CLAIMS

1. A device for vascularising a cell aggregate, the device comprising:

a matrix region configured to contain a gel-like matrix and the matrix region having at least one opening for positioning the cell aggregate therein based on a desired three-dimensional spatial location; and

one or more fluidic regions configured to contain a supporting fluid that is capable of supporting vascularisation of the cell aggregate, the one or more fluidic regions being in fluid communication with the matrix region,

wherein each fluidic region comprises at least two openings for facilitating introduction of the supporting fluid in each of the fluidic region,

wherein a flow passage from the one or more fluidic regions to a gel-like matrix disposed in the matrix region is configured to allow three-dimensional vascularisation around the cell aggregate and perfusion of the vasculature once formed, and

wherein the flow passage is substantially free from intervening structural obstacles disposed between the one or more fluidic regions and the matrix region.

2. The device as claimed in claim 1, wherein the at least one or more fluidic regions comprises at least two fluidic regions.

3. The device as claimed in claim 2, wherein one fluidic region is disposed lateral to the matrix region on one side and the other fluidic region is disposed lateral to the matrix region on the opposite side.

4. The device as claimed in claim 1, wherein the at least one opening is positioned substantially central to the matrix region.

5. The device as claimed in any one of claims 1 to 4, wherein the matrix region is substantially symmetrical in shape along its longitudinal length.

6. The device as claimed in claim 2, wherein the at least two fluidic regions are symmetrically disposed about the matrix region.

7. The device as claimed in any one of claims 1 to 6, further comprising a gel-like matrix disposed within the matrix region.

8. The device as claimed in any one of the preceding claims, wherein at least part of a plurality of walls defining the matrix region and the one or more fluidic regions comprise an elastomer.

9. The device as claimed in any one of the preceding claims, wherein the device comprises an elastomer disposed on a substrate,

wherein the elastomer comprises patterns formed on an open surface of the elastomer, the patterns corresponding to a layout of the matrix region and the one or more fluidic regions, and

wherein the substrate substantially fluidically seals the patterns at the open surface of the elastomer to form the matrix region and the one or more fluidic regions of the device.

10. The device as claimed in claim 2, wherein the at least two fluidic regions are separated from one another by the matrix region.

11. A chip comprising a plurality of the device of any one of claims 1 to 10.

12. A method for vascularising a cell aggregate, the method comprising:

providing a device comprising a matrix region configured to contain a gel-like matrix and the matrix region having at least one opening for positioning the cell aggregate therein based on a desired three-dimensional spatial location; and one or more fluidic regions configured to contain a supporting fluid that is capable of supporting vascularisation of the cell aggregate, the one or more fluidic regions being in fluid communication with the matrix region, wherein each fluidic region comprises at least two openings for facilitating introduction of the supporting fluid in each of the fluidic region, wherein a flow passage from the one or more fluidic regions to a gel-like matrix disposed in the matrix region is configured to allow three-dimensional vascularisation around the cell aggregate and perfusion of the vasculature once formed, and wherein the flow passage is substantially free from intervening structural obstacles disposed between the one or more fluidic regions and the matrix region;

introducing the gel-like matrix into the matrix region;

positioning a cell aggregate into the gel-like matrix via the at least one opening; and

introducing the supporting fluid into the one or more fluidic regions.

13. The method as claimed claim 12, wherein the gel-like matrix is substantially maintained in the matrix region by surface tension.

14. The method as claimed in one of claim 12 or 13, wherein the cell aggregate is positioned in the gel-like matrix such that the gel-like matrix fully surrounds the cell aggregate.

15. The method as claimed in any one of claims 12 to 14, wherein the method further comprises introducing cells capable of supporting vascularisation of the cell aggregate into the one or more fluidic regions.

16. The method as claimed in any one of claims 12 to 15, wherein the method further comprises introducing one or more cell types into the gel-

like matrix capable of supporting vascularisation of the cell aggregate and/or interacting with the cell aggregate.

17. The method as claimed in any one of claims 12 to 16, wherein the method further comprises vascularising the cell aggregate to obtain a three-dimensional vascularisation around the cell aggregate.

18. The method as claimed in any one of claims 12 to 17, further comprising introducing one or more test agents into the one or more fluid regions and/or the matrix region; and

analysing the effect of the one or more test agents on the cell aggregate.