

Materials List for:

Fluorescence Biomembrane Force Probe: Concurrent Quantitation of Receptor-ligand Kinetics and Binding-induced Intracellular Signaling on a Single Cell

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Materials

Name	Company	Catalog Number	Comments
Sodium Phosphate Monobasic Monohydrate (NaH ₂ PO ₄ • H ₂ O)	Sigma-Aldrich	S9638	Phosphate buffer preparation
Anhy. Sodium Phosphate Dibasic (Na ₂ HPO ₄)	Sigma-Aldrich	S7907	Phosphate buffer preparation
Sodium Carbonate (Na ₂ CO ₃)	Sigma-Aldrich	S2127	Carbonate/bicarbonate buffer preparation
Sodium Bicarbonate (NaHCO ₃)	Sigma-Aldrich	S5761	Carbonate/bicarbonate buffer preparation
Sodium chloride (NaCl)	Sigma-Aldrich	S7653	N2-5% buffer preparation
Potassium chloride (KCl)	Sigma-Aldrich	P9541	N2-5% buffer preparation
Potassium phosphate monobasic (KH ₂ PO ₄)	Sigma-Aldrich	P5655	N2-5% buffer preparation
Sucrose	Sigma-Aldrich	S0389	N2-5% buffer preparation
MAL-PEG3500-NHS	JenKem	A5002-1	Bead functionalization
Biotin-PEG3500-NHS	JenKem	A5026-1	RBC biotinylation
Nystatin	Sigma-Aldrich	N6261	RBC osmolarity adjustment
Ammonium Hydroxide (NH ₄ OH)	Sigma-Aldrich	A-6899	Glass bead silanization
Methanol	BDH	67-56-1	Glass bead silanization
30% Hydrogen Peroxide (H ₂ O ₂)	J. T. Barker	Jan-86	Glass bead silanization
Acetic Acid (Glacial)	Sigma-Aldrich	ARK2183	Glass bead silanization
3-Mercaptopropyltrimethoxysilane (MPTMS)	Uct Specialties, llc	4420-74-0	Glass bead functionalization
Borosilicate Glass beads	Distrlab Particle Technology	9002	Glass bead functionalization
Streptavidin-Maleimide	Sigma-Aldrich	S9415	Glass bead functionalization
BSA	Sigma-Aldrich	A0336	Ligand functionalizing
Fura2-AM	Life Technologies	F-1201	Intracellular calcium fluorescence dye loading
Dimethyl sulfoxide (DMSO)	Sigma-Aldrich	D2650	Intracellular calcium fluorescence dye loading
Quantibrite PE Beads	BD Biosciences	340495	Density quantification

Flow Cytometer	BD Biosciences	BD LSR II	Density quantification
Capillary Tube 0.7-1.0 mm x 30 inches	Kimble Chase	46485-1	Micropipette making
Flaming/Brown Micropipette Puller	sutter instrument	P-97	Micropipette making
Pipette microforce	Narishige	MF-900	Micropipette making
Mineral Oil	Fisher Scientific	BP2629-1	Chamber assembly
Microscope Cover Glass	Fisher Scientific	12-544-G	Chamber assembly
Micro-injector	World Precision Instruments	MF34G-5	Chamber assembly
1 ml syringe	BD	309602	chamber assembly
Micropipette holder	Narishige	HI-7	Chamber assembly
Home-designed mechanical parts and adaptors fabrications using CNC machining.	Biophysics Instrument	All parts are customized according to the CAD designs.	BFP system
Microscope (TiE inverted)	Nikon	MEA53100	BFP system
Objective CFI Plan Fluor 40x (NA 0.75, WD 0.72 mm, Spg)	Nikon	MRH00401	BFP system
Camera, GE680, 640 x 480, GigE, 1/3" CCD, mono	Graftek Imaging	02-2020C	BFP system
Prosilica GC1290 - ICX445, 1/3", C-Mount, 1280 x 960, Mono., CCD, 12 Bit ADC	Graftek Imaging	02-2185A	BFP system
Manual submicron probehead with high resolution remote control	Karl Suss	PH400	BFP system
Anti-vibration table (5' x 3')	TMC	77049089	BFP system
3D manual translational stage	Newport	462-XYZ-M	
SolidWorks 3D CAD software	SOLIDWORKS Corp.	Version 2012 SP5	BFP system
LabVIEW software	National Instruments	Version 2009	BFP system, BFP program
3D piezo translational stage	Physik Instrumente	M-105.3P	BFP system
Linear piezo accuator	Physik Instrumente	P-753.1CD	BFP system
Micromanager software		Version 1.4	fBFP system, fluorescence imaging program
Dual Cam (DC-2)	Photometrics	77054724	fBFP system
Dual Cam emission filter (T565LPXR)	Photometrics	77054725	fBFP system
Fluorescence Camera	Hamamatsu	ORCA-R2 C10600-10B	fBFP system
Plastic paraffin film (Parafilm)	Bemis Company, Inc	PM996	bottle sealing
Carbonate/bicarbonate buffer (pH 8.5)			8.4 g/L sodium carbonate (Na_2CO_3), 10.6 g/L sodium bicarbonate (NaHCO_3)
Phosphate buffer (pH 6.5-6.8)			27.6 g/L NaPhosphate monobasic ($\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$), 28.4 g/L Anhy. NaPhosphate dibasic (Na_2HPO_4)
N2-5% buffer (pH 7.2)			20.77 g/L potassium chloride (KCl), 2.38 g/L sodium chloride (NaCl), 0.13 g/L potassium phosphate monobasic (KH_2PO_4), 0.71 g/L anhy. sodium phosphate dibasic (Na_2HPO_4), 9.70 g/L sucrose