

Materials List for

Making Precise and Accurate Single-Molecule FRET Measurements using the Open-Source smfBox

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Materials

Name	Company	Catalog Number	Comments
Amino modified oligonucleotide	Eurogentec	N/A	May be ordered from various suppliers or synthesised; amino modification enables labeling with NHS-ester modified dyes
Avalanche photodiode (APD)	Excelitas	SPCM-AQRH-14	Two APDs are required for the smfBox setup
Bovine Serum Albumin (BSA)	Merck	A2153	System dependant; imaging buffer component (0.1 mg/mL in buffer)
Compact Laser Combiner	OMICRON	LightHUB-2	515 nm (80 mW) and 638 nm (100 mW) lasers
Coverglass	VWR	630-2742	Thickness: 0.17 ± 0.01 mm, LxW: 22x22 mm
Cy3B	Cytiva	PA63101	1 mg, PA63100 (5 mg), PA96106 (25 mg)
FRETBursts Python Package	N/A	N/A	Open-source python package for burst analysis of freely-diffusing single-molecule FRET data: https://fretbursts.readthedocs.io
Imaging Buffer	N/A		System dependant; 5 mM NaCl, 20 mM MgCl ₂ , 5 mM Tris pH 7.5 and 0.1 mg/mL BSA
Immersion Oil	Olympus	IMMOIL-F30CC	
Jupyter notebooks	Project Jupyter	N/A	Open-source web application to create and share documents that contain live code, equations, visualizations and text; data analysis notebooks for smfBox can be found in the SI
Lens Tissue	ThorLabs	MC-5	MC-50E is same item in bulk
Magnesium Chloride	Merck	M2670	System dependant; imaging buffer component (20 mM in buffer)
MilliQ/Ultrapure water	N/A		

Nanopositioner	Piezoconcept	FOC300	Nanopositioner for accurate positioning of microscope objective
NHS-ester modified ATTO-550	ATTO-TEC	AD 550-31	1 mg, AD 550-35 (5 mg)
NHS-ester modified ATTO-647N	ATTO-TEC	AD 647N-31	1 mg, AD 647N-35 (5 mg)
Objective lens	Olympus	N1480700	Olympus objective series from original smfBox discontinued; replaced by N5702300
OMICRON Control Center (OCC)-laser control center	OMICRON	N/A	v3.5.34 - OMICRON laser driver software
Press-To-Seal silicone isolator	Grace Bio-Labs	664201	8-9 mm Diameter x 1.7 mm Depth
smOTTER	N/A	N/A	Open-source acquisition software for the Craggs Lab smfBox: https://github.com/craggslab/smOTTER
Sodium Chloride	Merck	S7653	System dependant; imaging buffer component (5 mM in buffer)
Tris base	Merck	93362	System dependant; imaging buffer component (5 mM, pH 7.5 in buffer)
Type I ultrapure water	Merck	ZIQ7000T0	Milli-Q® IQ 7000 Ultrapure Water System