

# Microtensiometer for Confocal Microscopy Visualization of Dynamic Interfaces

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## Materials

Name	Company	Catalog Number	Comments
1.5 O.D. Tygon tubing	Fischer Scientific		Tubing
A1RHD Multiphoton upright confocal microscope	Nikon		Confocal Microscope
Acid Cleaning Solution			Sulfuric acid and Alnochromix diluted with water 50% by volume, wait until clear before diluting
Alnochromix	Alconox	2510	Mixed with sulfuric acid to package instruction and diluted to make acid cleaning solution
Ceramic glass cutter	Sutter Instruments		
Chloroform	Sigma-Aldrich	650471	HPLC Plus
Curosurf	Chiesi		Lung Surfactant
DI Water			18.5 MΩ - cm
Ethanol	any		200 proof used for hydrophobization, denatured used for cleaning
Fiber-Lite Model 190 fiber optic illuminator	Dolan-Jenner Industries Inc.	281900100	Light source; other light sources should work as well
Flow EZ F69 mbar w/Link Module	Fluigent	LU-FEZ-0069	Microfluidic Pump
Fluigent SDK VIs	Fluigent		Required for CPM virtual Interface
Fluoroelastomer gaskets			Machined from 1 mm thick Viton sheet, See figure 3
Gas filter	Norgren	F07-100-A3TG	Put between microfluidic pump and pressure regulator
Gas regulator	Norgren	10R0400R	Steps down pressure from source to range of pump, connected to gas filter range 2-120 psi
Glass Capillary	Sutter Instruments	B150-86-10	Borosilicate glass O.D. 1.5 mm I.D. 0.86 mm
Glass Slide	any		75 mm x 25 mm
Glass Syringe	Hamilton	84878	25 μL glass syringe
Hydrophobizing Agent	Sigma-Aldrich	667420	1H,1H,2H,2H-Perfluoro-octyltriethoxysilane 98%, other

			hydrophobic triethoxysilane can be substituted
Insoluble surfactant	Avanti	850355C-200mg	16:0 DPPC in chloroform
LabVIEW Software	National Instruments		2017
Longpass Filter	ThorLabs	FEL0650	650 nm Longpass filter, wavelength must remove excitation laser frequency
Lyso-PC	Avanti	855675P	16:0 Lyso PC 1-palmitoyl-2-hydroxy-sn-glycero-3-phosphocholine
Masterflex L/S variable speed analog console pump system w/ Easy-Load II pump head	Masterflex	HV-77916-20	Peristaltic Pump
MATLAB	Mathworks		R2019
Micropipette Puller P-1000	Sutter Instruments		Capillary Puller
Microtensiometer Cell and Holder			Cell machined from PEEK, holder machined from aluminum, See Figure 3 and 4
Microtensiometer Objective	Nikon		Fluor 20x/0.50W DIC M/N2 ∞/0 WD 2.0 mm
NI Vision Development Module	National Instruments		Required for CPM virtual Interface
PEEK finger tight fittings	IDEX	F-120x	10-32 Coned Ports
PEEK plug	IDEX	P-551	10-31 Coned Ports
pipette tips	Eppendorf	22492225	100 µL - 1000 µL, Autoclaved
Plastic Forceps	Thermo Scientific	6320-0010	
Plastic Syringe	Fischer Scientific	14-955-459	10 mL
Plumbing parts	Fischer Scientific		3-way valves and other plumbing parts to connect tubing.
Research Plus 1-channel 100 µL–1000 µL	Eppendorf	3123000063	Micro pipetter
Sulfuric Acid	any		Used for acid cleaning solution
T Plan SLWD 20x/0.30 OFN25 WD 30 mm	Nikon		Confocal Microscope Objective
Texas Red DHPE triethylammonium salt	Thermo Fischer Scientific	1395MP	Fluorophore
Vacuum Pump	Gast	DOA-P704-AA	