

# Shear Assay Protocol for the Determination of Single-Cell Material Properties

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jove.com/video/65333

## Materials

Name	Company	Catalog Number	Comments
<b>CELL CULTURE</b>			
.25% Trypsin, 2.21 mM EDTA, 1x[-] sodium bicarbonate	Corning	25-053-ci	For cellular detachment from substrate in cell culture
15 mL Centrifuge tubes	Falcon by Corning	05-527-90	
35 mm Petri dishes	Corning	430165	
50 mL Centrifuge tubes	Falcon by Corning	14-432-22	
Centrifuge	any		For sterile cell culture
Dulbecco's Modification of Eagle's Medium (DMEM) 1x	Corning	10-013-cv	Or any other media for culturing cells. DMEM was used for culturing U87 cells
Gloves	any		For sterile cell culture
Heracell Vios 160i CO <sub>2</sub> Incubator	Thermo Scientific	51033770	For Incubation during cell culture
Hood	any		For sterile cell culture
Micropipette	any		For sterile cell culture
Micropipette tips	any		For sterile cell culture
Microscope	Leica/any		For sterile cell culture
Phosphate Buffered Saline without calcium and magnesium PBS, 1x	Corning	21-040-CM	
Pipetman	any		For sterile cell culture
Pipette tips	any		For sterile cell culture
Precision GP 10 liquid incubator	Thermo Scientific	TSGP02	
T25 Flask	Corning	430639	
T75 Flask	Corning	430641U	
<b>SHEAR ASSAY</b>			
100 mL beaker	any		For creating DMEM + methyl cellulose viscous shear media

DMEM	Corning		
Flow chamber + rubber gasket	Glycotech	31-001	Circular Flow chamber Kit ( for 35 mm tissue culture dishes)
Hybrid Rheometer	HR-2 Discovery Hybrid Rheometer		For determination of shear fluid viscosity
Magnetic stir bar	any		For creating DMEM + methyl cellulose viscous shear media
Magnetic stir plate	any		For creating DMEM + methyl cellulose viscous shear media
Methyl cellulose	any		To increase viscosity of DMEM in flow media
Syringe Pump	KD Scientific Geminin 88 plus	788088	For programming fluid infusion and withdrawal
Syringes, tubing, and connectors			For shear apparatus setup
<b>SOFTWARE</b>			
ABAQUS software	Simulia		
Digital Image Correlation software	LaVision, Germany	DAVIS 10.1.2	
Imaging software	Leica/any microscope software		
MATLAB	MATLAB	MATLAB_R2020B	