

Supplementary information to poster
Fluorescent proteins illuminate cell biology

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Optical properties of bright fluorescent proteins

Protein	Peak ex./em.	EC	QY	EC × QY vs EGFP	Refs
<i>Monomers</i>					
mTagBFP	399/456	52	0.63	0.98	15
EBFP2	383/448	32	0.56	0.53	16
mTurquoise	433/475	30	0.84	0.75	17
mTFP1	462/492	64	0.85	1.6	18
mWasabi	493/509	70	0.80	1.7	19
sfGFP	488/507	83	0.65	1.6	20
EGFP	488/507	56	0.60	1.0	21
YPet	517/530	104	0.77	2.4	22
Venus	515/528	92	0.57	1.6	23
mOrange2	549/565	58	0.60	1.0	24
TagRFP-T	555/584	81	0.41	0.99	24
mKate2	588/633	63	0.40	0.74	25
mCherry	587/610	72	0.22	0.47	26
mNeptune	600/650	67	0.20	0.40	27
IFP1.4*	684/708	92	0.07	0.19	28
<i>Dimers</i>					
RFP611	559/611	116 × 2	0.45	1.6 × 2	29
(td)Tomato	554/581	69 × 2	0.69	1.4 × 2	26
(td)Katushka	588/633	66 × 2	0.37	0.73 × 2	30
E2-Crimson	611/646	126 × 4	0.23	0.86 × 4	31

*requires biliverdin cofactor

Optical properties of selected bright photoswitchable proteins

Protein	Switch state	Peak ex./em.	EC	QY	EC × QY vs EGFP	Refs
<i>Reversible</i>						
EYFP	Pre	514/528	83	0.61	1.5	4
	Post	405/528	ND	ND	ND	4
Dronpa	Pre	503/518	95	0.85	2.4	32
	Post	388/518	28	0.02	0.02	32
Padron	Pre	503/522	ND	ND	0.01	33
	Post	505/522	43	0.64	0.82	33
mTFP0.7	Pre	453/488	60	0.50	0.89	34
	Post	376/ND	ND	ND	ND	34
<i>Irreversible</i>						
PA-GFP	Pre	400/515	21	0.13	0.08	35
	Post	504/517	17	0.79	0.40	35
PS-CFP2	Pre	400/468	43	0.20	0.26	36
	Post	490/511	47	0.23	0.32	36
PATagRFP	Pre	351/ND	ND	ND	ND	37
	Post	562/595	66	0.38	0.75	37
Kaede	Pre	508/518	98 × 4	0.88	2.6 × 4	38
	Post	572/580	60 × 4	0.33	0.59 × 4	38
mKikGR	Pre	505/515	49	0.69	1.0	39
	Post	580/591	28	0.63	0.53	39
Dendra2	Pre	490/507	45	0.50	0.68	36
	Post	553/573	35	0.55	0.58	36
mEos2	Pre	506/519	56	0.84	1.4	40
	Post	573/584	46	0.66	0.90	40

Selected FRET sensor characteristics

Reporter	Analyte	Measurement	Max. % Δ	Refs
AKAR3	PKA	cpVenus/ECFP	35	41
AktAR	PKB (Akt)	cpVenus/Cerulean	40	42
CKAR	PKC	Citrine/ECFP	15	43
DKAR	PKD	ECFP/Citrine	23	44
EKAR	ERK	Venus/Cerulean	20	45
Camui	CaMKII α	Venus/ECFP	60	46
Picchu	Abl	YFP/CFP	60	47
Src reporter	SRC	ECFP/Citrine	25	48
Raichu-Ras	Ras	EYFP/ECFP	100	49
FRas-F	Ras	EGFP lifetime	-50	13
Raichu-RHOA	RHOA	ECFP/EYFP	50	50
RhoA biosensor	RHOA	Citrine/ECFP	100	51
ATeam	ATP	cpVenus/mseCFP	250	52
K9 reporter	Histone H3 methylation	Citrine/ECFP	60	53
K27 reporter	Histone H3 methylation	Citrine/ECFP	29	53
SuperGluSnFR	Glu	ECFP/Citrine	44	54
D3cpv	Ca ²⁺	cpVenus/ECFP	510	55
YC2.60	Ca ²⁺	cpVenus/ECFP	600	56
TnXXL	Ca ²⁺	Citrine/ECFP	150	57
Mermaid	Membrane voltage	mUKG/mKOK	40	58

Image sources

Bright multimers

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Chromophore-modulating sensors

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FRET sensors

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Intensity-based single-chromophore sensors

Sensor	Analyte	Min., midpoint and max. input	Peak ex./em.	Max. EC \times QY	Max. $\Delta F/F$	Refs
VSFP3.1-mOrange2	Membrane voltage	-140 mV, -63 mV and +60 mV	548/562	ND	0.03	59
Camgaroo-2	Ca ²⁺	100 nM, 5 μ M and 1 mM	506/524	ND	7	60
Flash-Pericam	Ca ²⁺	1 nM, 700 nM and 1 mM	494/511	17 \times 0.2	8	61
G-CaMP3	Ca ²⁺	100 nM, 700 nM and 10 μ M	500/512	ND	12	62
Superecliptic pHluorin	pH	5.5, 7.1 and 9.5	475/511	ND	15	63

Ratiometric single-chromophore sensors

Sensor	Analyte	Min., midpoint and max. input	Peak ex. 1/ex. 2	Peak em.	Max. $\Delta R/R$	Refs
Perceval	ATP/ADP ratio	0, 0.5 and 10	490/405	516	1.8	64
roGFP2	Redox potential	-200 mV, -272 mV and -350 mV	475/400	516	4	65
HyPer	Hydrogen peroxide	0 nM, ~50 nM and 250 nM	500/420	516	3.3	66

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