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 Jcm^{-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 thesample, thereby removing the target from the sample,

wherein the target is a protein, peptide, lectin, carbohydrate, metal, nucleic acidmolecule, 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, monoclonal antibody mimic 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 thatpermit the hydrophobic IR700-molecule conjugate-target molecule complex to aggregatecomprises 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 tosettle to the bottom of a container.

8. The method of any of claims 1-7, wherein separating the hydrophobic IR700-moleculeconjugate-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 fromthe 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.