Description	Corresponding Step in Fig. 1A	Work Time (mins)	Wait Time (mins)
Mix PDMS and degas*		5	30
Fill PDMS into needles with syringe†		5	30
Break needles and cut PDMS rods of equal lengths		15	0
Spin coat PDMS onto silicon wafers†		10	240
Peel PDMS layers from wafers and cut into rectangular sheets		15	0
Make channel cut via xurography on a 400-µm layer	Step 2	10	0
Bond the 400-µm layer with channel to a 250-µm layer†	Step 3	5	5
Align a 250-µm layer to top of assembly and punch inlet/outlet ports	Step 4	10	0
Bond a 250-µm layer below assembly†	Step 5	5	5
Use 4-mm biopsy punch to cut central gel chamber	Step 6	5	0
Bond the layer from Step 4 to top of assembly†	Step 7	5	5
Use 1.5-mm biopsy punch to cut gel ports	Step 8	5	0
Add PDMS rods to assembly	Step 9	20	0
Bond assembly to glass slides†	Step 10	5	5
Sub-total Time for Device Fabrication		**120**	**320**
Prepare and pipette hydrogel to gel chamber of device‡	Step 11	30	30
Remove sacrificial PDMS rods to reveal cylindrical lumen holds	Step 12	20	0
Sub-total Time for Hydrogel and Lumen Formation		**50**	**30**
Total Time		**170**	**350**

Supplementary Table 1: Description of steps and time to fabricate a batch of 20 open lumen microdevices. 20 devices can be made in approximately 2 hours of labor, i.e., 6 minutes of labor per device. Premade devices can be stored at room temperature indefinitely in petri dishes until ready to deploy. We recommend completing hydrogel steps on the day prior to microvessel seeding, which adds approximately 1 hour of additional labor. Wait Time is due to *degassing, †storage in the 65°C oven for curing or bonding, and ‡hydrogel polymerization. Inter-batch steps can be performed in parallel during Wait Times to significantly increase throughput.