melanoma, and it is only transiently found on activated T and B lymphocytes and dendritic cells. CD70 is especially advantageous as a target for the immunotherapy of AML as, unlike other AML targets, it is not expressed on normal hematopoietic stem cells and, therefore, as opposed to most of the CAR-T therapies for AML in clinic today, it is unlikely to result in prolonged cytopenias and the need for a hematopoietic stem cell transplant for the recipient after CAR therapy. The present disclosure provides a solution to long-felt needs in the art of cancer therapies for CD70-positive cancers.

BRIEF SUMMARY

[0005a] In one aspect, provided herein is a polynucleotide that encodes an anti-CD70 chimeric antigen receptor (CAR) comprising a signal peptide, an anti-CD70 antigen binding domain, transmembrane domain, and at least one intracellular domain, wherein the anti-CD70 antigen binding domain does not comprise an antibody, and optionally wherein a transmembrane domain of the CAR is not a CD27 transmembrane domain.

[0005b] In another aspect, provided herein is an immune cell comprising the polynucleotide as described herein.

[0005c] In another aspect, provided herein is a population of the immune cells as described herein, said cells present in a suitable medium.

[0005d] In another aspect, provided herein is use of the polynucleotide as described herein in the manufacture of a medicament for killing CD70-positive cells in an individual, wherein a therapeutically effective amount of cells harboring the polynucleotide as described herein is to be administered to the individual.

[0005e] In another aspect, provided herein is the polynucleotide as described herein for use in therapy.

The present disclosure is directed to method and compositions for the treatment or prevention of cancers having CD70-expressing cells. The disclosure concerns particular anti-CD70 chimeric antigen receptors (CAR) and their use to target CD70-positive cancers of any kind. In particular embodiments, the antigen binding domain that targets CD70, including upon specific binding of CD70, is not an antibody. In particular embodiments, the anti-CD70 CAR lacks an antibody of any kind, including a scFv that binds CD70. In particular embodiments, the extracellular domain of the anti-CD70 CAR does not comprise an scFv or any other type of antibody.

[0006] In particular embodiments, the antigen binding domain that targets CD70 is a natural receptor of CD70, such as the receptor CD27. In specific cases, part or all of CD27 is employed in the CAR molecule. In aspects of the disclosure, the antigen binding domain present in the anti-CD70 CAR molecule comprises part or all of the extracellular domain of CD27, and in specific cases the CAR molecule does or does not utilize the transmembrane domain of CD27. In some cases, the CD28 transmembrane domain is employed instead of the CD27 transmembrane domain, despite the use of the CD27 extracellular domain in the CAR. Particular intracellular domains may be utilized for the CAR, such as CD3zeta alone or combinations of CD3zeta with either DAP10 or DAP12, and in some cases the intracellular domain does not comprise that of 4-1BB.

[0007] Embodiments of the disclosure include any polynucleotide that encodes part or all of the anti-CD70 CAR. Specific embodiments encompass polynucleotides that encode anti-CD70 CARs comprising an antigen binding domain, transmembrane domain, and at least one intracellular domain (including one or more costimulatory domains), wherein the CAR comprises an antigen binding domain that does not comprise an antibody. Vectors that