

Cancer Combination Therapy with an Immunofunctional Carrier of Drugs and Genes

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- Biotechnology
- Pharmaceuticals

Keywords:

- Biopolymer
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- Cancer Drug
- Cancer Immunotherapy
- Cancer Therapy
- Cell Biology
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- Gene & Cell Therapy
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- Immune
- Immune Cell
- immunotherapy
- Medicinal Chemistry
- Patient Care
- Pharmaceutical Development
- Pharmaceutical Research
- Pharmaceuticals
- Pharmacology
- solid tumors
- Tumor Model

Researchers at Purdue University have developed a potent immunoadjuvant that simultaneously carries hydrophobic anticancer drugs and nucleic acids. The researchers designed this platform to improve effectiveness of cancer therapies for hard-to-reach unidentified tumors and provide patients with long-lasting protection from tumor relapse and metastasis. Stimulating antitumor immunity in situ within accessible tumors in turn creates systemic effects against distant tumors. The Purdue technology co-localizes multiple agents with unique physiochemical properties to elicit a complex immune response. To achieve this, the researchers developed an immunoactive

polymer, a polyethyleneimine-lithocholic acid conjugate (2E'), that delivers hydrophobic anticancer drugs as well as nucleic acids and nucleotides with immunomodulatory functions. In mouse models of colon cancer (CT26), breast cancer (4T1), and melanoma (B16F10), a formulation of 2E' with paclitaxel and PD-L1 siRNA or cyclic dinucleotide exhibited strong antitumor activity including immediate regression of large tumors, extended survival, and proved resistant to recurrence. This technology is a promising addition to the toolkit to fight cancer. Unlike tumor vaccines, it does not require prior knowledge of the tumor antigen, and it addresses the patient population that does not benefit from existing immune checkpoint inhibitors.

Technology Validation: The therapy, delivered intratumorally, showed strong antitumor activity, increased survival, and resisted tumor recurrence in mouse models of colon cancer, breast cancer, and melanoma.

Advantages

- Improved Efficacy of Cancer Immunotherapy in Mice
- Systemic Effect on Distant Tumors
- Enhanced Drug Delivery Capability

Applications

- Cancer Immunotherapy
- Drug Delivery Systems
- Pharmaceutical Research and Development

Related Publication:

A single local delivery of paclitaxel and nucleic acids via an immunoactive polymer eliminates tumors and induces antitumor immunity

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