

Researchers develop novel anti-tumor vaccine

October 2 2008

A novel anti-tumor vaccine for [neuroblastoma](#) and melanoma developed by scientists and clinicians at Children's National Medical Center in collaboration with investigators from the University of Iowa is showing significant impact on tumor growth in mice, according to new research published in the October edition of the research journal *Cancer Immunology, Immunotherapy*. The vaccine uses the tumor's own protein to induce an immune system response, allowing for a personalized approach to treatment.

The vaccine and delivery system, developed in the laboratory of Children's National Chief of General and Thoracic Surgery Anthony Sandler, MD, involves the creation of synthetic microparticles known as "immune stimulatory antigen loaded particles" (ISAPs), that consist of tumor antigens (proteins) from the specific tumor to be targeted, as well as immune stimulatory agents. The ISAPs are detected and engulfed by specialized immune cells and sensed to be immune-stimulating "foreign bodies."

The study shows that ISAPs are effective at blocking the growth of tumors in mice by inducing activation of immune cells that then stimulate the immune system to specifically target the tumor whose antigens match those that are loaded in the particles – known as tumor specific immunity.

The research team also discovered, however, that the impact of ISAPs on tumor growth was partially mitigated by an increased presence of regulatory t-cells (T-reg) when ISAPs are introduced into the body. The

researchers believe that T-regs play a key role in how the vaccine impacts tumor growth by suppressing the development of the specific immune cells needed to combat the tumor. By adding a T-reg suppressor such as cyclophosphamide or anti-CD25 antibody, the scientists were able to have a greater impact on preventing tumor growth using the ISAP approach.

"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 Dr. Sandler, lead author of the study. "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."

Source: Children's National Medical Center

Citation: Researchers develop novel anti-tumor vaccine (2008, October 2) retrieved 26 April 2024 from <https://medicalxpress.com/news/2008-10-anti-tumor-vaccine.html>

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