T cells targeted against multiple antigens for cancer treatment

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Category(s):

Technology Classifications > Therapeutics > Cells

Description:

GW researchers developed a cell therapy platform to manufacture multi-antigen-specific immune cell products for treating cancer. Tumors often are sheltered from attack by a patient's immune system. One problem is immune cells at the tumor may be dysfunctional, so they are unable to recognize and eliminate the tumor cells. Current gold-standard cellular immunotherapies involve genetically engineering an immune cell to target a specific tumor antigen, but genetic engineering is time- and labor-intensive, and generally target a few, defined antigens. Since tumors are heterogeneous, they can escape clearance from these therapies and relapse.

GW researchers developed a cell therapy manufacturing platform that avoids genetic engineering and activates immune cells against multiple, patient-specific target antigens simultaneously. A sample of a patient's cancer cells obtained by surgery or biopsy is treated with photothermal therapy (PTT) in vitro, delivered by Prussian blue nanoparticles (PBNPs) at an immunogenic thermal dose. Immune cells (e.g. T cells, NK cells) from the patient are then exposed to the PBNP-PTT-treated cancer cells in vitro to activate them against multiple patient-specific, tumor antigens. The activated immune cells are then re-infused to the patient. Preliminary ex vivo data and studies in xenograft animal models show superior specificity of T cells generated through this novel immuno-engineered platform against glioblastoma, over T cells generated through traditional methods.

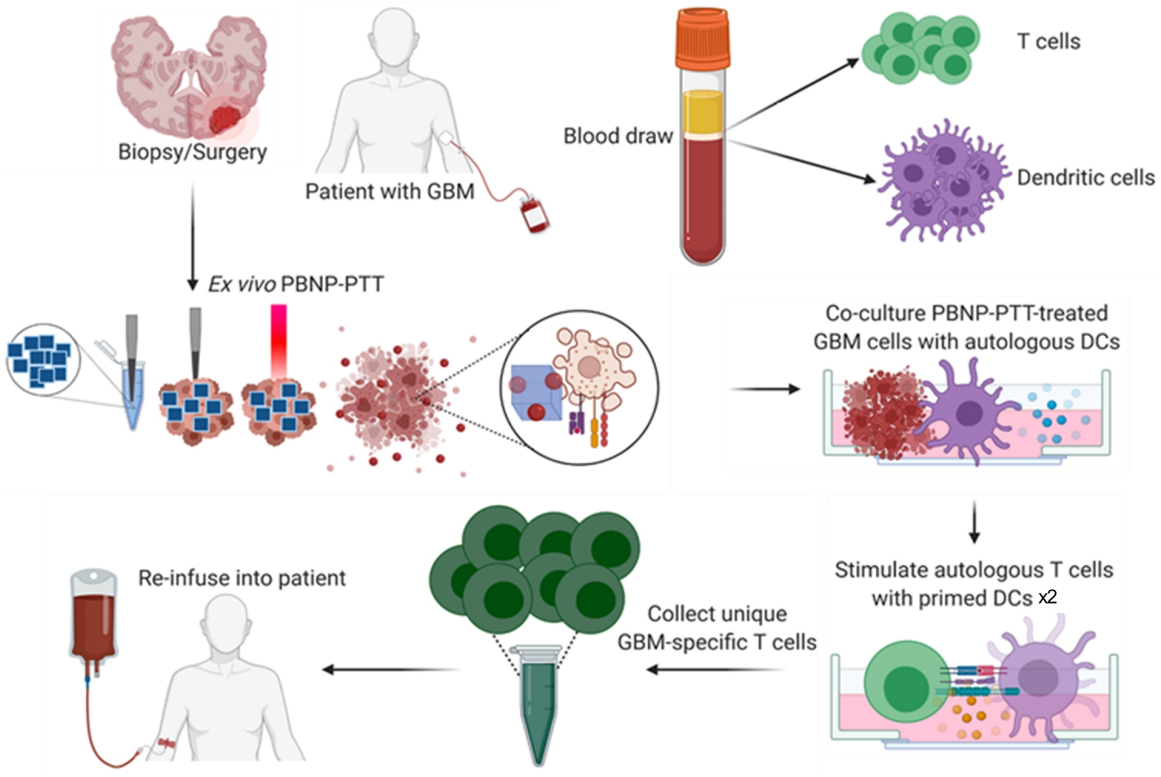

Figure. PBNP-PTT-mediated multi-antigen-specific T cell manufacture for cancer therapy

Application:

- Generation of immune cell products for treating cancer, including solid tumors, brain tumors, and hematological malignancies

Advantages:

- Increased T cell expansion compared to antigen-specific T cells generated through traditional methods
- Superior specificity of T cells over T cells generated through traditional methods
- Relies on antigens released from the tumor cells without prior knowledge, enabling patient specificity for many endogenous antigens simultaneously.
- Enables a faster and cheaper manufacture timeline, thereby treating patients sooner and at a lower cost

Patent Information:

Title	App Type	Country	Serial No.	Patent No.	File Date	Issued Date	Expire Date	Patent Status
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