Claims

1. Magnetic material for a cell-culture platform, comprising:
an elastomeric material and a dispersion of a plurality of magnetic particles embedded in the elastomeric material.

2. Magnetic material for a cell-culture platform according to claim 1, wherein an elongation at break of the magnetic material is at least 100%, or is from 200% to 400%.

3. Magnetic material for a cell-culture platform according to claim 1 or claim 2,
wherein the dispersion of the plurality of magnetic particles comprises a substantially homogenous distribution of the magnetic particles within the elastomeric material.

4. Magnetic material for a cell-culture platform according to any one of the preceding claims, wherein the magnetic particles comprise magnetic-field inducible magnets, or filings, or iron filings, or one or more of Iron, Cobalt, Nickel, Gadolinium, Dysprosium, Permalloy and Wairakite.

5. Magnetic material for a cell-culture platform according to any one of the preceding claims, wherein a weight of the magnetic particles is from 40% to 80% of a weight of the elastomeric material or wherein the weight of the magnetic particles is from 55% to 65% of the weight of the elastomeric material.

6. Cell-culture platform, comprising:
a biocompatible deformable receptacle for cell culture media; and
a deformation actuator attached to the biocompatible deformable receptacle, the deformation actuator comprising a magnetic material

according any one of claims 1 to 5, and being operable to deform the biocompatible deformable receptacle in response to a magnetic field.

7. Cell-culture platform according to claim 6, wherein the biocompatible deformable receptacle comprises a further elastomeric material, and wherein the deformation actuator and the biocompatible deformable receptacle are integrally formed as a composite material.

8. Cell-culture platform according to claim 7, wherein the further elastomeric material comprises silicone rubber.

9. Cell-culture platform according to any one of claims 6 to 8, wherein the deformation actuator encloses the biocompatible deformable receptacle and is operable to deform the biocompatible deformable receptacle along a plurality of axes.

10. Cell-culture platform according to any one of claims 6 to 9, wherein the biocompatible deformable receptacle comprises a base which is substantially transparent.

11. A method of producing a magnetic material for a cell-culture platform, comprising: mixing a predetermined weight of magnetic particles into a quantity of a liquid elastomer to disperse the magnetic particles in the quantity of the liquid elastomer; and
curing the quantity of the liquid elastomer to form the magnetic material.

12. A method of producing a magnetic material for a cell-culture platform according to claim 11, wherein the magnetic particles comprise filings, or iron filings, or one or more of Iron, Cobalt, Nickel, Gadolinium, Dysprosium, Permalloy and Wairakite.

13. A method of producing a magnetic material for a cell-culture platform according to claim 11 or claim 12, wherein mixing the predetermined weight of magnetic particles into the quantity of the liquid elastomer includes mixing a weight of the magnetic particles equivalent to from 40% to 80% of a weight of the quantity of the liquid elastomer or includes mixing the weight of the magnetic particles equivalent to from 55% to 65% of the weight of the quantity of the liquid elastomer.

14. A method of producing a cell-culture platform, comprising: producing a magnetic material in accordance with a method of any one of claims 11 to 13; and attaching a biocompatible deformable receptacle for cell culture media to the magnetic material.

15. A method of producing a cell-culture platform according to claim 14, wherein attaching the biocompatible deformable receptacle for cell culture media to the magnetic material includes:
applying a further quantity of a further liquid elastomer to the magnetic material and curing the further quantity of the further liquid elastomer to form a composite material comprising the biocompatible deformable receptacle and the magnetic material.

16. A method of producing a cell-culture platform according to claim 15, wherein the further liquid elastomer comprises silicone rubber.

17. A method of producing a cell-culture platform according to claim 15 or claim 16, wherein
applying the further quantity of the further liquid elastomer to the magnetic material includes:
removing a portion of the magnetic material to form a through-hole in the magnetic material; and introducing the further quantity of the further liquid elastomer into the through-hole.

18. A method of deforming cells using a cell-culture platform comprising a biocompatible deformable receptacle for cell-culture media, and a deformation actuator attached to the biocompatible deformable receptacle, the deformation actuator comprising an elastomeric material and a dispersion of a plurality of magnetic particles embedded in the elastomeric material, the method comprising:

applying a cell-binding coating to an inner surface of the biocompatible deformable receptacle;

seeding one or more cells onto the cell-binding coating; and

attracting the dispersion of the plurality of magnetic particles using an applied magnetic field to deform the biocompatible deformable receptacle and the one or more cells.

19. A method of deforming cells according to claim 18, further comprising:

adjusting an axis of deformation of the one or more cells by adjusting an angle of the applied magnetic field relative to the cell-culture platform.

20. A system for cell deformation comprising:

a magnet; and

a cell-culture platform according to any one of claims 6 to 10.