

Nanoparticle Developed To Boost Anti-Cancer Immunotherapy

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(PhysOrg.com) -- One of the hallmarks of cancer is that tumors are able to suppress the immune system, preventing the body's own defense system from eliminating the disease, particularly as tumors spread through the body. Cancer researchers have identified the molecule responsible for this unwanted immune suppression, and have even designed an inhibitor of this molecule. Now, they have the means of delivering this molecule to tumors - a biocompatible polymer nanoparticle that will release potentially therapeutic levels of the inhibitor for as long as a month at a time.

Reporting their work in the journal *Molecular Pharmaceutics*, Afsaneh Lavasanifar and her colleagues at the University of Alberta created their nanoparticle from the polymer poly(d,l-lactic-co-glycolic acid), or PLGA, and the inhibitor known as JSI-124.

This molecule binds to a protein known as signal transducer and activator of transcription-3, or STAT3, that plays a critical role in tumor-induced immune suppression. When administered to melanoma cells growing in culture, the nanoparticle caused marked inhibition of tumor cell growth. Subsequent studies showed that this nanoparticle suppressed STAT3 production by the [tumor cells](#), and that suppression in the presence of the [nanoparticles](#) continued for one month.

The investigators then demonstrated that nanoparticle delivery of JSI-124 to dendritic cells - key players in generating an immune response to foreign or damaged cells - suppressed STAT3 production in

cells producing the [immune response](#) suppressing protein. The researchers note that the ability of their nanoparticle to affect both tumor cells and [dendritic cells](#) bodes well for further development of immunotherapy for treating cancer.

This work is detailed in a paper titled "Development of a Poly(D,L-lactic-co-glycolic acid) Nanoparticle Formulation of STAT3 Inhibitor JSI-124: Implication for Cancer Immunotherapy." An abstract of this paper is available at the [journal's Web site](#).

Provided by National Cancer Institute

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