eradicating the cancer and lessening the toxicities often associated with the treatment.

Their findings were published in the August 2011 issue of the journal Biomaterials.

Andrew Wang, MD, assistant professor of radiation oncology and study senior author, explains, "Our study demonstrates the proof of principle of engineering 'smart' therapeutics that can preferentially deliver chemotherapeutic treatment to cancer. Such therapeutics were not possible until the development of nanoparticle therapeutic carriers. These tiny devices can be precisely engineered to carry therapeutic cargo and be targeted to cancer cells. We believe our preclinical study will facilitate the clinical development of these targeted nanoparticle-based treatments and eventually improve cancer treatment. " Wang is a member of UNC Lineberger Comprehensive Cancer Center.

Peritoneal metastasis, when the cancer has spread to the lining of the abdomen, is a major cause of side effects and death in ovarian cancer, and while intraperitoneal chemotherapy and radiotherapy have shown good clinical results, both are limited by their non-targeted nature.

To develop the nanoparticle, the team used folate, a water-soluble form of Vitamin B9 because most ovarian cancers overexpress the folate receptor. The nanoparticles encapsulated the chemotherapy drug Paclitaxel and the yittrium-90 as the therapeutic radioisotope.

Provided by University of North Carolina at Chapel Hill School of Medicine