NATIONAL CANCER INSTITUTE
Technology Transfer Center

Anti-SLAMF7 Chimeric Antigen Receptors

Summary

Chimeric Antigen Receptor T cell (CAR-T) therapies that specifically target Signaling Lymphocyte Activation Molecule F7 (SLAMF7) are strong therapeutic candidates for patients with Multiple Myeloma (MM). SLAMF7 is highly expressed on the malignant plasma cells that constitute MM. The expression of SLAMF7 by MM cells and lack of expression on nonhematologic cells makes SLAMF7 an attractive therapeutic target for MM. Researchers at the National Cancer Institute (NCI) have invented anti- SLAMF7 CAR constructs that allow genetically-modified T cells to express both the anti-SLAMF7 antibody and a suicide gene that allows T cells to specifically recognize and kill SLAMF7-expressing cells as well as allow for on-demand and reliable elimination of anti-SLAMF7 CAR T cells. NCI seeks licensing and/or co-development partners for this invention.

NIH Reference Number

E-158-2018

Product Type

- Therapeutics

Keywords

- Multiple Myeloma MM, SLAMF7, Adoptive Cell Therapy, ACT, Chimeric Antigen Receptor, CAR, Kochenderfer

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Immortalization of plasma cells leads to Multiple Myeloma (MM). Signaling Lymphocyte Activation Molecule F7 (SLAMF7) is highly expressed on the malignant plasma cells that constitute Multiple Myeloma. The expression of SLAMF7 by MM cells and lack of expression on nonhematologic cells makes SLAMF7 a promising target for chimeric antigen receptor (CAR) T cell therapies for the treatment of MM.

In addition to expression on normal and malignant plasma cells, SLAMF7 is also known to be expressed on a variety of other leukocytes including most natural killer (NK) cells, some CD8+ T cells, a small fraction of CD4+ T cells, NKT cells, some monocytes, and some dendritic cells. Therefore, a CAR targeting SLAMF7 may also eliminate SLAMF7-expressing leukocytes such as NK cells and dendritic cells, which could increase the risk of unwanted side effects from cancer therapies, such as infections. As a way to overcome such unwanted side effects, a “suicide gene” is needed to eliminate anti-SLAMF7 CAR T cells. Furthermore, a suicide gene might also be useful in controlling other types of toxicity such as severe cytokine-release syndrome.

Researchers at the National Cancer Institute (NCI) have created anti- SLAMF7 CAR constructs that allow genetically-modified T cells to express both anti-SLAMF7 antibody and a suicide gene. These CAR constructs allow T cells to specifically recognize and kill SLAMF7-expressing cells, and also allow for on-demand and reliable elimination of anti-SLAMF7 CAR T cells.

Potential Commercial Applications

- Treatment of Multiple Myeloma
- Avoid unwanted effects from treatment of CAR T therapies, such as infections

Competitive Advantages

- First in class CAR treatment targeting SLAMF7
- The suicide gene can help eliminate potential side effects

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/693,779 , Filed 03 Jul 2018

Therapeutic Area

- Cancer/Neoplasm

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