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-monoclonal antibody mimic 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. The method of any of claims 1-10, wherein the target is a metal, nucleic acid molecule, recreational drug, small organic molecule, pathogen, or spore.