chimeric antigen receptors (CARs), which are fusion proteins comprised of an antigen recognition moiety and T-cell activation domains (see, e.g., Kershaw et al., *supra*, Eshhar et al., *Proc. Natl. Acad. Sci. USA*, *90*(2): 720-724 (1993), and Sadelain et al., *Curr. Opin. Immunol.*, *21*(2): 215-223 (2009)).

[0005] For B-cell lineage malignancies, extensive progress has been made in developing adoptive T-cell approaches that utilize anti-CD19 CARs (see, e.g., Jensen et al., *Biology of Blood and Marrow Transplantation*, *16*: 1245-1256 (2010); Kochenderfer et al., *Blood*, *116*(20): 4099-4102 (2010); Porter et al., *The New England Journal of Medicine*, *365*(8): 725-733 (2011); Savoldo et al., *Journal of Clinical Investigation*, *121*(5): 1822-1826 (2011), Cooper et al., *Blood*, *101*(4): 1637-1644 (2003); Brentjens et al., *Nature Medicine*, *9*(3): 279-286 (2003); and Kalos et al., *Science Translational Medicine*, *3*(95): 95ra73 (2011)). Adoptively transferred anti-CD19-CAR-transduced T-cells have cured leukemia and lymphoma in mice (see, e.g., Cheadle et al., *Journal of Immunology*, *184*(4): 1885-1896 (2010); Brentjens et al., *Clinical Cancer Research*, *13*(18 Pt 1): 5426-5435 (2007); and Kochenderfer et al., *Blood*, *116*(19): 3875-3886 (2010)). In early clinical trials, adoptively transferred T-cells transduced with anti-CD19 CARs eradicated normal and malignant B-cells in patients with leukemia and lymphoma (see, e.g., Kochenderfer et l., *Blood*, *116*(20): 4099-4102 (2010); Porter et al., *supra*, Brentjens et al., *Blood*, *118*(18): 4817-4828 (2011); and Kochenderfer et al., *Blood*, December 8, 2011 (epublication ahead of print (2012)). CD19, however, is only rarely expressed on the malignant plasma cells of multiple myeloma (see, e.g., Gupta et al., *Amer. J. Clin. Pathology*, *132*(5): 728-732 (2009); and Lin et al., *Amer. J. Clin. Pathology*, *121*(4): 482-488 (2004)).

[0006] Thus, there remains a need for compositions that can be used in methods to treat multiple myeloma. This invention provides such compositions and methods.

BRIEF SUMMARY ~~OF THE INVENTION~~

[0007] The ~~invention~~ present disclosure provides an isolated or purified nucleic acid sequence encoding a chimeric antigen receptor (CAR), wherein the CAR comprises an antigen recognition moiety and a T-cell activation moiety, and wherein the antigen recognition moiety is directed against B-cell Maturation Antigen (BCMA).

[0007a] In one aspect, there is provided an isolated or purified nucleic acid sequence encoding a chimeric antigen receptor (CAR), wherein the CAR comprises an antigen recognition

moiety and a T-cell activation moiety, and wherein the antigen recognition moiety is directed against B-cell Maturation Antigen (BCMA).

[0007b] In another aspect, there is provided an isolated or purified CAR encoded by the nucleic acid sequence as described herein.

[0007c] In yet another aspect, there is provided a vector comprising the isolated or purified nucleic sequence as described herein.

[0007d] In yet another aspect, there is provided an isolated host cell which expresses the nucleic acid sequence as described herein.

[0007e] In yet another aspect, there is provided a method of destroying cancer cells, which method comprises contacting cancer cells that express BCMA with the isolated or purified nucleic acid sequence as described herein, whereby the CAR is produced and binds to BCMA on the cancer cells and the cancer cells are destroyed, wherein the cancer cells are *in vitro*.

[0007f] In yet another aspect, there is provided a method of destroying cancer cells, which method comprises contacting cancer cells that express BCMA with the vector of the present disclosure, whereby the CAR is produced and binds to BCMA on the cancer cells and the cancer cells are destroyed, wherein the cancer cells are *in vitro*.

[0007g] In yet another aspect, there is provided a method of destroying cancer cells, which method comprises contacting cancer cells that express BCMA with one or more of the isolated T-cells of the present disclosure, whereby the CAR is produced and binds to BCMA on the cancer cells and the cancer cells are destroyed, wherein the cancer cells are *in vitro*.

[0007h] In yet another aspect, there is provided a method of destroying cancer cells, which method comprises contacting cancer cells that express BCMA with one or more of the isolated NK cells of the present disclosure, whereby the CAR is produced and binds to BCMA on the cancer cells and the cancer cells are destroyed, wherein the cancer cells are *in vitro*.

[0007i] In yet another aspect, there is provided a use of the nucleic acid sequence as described herein, the CAR as described herein, the vector as described herein, or the host cell as described herein, in the manufacture of a medicament for the destruction of cancer cells.