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CAR-neutrophils Produced In Vivo to Treat Cancer

A novel chemo-immunotherapy exhibits significant anti-tumor activity against glioblastoma, maintaining efficacy even in immunosuppressive tumor microenvironments.

Researchers at Purdue University have developed a novel chemo-immunotherapy with anti-tumor activity against glioblastoma (GBM). GBM is a form of brain cancer with a poor prognosis and high mortality rate. Current chemotherapeutics are ineffective in delivering the active compound to the central nervous system. Neutrophils are white blood cells that can invade brain tumors. Researchers have developed nanoparticulated chemotherapies to deliver to neutrophils. Unfortunately, invasive surgery is needed, and the therapy does not target tumors that are in the brain. There is a dire need for safe and effective therapies that are combatable for the microenvironments of GBM.

Purdue researchers have developed a chemo-immunotherapy that demonstrated cytotoxicity to GBM cells in-vitro. Further studies show that this chemical is able to maintain anti-tumor activity even under immunosuppressive microenvironments. Furthermore, the developed biologic exhibited the ability to inhibit the growth of GBM in-vivo. This technology can be utilized to understand the nature of GBM or further be developed into a chemo-immunotherapy for patients with GBM.

Technology Validation: This technology has been validated using CytoToxGlo and mouse xenograft studies, showing that this novel chemo-immunotherapy has significant anti-tumor activity against GBM in-vitro and in-vivo.

Advantages:

-In-vitro activity

-Maintains activity in immunosuppressant environment

-Anti-tumor activity in mouse models

Technology ID

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Category

Pharmaceuticals/Drug Discovery & Development
Pharmaceuticals/Pharmaceutical Packaging & Delivery Systems
Pharmaceuticals/Computational Drug Delivery & Nanomedicine
Pharmaceuticals/Small Molecule Therapeutics
Pharmaceuticals/Research Tools & Assays

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Applications:

-GBM (Glioblastoma)

-Brain cancer

-Immunotherapy

TRL: 4

Intellectual Property:

Provisional-Patent, 2022-12-16, United States | NATL-Patent, 2023-12-18, Canada | NATL-Patent, 2023-12-18, Europe | NATL-Patent, 2023-12-18, China | PCT-Patent, 2023-12-18, WO | NATL-Patent, 2025-06-16, United States

Keywords: chemo-immunotherapy, anti-tumor activity, glioblastoma, GBM, brain cancer, cytotoxicity, immunosuppressive microenvironments, in-vivo, CytoToxGlo, mouse xenograft studies