



# Functionalized Nanoparticles Provide More Effective Anticancer Drug Delivery (20120116, Dr. Jayanth Panyam)

Technology No. 20120116

**IP Status:** Pending US Patent; **Application #:** 15/841,145

## Delivering Anticancer Drugs into the Tumor Matrix

Nanoparticles for cancer treatment are designed to deliver effective amounts of anticancer agents more directly to tumors so less anticancer agents are needed, reducing the overall toxicity and side effects of the treatment. Current nanoparticle delivery methods use the enhanced permeability and retention (EPR) effect to deliver the agents to a particular depth within the tumor. Due to a lack of convective flow, these nanoparticle systems rely entirely on diffusion into the tumor's extracellular matrix. The size of the particles and density of the tumor matrix impede this approach leading to insufficient drug delivery and tumor relapse.

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## Functionalized Nanoparticles Target Fibrin in Tumor Matrix

These newly developed functionalized nanoparticles can achieve greater penetration depth through the extracellular tumor matrix to deliver drugs. These nanoparticles possess an enzyme capable of digesting components of the tumor matrix thereby facilitating entry of an anti-cancer agent into the tumor. More specifically, these nanoparticles are functionalized in a way which digests fibrin, a major component in the tumor's extracellular matrix. This technology allows for more a more targeted and effective treatment for cancer.

**BENEFITS OF FUNCTIONALIZED NANOPARTICLES TO DELIVER ANTICANCER AGENTS**

- Nanoparticle and enzyme have been shown to co-localize together
- Deeper delivery of anticancer agents will improve effectiveness and reduce the chance of relapse
- Localized treatment could be improved for all types of solid tumors

**Product Details** Licensee receives details on the synthesis of these functionalized nanoparticles

**Fulfillment Details** Licensee will receive rights to practice the intellectual property (patent application) for the purposes of developing and manufacturing a commercial product.

**Phase of Development** In vitro assessment: The technology has been tested in-vitro and shows promising results. The technology is now being tested in-vivo in mice.

### **Researchers**

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