

CLAIMS

1. A method of screening compounds on a fabricated array having cells, comprising:
providing a mixture of cells and a UV curable hydrogel matrix, wherein the cells are embryonic stem cells, induced pluripotent stem cells (iPSC) or cardiomyocytes;
applying a volume of the mixture in a N x N matrix array to a support in a specific geometry;
exposing the support to UV light to cure each volume in the array and incubating the array under conditions that provide for cell viability;
contacting each volume of cells in the array with a nanoliter volume of the one or more compounds using ultrasonic deposition;
detecting whether the one or more compounds affect the cells.
2. The method of claim 1 wherein the cells are human iPSCs.
3. The method of claim 1 wherein the cells are human cardiomyocytes.
4. The method of claim 1 wherein the support is a rigid support.
5. The method of claim 1 wherein the support is a flexible support.
6. The method of claim 1 wherein the support comprises glass, ceramic or a polymer sheet or film.
7. The method of claim 1 wherein the array is coated with an adhesion polymer.
8. The method of claim 1 wherein the specific geometry is provided by a mold or by microstructures in the array.
9. The method of claim 1 wherein the support is transparent.

10. The method of claim 1 wherein the support is a polyester film, comprises polycarbonate or comprises glass.
11. The method of claim 1 wherein the support is porous.
12. The method of claim 1 wherein the support comprises a pre-embossed film substrate having microstructures that provide for the specific geometry, wherein the microstructures are coated with one or more cellular adhesion polymers; and
wherein the support is laminated to a microplate.
13. The method of claim 1 wherein the hydrogel comprises gelatin.
14. The method of claim 13 wherein the hydrogel comprises methacrylated gelatin (GelMA).
15. The method of claim 1 wherein the cells are incubated in the presence of RPMI supplemented with B27 with insulin (RB+) or Rho-associated protein kinase (Rock) inhibitor.
16. The method of claim 1 wherein the volume of cells is applied to the support and then mated to an embossing master tool with a pre-defined micro geometric pattern in the N x N matrix array.