

CLAIMS

1. A method of producing polymer-coated microparticles comprising:
 - combining protein powder and a polymer into a hydrocarbon solvent to form a non-aqueous first solution, wherein the protein is a molecule comprising two or more amino acid residues joined to each other by a peptide bond;
 - adding the first solution to a second solution, wherein the second solution comprises a fluorocarbon liquid and a fluorosurfactant;
 - agitating the combined solutions to form a non-aqueous emulsion comprising multiple emulsion hydrocarbon droplets in the fluorocarbon liquid;
 - removing the hydrocarbon solvent; and
 - removing the fluorocarbon liquid to isolate the microparticles, wherein the microparticles comprise protein encapsulated within a matrix of polymer, and wherein the hydrocarbon solvent is dichloromethane, chloroform, toluene, ethyl acetate, tetrahydrofuran, acetonitrile, dimethylformamide, dimethylsulfoxide, acetone, ethanol, methanol, pentane, propanol, hexane, or a combination thereof.
2. The method of claim 1, wherein the microparticles comprise: a single core-shell structure; or multiple cores dispersed within the polymer; or microparticles comprising a combination of a single core-structures encapsulated by a polymer and microparticles comprising multi-core structures encapsulated by a polymer.
3. The method of either of claim 1 or claim 2, wherein the fluorocarbon liquid comprises a perfluoro C5-C18 compound, or hydrofluoroether; optionally wherein the hydrofluoroether comprises 4-Ethoxy-1,1,1,2,2,3,3,4,5,6,6,6-didecafluoro-5-(trifluoromethyl)hexane.
4. The method of any one of claims 1-3, wherein the hydrocarbon solvent is selected from the group consisting of dichloromethane, chloroform, toluene, ethyl acetate, tetrahydrofuran, and a combination thereof.
5. The method of any one of claims 1-4, wherein the fluorosurfactant comprises Perfluoropolyether-b-Polyethylene glycol-b- Perfluoropolyether.

6. The method of any one of claims 1-5, wherein the polymer comprises polyorthoester (POE), or wherein the polymer is selected from the group consisting of polylactic acid and poly(lactic-co-glycolic acid).
7. The method of any one of claims 1-6, wherein the protein is an antibody or antigen binding fragment thereof, a fusion protein, a recombinant protein, or a fragment or truncated version thereof, optionally wherein the protein is a VEGF Trap protein, for example a truncated form of VEGF Trap protein.
8. The method of any one of claims 1-7, wherein the microparticles have a diameter of 1 to 200 μm .
9. The method of any one of claims 1-8, wherein the protein powder comprises particles comprising a diameter of 0.5 to 20 μm of micronized protein; and/or wherein protein powder is micronized by spray-drying, electrospray drying, reversible precipitation, spray freezing, microtemplating, or a combination thereof.
10. The method of any one of claims 1-9, wherein hydrocarbon solvent is removed while stirring the combined solutions, optionally wherein the hydrocarbon solvent is removed under vacuum to harden the microparticles; and/or wherein the hydrocarbon solvent is removed by evaporation.
11. The method of any one of claims 1-10, wherein:
 - (a) the emulsion is formed using homogenization, vortexing, sonication, cavitation, agitation, or a combination thereof; and/or
 - (b) the fluorocarbon liquid is removed by filtration optionally under vacuum; and/or
 - (c) a hydrofluoroether is used as a cosolvent to extract the hydrocarbon.