Platinum Drug Loaded Holmium and Dysprosium Containing Garnet Nanoparticles for Cancer Radiotherapy and Chemotherapy

Description:
Researchers at University of North Texas Health Science Center and University of Texas at Dallas have developed platinum-loaded radioactive holmium-166 iron garnet nanoparticles that can effectively be used for targeted, controlled release chemoradiation with applications for imaging using single-photon emission computed tomography/computed tomography.

Market Need:
Lung cancer remains the most common cancer worldwide with a 5 year survival of <15%. Platinum chemotherapy and radiation remain the mainstays of treatment, however cause significant side-effects and toxicity, often with poor therapeutic responses. Chemoradiation therapy improves local control and survival compared with sequential treatment, or sole administration of chemotherapy or radiation. There is a need for a targeted combined modality therapy with an anticancer drug that effectively sensitizes tumor cells to radiation and delivers radiation while sparing normal tissue.

Benefits and Advantages:
- Encapsulates chemo agents in a biocompatible delivery system, which prevents drug degradation, increases circulation time and prevents systemic exposure
- Allows for controlled, prolonged, combined therapy with maximum drug accumulation at the tumor site
- Uses two therapeutics: holmium-166 nanoparticles to deliver radiotherapy and platinum drugs
- Can be localized to tumor site with simultaneous imaging capabilities to ensure precise drug delivery
- Applicable to platinum-sensitive cancers including lung, neck, liver, esophageal and cervical cancers

“Platinum-loaded radioactive nanoparticles allow for controlled, prolonged, combined modality therapy with maximum drug accumulation at the tumor site.”

Technology Status: Tech 2013-017. Available for licensing or collaboration.
Intellectual Property: Patent Pending
Lead Inventor: Anthony J. Di Pasqua, PhD and Kenneth Balkus Jr., PhD