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## Small Business Evaluation and Entrepreneur's (SBEE) Program

A collaboration between the NU Nanoscale Science and Engineering Center NSEC and  
Kellogg Graduate School of Management

Directors: Professors Barry Merkin and Chad A. Mirkin

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Date: 11/9/06

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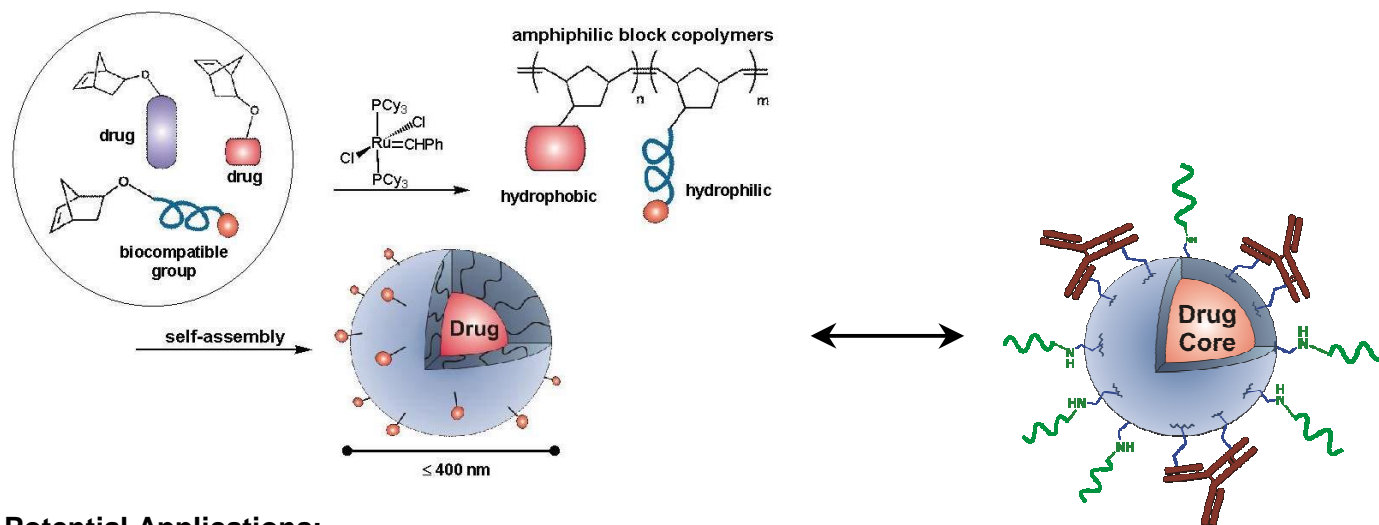
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**Title of Project:** Polymer Nanoparticles (PNPs) for Drug Delivery

### Summary:

Amphiphilic block copolymers containing a high density of small-molecule drugs modifiable hydrophilic segments can be assembled into core-shell PNPs that allowed for the surface-conjugation of other types of bioactive agents (DNA-based drugs, imaging agents, permeation enhancers) and cell-targeting antibodies. These multifunctional PNPs can be readily and selectively internalized in cells that overexpressed the antigens corresponding to the antibodies, allowing them to be used in the targeted treatment/visualization of disease organs with minimal side effects.



### Potential Applications:

Our methodology allows for the constructing of "smart" targeted nanoscale drug delivery vehicles that incorporate a wide range of chemotherapeutics with unique and potentially synergistic functions. In one potential application, the selective delivery of cytotoxic pharmaceuticals to specific cancerous sites can reduce the dangers associated with conventional chemotherapy and reduce the amount of expensive drugs that is often prescribed to cancer patients, thus enhancing their quality of life. Other applications may include the targeted delivery of gene and the simulation of stemcell growths.

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