

Researchers creating "designer lymph nodes"

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Researchers at Moffitt Cancer Center are in the first phase of creating "designer lymph nodes." Designer lymph nodes are built with specialized gene-modified cells that are injected into patients and produce a pre-planned immunologic response for cancer patients locally and then throughout their bodies. The researchers are examining a cancer vaccine "boosting" effect of the manufactured lymph nodes in patients with advanced melanoma.

"We used Moffitt's Total [Cancer Care](#)™ tissue biorepository, genomic database and longitudinal clinical database to identify the novel genes for creating designer [lymph nodes](#)," said James Mulé, Ph.D., executive vice president and associate center director for Translational Research at Moffitt. "The gene signature is also associated with better patient prognosis and survival, and will also be used to pre-select patients for immunotherapy interventions."

The work, funded by a five-year, \$2 million National Cancer Institute grant (RO1CA148995) as well as by the Adelson Medical Research and V Foundations, is in collaboration with researchers at Scripps Florida in Jupiter, Fla. Researchers at Scripps are using high-throughput screening technologies to rapidly identify biologic functions of the candidate genes.

"Patients with cancer have a dysfunctional immune system either because of the tumor's presence in the body or as a side effect of drugs or radiation used to treat the tumor," explained Mulé. "The designer lymph nodes, aimed at rebuilding their immune systems, may overcome

this dysfunction."

According to Mulé, the researchers are using antigen-presenting cells made from the patient's blood, which are then genetically manipulated to express certain genes before injection into patients. They can inject gene-modified cells at multiple, independent sites throughout the body to create independent lymph nodes that work together.

In the trial, the researchers have found early formation of lymph nodes at the vaccine injection sites and are subsequently testing the nature and anti-tumor function of them.

Mulé and colleagues anticipate partnering with other Florida-based institutions to create designer lymph nodes for diseases other than cancer and expand their designer gene immunity boosting research into fighting infectious diseases and even improving the function of immune systems in the elderly.

Provided by H. Lee Moffitt Cancer Center & Research Institute

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