

CLAIMS

1. The use of one or more antibody-IR700 molecules in the manufacture of a medicament for treating a metastatic cancer, wherein:

(a) a suppressor cell in the area of a tumor or lesion and comprising a suppressor cell surface protein is to be contacted with a therapeutically effective amount of one or more antibody-IR700 molecules, wherein:

the antibody specifically binds to the suppressor cell surface protein and the suppressor cell is a CD4+CD25+Foxp3+ regulatory T cell (Treg), a type II natural killer T (NKT) cell, a CD8+CD122+Treg, a M2 macrophage, a tumor infiltrating fibroblast, a myeloid-derived suppressor cell, or a combination thereof;

the antibody does not include a functional Fc region; and

the suppressor cell surface protein is one or more of cluster of differentiation 4 (CD4), C-X-C chemokine receptor type 4 (CXCR4), C-C chemokine receptor type 4 (CCR4), cytotoxic T-lymphocyte-associated protein 4 (CTLA4), glucocorticoid induced TNF receptor (GITR), OX40, folate receptor 4 (FR4), CD16, CD56, CD8, CD122, CD23, CD163, CD206, CD11b, Gr-1, CD14, interleukin 4 receptor alpha chain (IL-4Ra), interleukin-1 receptor alpha (IL-1Ra), interleukin-1 decoy receptor, fibroblast activation protein (FAP), CD103, CXCR2, CD33, CD25 and CD66b; and

(b) the area of the tumor or lesion is to be irradiated with near infrared (NIR) light at a wavelength of 660 to 740 nm and at a dose of at least 4 J cm^{-2} following the suppressor cell being contacted with the one or more antibody-IR700 molecules, thereby killing suppressor cells in the area of the tumor or lesion.

2. The use of claim 1, wherein the suppressor cell surface protein is not CD25.

3. The use of claim 1 or claim 2, wherein:

the suppressor cell is a CD4+CD25+Foxp3+ Treg, and the suppressor cell surface protein is one or more of CD25, CD4, GITR, OX40, FR4, CXCR4, CCR4, CTLA4, and CD103;

the suppressor cell is a type II NKT cell, and the suppressor cell surface protein is one or more of CD16 and CD56;

the suppressor cell is a CD8⁺CD122⁺ Treg, and the suppressor cell surface protein is one or more of CD8 and CD122;

the suppressor cell is a M2 macrophage, and the suppressor cell surface protein is one or more of CD23, CD163, CD206, CD11b, Gr-1, CD14, IL-4Ra, IL-1Ra, and interleukin-1 decoy receptor;

the suppressor cell is a tumor infiltrating fibroblast, and the suppressor cell surface protein is fibroblast activation protein (FAP); or

the suppressor cell is a myeloid-derived suppressor cell, and the suppressor cell surface protein is one or more of CXCR2, CD33, CD14, CD66b and CD11b.

4. The use of any of claims 1 to 3, wherein the antibody is one or more Fab' and/or F(ab')₂ fragments.

5. The use of any of claims 1 to 4, wherein the antibody-IR700 molecule comprises an anti-CD25-F(ab')₂-IR700 molecule.

6. The use of any of claims 1 to 5, wherein the one or more antibody-IR700 molecules comprises at least two different antibody-IR700 molecules, wherein a first antibody-IR700 molecule is specific for a first suppressor cell surface protein, and a second antibody-IR700 molecule is specific for a different epitope of the first suppressor cell surface protein or is specific for a second suppressor cell surface protein.

7. The use of any of claims 1 to 6, wherein the suppressor cell is in a subject, and the medicament is to be administered in a therapeutically effective amount to the subject.

8. The use of claim 7, wherein a therapeutically effective amount of one or more additional chemotherapeutic, biologic, or radiological agents is to be administered to the subject.

9. The use of any of claims 1-8, wherein the tumor is a cancer selected from the group consisting of: (i) cancer of the breast, liver, colon, ovary, prostate, pancreas, brain, cervix, bone, skin, head and neck, or lung; or (ii) cancer of the blood.

10. The use of any of claims 7-9, wherein the use reduces the weight, volume, or size of the tumor by at least 25% relative to the absence of treatment and/or the use reduces the weight, volume, or size of a metastasis not irradiated at a wavelength of 660 to 740 nm by at least 25%.

11. The use of any of claims 1 to 10, wherein irradiation of the tumor or lesion comprises irradiation of the blood by a device worn by the subject, wherein the device comprises a near infrared (NIR) light emitting diode (LED).