Claims

1. A plurality of coated particles useful in the treatment of hematologic cancers, such as multiple myeloma, said coated particles comprising:

(a) a solid core comprising a compound selected from the group consisting of lenalidomide and pomalidomide, or a pharmaceutically acceptable salt thereof, said core having a mean diameter of the between 0.1 µm and 50 µm; and

(b) a coating surrounding, enclosing and/or encapsulating said core, wherein the coating comprises a mixed oxide of at least two metal or metalloid oxides selected from the group consisting of iron oxide, zinc oxide, silicon oxide, titanium oxide, and aluminium oxide.

2. The plurality of coated particles according to claim 1, wherein said compound is lenalidomide.

3. The plurality of coated particles according to claim 1 or 2, wherein said coating comprises 1 to 20 discrete layers, such as 3 to 7 discrete layers, such as 4 to 6 discrete layers, wherein each layer comprises at least one oxide selected from the group consisting of iron oxide, zinc oxide, silicon oxide, titanium oxide, and aluminium oxide, and wherein at least one out of said 1 to 20 discrete layers comprises said mixed oxide.

4. The plurality of coated particles according to claim 3, wherein at least 2, such as at least 3, such as at least 4, such as all of said discrete layers comprise said mixed oxide.

5. The plurality of coated particles according to claim 3 or 4, wherein said at least one oxide is selected from the group consisting of zinc oxide, silicon oxide, and aluminium oxide, such as zinc oxide or aluminium oxide.

6. The plurality of coated particles according to any one of claims 1 to 5, wherein said at least two metal and/or metalloid oxides in said mixed oxide are selected from the group consisting of zinc oxide, silicon oxide, and aluminium oxide, such as zinc oxide and silicon oxide.

7. The plurality of coated particles according to any one of claims 1 to 6, wherein said at least two metal and/or metalloid oxides in said mixed oxide are zinc oxide and aluminium oxide,

optionally wherein the atomic ratio of Zn to Al is between 1 to 1 and 6 to 1, such as between 2 to 1 and 5 to 1, such as 2 to 1 and 4 to 1, such as 3 to 1.

8. The plurality of coated particles according to any one of the preceding claims, which particles:

(a) have a weight-, number-, or volume-based mean diameter that is between 10 nm (such as about 0.1 μm) and about 700 μm (e.g. about 100 or about 50 μm, or one or more of the particle size ranges described herein); and

(b) comprise solid cores comprising a compound selected from the group consisting of lenalidomide and pomalidomide, or a pharmaceutically-acceptable salt of either compound, coated, at least in part, by a coating of inorganic material comprising mixture of:

(i) zinc oxide; and

(ii) one or more other metal and/or metalloid oxides,

wherein the atomic ratio ((i):(ii)) is at least about 1:6 (e.g. about 1:1) and up to and including about 6:1.

9. The plurality of coated particles according to claim 8, wherein the ratio of zinc oxide to other metal and/or metalloid oxides is between about 2:1 and about 5:1.

10. The plurality of coated particles according to any one of the preceding claims, wherein more than one discrete layer of the mixture of oxides is applied to the core sequentially.

11. The plurality of coated particles according to claim 5, wherein between 3 and 10 discrete layers of the mixture of oxides are applied.

12. A method of preparing a plurality of coated particles according to any one of claims 1 to 11, wherein the coated particles are made by applying the precursors of at least two metal and/or metal oxides forming a mixed oxide on the solid cores, and/or the previously-coated solid cores, by a gas phase deposition technique, such as atomic layer deposition.

13. A method of according to claim 12, said method comprising the steps of:

(1) applying precursors of one or more metal and/or metalloid oxides selected from the group consisting of iron oxide, zinc oxide, silicon oxide, titanium oxide, and aluminium oxide, whereby a layer is formed on said solid cores by way of a gas phase deposition technique;

(2) disaggregating the coated solid core aggregates formed during step (1);

(3) applying precursors of at least one metal and/or metalloid oxides selected from the group consisting of iron oxide, zinc oxide, silicon oxide, titanium oxide, and aluminium oxide to the disaggregated, coated solid cores from step (2) whereby another layer is

formed on said previously-coated solid cores by way of a gas phase deposition technique; and

(4) repeating steps (2) and (3) one or more times to increase the total thickness of the coating that encloses said solid core,

wherein at least one of the layers is formed by applying precursors of at least two metal and/or metalloid oxides selected from the group consisting of iron oxide, zinc oxide, silicon oxide, titanium oxide, and aluminium oxide, whereby a mixed oxide is formed.

14. The method according to claim 13, wherein said disaggregating coated particles aggregates is done by way of a mechanical sieving technique,

optionally wherein the mechanical sieving technique comprises sonic sifting or vibrational sieving.

15. The method according to claims 13 or 14, wherein step 2 further comprises a step of discharging the coated solid cores from the gas phase deposition reactor, prior to disaggregating coated solid core aggregates formed during step (1); and the step of charging the coated solid cores back to the reactor subsequent to disaggregating coated solid cores aggregates formed during step (1).

16. A pharmaceutical or veterinary composition, comprising plurality of coated particles according to any one of claims 1 to 11 and a pharmaceutically acceptable diluent, carrier and/or excipient.

17. A composition according to claim 16 in the form of a sterile injectable and/or infusible dosage form.

18. The composition according to claim 17 in the form of a liquid, a sol, or a gel, administrable via a surgical administration apparatus or a syringe, which liquid, sol, or gel forms a subcutaneous depot formulation.

19. The use of a plurality of coated particles according to any one of claims 1 to 11 or a pharmaceutical composition according to any one of claims 16 to 18 for the manufacture of a medicament for the treatment of a hematologic cancer.

20. The use according to claim 19, wherein the hematologic cancer is multiple myeloma.