**WHAT IS CLAIMED:**

1. A composition comprising:

a shell surrounding a core, wherein said core comprises one or more lyophilised microspheres, wherein the shell comprises a shell additive, wherein the shell additive comprises a static mitigation material, a moisture barrier material, or a combination thereof.

2. The composition of claim 1, wherein the shell additive is a static mitigation material present in an amount no more than 40% w/w concentration of the shell.

3. The composition of claim 1, wherein the shell additive is a moisture barrier material present in an amount no more than 90% w/w concentration of the shell.

4. The composition of claim 1, wherein the shell additive comprises one or more of a polymer, a copolymer, a block copolymer, a second polyvinyl alcohol (PVA), an ammonium salt, a conductivity promoter, a stearate derivative, an oleate derivative, a laurate derivative, a polyether compound, an amino acid, tocopherol acetate, piperidyl sebacate, sodium salt, a buffer, a chelating agent, imidazolium salt, polyaniline, or any combination thereof.

5. The composition of claim 4, wherein the polyether compound is selected from polyethylene glycol, polypropylene glycol, a block copolymer derived from ethylene oxide (EO) and propylene oxide (PO), or any combination thereof.

6. The composition of any one of claims 4 through 5, wherein the amino acid is selected from one or more of leucine, isoleucine, phenylalanine, or any combination thereof.

7. The composition of any one of claims 4 through 6, wherein the sodium salt is selected from one or more of sodium chloride, sodium bisulfite, sodium citrate, or any combination thereof.

8. The composition of any one of claims 4 through 7, wherein the buffer is Trizma, Tris.HCl, or a combination thereof.

9. The composition of any one of claims 4 through 8, wherein the ammonium salt is selected from tetraalkyl ammonium chloride, tris(hydroxyethyl) alkylammonium chloride, or a combination thereof.

10. The composition of any one of claims 4 through 9, wherein the imidazolium salt is selected from 1-ethyl-3-methyl-imidazolium salt or polyquaternium or Luviquat® (copolymer of vinyl pyrrolidone and quaternized vinylimidazole), or a combination thereof.

11. The composition of any one of claims 1 through 10, wherein the shell additive comprises ammonium salt, copolymer, polyvinyl alcohol graft polyethylene glycol copolymer, polyvinyl alcohol (PVA), or any combination thereof.

12. The composition of any one of claims 1 through 11, wherein said core comprises one or more reagent selected from one or more enzyme, salt, surfactant, buffering agent, enzyme inhibitor, primer, nucleotide, organic osmolite, magnetic bead, molecular probe, crowding agent, small molecule, labelled-nucleotide, a fluorophore, or any combination thereof.

13. The composition of claim 12, wherein said reagent is a polymerase.

14. The composition of any one of claims 1 through 13, wherein said core further comprises one or more additional agent, wherein said additional agent is selected from one or more sugar, one or more amino acid, one or more polymer, one or more mesoporous silica, one or more quaternary amine, and any combination thereof.

15. The composition of claim 14, wherein, when said additional agent comprises one or more sugar, said sugar is selected from trehalose, mannitol, cyclodextrin, dextran, sucrose, or any combination thereof.

16. The composition of claim 14, wherein, when said additional agent comprises one or more amino acid with a hydrophobic side chain.

17. The composition of any one of claims 1 through 16, wherein the core comprises a core additive, wherein the core additive comprises a static mitigation material,

wherein the core additive is a static mitigation material present in an amount no more than 25% w/w concentration of the core.

18. The composition of claim 17, wherein the core additive comprises one or more of a polymer, a copolymer, a block copolymer, a second polyvinyl alcohol (PVA), a conductivity promoter, an ammonium salt, an imidazolium salt, a polyether compound, or any combination thereof.

19. A method of controlling release of one or more encapsulated microspheres comprising:

providing a composition of any one of claims 1 through 18, and

mixing said composition with a rehydration solution under a first condition effective to control release of one or more lyophilised microspheres from said composition.

20. The method of claim 19 further comprising:

modifying said first condition to a second condition.

21. The method of claim 20, wherein modifying said first condition comprises one or more of a modifying of temperature, a modifying of exposure time, a modifying of rehydration solution pH, or a modifying to position of encapsulated microspheres in said rehydration solution.

22. The method of claim 20 or claim 21, wherein a temperature in said first condition and/or said second condition is between about 10 ˚C and about 90 ˚C.

23. The method of any one of claims 19 through 22, wherein pH in said rehydration solution is between about 6.0 and about 10.0.

24. The method of any one of claims 19 through 23, wherein said first condition is effective to release a first lyophilised microsphere.

25. The method of any one of claims 20 through 24, wherein said second condition is effective to release a second lyophilised microsphere, wherein content of said second lyophilised microsphere is different from content of said first lyophilised microsphere.

26. The method of any one of claims 20 through 25, wherein modifying said first condition allows for a sequential release of one or more lyophilised microspheres.

27. The method of any one of claims 20 through 26, wherein modifying said first condition is effective to release two or more lyophilised microspheres, wherein said two or more lyophilised microspheres comprise different reagents.

28. The method of any one of claims 19 through 27 further comprising:

providing an additional composition of any one of claims 1 through 18, and

mixing said additional composition under a third condition effective to control release of one or more lyophilised microspheres from said additional composition.

29. The method of any one of claims 19 through 28 further comprising:

contacting one or more reagents with a sample to perform multiple co-assay reactions.

30. The method of claim any one of claims 19 through 29, wherein said shell comprises more than one lyophilised microsphere, and wherein said reagents in said more than one lyophilised are different.