



Targeted Nanomedicines for Cancer Therapy

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Research

We design novel therapeutic polymers to create nano-sized medicines (nanomedicines) with superior efficacy and minimal side effects. The new biocompatible therapeutic polymers are composed of three main components:

- **Water-soluble polymeric backbone**, such as HPMA (N-(2-hydroxypropyl)methacrylamide) or polyethylene glycol-b-polyethylenimine (PEG-b-PEI) as a drug carrier.
- **Therapeutic molecules**: chemotherapeutic agents, anti-inflammatory drugs, oligonucleotides.
- **Cell targeting ligands** to provide cell specificity and enhance drug efficacy.

The new therapeutic polymers were found to be very useful at several pre-clinical settings, in:

- Targeting drugs to primary tumors, to metastases and to inflammatory lesions, thus preventing cancer progression and further controlling inflammation.
- Preventing the formation of cancer metastases and further inhibiting leukocytes infiltration into inflamed sites, without the need for conventional drug cargos.
- Improving the intracellular penetration of therapeutic polymers upon exposure to external stimuli (i.e., light or polyanionic molecules).
- Detecting a variety of cancer and inflammatory diseases, including colorectal cancer, from the luminal aspect of the colon.

Applications & Products

- E-selectin targeted nanomedicines for controlling cancer progression and preventing metastasis.
- Stimuli-responsive polymers for drug delivery.
- Polymeric imaging probes for non-invasive detection of cancer and inflammatory diseases.

Patent Status

Patent on E-selectin targeted nanomedicines (tumor vascular targeted system) granted; Two additional patents covering composition of matter for different applications currently pending worldwide.