substance such as gelatin or gum arabic (Example 8 illustrates a combination of these two) or a cellulose derivative such as hydroxymethyl cellulose, methyl cellulose, hydroxyethyl cellulose, hydroxypropyl methylcellulose, hydroxypropyl ethylcellulose, carboxymethyl cellulose sodium and the like. Where the scarcely soluble drug is first dissolved in a hydrophobic organic solvent, the dispersion can be an emulsion. The solvent can be low-boil or non-volatile in which case it remains after drying and can be orally administered without harmful effect (eg glycerides, liquid paraffin, squalane, squalene, lecithin, pristine, etc).

**[033]** LiuXing et al in J. Controlled Release 93 (2003) 293-300 describe entrapment of peptide-loaded liposomes in calcium alginate gel beads ranging from 0.95 to 1.10mm in size. The goal was to obtain a colonic release form of the entrapped peptide (bee venom) and to protect the peptide from enzymic degradation and to disrupt the mucosal membrane to increase peptide absorption. The objective was to address the low drug incorporation efficiency arising from the porosity of alginate beads.

**[034]** Other problems with use of alginate results from loss of active principle during gelation due to diffusion from the concentrated gel to a less concentrated large volume cross-linking solution – see e.g. Wells et al., Eur J. of Pharmaceutics and Biopharmaceutics 65 (2007) 329-335.

**[035]** Toorisaka et al. (J. Controlled Release 107 (2005) 91-96) addressed the problem of physical-chemical instability of a solid-in-oil-in water (S/O/W) emulsion. The instability led to a need for storage at low temperatures, a major impediment to pharmaceutical development. The researchers resolved this by creating a dry S/O/W emulsion in which the active principle (insulin) coated with a surfactant was the solid phase dispersed in soybean oil (oil internal phase). This was then homogenized with aqueous hydroxypropylmethylcellulose phthalate (HPMCP) to form the S/O/W emulsion. This was then dropped into hydrochloric acid to gellify the HPMCP and the resultant spherical microparticles were lyophilized to yield 1μm diameter oil droplets coated with HPMCP. This process has many steps and is therefore complex to industrialise.

## BRIEF SUMMARY OF THE DISCLOSURE

**[036]** In accordance with the present disclosure,~~invention~~ there is provided a composition comprising a water-soluble polymer matrix in which are dispersed droplets of oil, the composition comprising an active principle. The disclosure~~invention~~ includes embodiments in which the active principle is included in at least some of the oil droplets as well as embodiments in which the oil droplets

are free of active principle. The oil droplets are released as the matrix containing them dissolves in an aqueous medium. In one embodiment, the oil droplets are substantially immobilized in or by the matrix and the immobilizing feature is lost as the matrix dissolves in aqueous media. In certain embodiments, the oil drops may collectively be referred to as the oil phase of the composition of the invention.

**[037]** In one embodiment, the disclosure~~invention~~ provides a composition comprising a water-soluble polymer matrix in which are dispersed droplets of oil, the matrix including a surfactant and the composition comprising an active principle. In another embodiment, the disclosure~~invention~~ provides a composition comprising a water-soluble polymer matrix in which are dispersed droplets of oil, the oil comprising a surfactant and the composition comprising an active principle. In a further embodiment, the disclosure~~invention~~ provides a composition comprising a water-soluble polymer matrix in which are dispersed droplets of oil, the matrix including a surfactant, the oil comprising a surfactant, and the composition comprising an active principle.

**[038]** The extent to which dissolution may affect the composition's physical form and features depends on the initial shape, size and make-up of the composition. Where the composition bears a coat, the rate and manner of dissolution can be modified (see below).

**[039]** In one embodiment~~aspect~~, the present disclosure~~invention~~ relates to~~can be described as~~ a dried oil-in-water (o/w) emulsion, one embodiment of which is non-powdered. Another embodiment is moulded and/or shaped e.g. in the form of beads, especially mini-beads e.g. spherical mini-beads. The disclosed composition~~ of the invention~~ generally comprises multiple oil drops or droplets within a moulded or shaped form e.g. a mini-bead.

**[040]** Another embodiment~~aspect~~ of the present disclosure~~invention~~ provides a composition (suitable e.g. for pharmaceutical or nutraceutical use) comprising a plurality of optionally coated mini-beads of a water-soluble polymer matrix. In a particular embodiment, there is disclosed~~ present invention provides~~ a composition comprising a plurality of mini-beads of dried oil-in-water emulsion.

**[041]** In either case, at least some of the mini-beads (eg a first population) may comprise an active principle (or more than one) and optionally other beads (eg a second population) which comprise an active principle (or more than one) or one population may be free of active principles or include "deactivating" principles e.g. enzyme or toxin sequesters or include active excipients, such as, for example, permeability enhancers, which may enhance, moderate or potentiate the effect of an active principle in another population. In related embodiments, the

disclosed composition ~~of the invention~~ may comprise multiple populations of mini-spheres. The active principles may be the same or different as between populations.

**[042]** In a specific embodiment, one or more active principle(s) is (are) incorporated in the oil phase of the composition or dried emulsion. In another specific embodiment, one or more active principle(s) is (are) incorporated in the aqueous phase of the composition or dried emulsion. In another embodiment, the beads may be coated with a polymer to alter the release profile or to protect the bead and/or the active principle within the bead from degradation or oxidation or hydrolysis or proteolysis or degradation mediated by high or low pH.

**[043]** The disclosed composition ~~of the invention~~ is of particular interest for active principles of low aqueous solubility and/or liposoluble compounds (active principles) where incorporation into the oil phase brings particular advantages.

**[044]** Thus in one embodiment~~aspect~~, the disclosure~~relation~~ relates to formulating active principles for oral administration as mini-beads of dried oil-in-water emulsions in which the active principle can be incorporated in the oil phase of the emulsion and with the beads being optionally coated with a polymer.

**[045]** The water-soluble immobilizing polymer matrix (or in one aspect, the aqueous phase of a dried emulsion) comprises, in one embodiment, a cross-linked water-soluble polymer e.g. resulting from chemical or physico-chemical (eg drying) solidification of a fluid aqueous continuous phase such that, in the matrix or dried emulsion, water is substantially absent and the oil droplets are immobilized. In this embodiment, the dried aqueous phase can therefore be referred to as an immobilization matrix.

**[046]** The term "dried emulsion" generally means an emulsion whose internal (discontinuous) phase has been immobilized in a substantially solid or solidified external phase. The solid external phase dissolves on contact with an aqueous medium.

**[047]** The term "matrix" is a term well-known in the art and generally means, according to context, a solid, semi-solid, undissolved or not-yet-dissolved material which provides structure and volume to a composition. In some contexts, the term "matrix" may mean a scaffold.

**[048]** Solidification of the external phase may have arisen through various means including chemically (eg by cross-linking) or physically (eg by cooling or heating). By use of the term

"dried", it is not sought to imply that a drying step is necessary to produce the dried emulsion (although this is not excluded) rather that the solid or solidified aqueous external phase is substantially free of water or free of available water. In this respect, the term "aqueous phase" is nevertheless employed in this document to denote the external (continuous) phase of the disclosed composition ~~of the invention~~ even though water, in certain embodiments, is largely absent from (or trapped within the cross-linked matrix of) the disclosed composition ~~of the invention~~, particularly when in the form of mini-beads. The external phase of the disclosed composition ~~of the invention~~ is however water-soluble and dissolves in aqueous media. In one embodiment, the oil droplets are released when the aqueous phase dissolves or is exposed to aqueous media.

**[049]** The term "released" in relation to the oil droplets means free to move, egress, coalesce, dissolve, (re)emulsify etc. although actual movement, egression, coalescence, association or (re)emulsification is not a requirement ie. may not occur and indeed may intentionally be constrained e.g. by presence of a coat or coating and/or by incorporation of certain constraining or retarding substances into the water-soluble polymer matrix..

**[050]** It has additionally been found, to the inventors' surprise, that within the broad invention described herein, i.e. in certain embodiments, the constituents of the oil phase can be chosen to produce particular advantages in relation to certain active principles, particularly hydrophobic and/or lipophilic active principles. In particular it has been found that judicious choice of oil components one of which may be a surfactant allows certain lipophilic active principles to be solubilized in such a way as to maintain the solubilized state until the target release zone of the GI tract (eg colon) is reached. Indeed, selection of a particular kind of oil e.g. with surfactant properties, can in certain embodiments yield compositions whose oil phase is otherwise free of surfactant and in other embodiments yield compositions in which the aqueous phase is free of surfactant. In this group of embodiments, the inclusion of a surfactant in the aqueous phase is however preferred, particularly if it is desired to obtain a microemulsion according to the disclosure~~invention~~.

**[051]** Another surprising development from the work ~~leading to the present invention~~ is that, for certain embodiments, the inclusion in the aqueous phase of a surfactant (described below) leads to improved dissolution of the active principle. In particular, it has been found that, when the disclosed composition ~~of the invention~~ is in the form of beads bearing a polymeric coating, inclusion of a surfactant in the aqueous phase enhances dispersion/egress through pores or other openings in the polymer coat (or other local removal, swelling or weakening of the polymer

coat). Where the oil phase comprises a surfactant, the surfactant included in the aqueous phase may be different from any surfactant included in the oil phase.

**[052]** For certain of the mini-bead embodiments, a further unexpected benefit arising from the work ~~leading to the present invention~~ is that selection of the appropriate combination of surfactants for the aqueous and oil phases leads to the maintenance of the API in a dissolved (or semi-dissolved or pre-dissolved) state on or immediately after dispersion/egress from the water-soluble matrix and (if present) polymer coating on the beads. For certain active principles, a particular choice of surfactant combination (described below) ensures immediate or early activity (or absorption) of the active principle at the site of release from the mini-bead.

**[053]** Against the background of increasing sophistication and complexity of dissolution methods, media and apparatus, the present applicant and inventors have also surprisingly found that USP/EP/JP etc (compendial) methods and media can, contrary to expectations, provide for certain embodiments a valuable guide to in vivo performance – for example the time required for a given proportion of sample (composition or dosage form) to dissolve and/or release active principle. This surprising finding applies in a particular embodiment to poorly water-soluble drugs where the inventors/applicants have found that no surfactant need be added to the medium to achieve full dissolution/dispersion within a reasonable time frame noting, however, that low levels of surfactant in the medium may be desirable to maintain dissolution for longer periods.

**[054]** In relation to specific embodiments, the present applicants/inventors have found that the advantages of compendial methods and media are particularly applicable to the development of novel compositions which incorporate a colonic release component. In addition, the present applications/inventors have found in relation to certain embodiments that the use of surfactants in compendial dissolution media, while aiding full dissolution for testing purposes, do not reflect in vivo conditions, particularly in the colon.

**[055]** According to certain embodiments, complete or substantially complete dissolution of active principle (API) in USP/EP/JP etc dissolution apparatus using standard media can be achieved without addition of surfactant to the dissolution medium (and that maintenance of dissolution can be achieved with addition of very low quantities of surfactant to the dissolution medium) by incorporating in the composition according to this embodiment ~~of the invention~~ one or more surfactants even when the quantity of surfactant incorporated into the composition is much smaller than would have been required in the medium to achieve a comparable degree

of dissolution of a composition (or formulation) containing no surfactant. In fact, one embodimentaspect of the present disclosureinvention (described in more detail below) is the incorporation of surfactants in the disclosed composition of the invention, particularly in the mini-bead embodiment of the invention.

**[056]** In particular, it has surprisingly been found in relation to certain embodiments that the disclosed composition according to the invention leads to complete or substantially complete dissolution of active principle (API) in USP/EP/JP etc dissolution apparatus using standard media without addition (or with addition of only small amounts of) surfactant to the dissolution medium (sufficient to maintain rather than establish dissolution) by incorporating in to the formulation or composition (preferably the aqueous phase thereof) one or more surfactants which facilitate complete or substantially complete dissolution/egress of API such that the quantity of surfactant incorporated into the composition is much smaller than would have been required in the medium to achieve a comparable degree of dissolution of a composition containing no surfactant. In essence, the invention provides in this embodiment provides a composition which dissolves in standard dissolution medium independently of the medium's surfactant content.

**[057]** Another surprising feature emerging from experiments leading to the present invention is the make up of the optional polymeric coating. For instance, it has been discovered that judicious combination of different types of polymeric coating (described in more detail below) can produce unexpected advantages in relation to the in vitro dissolution and in vivo performance of the composition of the invention. In particular, it has now been discovered for these embodiments that inclusion of a polymer which degrades in the presence of bacterial enzymes present in the colon (and/or a polymer which encourages the formation of pores in the coating – a "pore-former") with a pH-independent polymer leads to release of active principle substantially in the colon or other pre-determined site of the GI tract. In a particular embodiment, the above mentioned polymer degradable by bacterial enzymes is water-soluble. At least in embodiments, the invention ameliorates or solves one or more of the shortcomings of the prior art. In particular, the invention comprises formulations or compositions which enable multiple problems of the prior art to be solved.

**[057a]** In one aspect, there is provided a process for making a composition comprising the steps of: mixing an oil phase with an aqueous phase to form an emulsion, wherein at least one of the oil phase and the aqueous phase comprises an active principle; wherein a. the oil phase comprises non-ionic surfactant; and b. the aqueous phase comprises a water-soluble polymer matrix material and anionic surfactant, the anionic surfactant being in an amount of 0.1% to 5%, as a proportion of dry weight of the composition; and then causing the emulsion to solidify.

**[057b]** In another aspect, there is provided a composition obtainable by the process described above.

**[057c]** In another aspect, there is provided a dried oil-in-water emulsion composition comprising a water-soluble polymer matrix material in which are dispersed droplets of oil, wherein the composition comprises ciclosporin in an amount of 80 to 120 mg/g; 2-(2-ethoxyethoxy)ethanol at 99.9% purity (Transcutol HP) in an amount of 150 to 190 mg/g; polyethoxylated castor oil (Cremophor EL) in an amount of 80 to 120 mg/g; caprylic/capric triglyceride (Migyol 810) in an amount of 20 to 60 mg/g; SDS in an amount from 15 to 50 mg/g, D-sorbitol in an amount of 30 to 80 mg/g; and gelatin in an amount of 450 to 550 mg/g.

**[057d]** In still another aspect, there is provided a composition as defined above for use in the treatment or prevention of a disease of the GI tract.

**[058]** Throughout the description and claims of this specification, the words "comprise" and "contain" and variations of them mean "including but not limited to", and they are not intended to (and do not) exclude other moieties, additives, components, integers or steps. Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity, unless the context

**CLAIMS**

1. A composition comprising a water-soluble polymer matrix material in which are dispersed droplets of oil, the composition comprising an active principle.
2. A composition according to claim 1 in which the water-soluble polymer matrix material is comprised in the aqueous phase of a dried oil-in-water emulsion.
3. A composition according to claim 2 in which the aqueous phase comprises at least one surfactant.
4. A composition according to claim 2 or claim 3 in which the aqueous phase comprises gelatine as the water-soluble polymer matrix material.
5. A composition according to claim 4 in which gelatine is substantially the only water-soluble polymer matrix material.
6. A composition according to any preceding claim wherein the water-soluble matrix material is selected from a hydrocolloid, a non-hydrocolloid gum and chitosan and derivatives thereof.
7. A composition according to any preceding claim wherein the active principle is included in at least some of the oil droplets.
8. A composition according to any preceding claim in the form of a mini-bead.
9. A composition according to claim 8 wherein the mini-bead is monolithic, optionally with layers thereon.
10. A composition according to claim 8 or 9 in which the mini-bead has a coat.
11. A composition comprising a plurality of mini-beads according to any of claims 8 to 10.
12. A composition according to claim 11 comprising more than one population of mini-beads.
13. A composition according to any preceding claim in which the active principle is of low aqueous solubility.
14. A composition according to any preceding claim in which the water-soluble polymer matrix material is associated with at least one surfactant.
15. A composition according to claim 3 or 14 wherein the surfactant is a readily diffusible or diffusing surfactant.
16. A composition according to any preceding claim in which the active principle is soluble in the oil droplets.

17. A composition according to claim 16 in which the active principle is ciclosporin.

18. A composition according to any preceding claim in which the oil phase (oil droplets) represent from 10-85% by dry weight of the composition.

19. A composition according to any preceding claim in which the oil phase (oil droplets) comprise at least one oil and at lease one solubilizer.

20. A composition according to claim 19 in which at least one oil has a low HLB and at least one solubilizer has a high HLB.

21. A composition according to claim 20 in which the ratio of oil of low HLB to solubilizer of high HLB is in the range 1-4:1, preferably 1.2-3.0:1 by weight.

22. A composition according to any preceding claim in which the oil phase (oil droplets) comprises at lease one co-solvent.

23. A composition according to claim 22 in which the co-solvent is 2-(2-ethoxy)ethanol and the active principle is ciclosporin.

24. A composition according to claim 22 comprising at least one oil of low HLB, at least one solubilizer of high HLB, at least one solubilizer and wherein the active principle is ciclosporin.

25. A composition according to any preceding claim in which the mini-bead has a low water content.

26. A composition according to any preceding claim which is coated or has at least one coat or coating which preferably comprises one or more substances preferably of a polymeric nature.

27. A composition according to claim 26 wherein the coating comprises ethylcellulose optionally in association with an emulsification agent such as, for example, ammonium oleate.

28. A composition according to claim 27 wherein the ethylcellulose is also in association with a plasticizer, e.g. dibutyl sebacate or medium chain triglycerides.

29. A composition according to claim 27 or 28 wherein the coating also comprises polymer susceptible of degradation by bacterial enzymes.

30. A composition according to claim 28 wherein the polymer susceptible of degradation by bacterial enzymes is water-soluble, preferably pectin.

31. A composition according to any of claims 1 to 29 preceding claim for the absorption of active principles e.g. from the environment, gastro-intestinal lumen, polluted water etc.

32. A composition according to any of claims 1 to 29 for the sterilisation and/or purification of contaminated liquids.

33. A composition according to any of claims 1 to 29 for deactivation, inhibition or down-regulation of enzymes in the intestinal lumen.

34. A composition according to any of claims 1 to 29 for the delivery of an active principle able to interact with bacteria.

35. A composition according to any of claims 1 to 29 for the sequestering of antibodies in the colon.

36. A composition according to any of claims 1 to 29 which is a mini-bead coated to release an active principle in the colon wherein the active principle is not significantly absorbed from the colon.

37. A composition according to any of claims 1 to 29 which releases an active principle relatively proximally in the GI tract and reabsorbs, sequesters, neutralises, inactivates, activates (eg by acting on a pro-drug) the active principle or a derivative thereof, relatively distally in the GI tract.

38. A method of making the composition according to any of claims 1 to 29 which comprises mixing an oil phase with an aqueous phase comprising a water soluble polymer matrix material to form an emulsion and then causing the emulsion to solidify.

39. A method according to claim 38 in which the emulsion is formed into droplets which are then exposed to a solidification medium.

40. An emulsion comprising oil droplets dispersed in an aqueous phase characterised in that the aqueous phase comprises a water-soluble polymer matrix material and in that the emulsion comprises an active principle in the aqueous phase or the oil phase or both.

41. A method of treating or nourishing an animal preferably a mammal by oral administration of a composition according to any of the relevant ones of claims 1 to 37 or 40.

42. A method according to claim 41 for the treatment of diseases of the GI tract.

43. A method according to claim 41 or 42 wherein the active principle is released into the colon for local effect, lymphatic absorption, absorption into blood or for immunological effect.

44. A method of coating a composition e.g. mini-beads, of any previous claim comprising applying a solution of a polymer coat to the mini-beads e.g. using a coating machine.

45. A method according to claim 44 wherein the coating solution is a dispersion of ethylcellulose in a sub-micron to micron particle size range from about 0.1 to 10 microns in size homogeneously suspended in water with the aid of an emulsification agent e.g. ammonium oleate.

46. A composition of any of claims 1-37 comprising a layer of drug coating optionally with a polymeric coat.

## CLAIMS

1. A process for making a composition comprising the steps of:

   mixing an oil phase with an aqueous phase to form an emulsion, wherein at least one of the oil phase and the aqueous phase comprises an active principle; wherein

   a. the oil phase comprises non-ionic surfactant; and
   b. the aqueous phase comprises a water-soluble polymer matrix material and anionic surfactant, the anionic surfactant being in an amount of 0.1% to 5%, as a proportion of dry weight of the composition; and then

   causing the emulsion to solidify.

2. A process according to claim 1 wherein the anionic surfactant is in an amount of 1% to 5%, as a proportion of dry weight of the composition.

3. A process according to claim 2 wherein the anionic surfactant is within a range of 2% to 4%, as a proportion of dry weight of the composition.

4. A process according to any one of the preceding claims wherein the water soluble matrix material is present in an amount between 20% and 70% by dry weight of the composition.

5. A process according to claim 4 wherein the water-soluble polymer matrix material is present in an amount between 30 and 60% by dry weight of the composition.

6. A process according to claim 5 wherein the water-soluble polymer matrix material is present in an amount between 35 and 55% by dry weight of the composition.

7. A process according to any one of the preceding claims wherein the water-soluble polymer matrix material comprises a hydrocolloid, preferably a reversible hydrocolloid.

8. A process according to any one of the preceding claims wherein the water-soluble polymer matrix material is selected from one or more of gelatin, agar, a polyethylene glycol, starch, casein, chitosan, soya bean protein, safflower protein, alginates, gellan gum, carrageenan, xanthan gum, phthalated gelatin, succinated gelatin, cellulosephthalate-acetate, oleoresin, polyvinylacetate, hydroxypropyl methyl cellulose, polymerisates of acrylic or methacrylic esters and polyvinylacetate-phthalate and any derivative of any of the foregoing, and pectin.

9. A process according to any one of the preceding claims wherein the water-soluble polymer matrix is selected from carrageenan, gelatin, agar and pectin.

10. A process according to claim 8 or claim 9 wherein the water-soluble polymer matrix material is gelatin.

11. A process according to claim 10 wherein the gelatin comprises a plasticizer.

12. A process according to claim 11 wherein the plasticizer is a low molecular weight polyol.

13. A process according to claim 12 wherein the plasticizer is selected from glycerin (1,2,3-propanetriol), D-sorbitol (D-glucitol), sorbitol BP (a non-crystallizing sorbitol solution) or an aqueous solution of D-sorbitol and sorbitans (e.g. Andidriborb 85/70).

14. A process according to any one of claims 11 to 13 wherein the plasticizer is present at up to 10% dry weight of the composition.

15. A process according to any one of the preceding claims wherein the anionic surfactant is selected from perfluoro-octanoate (PFOA or PFO), perfluoro-octanesulfonate (PFOS), sodium dodecyl sulphate (SDS), ammonium lauryl sulphate, and other alkyl sulfate salts, sodium laureth sulphate and alkyl benzene sulphonate or mixtures thereof.

16. A process according to claim 15 wherein the surfactant is SDS in an amount of between 1.0% and 5% by dry weight of the total composition.

17. A process according to claim 16 wherein the surfactant is SDS in an amount of between 1% and 4.5%, by dry weight of the total composition.

18. A process according to any one of the preceding claims in which the oil phase comprises at least one oil having a low HLB in the range of 0 to 10 and at least one non-ionic surfactant having a high HLB in the range 10 to 20.

19. A process according to claim 18 wherein the ratio of oil of low HLB to surfactant of high HLB is in the range 1-4:1 by weight.

20. A process according to claim 18 wherein the ratio of oil of low HLB to surfactant of high HLB is in the range 1.2-3.0:1 by weight.

21. A process according to claim 1 wherein:

the oil phase and aqueous phase are mixed in a proportion in the range 1:6-10; and

the aqueous phase is prepared by adding 1 – 5 wt % sorbitol, 0.8 – 1 wt % SDS and 15 – 25 wt % gelatin to 75 – 85 wt % water to form a gelatin solution.

22. A process according to any one of the preceding claims wherein the active principle is selected from:

(a) insoluble active ingredients for example nifedipine; lipid soluble active ingredients for example gemfibrizol; and pH sensitive active ingredients for example captopril;

(b) active ingredients which are sensitive to the pH environment in the stomach for example omeprazole and other proton pump inhibitors used in anti -ulcer treatment; and active ingredients for the treatment or prevention of H. pylori infection;

(c) active ingredients having low bioavailablility for example terfenadine; active ingredients which are poorly absorbed from or are destroyed in the gastrointestinal tract for example captopril, cyclosporin, calcitonin, heparins and heparinoids; certain antibiotics including some lantibiotics for example lacticin;

(d) cardiovascular agents, lipid lowering agents, anti-diabetic agents e.g. PPAR-gamma activators e.g. rosiglitazone or pioglitazone, anti-epileptics, anti-infectives (including antibiotics for example, (antibiotics and bacteriocins), anti-fungal agents, anti-viral agents, antipsychotic agents, immunosuppressants, protease inhibitors and cyclic peptides; and

(e) hormones, analgesics, anti-migraine agents, anti-coagulant agents, medications directed to the treatment of diseases and conditions of the central nervous system, narcotic antagonists, immunosuppressants, immunostimulators, agents used in the treatment of AIDS, chelating agents, anti-anginal agents, chemotherapy agents, sedatives, anti-neoplastics, prostaglandins, antidiuretic agents; and NSAIDs.

23. A process according to any one of the preceding claims wherein the active principle is included in at least some of the oil phase.

24. A process according to claim 23 wherein the active principle is included in at least some of the oil phase that comprises water-in-oil-emulsion.

25. A process according to claim 23 wherein the active principle is soluble in the oil phase.

26. A process according to claim 23 wherein the oil phase comprise medium chain tryglycerides.

27. A process according to claim 25or claim 26 in which the active principle is ciclosporin.

28. A process according to any one of the preceding claims wherein one or more active principle(s) is incorporated in the water soluble polymer matrix material.

29. A process according to claim 21 wherein the oil phase is prepared by adding a volatile or non-volatile solvent, co-solvent and/or solubilizer as well as ciclosporin to oil, wherein the ciclosporin is in an amount of from 25-27 wt % of the oil phase.

30. A process according to claim 29 wherein the oil phase is made up of an oil having an HLB of 1-4, a solubiliser having an HLB of 10-14 and a co-solvent.

31. A process according to any one of the preceding claims wherein the emulsion is formed into droplets which are then exposed to a solidification medium.

32. A process according to claim 31 wherein the resultant composition is in the form of mini-beads which mini-beads have a diameter of from 0.5mm to 5mm.

33. A process according to claim 32 wherein the mini-bead is a monolithic mini-bead.

34. A process according to claim 32 or claim 33 wherein the mini-bead has additional layers of material applied which layers comprise the same or different active principle and/or the same or different excipients.

35. A process according to any one of claims 32 to 34 in which the mini-bead is coated.

36. A process according to claim 35 wherein the coat comprises one or more substances of a polymeric nature.

37. A process according to claim 35 or claim 36 wherein the coat comprises ethylcellulose.

38. A process according to claim 37 wherein ethylcellulose is in association with an emulsification agent and/or in association with a plasticizer.

39. A process according to claim 38 wherein the emulsification agent is ammonium oleate.

40. A process according to claim 38 or claim 39 wherein the plasticizer is dibutyl sebacate or medium chain triglycerides.

41. A process according to any one of claims 37 to 40 wherein the coat also comprises a polysaccharide susceptible to degradation by a bacterial enzyme normally found in the colon.

42. A process according to any of claims 35 to 41 wherein said coat is a second coat applied outside a first coat, and the first coat comprises a cellulosic film-forming polymer.

43. A process according to claim 42 wherein the film-forming polymer is hydroxypropylmethyl cellulose, hydroxypropyl cellulose, or a combination thereof.

44. A process according to any one of the preceding claims which further comprises an excipient selected from sodium caprate, sodium dodecanoate, sodium palmitate, SNAC, chitosan and derivatives thereof, fatty acids, fatty acid esters, polyethers, bile salts, phospholipids, alkyl polyglucosides, hydroxylase inhibitors, antioxidants (e.g. ascorbic acid) and/or nitric oxide donors.

45. A process according to any of claims 1 to 32 wherein the composition is in the form of a mini-bead comprising a polymeric coating which coating comprises a polymer which degrades in the presence of bacterial enzymes present in the colon with a pH-independent polymer.

46. A process according to claim 45 wherein the polymer is a polysaccharide.

47. A process according to claim 1 or claim 31 for making a composition in the form of a mini-bead wherein: the water-soluble polymer matrix material comprises gelatin and SDS, the SDS being present in an amount of from 2 to 4 % as a proportion of dry weight of the composition; and the oil phase comprises caprylic/capric triglyceride, 2-(2-ethoxyethoxy)ethanol and polyethoxylated castor oil; the composition comprising active principle, ciclosporin, which active principle is included in the oil phase.

48. A process according to claim 47 in which the mini-bead is coated with a first coating, which comprises hydroxypropylmethyl cellulose, and a second coating comprising pectin and ethylcellulose coating materials.

49. A process according to claim any of the preceding claims for making a composition comprising a plurality of mini-beads.

50. A process according to claim 49 wherein the plurality of mini-beads is contained in a hardgel capsule.

51. A composition obtainable by the process described in any one of claims 1 to 50.

52. A dried oil-in-water emulsion composition comprising a water-soluble polymer matrix material in which are dispersed droplets of oil, wherein the composition comprises ciclosporin in an amount of 80 to 120 mg/g; 2-(2-ethoxyethoxy)ethanol at 99.9% purity (Transcutol HP) in an amount of 150 to 190 mg/g; polyethoxylated castor oil (Cremophor EL) in an amount of 80 to 120 mg/g; caprylic/capric triglyceride (Migyol 810) in an amount of 20 to 60 mg/g; SDS in an amount from 15 to 50 mg/g, D-sorbitol in an amount of 30 to 80 mg/g; and gelatin in an amount of 450 to 550 mg/g.

53. A composition according to claim 52 in the form of a mini-bead wherein the mini-bead has a diameter of from 0.5mm to 5mm.

54. A composition according to claim 53 wherein the mini-bead is a monolithic mini-bead.

55. A composition according to claim 53 or claim 54 wherein the mini-bead has additional layers of material on it which layers comprise the same or different active principle and/or the same or different excipients.

56. A composition according to any one of claims 53 to 55 in which the mini-bead has a coat.

57. A composition according to claim 56 wherein the coat comprises one or more substances of a polymeric nature.

58. A composition according to claim 56 or claim 57 wherein the coat comprises ethylcellulose.

59. A composition according to claim 58 wherein ethylcellulose is in association with an emulsification agent and/or in association with a plasticizer.

60. A composition according to claim 59 wherein the emulsification agent is ammonium oleate.

61. A composition according to claim 59 or claim 60 wherein the plasticizer is dibutyl sebacate or medium chain triglycerides.

62. A composition according to any one of claims 58 to 61 wherein the coat also comprises a polysaccharide susceptible to degradation by a bacterial enzyme normally found in the colon.

63. A composition according to any of claims 56 to 62 wherein said coat is a second coat outside a first coat, and the first coat comprises a cellulosic film-forming polymer.

64. A composition according to claim 63 wherein the film-forming polymer is hydroxypropylmethyl cellulose, hydroxypropyl cellulose, or a combination thereof.

65. A composition according to any one of claims 51 to 64 for use in the treatment or prevention of a disease of the GI tract.

66. A composition according to claim 65 wherein the disease of the GI tract is inflammatory bowel disease or colorectal cancer.

67. A composition according to any one of claims 51 to 66 for use as a medicament for colonic delivery of the active principle by oral administration.

68. A composition according to claim 66, wherein the active principle is ciclosporin.

69. A composition according to any one of claims 51 to 64 wherein the active principle is ciclosporin, for use in the colonic delivery of ciclosporin for the treatment or prevention of ulcerative colitis or other inflammatory bowel disease.