AAV-Based Gene Therapy for Glioblastoma Treatment Using Interferon Cytokines

Tech ID: 34397 / UC Case 2019-216-0

TECHNOLOGY DESCRIPTION

This therapeutic platform leverages recombinant adeno-associated virus (AAV) vectors to deliver interferon (IFN) cytokines directly to glioblastoma tumors. The proprietary method utilizes a single AAV viral vector encoding one or more IFN cytokines, IFN-alpha, IFN-beta, and IFN-gamma, via a polycistronic transgene under the control of the optimized CAG promoter. The AAV9 capsid facilitates targeted delivery, and administration through Convection Enhanced Delivery (CED) ensures precise intratumoral infusion. This approach overcomes challenges in systemic interferon therapy, including short half-life and systemic toxicity, by enabling localized, sustained expression of IFNs at the tumor site.

STAGE OF DEVELOPMENT

Preclinical Validation Completed:

- **Efficacy Demonstrated in Multiple Models**:
  - Mouse models (syngeneic and xenograft) showed significant tumor growth inhibition and prolonged survival.
  - Human PDX models revealed durable complete responses in a subset of treated mice.
  - Canine glioblastoma xenografts validated cross-species applicability, offering potential for veterinary treatments.
- **Organoid Studies**: Glioblastoma co-cultures with human cerebral organoids confirmed tumor suppression by vectorized IFNs without damaging healthy tissue.

RELATED MATERIALS

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	2024-020744	06/27/2024	2019-216

Additional Patent Pending

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OTHER INFORMATION

KEYWORDS

AAV, Glioblastoma,

Interferon Cytokines

CATEGORIZED AS

- Medical
  - Disease: Cancer
  - Gene Therapy
  - Therapeutics

RELATED CASES

2019-216-0

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