

CLAIMS

1. A device comprising (i) a chamber, the chamber comprising a non-linear lumen and projections in the lumen, the lumen comprising (ii) a gel matrix secured by the projections, the gel matrix positioned above (iii) a porous membrane, the membrane positioned above one or
5 more (iv) fluidic channels.
2. A device according to Claim 1, in which fibroblasts are within the gel matrix and keratinocytes are on top of the gel matrix.
3. A device according to Claim 2, in which the keratinocytes comprise more than one layer on top of the gel matrix.
- 10 4. A device according to Claim 1, in which a layer of endothelial cells is positioned on the bottom of the membrane so as to be in contact with the fluidic channels.
5. A device according to Claim 1, in which the non-linear lumen is circular.
6. A device according to Claim 1, further comprising a removable cover.
7. A device according to Claim 1, in which the device is a microfluidic device and the
15 fluidic channels are microfluidic channels.
8. A microfluidic device comprising (i) a chamber, the chamber comprising a lumen, the lumen comprising (ii) a gel matrix comprising at least one of neurons and astrocytes, the gel matrix positioned above (iii) a porous membrane, the membrane comprising brain microvascular endothelial cells in contact with (iv) microfluidic channels.
- 20 9. A microfluidic device according to Claim 8, in which neurons are on, in or under the gel matrix.
10. A microfluidic device according to Claim 8, in which astrocytes are on, in or under the gel matrix.
11. A method comprising:
 - 25 (a) providing a microfluidic device comprising (i) a chamber, the chamber comprising a non-linear lumen, the lumen comprising (ii) a gel matrix, the gel matrix positioned above (iii) a porous membrane, the membrane positioned above one or more (iv) fluidic channels; and
 - (b) stretching the gel matrix.

12. A method according to Claim 11, in which the gel matrix has a thickness of between 0.5 mm and 3.5 mm.
13. A method according to Claim 12, in which the stretching is uniform across the thickness of the gel.
- 5 14. A method according to Claim 11, in which the stretching causes the entire gel matrix to expand.
15. A method according to Claim 11, in which the gel matrix comprises cells.
16. A method according to Claim 15, in which the cells comprise lung cells.