

Cancer Therapy Using an Immunoactive Nanocarrier of Immunogenic Cell Death Inducers

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Categories:

- Biotechnology
- Pharmaceuticals

Keywords:

- ATP
- Cancer
- Chemoattractant
- Combination Therapy
- Drug Delivery
- Immune Checkpoint Blockage
- Immunofunctional
- Immunogenic Cell Death
- immunotherapy
- Oncology
- Pharmaceuticals
- Polymeric Nanoparticles
- Sustained Release

Purdue University researchers have developed a nanoparticle delivery system to enhance the efficacy of immunogenic cell death (ICD) inducing cancer drugs. ICD inducers are being used to improve the scope of immune checkpoint blockade therapy, which is effective in as few as 20 percent of patients for some cancer types. Unfortunately, traditional ICD inducers are limited by their immunotoxicity and insufficient adjuvanticity. The Purdue researchers designed a nanoparticle drug carrier to address these shortcomings. This technology encapsulates ICD inducers in functionalized nanoparticles. The nanoparticles are designed to release the ICD inducers in a sustained manner, and the nanoparticles are functionalized with a chemoattractive agent to recruit immune cells and prevent an immunosuppressive microenvironment. The nanoparticle's chemoattractive properties were validated in an in vitro cell migration assay and in vivo anti-tumor immune responses. Tumors grew slower in mice treated with paclitaxel encapsulated in the functionalized nanoparticle than those treated with paclitaxel in non-functionalized nanoparticles or with a mixture of paclitaxel in non-functionalized nanoparticles and the chemoattractive agent in its free form.

Technology Validation: The functionalized nanoparticle attracts immune cells in a cell migration

assay and slows tumor growth in a mouse xenograft model.

Advantages

- Less toxic
- Improves anti-tumor immune response
- Promises to expand the scope of immune checkpoint blockade therapy

Applications

- Cancer Treatment

People:

- Yeo, Yoon (Project leader)
- Kwon, Soonbum

Intellectual Property:

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Contact OTC:

Purdue Office of Technology Commercialization
The Convergence Center
101 Foundry Drive, Suite 2500
West Lafayette, IN 47906

Phone: (765) 588-3475
Fax: (765) 463-3486
Email: otcip@prf.org