CLAIMS

1. A method of detecting the presence of *Vibrio spp.* in a sample, the method comprising:
    a) contacting the sample with a substrate to capture *Vibrio spp.* onto the substrate; and
    b) contacting the substrate with an anti-*Vibrio* aptamer nanoparticle conjugate, wherein specific binding of the anti-*Vibrio* aptamer nanoparticle conjugate to the *Vibrio spp.* on the substrate indicates the presence of *Vibrio spp.* in the sample;

    wherein the aptamer consists of a nucleic acid sequence of:
    5'-
    AGCCGGGGTGGTCATTAGCAGCAGCACAACAGGCAGCACAACAGGCA
    G-3' (SEQ ID NO: 1).

2. The method of claim 1, wherein the method comprises detecting anti-*Vibrio* aptamer nanoparticle conjugate that is present on the substrate, wherein an increased level of anti-*Vibrio* aptamer nanoparticle conjugate that is present on the substrate as compared to a reference indicates the presence of *Vibrio spp.* in the sample, wherein the reference is a substrate that has been contacted with a sample that does not contain *Vibrio spp.*.

3. The method of claim 1 or 2, wherein the sample is a liquid sample (such as a water sample) and wherein the substrate is a porous substrate that is capable of filtering *Vibrio spp.* from the sample.

4. The method of claim 3, wherein step a) comprises flowing the liquid sample through the porous substrate to capture *Vibrio spp.* from the sample.

5. The method of claim 1 or 2, wherein the sample is a solid/semi-solid sample (such as a biological tissue sample) and wherein the substrate is a swab that is capable of capturing *Vibrio spp.* onto its surface.

6. The method of any one of claims 1 to 5, wherein the substrate is conjugated with an anti-*Vibrio* aptamer and/or antibody to capture *Vibrio spp.* from the sample.

7. The method of any one of claims 1 to 6, wherein the nanoparticle is a plasmonic and/or fluorescent nanoparticle.

8. The method of claim 7, wherein the nanoparticle is a metallic nanoparticle.

9. The method of claim 7 or 8, wherein the nanoparticle is detected by addition of a metallic precursor to improve visual detection of the nanoparticle.

10. The method of any one of claims 1 to 9, wherein the method comprises washing the substrate to remove unbound anti-*Vibrio* aptamer nanoparticle conjugate after contacting the substrate with the anti-*Vibrio* aptamer nanoparticle conjugate.

11. A method of detecting the presence of *Vibrio spp.* in a liquid sample, the method comprising:

    a) flowing the liquid sample through a porous substrate to capture *Vibrio spp.* on the porous substrate; and

    b) contacting the porous substrate with an anti-*Vibrio* aptamer nanoparticle conjugate, wherein specific binding of the anti-*Vibrio* aptamer nanoparticle conjugate to the *Vibrio spp.* on the porous substrate indicates the presence of *Vibrio spp.* in the sample;

    wherein the aptamer consists of a nucleic acid sequence of:

    5'-AGCCGGGGTGGTCATTAGCAGCAGCACAACAGGCAGCACAACAGGCAG-3' (SEQ ID NO: 1).

12. A method of detecting the presence of *Vibrio spp.* in a solid/semi-solid sample, the method comprising:

a) contacting the sample with a swab to capture *Vibrio spp.* onto the surface of the swab; and

b) contacting the swab with an anti-*Vibrio* aptamer nanoparticle conjugate, wherein specific binding of the anti-*Vibrio* aptamer nanoparticle conjugate to the *Vibrio spp.* on the swab indicates the presence of *Vibrio spp.* in the sample;

wherein the aptamer consists of a nucleic acid sequence of:

5'-AGCCGGGGTGGTCATTAGCAGCAGCACAACAGGCAGCACAACAGGCAG-3' (SEQ ID NO: 1).

13. The method of claim 12, wherein the method comprises conjugating an anti-*Vibrio* antibody or aptamer to the swab to capture *Vibrio spp.* from the sample.

14. A kit or sensor for performing a method according to any one of claims 1 to 13, wherein the kit or sensor comprises an anti-*Vibrio* aptamer nanoparticle conjugate, wherein the aptamer consists of a nucleic acid sequence of:

5'-AGCCGGGGTGGTCATTAGCAGCAGCACAACAGGCAGCACAACAGGCAG-3' (SEQ ID NO: 1).

15. An *anti-Vibro* aptamer consisting of a nucleic acid sequence of:

5'-AGCCGGGGTGGTCATTAGCAGCAGCACAACAGGCAGCACAACAGGCAG-3' (SEQ ID NO: 1).

16. A composition for capturing *Vibrio spp.* from a sample, the composition comprising a substrate and an anti-*Vibrio* aptamer that has been conjugated to the substrate, wherein the aptamer consists of a nucleic acid sequence of:

5'-AGCCGGGGTGGTCATTAGCAGCAGCACAACAGGCAGCACAACAGGCAG-3' (SEQ ID NO: 1).

17. The composition of claim 16, wherein the substrate is a porous substrate or a swab.