



Administration of Nanodrugs in Proper Menstrual Stage for Maximal Drug Retention in Breast Cancer (VA Reference No. 08-038)

Novel concept for significantly increased drug retention in breast cancer patients resulting in more efficacious cancer therapy

Technology

Method of breast cancer drug administration to ensure maximum drug retention and efficacy

Inventor

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Key Features

- Optimize administration of cancer drug therapy and standard of care for breast cancer patients
- Potential to increase success of breast cancer treatment
- Potential to reduce side effects of breast cancer drugs

Stage of Development

Conceptual stage

Keywords

Therapeutic

- Breast Cancer
- Drug Delivery
- Nanodrugs
- Menstrual stage
- Vascular endothelial growth factor (VEGF)

Patent Status

Patent application has been filed

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Technology

The Department of Veterans Affairs has developed the concept of administering nanodrugs at the menstrual stage with the predicted highest vascular endothelial growth factor (VEGF) expression and vascular permeability that would allow significantly increased drug retention in breast cancer and result in more efficacious cancer treatment and reduce metastatic spread.

Description

The developed treatment methodology has the potential to increase the success rate in breast cancer treatment by timing the delivery of breast cancer drugs to correlate with the menstrual cycle stage that exhibits both the highest vascular permeability and highest VEGF blood levels in cancer cells.

Nanodrugs could be delivered at the menstrual stage with the predicted highest VEGF expression and cancer vascular permeability. This method would allow significantly increased drug retention in breast cancer and could result in a more efficacious cancer treatment.

The periodical sex hormonal milieu during the female fertility cycle modulate cyclic surges of cancer VEGF expression and vascular permeability. Since the expression of cancer VEGF varies considerably at different stages of the menstrual cycle, the variation between the highest and lowest cancer vascular permeabilities is expected to be significant.

Competitive Advantages

Breast cancer in premenopausal women has been associated with more aggressive biological characteristics and worse prognoses. Therapeutic strategies designed specifically for these younger patients are currently lacking. In addition, it is critical in clinical practice to ensure that cancer drug administration occurs at the appropriate time of the menstrual cycle to ensure drug retention and efficacy.

This invention:

- Has the potential to reduce dosages in patients experiencing severe side effects without compromising efficacy of the therapy.
- Significantly increases the retention of breast cancer drugs with optimal timing of administration.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).