

Materials List for

3D Bioprinting Phototunable Hydrogels to Study Fibroblast Activation

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Materials

Name	Company	Catalog Number	Comments
AccuMax Radiometer/Photometer Kit	Spectronics Corporation	XPR-3000	To measure light intensity, used for photostiffening
Acetic Acid	Fisher Scientific	BP2401-500	Used during PEGaMA synthesis
Acetone	Fisher Scientific	A184	Used with the cryosections
ActinGreen 488 ReadyProbes	Fisher Scientific	R37110	Used for staining
Aluminum Foil	Reynolds	F28028	
Anhydrous Tetrahydrofuran (THF)	Sigma-Aldrich	401757-1L	Used during PEGaMA synthesis
Argon Compressed Gas	Airgas	AR R300	Used during PEGaMA synthesis
8 Arm Poly(ethylene glycol)-hydroxyl (PEG-OH)	JenKem Technology	8ARM-PEG-10K	Used during PEGaMA synthesis
365 nm Bandpass Filter	Edmund Optics	65-191	Used for photostiffening
Bovine Serum Albumin (BSA)	Fisher Scientific	BP9700-100	Used during staining process
Buchner Funnel	Quark Glass	QFN-8-14	Used during PEGaMA synthesis
Calcein AM	Invitrogen	65-0853-39	Used during staining process
Celite 545 (Filtration Aid)	EMD Millipore	CX0574-1	Used during PEGaMA synthesis
Charged Microscope Slides	Globe Scientific	1358W	
Chloroform-d	Sigma-Aldrich	151823-10X0.75ML	Used to characterize PEGaMA
Click-iT Plus EdU Cell Proliferation Kit	Invitrogen	C10637	Used for staining
50 mL Conical Tubes	CELLTREAT	667050B	
Cryogenic Safety Kit	Cole-Parmer	EW-25000-85	
Cryostat	Leica	CM 1850-3-1	
Dialysis Tubing	Repligen	132105	
4',6-Diamidino-2-Phylindole (DAPI)	Sigma-Aldrich	D9542-1MG	Used for staining
Diethyl Ether	Fisher Scientific	E1384	Used during PEGaMA synthesis
1,4-Dithiothreitol (DTT)	Sigma-Aldrich	10197777001	Bioink component
Dulbecco's Modified Eagle's Medium (DMEM)	Cytiva	SH30271.FS	

Filter Paper	Whatman	1001-090	Used during PEGaMA synthesis
Freezone 2.5L Freeze Dry System	Labconco	LA-2.5LR	Lyophilizer
Fusion 360	Autodesk	N/A	Software download
2.5 mL Gastight Syringe	Hamilton	81420	Used for bioprinting
15 Gauge 1.5" IT Series Tip	Jensen Global	JG15-1.5X	Used for bioprinting
30 Gauge 0.5" HP Series Tip	Jensen Global	JG30-0.5HPX	Used for bioprinting
Goat Anti-Mouse Alexa Fluor 555 Antibody	Fisher Scientific	A21422	Used for staining
Glycine	Fisher Scientific	C2H5NO2	Used during staining process
Hemocytometer	Fisher Scientific	1461	
Hoechst	Thermo Scientific	62249	Used during staining process
Human Pulmonary Artery Adventitial Fibroblasts (HPAAFs)	AcceGen	ABC-TC3773	From a 2-year-old male patient
Hydrochloric Acid (HCl)	Fisher Scientific	A144-500	Used to pH adjust solutions
ImageJ	National Institutes of Health (NIH)	N/A	Free software download
ImmEdge® Pen	Vector Laboratories	H-4000	Used during staining process
Incubator	VWR	VWR51014991	
LifeSupport Gelatin Microparticle Slurry (Gelatin Slurry)	Advanced Biomatrix	5244-10GM	Used for bioprinting
Light Microscope	Olympus	CKX53	Inverted light microscope
Lithium Phenyl-2,4,6-Trimethylbenzoylphosphinate (LAP)	Sigma-Aldrich	900889-5G	Photoinitiator used for photostiffening
Liquid Nitrogen	N/A	N/A	
LulzBot Mini 2	LulzBot	N/A	Bioprinter adapted
Methacryloxyethyl Thiocarbamoyl Rhodamine B	Polysciences Inc.	669775-30-8	
2-Methylbutane	Sigma-Aldrich	M32631-4L	
Microman Capillary Pistons CP1000	VWR	76178-166	Positive displacement pipette tips
MMP2 Degradable Crosslinker (KCGGPQGIWGQGCK)	GL Biochem	N/A	Bioink component
Mouse Anti-Human α SMA Monoclonal Antibody	Fisher Scientific	MA5-11547	Used for staining
OmniCure Series 2000	Lumen Dynamics	S2000-XLA	UV light source used for photostiffening
Paraformaldehyde (PFA)	Electron Microscopy Sciences	15710	Used to fix samples
pH Meter	Mettler Toledo	FP20	
pH Strips	Cytiva	10362010	
Phosphate Buffered Saline (PBS)	Hyclone Laboratories, Inc.	Cytiva SH30256.FS	
Pipette Set	Fisher Scientific	14-388-100	
10 μ L Pipette Tips	USA Scientific	1120-3710	
20 μ L Pipette Tips	USA Scientific	1183-1510	
200 μ L Pipette Tips	USA Scientific	1111-0700	
1000 μ L Pipette Tips	USA Scientific	1111-2721	
Poly(Ethylene Glycol)-Alpha Methacrylate (PEGaMA)	N/A	N/A	Refer to manuscript for synthesis steps
Poly(Ethylene Oxide) (PEO)	Sigma-Aldrich	372773-250G	Bioink component
Positive Displacement Pipette	Fisher Scientific	FD10004G	100-1000 μ L
Potassium Hydroxide (KOH)	Sigma-Aldrich	221473-500G	Used to pH adjust solutions
ProLong Gold Antifade Reagent	Invitrogen	P36930	Used during staining process
Pronterface	All3DP	N/A	Software download

Propidium Iodide	Sigma-Aldrich	P4864-10ML	Used for staining
RGD Peptide (CGRGDS)	GL Biochem	N/A	Bioink component
Rocker	VWR	10127-876	
Rotary Evaporator	Thomas Scientific	11100V2022	Used during PEGaMA synthesis
Rubber Band	Staples	808659	
Schlenk Flask	Kemtech America	F902450	Used during PEGaMA synthesis
Slic3r	Slic3r	N/A	Software download
Smooth Muscle Cell Growth Medium-2 (SmGM-2) BulletKit	Lonza	CC-3182	Kit contains CC-3181 and CC-4149 components
Sodium Hydride	Sigma-Aldrich	223441-50G	Used during PEGaMA synthesis
Sorvall ST 40R Centrifuge	Fisher Scientific	75-004-525	
Stir Bar	VWR	58948-091	
Syringe Filter	VWR	28145-483	Used to sterile filter solutions
T-75 Tissue-Cultured Treated Flask	VWR	82050-856	Used for cell culture work
Tissue-Tek Cyromold	Sakura	4557	
Tissue-Tek O.C.T Compound (OCT)	Sakura	4583	
Tris(2-Carboxyethyl) Phosphine (TCEP)	Sigma-Aldrich	C4706-2G	
Triton X-100	Fisher Bioreagents	C34H622O11	Used during staining process
Trypan Blue	Sigma-Aldrich	T8154-20ML	Used for cell culture work
0.05% Trypsin-EDTA	Gibco	25-300-062	Used for cell culture work
Tween 20	Fisher Bioreagents	C58H114O26	Used during staining process
Upright Microscope	Olympus	BX63F	Fluorescent microscope capabilities
Water Bath	PolyScience	WBE20A11B	
24-Well Tissue Culture Plates	Corning	3527	