

Personalized Immunotherapy for Cancer Dormancy

Dormancy Vaccine Targeting Cancer Neoantigens

Cancer is typically treated using a combination of surgical, radiotherapy, chemotherapy, and immunotherapy treatment. Unfortunately, these therapies can leave behind dormant cancer cells that are not targeted by previous treatments. These cells remain inactive and undetectable before again becoming an active cancer. Treatment of these newly active cancer cells is difficult, as dormant cells are often resistant to various therapies. However, researchers at Virginia Commonwealth University (VCU) have developed a new method for the detection and treatment of dormant cancer.

The technology

Researchers at VCU have identified novel neoantigens, such as Ki67, which is expressed in dormant cancer cells. Identification of these antigens allow dormant cancer cells, such as those found in triple negative breast cancer to be identified by means of biopsy or tumor resection. After identification, personalized immunotherapy treatments have been developed by priming T-cells to recognize the dormant cancer cells. This allowed for a roughly 3 fold increase in the percentage of responsive T-cells. Moreover, the increased T-cell response allowed complete inhibition of tumor growth in mice challenged with R-FAC tumor cells, a mammary cell line established from dormant cancer cells of both the lung (R-FAC/AIT) and liver (R-FAC/AIT L) shown in part B of the figure below. Researchers at VCU also have shown that use of the novel neoantigen as an adjuvant vaccine also prevents the growth of dormant cancer in patients who have previously been treated with other cancer therapies.

Benefits

- » Selective targeting of cancer cells
- » Induces immunogenic response
- » Prevents tumor dormancy and reoccurrence

Applications

- » Immunotherapy cancer treatment
- » Personalized cancer vaccine
- » Diagnostic for dormant cancer cells

Patent status:

Patent pending: U.S. and foreign rights are available.

License status:

This technology is available for licensing to industry for further development and commercialization.

Category:

Biomedical

VCU Tech #:

20-031F

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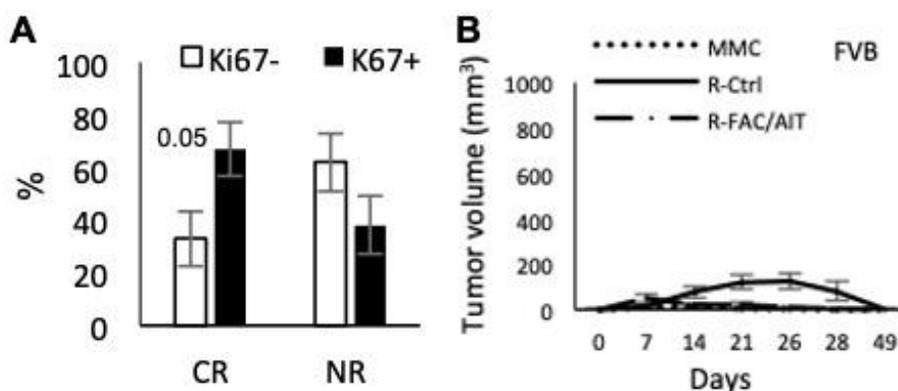


Figure 1. Effect of neoadjuvant chemotherapy on early stage breast cancer. (a) Tumor biopsies taken from triple negative breast cancer patients before and after neoadjuvant therapy and stained for Ki67 antigen. (b) Inhibition of tumor growth in mice challenged with dormant tumor cells after immunotherapy treatment.