CLAIMS

1. A cell culture plate for conducting 3D cell culture comprising:

a plurality of sample wells for containing one or more cells, wherein each of the plurality of sample wells is defined by a peripheral wall and an aperture at a top portion of the peripheral wall for insertion of the one or more cells into the plurality of sample wells,

wherein each of the plurality of sample wells is configured to include a shape that converges from the peripheral wall to the aperture at the top portion, thereby preventing an aggregation of the cells formed in the 3D cell culture from escaping the plurality of sample wells through the aperture.

2. The cell culture plate as claimed in claim 1, wherein the one or more cells form into a spheroid during the 3D cell culture.

3. The cell culture plate as claimed in claim 1 or 2, wherein the shape of the plurality of sample wells comprises a shape of a truncated pyramid.

4. The cell culture plate as claimed in claim 1 or 2, wherein the shape of the plurality of sample wells comprises a shape of a truncated cone.

5. The cell culture plate as claimed in any one of the preceding claims, wherein each of the plurality of sample wells comprises a through hole formed within a membrane.

6. The cell culture plate as claimed in claim 5, wherein the membrane is configured to be detachably adhered to a vessel, such that the membrane and vessel are detachable from each other to release the one or more cells contained inside the plurality of sample wells.

7. The cell culture plate as claimed in any one of the preceding claims, wherein the peripheral wall of the plurality of sample wells is at least partially provided with a reflective surface to illuminate the one or more cells contained in the plurality of sample wells by reflecting an incident lightsheet.

8. The cell culture plate as claimed in claim 7, wherein the reflective surface comprises a metal coat deposited on the peripheral wall.

9. The cell culture plate as claimed in any one of the preceding claims, wherein the peripheral wall comprises one or more side walls that taper at an angle of 45° from a horizontal plane.

10. The cell culture plate as claimed in any one of the preceding claims, wherein the peripheral wall of the plurality of sample wells is treated with a long term passivation technique to avoid an adhesion of the one or more cells to the peripheral wall.

11. The cell culture plate as claimed in any one of the preceding claims, wherein the cell culture plate is fabricated using at least one UV curable polymer selected from a group consisting of: acrylate-based polymer, polycarbonate-based polymer, polystyrene polymer, glass, glass-like or glass particles filled resins and elastomeric polymer.

12. A method of fabricating a cell culture plate for conducting 3D cell culture, the method comprising the steps of:

dropping a liquid polymer onto a mould to fill in cavities defined by the mould; and

curing the liquid polymer to form a plurality of sample wells, wherein each of the plurality of sample wells is defined by a peripheral wall and an aperture at a top portion of the peripheral wall for insertion of one or more cells into the plurality of sample wells,

wherein the cavities mould each of the plurality of sample wells into a shape that converges from the peripheral wall to the aperture at the top portion, thereby preventing an aggregation of the cells formed in the 3D cell culture from escaping the plurality of sample wells through the aperture.

13. The method as claimed in claim 12, wherein the cavities provide each of the plurality of sample wells with a shape of a truncated pyramid.

14. The method as claimed in claim 12, wherein the cavities provide each of the plurality of sample wells with a shape of a truncated cone.

15. The method as claimed in any one of claims 12 to 14, wherein each of the plurality of sample wells comprises a through hole formed within a membrane.

16. The method as claimed in claim 15, wherein the membrane is configured to be detachably adhered to a vessel, such that the membrane and vessel are detachable from each other to release the one or more cells contained inside the plurality of sample wells.

17. The method as claimed in any one of claims 12 to 16, further comprises the step of:

providing a reflective surface to at least a part of the peripheral wall of the plurality of sample wells, wherein the reflective surface is configured to illuminate the one or more cells contained in the plurality of sample well by reflecting an incident lightsheet.

18. The method as claimed in claim 17, wherein the step of providing a reflective surface comprises depositing a metal coat onto the peripheral wall.

19. The method as claimed in any one claims 12 to 18, wherein the peripheral wall comprises one or more side walls that taper at an angle of 45° from a horizontal plane.

20. The method as claimed in any one of claims 12 to 19, further comprises the step of:

treating the peripheral wall of the plurality of sample wells with a long term passivation technique to avoid an adhesion of the one or more cells to the peripheral wall.

21. The method as claimed in any one of claims 12 to 20, wherein the liquid polymer comprises at least one UV curable polymer selected from a group consisting of: acrylate-based polymer, polycarbonate-based polymer, polystyrene polymer and elastomeric polymer.

22. A microscope assembly comprising a cell culture plate according to any one of claims 1 to 11.

23. The microscope assembly according to claim 22, wherein the microscope assembly comprises a fluorescence microscopy.

24. The microscope assembly according to claim 23, wherein the fluorescence microscopy is a selective plane illumination microscopy (SPIM).

25. A method for imaging cell cultures, the method comprising the steps of:

seeding a sample comprising one or more cells into the cell culture plate as claimed in any one of claims 1 to 11;

adding a culture medium to the cell culture plate containing the one or more cells; and

capturing an image of the one or more cells contained within the cell culture plate using a microscopy technique.

26. The method for imaging cell cultures as claimed in claim 25, wherein the microscopy technique is fluorescence microscopy.

27. The method for imaging cell cultures as claimed in claim 26, wherein the fluorescence microscopy is selective plane illumination microscopy (SPIM).