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# Nanoparticle Chemotherapy with Anticancer Prodrugs (20110152, Dr. Thomas Hoye)

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## Nanoparticle Distribution of Anticancer Agent for Chemotherapy

A prodrug nanoparticle distribution technique has been developed that will aid in chemotherapy as a dispersal method of anticancer agents. Currently the nanoparticle system has been used with Paclitaxel, an antitumor agent that breaks down solid tumors through permeation and toxically promotes cancerous cell death. However, this system can be applied to other cancer therapeutics. Formulated in polymer-based nanoparticles, prodrugs can be transported to specific areas in the body through this novel method in a way that is more efficient than previous chemotherapies. Nanoparticles loaded with the prodrugs are protected from chemical reaction by the nanoparticles until they reach the reaction site, making them efficient options for drug targeting. This new treatment with nanoparticle-based prodrugs has higher permeation and retention of the anticancer agents into solid tumors than current chemotherapeutic treatments.

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## Chemotherapy Prodrugs

Cancer treatment medications and therapies currently exist to help eliminate tumors and cancerous cells throughout the body. However, the method of distribution within the patient can be a difficult task, as some drugs are harmful to other cells and the proper transport and dispersal of the drug is a key factor in effectiveness. Prodrugs are medications taken to work as a chemical derivative to provide better uptake of a separate, active medication. These aiding drugs can be used in conjunction with current chemotherapy treatments to increase the efficiency and safety of the medications being administered. Because proper drug administration is a high priority, the search for efficient prodrugs is a key factor in cancer research.

### **BENEFITS OF NANOPARTICLE PRODRUG THERAPY**

- Size range enhances permeation and retention in solid tumors
- Able to be transported and dispersed to the body using hydrophobic copolymers
- Promotes cell death in cancerous tumors

## Researchers

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