Integrin Activation to Bypass the CD47 Macrophage Checkpoint and Enable Phagocytosis of Cancer Cells

Tech ID: 32691 / UC Case 2020-047-0

TECHNOLOGY DESCRIPTION

Checkpoint inhibitors enable immune cells to identify and destroy cancer cells. The currently available checkpoint immunotherapies target CTLA-4 and the PD-1/PD-L1 axis in T cells. Unfortunately, they do not work for all cancer patients and can cause serious and fatal side effects, highlighting the urgent need for more safe and effective therapies.

This invention by researchers at UCSF describes methods for activating integrin signaling to bypass CD47 checkpoint thereby enabling macrophages and other phagocytic cells to ingest cancer cells. The integrin agonists include manganese, high affinity ligands, small molecules, and their combination. This method of bypassing the inhibitory CD47 checkpoint holds promise for treating a variety of hematological and solid malignancies, especially cancers that overexpress CD47 signature.

There are no approved cancer therapies that target the CD47 checkpoint in macrophages and other innate immune cells. We seek an industry partner to develop and commercialize this technology for patient benefit.

APPLICATION

1. Macrophages mobilized via integrin activation could easily penetrate solid tumors to engulf cancer cells

2. Potentially effective for hematological and solid cancers

3. Can be used in combination with CAR therapies and adoptive transfer of engineered macrophages

RELATED MATERIALS

CONTACT

Kristin A. Agopian
kristin.agopian@ucsf.edu
tel: 415-340-2619.

INVENTORS

- Morrissey, Meghan
- Vale, Ronald D.

OTHER INFORMATION

KEYWORDS

Cell Therapy, Oncology, Macrophages, Integrin

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Disease: Cancer
  - Therapeutics

RELATED CASES

2020-047-0

▶ Morrissey MA, Kern N, Vale RD. CD47 Ligation Repositions the Inhibitory Receptor SIRPA to Suppress Integrin Activation and Phagocytosis. Immunity. 2020 Aug 18;53(2):290-302.e6. doi: 10.1016/j.immuni.2020.07.008. PMID: 32768386

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20220280486	09/08/2022	2020-047

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: