

Materials List for:

Scalable Fabrication of Stretchable, Dual Channel, Microfluidic Organ Chips

Richard Novak^{*1}, Meredyth Didier^{*1,2}, Elizabeth Calamari¹, Carlos F Ng¹, Youngjae Choe¹, Susan L Clauson¹, Bret A Nestor¹, Jefferson Puerta¹, Rachel Fleming¹, Sasan J Firoozinezhad¹, Donald E Ingber^{1,3,4}

¹Wyss Institute for Biologically Inspired Engineering, Harvard University

²Apple, Inc

³Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard University

⁴Vascular Biology Program and Department of Surgery, Boston Children's Hospital and Harvard Medical School

* These authors contributed equally

Correspondence to: Richard Novak at richard.novak@wyss.harvard.edu

URL: <https://www.jove.com/video/58151>

DOI: [doi:10.3791/58151](https://doi.org/10.3791/58151)

Materials

Name	Company	Catalog Number	Comments
<i>Personal Protective Equipment</i>			
Hairnet	VWR	89107-770	
Tyvek lab coat	VWR	13450-506	
Extended cuff gloves	VWR	89521-898	
<i>Equipment</i>			
Cutting mat	VWR	102096-430	
Tile cutter	McMaster-Carr	26765A31	
Mold-in-place (MIP) top molds	Protolabs, Inc.	custom	printed in Prototherm 12120
Mold-in-place (MIP) bottom molds	Protolabs, Inc.	custom	printed in Prototherm 12121
Duckbill curved forceps	VWR	63041-864	
Sharp tipped forceps	Electron Microscopy Sciences	72700-D	
Metal spatula	VWR	82027-528	
Deep reactive ion etch (DRIE) pillar array wafers	Sensera, Inc.	custom	Four 50 x 50 mm pillar arrays per wafer; pillars 7 um wide, 50 um tall, spaced hexagonally 40 um apart
Textured polycarbonate .01" thick	McMaster-Carr	85585K33	cut to 45 mm square
PDMS blocks (40 x 40 x 5 mm)	n/a	custom	
Laminar flow hood	Germfree	BVBI	cast in-house
Air gun			
60°C level oven			
Vacuum desiccator			
Mass balance			accuracy to 0.1 g
Plasma machine	Diener	Nano	oxygen plasma capability is critical
<i>Supplies</i>			
Sylgard 184 poly (dimethylsiloxane) (PDMS) base/ curing agent kit	Ellsworth Adhesives	4019862	
Mixing cup			Ensure adequate ventilation when handling prepolymer due to low levels of ethylbenzene
1 mL syringe	VWR	10099-395	
Cleanroom wipes	VWR	TWTX1080	

25 x 75 mm glass microscope slides	VWR	48311-703	
Packing tape	VWR	500043-724	
Scotch tape	VWR	500026-873	
Die-cut Polyurethane (PU) strips	Atlantic Gasket, Inc.	custom: AGWI2X3	1/8" thick; 60 Durometer Black Polyurethane; 2" x 3"
Polycarbonate film .005" thick	McMaster-Carr	85585K102	
100 x 100 x 15 mm square gridded petri dishes	VWR	60872-480	
Aluminum foil			
<i>Optional Equipment</i>			
Thinky PDMS Mixer	Thinky	ARE-310	
Mold-in place (MIP) jig	in-house		screw clamp compression jig
Automated membrane fabricator (AMF)	in-house		pneumatic compression piston array with programmable heater