**WHAT IS CLAIMED IS:**

1. A kit comprising:

a bio-assembly comprising:

a substrate, and

a bio-scaffold affixed to the substrate; and

a loader plate comprising:

a partition comprising a partition outlet and a partition inlet, the partition outlet and the partition inlet in fluid communication with the bio-scaffold, and

a bio-compatible adhesive positioned between the substrate and the loader plate, the adhesive configured to maintain a fluid-impermeable bond between the substrate and the loader plate.

2. The kit of claim 1, further comprising a fluid mixture configured to be injected into the bio-scaffold.

3. The kit of any of claims 1 or 2, wherein the bio-scaffold is a hydrogel or a vascular component having a vascular inlet and a vascular outlet.

4. The kit of claim 3, wherein the vascular inlet is in fluid communication with the partition inlet and the vascular outlet is in fluid communication with the partition outlet.

5. The kit of claim 3, wherein the vascular component comprises one or more vascular inlets and one or more vascular outlets.

6. The kit of any of claims 1-5, wherein the partition inlet and the partition outlet are substantially parallel to a top surface of the loader plate.

7. The kit of claim 6, wherein the partition comprises more than one partition inlet and more than one partition outlet, and wherein each of the one or more vascular inlets is in fluid communication with an associated partition inlet and each of the one or more vascular outlets is in fluid communication with an associated partition outlet.

8. The kit of any of claims 1-7, wherein the bio-scaffold and partition fluid communication are mediated by a tapered constriction in the bio-scaffold and provides a fluidic seal at a normal operating fluid pressure.

9. The kit of any of claims 1-8, wherein the bio-scaffold comprises a void, the void comprising a perfusable or injectable space with one or more inlets and one or more outlets.

10. The kit of claim 9, wherein the fluid mixture is configured to be combined with live cells, the combination being injectable into the void.

11. A method for generating a kit containing cells, the method comprising:

providing a bio-assembly comprising a substrate and a bio-scaffold affixed to the substrate, wherein the bio-scaffold comprises a vascular component having a vascular inlet and a vascular outlet;

providing a loader plate comprising a partition comprising a partition outlet and a partition inlet;

connecting the partition inlet to the vascular inlet and connecting the partition outlet to the vascular outlet;

attaching cells to the vascular component; and

perfusing the vascular component to form a cellular layer.

12. The method of claim 11, wherein the cellular layer comprises at least one of an endothelial layer, an epithelial layer, a smooth muscle cell layer, a sequentially delivered smooth muscle cell layer and endothelial layer, a sequentially delivered smooth muscle cell layer and epithelial layer, a sequentially delivered smooth muscle cell layer, gel layer, endothelial or epithelial layer, a sequentially delivered pericyte layer and endothelial layer, or a sequentially delivered pericyte layer and epithelial layer.

13. The method of any of claims 11 or 12, further comprising:

injecting a fluid mixture into the bio-scaffold, wherein the fluid mixture comprises multiple fluid components from a list of a liquid, foam, or secondary pre-matrix.

14. The method of any of claims 11-13, wherein the bio-scaffold comprises a void, the void comprising a perfusable or injectable space with one or more inlets and one or more outlets.

15. The method of any of claims 11-14, further comprising:

adding individual cells or multi-cellular aggregates with or without hydrogel material to a void of the bio-scaffold.