CLAIMS

1. A method of culturing cells or tissues, the method comprising
   a) providing a support, wherein the support is an optical medium with a patterned surface, wherein the patterned surface of the optical medium comprises or consists essentially of pre-grooves;
   b) contacting the support with cells and a culture medium; and
   c) culturing the cells under suitable cultivation conditions.

2. The method according to claim 1, wherein the cultured cells or tissues are at least substantially aligned with the patterned surface of the optical medium.

3. The method according to claim 1 or 2, wherein the patterned surface of the optical medium comprises a grating.

4. The method according to claim 3, wherein the grating is a diffraction grating.

5. The method of any one of claims 1 to 4, further comprising treating the patterned surface prior to step b) to render the surface suitable for cell growth.

6. The method according to claim 5, wherein treating the patterned surface comprises contacting the patterned surface with a solvent to remove organic material from the patterned surface.

7. The method according to claim 5 or 6, wherein treating the patterned surface comprises contacting the patterned surface with a disinfectant or autoclaving to sterilize the patterned surface.

8. The method according to any one of claims 5 to 7, wherein treating the patterned surface comprises treating the patterned surface with an ionized oxygen-containing plasma.

9. The method according to any one of claims 5 to 8, wherein treating comprises exposing a patterned surface of an optical medium.

10. The method according to claim 9, wherein exposing comprises physically removing layers of material coated on the patterned surface.

11. The method according to any one of claims 1 to 10, wherein the optical medium is selected from the group consisting of CDs, CD-Rs, CD-RWs, DVDs, DVD-Rs, DVD-RWs, DVD+Rs, DVD+RWs, BDs, BD-Rs, BD-REs, laser discs, mini discs, hybrid discs, and holographic gratings.

12. The method according to any one of claims 1 to 11, wherein the optical medium is selected from the group consisting of CD-Rs, CD-RWs, DVD-Rs, DVD-RWs, DVD+Rs, DVD+RWs, BD-Rs, BD-REs, laser discs, mini discs, hybrid discs, and holographic gratings.

13. The method according to any one of claims 1 to 12, wherein the patterned surface of the optical medium comprises grooves which are arranged at least substantially parallel to one another.

14. The method according to any one of claims 1 to 13, wherein the optical medium comprises or consists of a biocompatible material.

15. The method according to any one of claims 1 to 14, wherein the optical medium comprises or consists of polymer, glass, silicon, metal, alloys, metal oxides, metal carbides, metal fluorides, or mixtures thereof.

16. The method according to claim 15, wherein the polymer is selected from the group consisting of polycarbonate, polyester, polystyrene, poly(methyl methacrylate), polyurethane, polyacrylic acid, derivatives thereof and copolymers thereof.

17. The method according to any one of claims 1 to 16, wherein the cells comprise or consist essentially of mammalian cells.

18. The method according to any one of claims 1 to 17, wherein the cells are selected from the group consisting of organ cells, muscle cells, nerve cells, stem cells, epithelial cells, connective tissue cells, cancerous cells (cell lines), and combinations thereof.

19. The method according to any one of claims 1 to 18, wherein the cells are selected from the group consisting of human embryonic stem cells (hECs), human mesenchymal stem cells (hMSCs), keratinocytes, tenocytes, ligament cells, cardiomyocytes, osteoblasts, fibroblasts, myoblasts, endothelial cells, and combinations thereof.

20. The method according to any one of claims 1 to 19, wherein the cells are selected from the group consisting of Chinese Hamster Ovary (CHO) cells, COS cells, HL-1 cells, H9C2 cells, 3T3 cells, C2C12 cells, PC12 cells, NIH3T3 cells, HeLa cells, and combinations thereof.

21. The method according to any one of claims 1 to 20, wherein the optical medium is a recycled optical medium.

22. A cell culture dish or a well plate or a flask comprising an optical medium, wherein a patterned surface of the optical medium forms a support upon which cells are cultivated, wherein the patterned surface of the optical medium comprises or consists essentially of pre-grooves.