

CLAIMS

1. A microfluidic device comprising a chamber, the chamber comprising a lumen and projections in the lumen, the lumen comprising a gel matrix anchored by the projections to prevent delamination, the gel matrix positioned above a porous membrane, and the membrane
5 positioned above one or more microfluidic channels.
2. A microfluidic device according to Claim 1, in which fibroblasts are within the gel matrix and keratinocytes are on top of the gel matrix.
3. A microfluidic device according to Claim 2, in which the keratinocytes comprise more than one layer on top of the gel matrix.
- 10 4. A microfluidic 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 microfluidic channels.
5. A microfluidic device according to Claim 1, in which the lumen is circular.
6. A microfluidic device according to Claim 1, further comprising a removable cover.
- 15 7. A microfluidic microfluidic device according to Claim 1, in which the gel matrix comprises at least one of neurons and astrocytes and the membrane comprises brain microvascular endothelial cells in contact with the microfluidic channels.
8. A microfluidic device according to Claim 7, in which neurons are on, in or under the gel matrix.
- 20 9. A microfluidic device according to Claim 7, in which astrocytes are on, in or under the gel matrix.
10. A microfluidic device according to Claim 1, in which the gel matrix comprises cells.
11. A microfluidic device according to Claim 10, in which the cells comprise lung cells.