

Materials List for:

Construction and Characterization of a Novel Vocal Fold Bioreactor

Aidan B. Zerdoum¹, Zhixiang Tong², Brendan Bachman², Xinqiao Jia^{1,2}

¹Biomedical Engineering Program, University of Delaware

²Department of Materials Science and Engineering, Delaware Biotechnology Institute, University of Delaware

Correspondence to: Xinqiao Jia at xjia@udel.edu

URL: <https://www.jove.com/video/51594>

DOI: [doi:10.3791/51594](https://doi.org/10.3791/51594)

Materials

Name	Company	Catalog Number	Comments
Silicone elastomer kit	Dow Corning	Sylgard 184	Cure the membrane at 100 °C for 2 hr
PCL	Sigma Aldrich	440744-500G	Mn ~80 kDa, dissolve O/N
Chloroform	Sigma Aldrich	C7559-5VL	
Human bone marrow-derived MSCs	Lonza	PT-2501	Received with passage 2
MSC maintenance media	Lonza	PT-3001	10% FBS in basal media supplemented with L-glutamine, gentamicin and amphotericin
Accutase cell dissociation reagent	Life Technologies	A11105-01	
Ethanol	Sigma Aldrich	E7023-500ML	
Fibronectin	Sigma Aldrich	F2006-1MG	
MMP1 DuoSet ELISA kit	R&D systems	DY901	
HA ELISA kit	Echelon Biosciences	K-1200	
PBS	Life Technologies	14190-136	
Propidium iodide	Life Technologies	P1304MP	
Syto-13	Life Technologies	S7575	
QuantiTect reverse transcription kit	Qiagen	205311	
SYBR Green PCR master mix	Life Technologies	4309155	
Replacement speaker	DAYTON audio (via Parts Express)	DS90-8	Paper cone, full range (80-13,000 Hz), 85 dB
Ergo Micro torque screwdriver	Mountz	# 020377	Torque range: 20-120 cN·m
Stereo speaker selector	RadioShack	40-244	Maximum power handling 50 W
Function generator	Agilent	33220A	Frequency range 1 µHz-20 MHz
Power amplifier	PYLE audio	PylePro PT2400	Frequency response: 10 Hz-50 kHz, two speaker channels
Cell culture incubator	Thermo Fisher	Steri-Cult 3307	
Syringe pump	New Era Pump Systems	NE-300	
High voltage power supply	Spellman	CZE 1000R	Output voltage: 0-30 kV
Scanning electron microscope	JEOL-USA	JSM-7400F	
Desk gold sputter coater	Denton Vacuum	DSK00V-0013	
Doppler laser vibrometer	Polytec	PDV-100	Non-contact velocity measurement (0-22 kHz)
PCR sequence detection system	Applied Biosystems	ABI7300	
Multiphoton confocal microscope	Zeiss	Zeiss 510Meta NLO	

UV-VIS Spectrophotometer	NanoDrop Products via Thermo Scientific	ND-2000	
VibSoft Data Acquisition Software	Polytec		Acquisition bandwidth up to 40 MHz
Origin 8.5 data analysis software	OriginLab		
qbasePlus qPCR data analysis software	Biogazelle	V2.3	
Aluminium alloy	McMaster-Carr	Alloy 6061	
Acrylic blocks	McMaster-Carr		
Polycarbonate anti-humidity chamber	McMaster-Carr		Impact-Resistant Polycarbonate
screws	McMaster-Carr		
Electronic cable/wire			
Medical grade PVC tubing	US Plastic Corp.	Tygon S-50-HL	Clear, biocompatible
10 ml Syringe	Becton Dickinson	309604	
21 G Blunt ended needle	Small Parts	NE-213PL-25	1-1/2" length
Alligator clip adapters	RadioShack	270-354	Fully insulated
8 mm Biopsy punch	Sklar Surgical Instruments	96-1152	Sterile, disposable
12 mm Biopsy punch	Acuderm (via Fisher Scientific)	NC9998681	
Tissue culture flasks	Corning		Cell culture treated