

# Immunoactive Nanocarrier of Immunogenic Cell Death Inducers

**FDA-compatible polymers that prevent protein aggregation and extend antibody shelf life.**

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

**Technology ID**  
2022-YEO-69546

## Category

Pharmaceuticals/Drug Discovery  
& Development  
Pharmaceuticals/Pharmaceutical  
Packaging & Delivery Systems  
Pharmaceuticals/Computational  
Drug Delivery & Nanomedicine

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**Applications:**

-Cancer Treatment

**Related Publications:**

Systemic delivery of paclitaxel by find-me nanoparticles activates anti-tumor immunity and eliminates tumors. ACS Nano. (2024) 18: 3681–3698. doi: 10.1021/acsnano.3c11445

**TRL:** Pharmaceuticals

**Intellectual Property:**

Provisional-Gov. Funding, 2021-07-21, United States

NATL-Patent, 2022-07-20, Europe

PCT-Gov. Funding, 2022-07-20, WO

NATL-Patent, 2022-07-20, Japan

NATL-Patent, 2022-07-20, Canada

NATL-Patent, 2024-01-19, United States

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