Enhanced delivery of drugs and other compounds to the brain and other tissues

Value Proposition

For many drugs and diagnostic agents, no readily available method permits effective access to certain privileged portions of mammalian bodies, such as the CNS. For example, current therapy for malignant glioma is incapacitating as a result of nonspecific, dose-limiting toxicity. In contrast, immunotherapy promises an exquisitely precise approach, and evidence now exists that adoptively transferred T cells expressing modified T-cell receptors (TCR) or chimeric antigen receptors (CAR) can eradicate large tumors in the central nervous system (CNS) in both preclinical and clinical studies. Although promising, these approaches rely on ex vivo expanded and genetically manipulated T cells, processes that are laborious, inconsistent, and often require complex viral transductions. In addition, these T cells are almost always targeted to antigens shared with normal tissues, which has led to lethal autoimmune toxicity. There is a continuing unmet need for methods and products to enhance the localization of molecules to specific tissue types and compartments, including across the blood-brain barrier into the CNS parenchyma.

Technology

Duke researchers have developed a method to enhance the delivery of therapeutics, diagnostics, and other useful compounds to the brain and other areas of the body. As an example, a clinically translatable method to specifically target malignant glioma using a tumor-specific, fully human bispecific antibody that redirects patients’ own T cells to recognize and destroy tumors was reported. This technology results in robust, antitumor immune responses capable of curing well-established, patient-derived malignant glioma that heterogeneously expresses the target antigen. This translatable, off-the-shelf, fully human therapeutic is produced in a fashion compatible with existing clinical antibody manufacturing infrastructure and has significant potential to improve public health and quality of life for patients affected by malignant glioma and other cancers.

Advantages

- A translatable, off-the-shelf, fully human therapeutic is produced in a fashion compatible with existing clinical antibody manufacturing infrastructure
- The antigen specificity of this technology is critical to precisely eliminating cancer without the risk of toxicity and collateral damage to healthy cells and tissue
Has significant potential to improve public health and quality of life for patients affected by malignant glioma and other cancers

**Publications**

- **Antibody-mediated Immunotherapy of Brain Tumors (Dissertation)**
- **Published PCT Application (US2019/045437)**

**Patents**

- Patent Number: PCT/US2019/045437
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