**Claims**

1. An in vitro method of removing a target from a sample, comprising:

contacting the sample with an IR700-molecule conjugate to form an IR700-molecule conjugate-target complex, wherein the molecule of the IR700-molecule conjugate comprises a specific binding agent that specifically binds to the target;

irradiating the sample at a wavelength of 660 to 710 nm and at a dose of at least 1 J $cm^{-2}$ under conditions sufficient for generating a hydrophobic IR700-molecule conjugate-target complex;

incubating the sample under conditions that permit the hydrophobic IR700-molecule conjugate-target complex to aggregate; and

separating the hydrophobic IR700-molecule conjugate-target complex from the sample, thereby removing the target from the sample,

wherein the target is a protein, peptide, lectin, carbohydrate, metal, nucleic acid molecule, recreational drug, small organic molecule, pathogen, or spore.

2. The method of claim 1, wherein the pathogen is a virus, bacterium, parasite, or fungus.

3. The method of claim 1 or 2, wherein the IR700-molecule conjugate comprises an IR700-antibody conjugate, IR700-antibody fragment conjugate, IR700-Affibody® molecule conjugate, IR700-hapten conjugate, IR700-lectin conjugate, IR700-protein conjugate, IR700- nucleic acid molecule conjugate, or IR700-functional nucleic acid conjugate wherein the antibody, antibody fragment, Affibody® molecule, hapten, lectin, protein, nucleic acid molecule, and the functional nucleic acid can specifically bind to the target molecule.

4. The method of any of claims 1-3, wherein the sample is a food sample, environmental sample, reactor sample, fermentation sample, or sample obtained from a subject.

5. The method of any of claims 1-4, wherein the sample is irradiated at a wavelength of 690 nm +/-20 nm or 690 nm +/-4 nm.

6. The method of any of claims 1-5, wherein incubating the sample under conditions that permit the hydrophobic IR700-molecule conjugate-target molecule complex to aggregate comprises centrifuging the sample under conditions that permit the hydrophobic IR700-molecule conjugate-target molecule complex to form a pellet.

7. The method of any of claims 1-5, wherein incubating the sample under conditions that permit the hydrophobic IR700-molecule conjugate-target molecule complex to aggregate comprises allowing the hydrophobic IR700-molecule conjugate-target molecule complex to settle to the bottom of a container.

8. The method of any of claims 1-7, wherein separating the hydrophobic IR700-molecule conjugate-target molecule complex from the sample comprises removing a supernatant after allowing the hydrophobic IR700-molecule conjugate-target molecule complex to aggregate.

9. The method of any of claims 1-8, further comprising measuring the target removed from the sample.

10. The method of any of claims 1-9, further comprising detecting other molecules bound to the target.

11. Use of a therapeutically effective amount of an IR700-molecule conjugate in the manufacture of a medicament for the removal of a target molecule from a subject, wherein the medicament is to be administered

to a subject wherein the molecule of the IR700-molecule conjugate in the medicament comprises a specific binding agent that specifically binds to the target;

the subject is to be irradiated at a wavelength of 660 nm to 710 nm and at a dose of at least 4 J $cm^{-2}$ under conditions that form a hydrophobic IR700-molecule conjugate;

the medicament is to be allowed to aggregate;

the medicament is to be allowed to be removed from the subject, thereby removing the target molecule from the subject; and

subsequently detecting a decrease in the amount of the target molecule in the subject or detecting an increase in the amount of the target molecule removed from the subject.

12. The use of claim 11, wherein the target is a protein, peptide, lectin, carbohydrate, metal, nucleic acid molecule, small organic molecule, recreational drug, pathogen, spore, cell, or pharmacological agent.

13. The use of claim 12, wherein the target cell is a cell in a tumor.

14. The use of claim 13, wherein the cell in the tumor is a tumor cell, immune cell, or cancer stem cell.

15. The use of claim 12, wherein the target cell is a negative regulatory T-cell.

16. The use of claim 15, wherein the negative regulatory T-cell is a $CD4^{+}CD25^{+}FoxP3^{+}$ T cell, and the IR700-molecule conjugate comprises an anti-CD25 or anti-CLTA4 antibody.

17. The use of claim 12, wherein the IR700-molecule conjugate comprises the target molecule, and wherein the target molecule comprises a pharmacological agent.

18. The use of claim 17, wherein the pharmacological agent comprises a chemotherapeutic, biologic agent, antibiotic, anti-hypertensive drug, antidepressant, analgesic, reproductive hormone, blood thinner, steroid, or statin.

19. The use of claim 11, wherein the IR700-molecule conjugate comprises an IR700-antibody conjugate, IR700-antibody fragment conjugate, IR700-Affibody® molecule conjugate, IR700-hapten conjugate, IR700-lectin conjugate, IR700-protein conjugate, IR700- nucleic acid molecule conjugate, or IR700-functional nucleic acid conjugate wherein the antibody, antibody fragment, Affibody® molecule, hapten, lectin, protein, nucleic acid molecule, and the functional nucleic acid can specifically bind to the target molecule.

20. The use of any of claims 11-19, wherein the subject is to be irradiated at a wavelength of 690 nm +/- 20 nm or 690 nm +/- 4 nm.

21. The use of any of claims 11-20, wherein the irradiation ofthe subject comprises using a device worn by the subject, wherein the device comprises a near infrared (NIR) light emitting diode (LED).

22. The use of any of claims 11-21, wherein the subject has a cancer of the breast, liver, kidney, uterus, colon, ovary, prostate, pancreas, brain, cervix, bone, skin, or lung.

23. The use of any of claims 11-22, wherein subsequently allowing the medicamentto be removed from the subject comprises allowing the medicamentto reach the liver and be degraded, thereby removing the target molecule from the subject.

24. The use of any of claims 11-23, wherein detecting a decrease in the amount of the target molecule in the subject comprises measuring an amount of the target in a blood sample obtained from the subject.