CLAIMS

1. A microcapsule comprising a living cell and a label.

2. A microcapsule according to claim 1, which comprises a cell unit.

3. A microcapsule according to claim 1 or claim 2, in which the label is an RFID label.

4. A microcapsule according to claim 1 or claim 2, which comprises two or more capsule layers.

5. A microcapsule according to claim 4, wherein the two or more capsule layers each comprise one or more labels.

6. A microcapsule according to any preceding claim, wherein the microcapsule is formed by layer-by-layer addition of polyelectrolyte capsules.

7. A microcapsule according to any one of claims 1 to 5, wherein the microcapsule is formed by jetting encapsulation.

8. A microcapsule according to any one of claims 1 to 5, wherein the microcapsule is formed by microfluidic encapsulation.

9. A microcapsule according to any preceding claim, wherein the microcapsule is composed of a polymer, and the polymer composing the capsule layer is labelled by incorporating a fluorescent dye.

10. A method for labelling a cell unit, comprising the steps of:

(a) providing one or more cell units each comprising one or more cells; and

(b) microencapsulating said cell unit(s) together with one or more first labels.

11. A method according to claim 10, further comprising: (c) repeating the microencapsulation of step (b) together with a second label.

12. A method according to claim 10 or claim 11, wherein the first and second labels are different.

13. A method for labelling a group of cells with a plurality of labels, comprising the steps of:

a) providing a first group of one or more cell units each comprising one or more cells;

(b) microencapsulating said cell units together with a first identifying label;

(c) optionally, mixing the cell units with one or more cell units which have been microencapsulated with a second identifying label to form a second group;

(d) repeating step (b) with the second group, using a third identifying label.

14. A method according to claim 13, wherein at least two of the first, second and third labels are different.

15. A method according to claim 13 or claim 14, wherein the first group of cell units is split into two or more groups before or after step (c).

16. A method according to any one of claims 13 to 15, wherein the groups of cell units are exposed to different culture conditions.

17. A method for labelling a group of cells which has been exposed to a plurality of culture conditions, comprising the steps of:

a) providing a first set of groups of cell units each comprising one or more cells, and exposing said groups to desired culture conditions;

(b) microencapsulating said cell units together with an identifying label;

(c) pooling two or more of said groups to form at least one pool;

(d) subdividing the pool to create a further set of groups of cell units;

(d) exposing said further groups to desired culture conditions;

(e) repeating steps (b) - (d).

18. A method according to any one of claims 13 to 15, wherein the microencapsulation is performed by a jetting procedure, which is optionally selected from the group consisting of bio-electrospray jetting, aerodynamically-assisted bio-jetting and pressure-assisted cell jetting.

19. A method according to any one of claims 13 to 17, wherein the microencapsulation is performed by layer-by-layer addition of polyelectrolytes.

20. A method according to any one of claims 13 to 19, wherein the cell units comprise at least one microcarrier and one or more cells.

21. A method according to any one of claims 10 to 20, wherein the label is selected from the group consisting of a fluorescent compound, a secondary amine, a mixture of stable isotopes, a bar code, an optical tag, a bead, a quantum dot and a radiofrequency encoding tag.

22. A method according to claim 21, wherein the label is a microsphere.

23. A method according to claim 16, wherein the culture conditions are selected from the group consisting of growth media, temperature regimes, substrates, atmospheric conditions and physical cell handling.

24. A method according to any one of claims 10 to 23, wherein substantially each microcapsule contains a single cell unit.

25. A method according to any one of claims 10 to 23, wherein substantially each microcapsule contains a plurality of cell units.

26. A method according to any one of claims 10 to 23, wherein each microcapsule contains a plurality of cell units, each cell unit itself being individually microencapsulated.

27. A microencapsulated cell unit comprising at least one cell unit encapsulated within a first microcapsule together with a first identifying label, said encapsulated cell unit being itself encapsulated within a second microcapsule together with a second identifying label.

28. A microencapsulated cell unit according to claim 27, wherein the second microcapsule comprises a plurality of microencapsulated cell units.

29. A kit for encapsulating a cell unit, comprising:

(a) a microcarrier;

(b) a detectable tag;

(c) sodium alginate; and optionally

(d) a polyelectrolyte.

CLAIMS

1. A method for labelling a cell unit, comprising the steps of:

(a) providing one or more cell units each comprising one or more cells;

(b) microencapsulating the cell unit(s) together with one or more first labels; and

(c) repeating the microencapsulation of step (b) together with a second label,

in which the first and second labels are different.

2. A method for labelling a group of cells with a plurality of labels, comprising the steps of:

(a) providing a first group of one or more cell units each comprising one or more cells;

(b) microencapsulating the cell units together with a first identifying label;

(c) mixing the cell units with one or more cell units which have been microencapsulated with a second identifying label to form a second group;

(d) repeating step (b) with the second group, using a third identifying label, in which at least two of the first, second and third labels are different.

3. A method according to Claim 2, in which the first group of cell units is split into two or more groups before or after step (c).

4. A method according to Claim 2 or 3, in which the groups of cell units are exposed to different culture conditions.

5. A method for labelling a group of cells which has been exposed to a plurality of culture conditions, comprising the steps of:

(a) providing a first set of groups of cell units each comprising one or more cells, and exposing the groups to desired culture conditions;

(b) microencapsulating the cell units together with a first identifying label;

(c) pooling two or more of the groups to form at least one pool;

(d) subdividing the pool to create a further set of groups of cell units;

(e) exposing the further groups to desired culture conditions;

(f) repeating steps (b) - (e) with a second identifying label, in which the second identifying label differs from the first identifying label.

6. A method according to any preceding claim, in which the microencapsulation is performed by a jetting procedure, which is optionally selected from the group consisting of bio-electrospray jetting, aerodynamically-assisted bio-jetting and pressure-assisted cell jetting.

7. A method according to any of Claims 1 to 5, in which the microencapsulation is performed by layer-by-layer addition of polyelectrolytes.

8. A method according to any preceding claim, in which the cell units comprise at least one microcarrier and one or more cells.

9. A method according to any preceding claim, in which the label is selected from the group consisting of a fluorescent compound, a secondary amine, a mixture of stable isotopes, a bar code, an optical tag, a bead, a quantum dot and a radiofrequency encoding tag.

10. A method according to Claim 9, in which the label is a microsphere.

11. A method according to Claim 4, in which the culture conditions are selected from the group consisting of growth media, temperature regimes, substrates, atmospheric conditions and physical cell handling.

12. A method according to any preceding claim, in which substantially each microcapsule contains a single cell unit.

13. A method according to any of Claims 1 to 11, in which substantially each microcapsule contains a plurality of cell units.

14. A method according to any of Claims 1 to 10, in which each microcapsule contains a plurality of cell units, each cell unit itself being individually microencapsulated.

15. A microcapsule comprising a living cell and a label, in which the microcapsule comprises two or more layers of encapsulation containing two or more labels, in which the labels in a first layer of encapsulation differ from the labels in another layer of encapsulation.

16. A microcapsule according to Claim 15, which comprises a cell unit.

17. A microcapsule according to Claim 15 or 16, in which the label is an RFID label.

18. A microcapsule according to any of Claims 15 to 17, in which a polymer composing a layer of encapsulation is labelled by an incorporated fluorescent dye.

19. A microencapsulated cell unit comprising at least one cell unit encapsulated within a first microcapsule together with a first identifying label, the encapsulated cell unit being itself encapsulated within a second microcapsule together with a second identifying label different from the first identifying label.

20. A microencapsulated cell unit according to Claim 22, in which the second microcapsule comprises a plurality of microencapsulated cell units.

21. A kit for encapsulating a cell unit, comprising:

(a) a microcarrier;

(b) two different detectable tags;

(c) sodium alginate; and optionally

(d) a polyelectrolyte.