Myeloid Differentiation Factor-Expressing Retroviral Vector for Tumor Therapy

Tech ID: 33639 / UC Case 2024-156-0

CONTACT

Gemma E. Rooney
Gemma.Rooney@ucsf.edu
tel: 415-625-9093.

OTHER INFORMATION

KEYWORDS

Myeloid Differentiation Factor, Retrovirus, Retroviral Therapy, Brain Tumors, Glioblastoma, Solid Tumors, Interferon Regulatory Factor 8

CATEGORIZED AS

- **Medical**
  - Disease: Cancer
  - Gene Therapy
  - Therapeutics

RELATED CASES

2024-156-0

TECHNOLOGY DESCRIPTION

Current therapies for GBM and other solid tumors have limitations due to resistance, recurrence, and non-selectivity towards tumor cells, leading to severe side effects. Novel targeted therapies with better efficacy and less toxicity are urgently needed.

Our inventors have developed a retroviral replicating vector (RRV) carrying a transgene that encodes a myeloid/dendritic cell differentiation factor, such as Interferon Regulatory Factor 8 (IRF8). This RRV can be used as a targeted therapeutic agent to increase the killing of tumor cells and reduce tumor burden.

This approach targets two major hinderances in the anti-tumor immune response: an abundance of immunosuppressive myeloid cells and lack of antigen presenting cells (APCs), which are necessary for T-cell-mediated tumor cell killing. To concurrently address these, an RRV expressing IRF8 was employed to “reprogram” immunosuppressive myeloid cells into APCs, with the goal of both reducing immunosuppression and activating T-cells. The RRV selectively infects and replicates within proliferating tumor and immune cells, causing myeloid-derived suppressor cells to differentiate into potent APCs, increasing cytotoxic T-cell numbers, and enhancing tumor cell killing. This approach leverages the body’s immune system and inherently targets tumor cells, reducing off-target effects. Moreover, it can be used alone or in combination with other treatments such as T-cell therapies, cancer vaccines, immune checkpoint inhibitors, and traditional chemotherapies, maximizing therapeutic outcomes.

RELATED MATERIALS

- IRF8-driven reprogramming of the immune microenvironment enhances anti-tumor adaptive immunity and reduces immunosuppression in murine glioblastoma - 04/03/2024

DATA AVAILABILITY

Effects of RRV-IRF8 on survival and tumor growth kinetics were examined in the SB28 murine GBM model. Functional immunosuppression and antigen presentation was assayed by ex vivo T-cell-myeloid co-culture.

PATENT STATUS

Patent Pending

ADDRESS
UCSF
Innovation Ventures
600 16th St, Genentech Hall, S-272,
San Francisco,CA 94158

CONTACT
Tel:
innovation@ucsf.edu
https://innovation.ucsf.edu
Fax: