

Supporting information

Compact wide-field femtoliter chamber imaging system for high-speed and accurate digital bioanalysis

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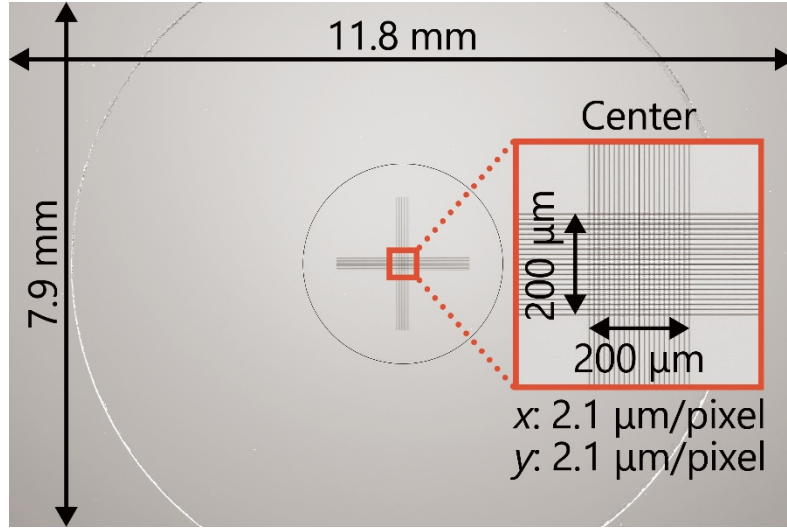


Fig. S1. Bright-field imaging with COWFISH

Bright-field image of micrometer. Line interval is 10 μm. Inset is the zoom-up.

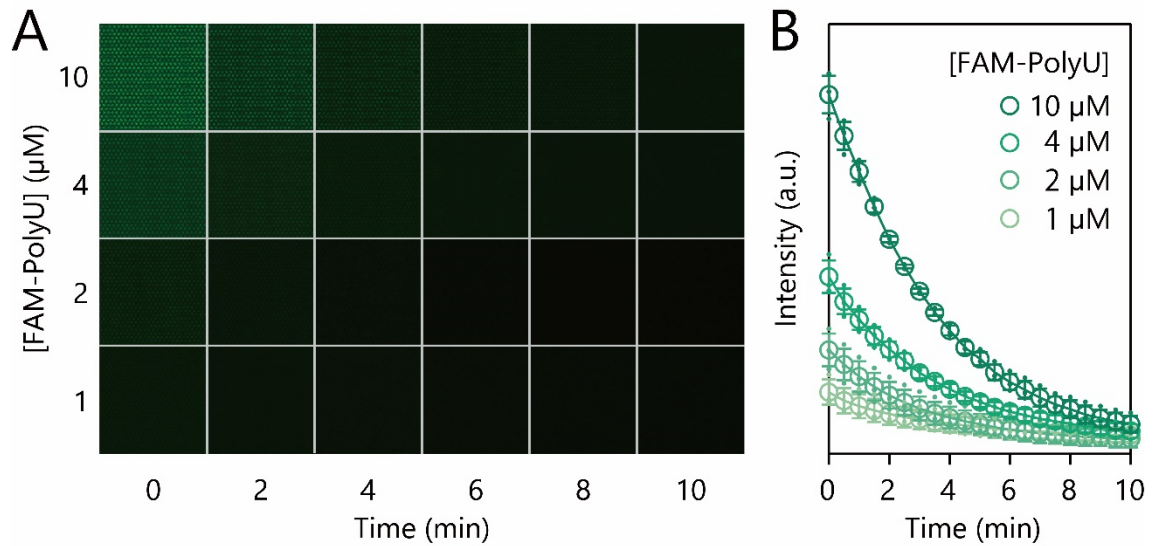


Fig. S2. Fluorescence decay

(A) Time-lapse fluorescence images at each concentration of FAM-polyU. (B) Time course of fluorescence decay. The solid lines indicate the curve fitting with single exponential decay function. (n = 3 technical replicates)

Table S1. Image pixel pitch and FWHM

Position	Image pixel pitch ($\mu\text{m}/\text{pixel}$)		FWHM (μm)			
			Green fluorescence		Red fluorescence	
	<i>x</i> -axis	<i>y</i> -axis	<i>x</i> -axis	<i>y</i> -axis	<i>x</i> -axis	<i>y</i> -axis
1. Top left	2.1	2.1	3.8 ± 0.8	3.8 ± 0.6	5.9 ± 0.9	5.7 ± 1.0
2. Top right	2.1	2.1	3.7 ± 0.6	3.5 ± 0.5	6.3 ± 1.0	5.6 ± 0.9
3. Center	2.1	2.1	3.3 ± 0.3	3.4 ± 0.3	4.4 ± 1.1	5.0 ± 0.7
4. Bottom left	2.1	2.1	3.3 ± 0.3	3.3 ± 0.2	7.2 ± 0.8	6.1 ± 1.0
5. Bottom right	2.1	2.1	3.4 ± 0.5	3.4 ± 0.3	6.3 ± 1.2	5.4 ± 1.0

Table S2. Cost of COWFISH

Component	Product #	Manufacturer	Amount	Price (US\$)
Imaging unit				
Digital SLR camera	D7500	Nikon	1	788
power connector	EP-5B	Nikon	1	22
AC adapter	EH-5d	Nikon	1	89
telecentric lens	LSTL20H-F	Myutron	1	2,219
mirror	PFE10-G01	Thorlabs	1	76
emission quad-band pass filter	89402m	Chroma	1	570
right-angle mirror mount	KCB1EC/M	Thorlabs	1	200
cage rotation mount	CRM1T/M	Thorlabs	1	86
cage assembly rod	ER05-P4	Thorlabs	1	19
SM1 lens tube coupler	SM1T3	Thorlabs	1	20
SM1-M55 adapter	-	Custom made	1	19
Imaging unit Subtotal				4,107
Illumination unit				
mounted LED, 470 nm	M470L5	Thorlabs	1	219
mounted LED, 625 nm	M625L4	Thorlabs	1	213
T-Cube™ LED driver	LEDD1B	Thorlabs	2	638
power supply unit	KPS201	Thorlabs	2	72
aspheric condenser lenses	ACL25416U-A	Thorlabs	2	58
excitation filter 475/35 nm	MF475-35	Thorlabs	1	254

excitation filter 635/20 nm	ZET635/20x	Chroma	1	322
SM1 lens tube	SM1L15	Thorlabs	2	31
lens tube ring	SM1RR	Thorlabs	2	18
lens tube mount	SM1RC/M	Thorlabs	2	49
Illumination unit Subtotal	1,865			
Control device				
laptop PC	5410	Dell	1	710
USB DAQ	USB-6001	NI	1	215
BNC-lead adapter	4970	Pomona	1	14
Control device subtotal	939			
Others				
single-axis manual stage	XCRS40	MISUMI	1	83
two-axis manual stage	XYCRSC40-A	MISUMI	1	214
right-angle bracket	A47-4	SURUGA SEIKI	1	30
optical post 30 mm	TR30/M	Thorlabs	3	15
optical post 75 mm	TR75/M	Thorlabs	2	11
right-angle clamp	RA90/M	Thorlabs	3	30
post holder	UPH30/M	Thorlabs	2	64
breadboard and other custom parts	-	Custom made	1	406
aluminium exterior box	TCL-01	ISEL	1	901
vibration proof rubber feet	VD4-2520M6	IMAO	5	5
Others subtotal	1,758			
Total	8,669			