

Materials List for:

# Fabricating Degradable Thermoresponsive Hydrogels on Multiple Length Scales via Reactive Extrusion, Microfluidics, Self-assembly, and Electrospinning

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## Materials

Name	Company	Catalog Number	Comments
<b>Chemicals</b>			
2,2 - azobisisobutyric acid dimethyl ester	Wako Chemicals	101138	
Di(ethylene glycol) methyl ether methacrylate (M(EO)2MA)	Sigma Aldrich	447927	188.2 g/mol, n=2 ethylene oxide repeat units
Oligo (ethylene glycol) methyl ether methacrylate (OEGMA475)	Sigma Aldrich	447943	475 g/mol, n=8-9 ethylene oxide repeat units
Acrylic acid (AA), 99%	Sigma Aldrich	147230	
Thioglycolic acid (TGA), 98%	Sigma Aldrich	T3758	
Dioxane, 99%	Caledon Labs	360481	
Nitrogen, UHP grade	Air Liquide	Alphagaz1 765A-44	
Adipic acid dihydrazide (ADH), 98%	Alfa Aesar	A15119	
N'-ethyl-N-(3-dimethylaminopropyl)-carbodiimide (EDC, x%)	Carbosynth	FD05800	
Hydrochloric acid (HCl), 37%	Sigma Aldrich	320331	
Sodium hydroxide (NaOH), 97%	Sigma Aldrich	221465	
Aminoacetyl aldehyde dimethyl acetal, 99%	Sigma Aldrich	121967	
4-Hydroxy-TEMPO, 97%	Sigma Aldrich	176141	
Methacryloyl chloride, 97x%	Sigma Aldrich	523216	
Petroleum ether, 95%	Sigma Aldrich	32047	
Magnesium sulfate, 99.5%	Sigma Aldrich	M7506	
tert-Butyl methyl ether, >99.0%	Sigma Aldrich	443808	
Phosphate buffered saline	BioShop	PBS405.1	1x, pH 7.3-7.5
N-isopropylacrylamide, 99%	J&K Scientific	258717	Recrystallized from 60% hexanes/40% toluene
Ethanol, anhydrous	Commerical Alchols	P016EAAN	
Span 80	Sigma Aldrich	S6760	
Heavy paraffin oil	Caledon Labs	1326197	
Pentane, reagent grade	Caledon Labs	1/10/7800	
Poly (ethylene oxide) average Mw 600,000	Sigma Aldrich	182028	
<b>Supplies essential for synthesis and hydrogel fabrication</b>			

Rotary evaporator	Heidolph	G3	
Dialysis tubing (3500 Da molecular weight cut-off)	Spectrum Labs	28170-166	Vol/length= 6.4mL/cm
Double barrel syringe	Medmix	L series	L series, 2.5 mL, 1:1 volume ratio
Static mixer	Medmix	L series	L series, 2.5 mL, 1:1 volume ratio, 1.5" length
Silicone rubber sheet, 1/16" thickness	McMaster-Carr	9010K12, 30A Durometer (Super Soft)	
Syringe pump	KD Scientific	KDS Legato 200	Infuse Only Dual Syringe Pump
High voltage power supply	Spellman	230-20R	0 to 20 kV
<b>Microfluidic Chip Fabrication</b>			
Silicon wafer	University Wafer	2080	D = 76.2 mm; 380 µm thickness; P-doped; <100> orientation
SU-8 100	MicroChem	Y131273	
SU-8 Developer	MicroChem	Y020100	
Custom 2.5" spincoater	Built in-house	N/A	
Mask Aligner	KARL SUSS	MJB3 UV400 (with a 276 W lamp)	
Masterflex L/S 13 Silicone Tubing	Cole Parmer	OF-96400-13	Peroxide-cured
Dow Corning Sygard 184 Silicone Elastomer Base	Ellsworth Adhesives	4019862	
Dow Corning Sygard 184 Silicone Elastomer Curing Agent	Ellsworth Adhesives	4019862	
High Power Plasma Cleaner	Harrick	PDC-002-HP	
<b>Characterization Instruments</b>			
Mach 1 micromechanical tester	Biomomentum	LB007-EN	
Cellstar tissue culture 12 well plate	Greiner Bio-one	665 180	
Cell culture insert for 12 well plate	Corning	08-771-12	8 µm pore size
Optical microscope	Olympus BX51 optical microscope	BX51	
Temperature-controlled microscope stage	Linkam Scientific	THMS600	
Gel permeation chromatograph (GPC)	Waters	590 HPLC Pump	Waters Styragel columns (HR2, HR3, HR4; 30 cm x 7.8 mm (ID); 5 mm particles), Waters 410 refractive index detector
Dynamic light scattering (DLS)	Brookhaven	90Plus Particle Size Analyzer	
Transmission electron microscopy (TEM)	TEMSCAN	JEOL 1200EX	Accelerating voltage 100 kV
Scanning electron microscopy (SEM)	Tescan	Vega II LSU	Accelerating voltage 10 kV
Microsquisher	CellScale Biomaterials Testing	MS-50M-01	