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Promising New Anti-Tumor Vaccine Effectively Delivered In Mice

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Research published in the journal *Cancer Immunology, Immunotherapy* reports that a new anti-tumor vaccine for neuroblastoma and melanoma is significantly impacting tumor growth in mice. The vaccine represents a more personal approach to treatment since it uses the tumor's own protein to induce an immune system response. The investigation was conducted by scientists and clinicians at Children's National Medical Center (Washington, D.C.) along with investigators from the University of Iowa, and the project was funded by the National Institutes of Health and the American Cancer Society.

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Created in the laboratory of Children's National Chief of General and Thoracic Surgery Anthony Sandler, MD, the vaccine and its unique delivery system begins with the synthesis of microparticles called "immune stimulatory antigen loaded particles" (ISAPs). These ISAPs consist of immune stimulatory agents and tumor antigens (proteins) derived from the specific tumor being targeted. Then they are detected and surrounded by specialized immune cells so that the body's immune system reacts and considers them "foreign bodies".

The process achieves what is known as tumor specific immunity in order to stop the growth of tumors in mice. The immune system is stimulated to target the tumor whose antigens are the same as those that are loaded in the particles because the ISAPs induce activation of immune cells and then stimulate the immune system.

Although the ISAPs had an effect on tumor growth, their impact was slightly lessened because of an increase in the presence of regulatory t-cells (T-reg) after ISAPs were introduced into the body. It is possible, according to the researchers, that T-reg's affect the manner in which the vaccine impacts tumor growth by halting the development of certain necessary immune cells that fight the tumor. The researchers were able to improve the impact on tumor growth in this ISAP approach by adding a T-reg suppressor such as cyclophosphamide or anti-CD25 antibody.

"For tumors like neuroblastoma, reduction to minimal residual disease with standard therapies like chemotherapy and/or surgical resection and subsequent treatment with this vaccine could quite possibly cure the patient of the disease in the not too distant future," said lead author Dr. Sandler. "Creation of ISAPs allows us to target our treatments to the specific tumor of interest, a capability that will more effectively combat a wide range of these tumors in a personalized fashion."

Immune stimulatory antigen loaded particles combined with depletion of regulatory T-cells induce potent tumor specific immunity in a mouse model of melanoma

Robin Goforth, Aliasger K. Salem, Xiaoyan Zhu, Suzanne Miles, Xue-Qing Zhang, John H. Lee and Anthony D. Sandler

Cancer Immunology, Immunotherapy (2008).

DOI: 10.1007/s00262-008-0574-6

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Written by: Peter M Crosta

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