

Materials List for:

Maturation of Human Stem Cell-derived Cardiomyocytes in Biowires Using Electrical Stimulation

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Materials

Name	Company	Catalog Number	Comments
L-Ascorbic acid	Sigma	A-4544	hPSC-CM culture media componet
AutoCAD	Autodesk, Inc		Software to design device
Carbon rods, Ø 3 mm			Electrical stimulator chamber component
Collagen, type 1, rat tail	BD Biosciences	354249	Collagen gel: 2.1 mg/mL of rat tail collagen type I in 24.9 mM glucose, 23.8 mM NaHCO ₃ , 14.3 mM NaOH, 10 mM HEPES, in 1x M199 media with 10 % of growth factor-reduced Matrigel.
Collagenase type I	Sigma	C0130	0.2% collagenase type I (w/v) and 20% FBS (v/v) in PBS with Ca ²⁺ and Mg ²⁺ . Sterilize with 0.22 µm filter and make 12 mL aliquots. Store at -20 °C.
Deoxyribonuclease I (DNase I)	EMD Millipore	260913-25MU	Make 1 mg/mL DNase I stock solution in water. Filter sterile and store 0.5 mL aliquots at -20 °C
Drill & drill bits (Ø 1 mm and 2 mm)	Dremel		Drill holes in polycarbonate frames
Electrical stimulator	Grass	s88x	
Fetal bovine serum (FBS)	WISENT Inc.	080-450	
D-(+)-Glucose	Sigma	G5767	Collagen gel component
L-Glutamine	Thermo Fisher Scientific	25030081	
H ₂ O	MilliQ		18.2 MΩ·cm at 25 °C, ultrapure, to make all solutions
HEPES	Sigma	H4034	Collagen gel component
Hot plate	Torrey Pines	HS40	
Iscove's Modified Dulbecco's Medium(IMDM)	Thermo Fisher Scientific	12440053	
Mask aligner	EVG	EVG 620	
Matrigel, growth factor reduced	Corning	354230	Collagen gel component
Medium 199 (M199)	Thermo Fisher Scientific	11825015	Collagen gel component
Monothioglycerol (MTG)	Sigma	M-6145	hPSC-CM culture media componet
Orbital shaker	VWR	89032-088	
Penicillin/Streptomycin (P/S)	Thermo Fisher Scientific	15070063	

Phosphate-buffered saline (PBS) with Ca ²⁺ and Mg ²⁺	Thermo Fisher Scientific	14040133	
Plate (6-well)	Corning	353046	
Plate (6-well), low attachment	Corning	3471	
Platinum wires, 0.2 mm			Electrical stimulator chamber component
Polydimethylsiloxane (PDMS)	Dow Corning	Sylgard 184	
Propylene glycol monomethyl ether acetate (PGMEA)	Doe & Ingalls Inc.		To develop the wafer
Pouch, peel-open	Convertors	92308	For steam sterilization
Silicon wafer, 4 inch	UniversityWafer Inc.		
Sodium bicarbonate (NaHCO ₃)	Sigma	S5761	Collagen gel component
Sodium hydroxide	Sigma	S8045	Collagen gel component
Sprin coater	Specialty Coating Systems	G3P-8	
StemPro-34 culture medium	Thermo Fisher Scientific	10639011	hPSC-CM culture medium. To make 50 mL, add 1.3 mL supplement, 500 µL of 100× L-Glutamine, 250 µL of 30 mg/mL transferrin, 500 µL of 5 mg/mL ascorbic acid, 150 µL of 26 µl /2 mL monothioglycerol (MTG), and 500 µL (1 %) penicillin/streptomycin.
Stop media			Wash medium:FBS (1:1)
SU-8 50	MicroChem Corp.		photoresist, master component
SU-8 2050	MicroChem Corp.		photoresist, master component
Transferrin	Roche	10-652-202	hPSC-CM culture media componet
Trypsin/EDTA, 0.25%	Thermo Fisher Scientific	25200056	hPSC-CM culture media componet
Wash medium			IMDM containing 1% Penicillin/Streptomycin