We claim:

1. A method of killing a cell, comprising:

contacting a cell comprising a cell surface protein with a therapeutically effective amount of one or more antibody-IR700 molecules, wherein the antibody specifically binds to the cell surface protein;

irradiating the cell at a wavelength of 660 to 740 nm and at a dose of at least 1 J cm^{-2}; and

contacting the cell with one or more therapeutic agents about 0 to 8 hours after irradiating the cell, thereby killing the cell.

2. A method of detecting cell killing in real-time, comprising:

contacting a cell comprising a cell surface protein with a therapeutically effective amount of one or more antibody-IR700 molecules, wherein the antibody specifically binds to the cell surface protein;

irradiating the cell at a wavelength of 660 to 740 nm and at a dose of at least 30 J cm^{-2};

detecting the cell with fluorescence lifetime imaging about 0 to 48 hours after irradiating the cell, thereby detecting the cell killing in real-time.

3. The method of claim 1, further comprising:

detecting the cell with fluorescence lifetime imaging about 0 to 48 hours after irradiating the cell.

4. The method of any of claims 1 to 3, wherein the cell is a tumor cell.

5. The method of claim 3, wherein the tumor cell is a cancer cell.

6. The method of claim 5, wherein the cancer cell is a cancer cell of the breast, liver, colon, ovary, prostate, pancreas, brain, cervix, bone, skin, or lung.

7. The method of claim 5, wherein the cancer cell is a cancer cell of the blood.

8. The method of any of claims 1-7, wherein the cell surface protein is a tumor-specific protein.

9. The method of claim 8, wherein the tumor-specific protein comprises HER1, HER2, CD20, CD25, CD33, CD52, CD44, CD133, Louis Y, mesothelin, CEA or prostate specific membrane antigen (PSMA).

10. The method of any of claims 1 to 9, wherein the antibody-IR700 molecule comprises a Panitumumab-IR700 molecule, Trastuzumab-IR700 molecule, Basilitumab-IR700 molecule, Zenapax-IR700 molecule, Simitect-IR700 molecule or J591-IR700 molecule.

11. The method of any of claims 1 to 10, wherein the cell is irradiated at a wavelength of 680 nm.

12. The method of any of claims 1 to 11, 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 antigen, and a second antibody-IR700 molecule is specific for a different epitope of the first antigen or is specific for a second antigen.

13. The method of any of claims 1 to 12, wherein the cell is in a subject, and contacting the cell with the one or more antibody-IR700 molecules and the one or more therapeutic agents comprises administering a therapeutically effective amount of the one or more antibody-IR700 molecules and the one or more therapeutic agents to the subject.

14. The method of any of claims 1 to 13, wherein the cell is in a subject, and irradiating the cell comprises:

irradiating the subject; and/or

irradiating a tumor in the subject.

15. The method of any of claims 1 to 14, wherein the cell is in a subject's blood, and wherein irradiating the cell comprises irradiating the blood by using a device worn by the subject, wherein the device comprises a near infrared (NIR) light emitting diode (LED).

16. The method of any of claims 1 to 15, wherein the cell is in a subject, and the method further comprises:

selecting a subject with a tumor that expresses a cell surface protein that can specifically bind to the antibody-IR700 molecule.

17. The method of any of claims 1 to 16, wherein the method reduces the volume or size of the tumor by at least 25% relative to the absence of treatment.

18. The method of any of claims 13-17, wherein the method increases survival time of the subject relative to an absence of administration of the antibody-IR700 molecule and irradiation.

19. The method of any of claims 1 or 3-18, further comprising:

contacting the cell with one or more antibody-IR700 molecules in an amount less than the therapeutically effective amount; and

irradiating the cell at a wavelength of 660 to 740 nm and at a dose of at least 0.001 J cm^{-2}, thereby permitting detection of the cell.

20. A composition comprising a Panitumumab-IR700 molecule, a Trastuzumab-IR700 molecule, or a J591-IR700 molecule.

21. A wearable device comprising:

an article of clothing, jewelry, or covering; and

an NIR LED incorporated into the article of clothing, jewelry, or covering.

22. The wearable device of claim 21, further comprising a power source and/or a cooling source incorporated into the article of clothing, jewelry, or covering.

23. A method of killing a tumor cell in a subject's blood, comprising:

administering to the subject a therapeutically effective amount of one or more antibody-IR700 molecules, wherein the antibody specifically binds to a cell surface protein on the tumor cell; and

irradiating the tumor cell with a NIR LED at a wavelength of 660 to 740 nm at a dose of at least 20 J cm^{-2}, thereby killing the cell, wherein the NIR LED is present in the wearable device of any of claims 21-22 worn by the subject.

We claim:

1. A method of killing a cell *in vitro*, comprising:

contacting a cell comprising a cell surface protein with a therapeutically effective amount of one or more antibody-IR700 molecules, wherein the antibody specifically binds to the cell surface protein;

irradiating the cell at a wavelength of 660 to 740 nm and at a dose of at least 1 J cm^{-2}; and

contacting the cell with one or more therapeutic agents about 0 to 8 hours after irradiating the cell, thereby killing the cell.

2. A method of detecting cell killing *in vitro* in real-time, comprising:

contacting a cell comprising a cell surface protein with a therapeutically effective amount of one or more antibody-IR700 molecules, wherein the antibody specifically binds to the cell surface protein;

irradiating the cell at a wavelength of 660 to 740 nm and at a dose of at least 30 J cm^{-2};

detecting the cell with fluorescence lifetime imaging about 0 to 48 hours after irradiating the cell, thereby detecting the cell killing in real-time.

3. The method of claim 1, further comprising:

detecting the cell with fluorescence lifetime imaging about 0 to 48 hours after irradiating the cell.

4. The method of any of claims 1 to 3, wherein the cell is a tumor cell.

5. The method of claim 4, wherein the tumor cell is a cancer cell.

6. The method of claim 5, wherein the cancer cell is a cancer cell of the breast, liver, colon, ovary, prostate, pancreas, brain, cervix, bone, skin, or lung.

7. The method of claim 5, wherein the cancer cell is a cancer cell of the blood.

8. The method of any of claims 1-7, wherein the cell surface protein is a tumor-specific protein.

9. The method of claim 8, wherein the tumor-specific protein comprises HER1, HER2, CD20, CD25, CD33, CD52, CD44, CD133, Louis Y, mesothelin, CEA or prostate specific membrane antigen (PSMA).

10. The method of any of claims 1 to 9, wherein the antibody-IR700 molecule comprises a Panitumumab-IR700 molecule, Trastuzumab-IR700 molecule, Basilitumab-IR700 molecule, Zenapax-IR700 molecule, Simitect-IR700 molecule or J591-IR700 molecule.

11. The method of any of claims 1 to 10, wherein the cell is irradiated at a wavelength of 680 nm.

12. The method of any of claims 1 to 11, 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 antigen, and a second antibody-IR700 molecule is specific for a different epitope of the first antigen or is specific for a second antigen.

13. The method of any of claims 1 to 12, wherein the method reduces the volume or size of the tumor by at least 25% relative to the absence of treatment.

14. The method of any of claims 1 or 3-13, further comprising:

contacting the cell with one or more antibody-IR700 molecules in an amount less than the therapeutically effective amount; and

irradiating the cell at a wavelength of 660 to 740 nm and at a dose of at least 0.001 J cm^{-2}, thereby permitting detection of the cell.

15. A composition comprising a Panitumumab-IR700 molecule, a Trastuzumab-IR700 molecule, or a J591-IR700 molecule.