

**[0192]** The method further comprises forming a suspension of particulate cell concentration agent in a liquid sample. The suspension may be formed in the housing or it may be formed outside the housing. If the suspension is formed outside of the housing, the method further comprises transferring the suspension into the housing. The method further comprises contacting the particulate cell concentration agent with the liquid sample for a period of time sufficient to capture a microorganism. The contacting may occur in the housing. The contacting may occur outside the housing. The contacting may occur both outside and inside the housing. The method further comprises separating a portion of a liquid sample from a suspension the particulate material in the liquid sample, as described above for the devices of FIGS. 2A, 3A, 4A, 5A, 7A, and 10A.

#### Sample Preparation and Detection Kits:

**[0193]** Components and/or devices of the present disclosure can be packaged together with instructions and optionally, accessory articles or reagents, to produce sample preparation and detection kits. Thus, in one aspect, the present disclosure provides a kit comprising i) a housing comprising at least two receptacles with a passageway therebetween, ii) means for isolating an upper receptacle from a lower receptacle in the housing, iii) a cell concentration agent, and iv) means for transferring the cell concentration agent from the upper receptacle to the lower receptacle. The upper receptacle comprises an opening configured to receive a sample. The lower receptacle comprises a detection reagent disposed therein. In some embodiments, the housing can further comprise the means for isolating the upper receptacle from the lower receptacle, as described herein. In some embodiments, the housing can further comprise the means for transferring the cell concentration agent from the upper receptacle to the lower receptacle. In some embodiments, the cell concentration agent is disposed in the upper receptacle of the housing.

**[0194]** In some embodiments, kits of the present disclosure include accessory articles or reagents that can be used with the sample preparation and detection devices. Nonlimiting examples of accessory articles include a sample acquisition device, a filter, a glove, a culture device (e.g., a petri plate, a culture tube, a PETRIFILM plate obtained from 3M Company (St. Paul, Minn.), or the like), nucleic acid isolation or amplification reagents, immunoassay devices such as lateral flow devices, ELISA plates and reagents, or any combination of two or more of the foregoing articles. Nonlimiting examples of accessory reagents include water, a buffering agent, an indicator (e.g., a pH indicator), a dye, a somatic cell extractant, a hydrogel comprising a cell extractant, a binding partner as described herein, an enzyme, an enzyme substrate, oligonucleotides, control samples or any combination of two or more of the foregoing reagents.

#### EXAMPLES

**[0195]** The present invention has now been described with reference to several specific embodiments foreseen by the inventor for which enabling descriptions are available. Insubstantial modifications of the invention, including modifications not presently foreseen, may nonetheless constitute equivalents thereto. Thus, the scope of the present invention

should not be limited by the details and structures described herein, but rather solely by the following claims, and equivalents thereto.

#### Materials:

**[0196]** All bacterial cultures were obtained from The American Type Culture Collection (ATCC, Manassas, Va.), unless specified otherwise.

**[0197]** All water was obtained as 18 megaohm sterile deionized water using a Milli-Q™ Gradient deionization system from Millipore Corporation (Bedford, Mass.), unless specified otherwise.

**[0198]** CM-111: amorphous, spheroidized magnesium silicate; microspheres were obtained as 3M™ Cosmetic Microspheres CM-111 from 3M Company, St. Paul, Minn. The particles were shaped as solid spheres with particle density of 2.3 g/cc and had a surface area approximately 3.3 m<sup>2</sup>/g. Ninety percent of the particles were less than about 11 microns. Fifty percent of the particles were less than about 5 microns. Ten percent of the particles were less than about 2 microns. CM-111 microspheres were prepared as described in Example 1 of U.S. Patent Application No. 61/289,213, filed on Dec. 22, 2009 and entitled "MICROORGANISM CONCENTRATION PROCESS AND CONCENTRATION AGENT FOR USE THEREIN", which is incorporated herein by reference in its entirety.

**[0199]** The 100× adsorption buffer containing 500 mM KCl, 100 mM CaCl<sub>2</sub>, 10 mM MgCl<sub>2</sub>, and 100 mM K<sub>2</sub>HPO<sub>4</sub> at pH 7.2 was prepared and filter-sterilized prior to use.

**[0200]** Surface-sterilized components were contacted (wiped with or immersed in) 70% isopropyl alcohol. The excess alcohol was poured off and the components were allowed to air-dry for at least 30 minutes before use.

**[0201]** All chemicals were obtained from Sigma-Aldrich Chemical Company, Milwaukee, Wis., unless specified otherwise.

#### Example 1

##### Incorporation of Cell Extractant into Hydrogel Beads after Polymerization of the Hydrogel

**[0202]** Hydrogel beads were prepared as described in example 1 of the International Patent Publication No. WO 2007/146722. Active beads were prepared by drying as described in example 19 and then soaking in active solution as described in example 23 of the International Patent Publication No. WO 2007/146722. One gram of beads was dried at 60° C. for 2 h to remove water from the beads. The dried beads were soaked in 2 grams of 50% (w/v) aqueous solutions of BARDAC 205M (Lonza Group Ltd., Valais, Switzerland) for at least 3 hrs to overnight at room temperature. After soaking, the beads were poured into a Buchner funnel to drain the beads and then rinsed with 10 to 20 ml of distilled water. The excess water was removed from the surface of the beads by blotting them with a paper towel. The beads were stored in a jar at room temperature for at least two weeks before they were used.

#### Example 2

##### Cell Concentration by Use of Microparticles and Detection Using Cell Extractant-Loaded Hydrogels and ATP Bioluminescence

**[0203]** 3M™ CLEAN-TRACE Surface ATP system was obtained from 3M Company (St. Paul, Minn.). Pure cultures