PVA Nanocarrier System for Controlled Drug Delivery
Tech ID: 27195 / UC Case 2012-126-0

ABSTRACT
Researchers at the University of California, Davis have designed and synthesized a unique type of water-soluble, biodegradable targeting poly(vinyl alcohol) (PVA) nanocarrier system for controlled delivery of boronic acid containing drugs, chemotherapy agents, proteins, photodynamic therapy agents and imaging agents.

FULL DESCRIPTION
Nanotechnology, as an emerging field, shows promise for the development of novel diagnostic, imaging and therapeutic agents for a variety of diseases including cancer. Nanoparticles offer several distinct advantages in these applications such as improved solubility, prolonged in vivo circulation time and preferential accumulation at a tumor site. One obstacle to the effective clinical application of nano-therapeutics is a lack of high affinity and high specificity targeting ligands that can deliver nanomedicines to a tumor or target site with high efficiency in vivo.

Researchers at the University of California, Davis have designed and synthesized a unique type of water-soluble, biodegradable targeting PVA nanocarrier system for controlled delivery of boronic acid containing drugs, chemotherapy agents, proteins, photodynamic therapy agents and imaging agents. These PVA-based carriers can: (i) be engineered to maximize preferential uptake into target sites (e.g. tumors); (ii) minimize premature release of boronic acid containing therapeutics, chemotherapeutic agents, and proteins; and (iii) can be triggered to release a payload drug on demand at the tumor site via exogenous administration of mannitol and/or reducing agents. These biodegradable nanoparticles are promising agents for the targeted intracellular delivery of anticancer drugs.

APPLICATIONS
- Cancer treatment via targeted nanotechnology

FEATURES/BENEFITS
- Cost effective
- Biocompatible and water soluble polymer
- Maximum preferential uptake at target site
- Controlled release of boronic acid therapeutics, chemotherapeutic agents and proteins
- On demand triggered release of payload at target site (e.g. tumor)

PATENT STATUS
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ADDITIONAL TECHNOLOGIES BY THESE INVENTORS
- Nanoparticles for Drug Delivery, Tissue Targeting and Imaging Analysis
- Conjugates That Combine HDAC Inhibitors and Retinoids into Disease Preventatives/Treatments
- A Novel RGD-Containing Cyclic Peptide for use in Cancer Imaging and as a Targeted-Therapy Ligand
- Site-Specific Ligation and Compound Conjugation to Existing Antibodies
- Ligands for Alpha-4-Beta-1 Integrin
- Functional Illumination in Living Cells
- Transformable Smart Peptides as Cancer Therapeutics
- Small Molecule Inhibitors of Amyloid-beta Protein Oligomers
- Engineered Biomaterial to Prevent Endothelial Inflammation
- Sequential Targeting and Crosslinking Nanoparticles for Tackling the Multiple Barriers to Treat Brain Tumors
- Early Detection of Ovarian Cancer Using Markers to Short Chain Carbohydrates
- Two-Way Magnetic Resonance Tuning Platform for Noninvasive Tissue Imaging