

# A Femtoliter Droplet Array for Massively Parallel Protein Synthesis from Single DNA Molecules

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## Materials

Name	Company	Catalog Number	Comments
(3-aminopropyl)triethoxysilane	Sigma-Aldrich	440140	
1 mL syringe	Terumo	SS-01T	
2-propanol	Kanto Chemical	EL grade	EL: for electronic use.
3D laser scanning confocal microscope	Lasertec	OPTELCICS HYBRID	Other similar microscopes (e.g., Keyence VK-X1000, Olympus LEXT OLS5000) are also applicable.
50 mL syringe	Terumo	SS-50LZ	
6,8-difluoro-4-methylumbelliferyl phosphate	Thermo Fisher Scientific	D6567	Prepare a 5 mM stock solution in dimethyl sulfoxide
Acetone	Kanto Chemical	EL grade	EL: for electronic use. Purity 99.8%.
Air blower	Hozan	Z-263	
Aluminum block	BIO-BIK	AB-24M-02	
Aluminum microtube stand	BIO-BIK	AB-136C	
ASAHIKLIN AE-3000	AGC	(Test sample)	Free test sample may be available upon inquiry to AGC.
BEMCOT PS-2 wiper	Ozu	028208	
Biopsy punch with plunger	Kai	BPP-10F	
Cover glass	Matsunami Glass	No. 1 (24 mm × 32 mm, 0.13~0.17 mm thickness)	Size-customized.
Cover glass staining rack	Nakayama	803-131-11	
CRECIA TechnoWipe clean wiper	Nippon Paper Crecia	C100-M	
Cutting mat	GE Healthcare	WB100020	
CYTOP	AGC	CTL-816AP	
Deaeration mixer	Thinky	AR-100	
Desktop cutter	Roland	STIKA SV-8	
Developer	AZ Electronic Materials	AZ 300 MIF	AZ Electronic Materials was now acquired by Merck.

			Other alkaline developers may be also applicable but should require optimization of development conditions (time, temperature, etc.)
Double-coated adhesive Kapton film tape	Teraoka Seisakusho	7602 #25	
Ethanol	Kanto Chemical	EL grade	EL: for electronic use. Purity 99.5%.
Fiji			Version: ImageJ 1.51n
Flat-cable cutter	Tokyo-IDEAL	MT-0100	
Fomblin oil	Solvay	Y25, or Y25/6	Free test sample may be available upon inquiry to Solvay. Fomblin Y25/6 is an alternative if Y25 is not readily available.
Hot plate	AS ONE	TH-900	
Injection needle	Terumo	NN-2270C	22G × 70 mm
Inverted fluorescence microscope	Nikon	Eclipse Ti-E	Epifluorescence specification, CCD or sCMOS camera, motorized stage, autofocus system, and high NA objective lens are required.
KaleidaGraph	Synergy		Version: 4.5
Mask aligner	SUSS	MA-6	Other mask aligners are also applicable as long as the vacuum contact mode is available.
MICROMAN pipette	GILSON	E M250E	Capillary piston tip: CP250
Microsoft Excel	Microsoft		Version: 16.16.15
Mini vacuum chamber	AS ONE	MVP-100MV	
Nuclease-free water	NIPPON GENE	316-90101	
Parafilm	Amcor	PM-996	
PCR tube	NIPPON Genetics	FG-021D/SP	
Petri dish	AS ONE	GD90-15	Diameter 90 mm, height 15 mm.
Photoresist	AZ Electronic Materials	AZ P4903	AZ Electronic Materials was now acquired by Merck. AZ P4620 is an alternative.
Plate reader	BioTek	POWERSCAN HT	
Polyethelene gloves	AS ONE	6-896-02	Trade name: Saniment.
PURExpress in vitro protein synthesis kit	New England Biolabs	E6800S or E6800L	For cell-free protein synthesis reaction.
Reactive-ion etching system	Samco	RIE-10NR	Other RIE systems are also applicable but should require optimization of RIE conditions (gas flow rate, chamber pressure, RF power, etching time, etc.)
RNase inhibitor	New England Biolabs	M0314S	
Scotch tape	3M	810-1-18D	
Sodium hydroxide solution	FUJIFILM Wako Pure Chemical	194-09575	8 M concentration; danger.
Spin coater	Oshigane	SC-308	
SURFLON S-386 surfactant	AGC	(Test sample)	Free test sample may be available upon inquiry to AGC.
SYLGARD 184 silicone elastomer	Dow	Sylgard184	Chemical composition: polydimethylsiloxane. The default mixing ratio is base : curing agent = 10 : 1 (m/m).
Tweezers	Ideal-tek	2WF.SA.1 2A	
Ultrasonic cleaner	AS ONE	ASU-2M	

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Vacuum chuck	Oshigane	(Customized)	Material: delrin; rectangular sample stage with multiple holes (48 holes, each with 1 mm diameter); the size is customzied to fit the size of the cover glass (24 mm × 32 mm).
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