

Genetically encoded biosensors based on engineered fluorescent proteins

Wolf B. Frommer, Michael W. Davidson, Robert Campbell

Supplementary Table I. List of biosensors based on single polypeptide chains

	Biosensor specificity	Representative biosensor(s)	Reference(s)
Translocation-based biosensors			
	PtdIns(4,5)P ₂ :Ins(1,4,5)P ₃ dynamics	GFP-PH _{PLCδ} , CYPHR	1-3
	PtdIns(3,4,5)P ₃	GFP-ARNO; CFP-AktPH	4,5
	1,2-diacylglycerol	Cys1-GFP, DAGR	3,6
Single FP-based <i>intrinsic</i> biosensors			
	pH	pHluorins; deGFP1-4; E ² GFP	7-9
	halide ions	YFP-H148Q	10
	redox	roGFP1,2	11,12
	redox (superoxide)	cpYFP	13
Single FP-based <i>extrinsic</i> biosensors			
	Ca ²⁺	Camgaroo; Pericam; G-CaMP; Case12	14-17
	ATP:ADP ratio	Perceval	18
	cGMP	FlinG	19
	voltage	FlaSh; SPARC	20,21
	redox (H ₂ O ₂)	HyPer	22
FRET-based biosensors			
For imaging of ions	Ca ²⁺	Cameleons; FIP-CB _{SM} ; TN-XXL	23-26
	Zn ²⁺	CLY9-2His; Cys ₂ His ₂	27,28
	Cl ⁻	Clomeleon; Cl-sensor	29,30
	PO ₄ ²⁻	FLIPPi	31
	pH	CFP-YFP tandem	32
For imaging of metabolites	cAMP	CFP-Epac-YFP; ICUE1; HCN2-camps	33-35
	cGMP	CGY; Cygnet; cGES-DE5, cGi series	36-39
	PtdIns(3,4)P ₂ , PtdIns(4,5)P ₂ , PtdIns(3,4,5)P ₃	CAY	40
	inositol 1,4,5-trisphosphate	LIBRA	41
	diacylglycerol	Daglas	42
	BAI2 (a furanosyl borate diester)	CLPY	43
	various sugars	FLIP series	44-47
	various amino acids	FLIP series; Arg sensor; GluSnFR	46,48-50
	Protein kinase A	ART; AKAR1-3	51-53
	Protein kinase B/Akt	Aktus; BKAR	54,55
	Protein kinase C	CKAR; KCP-1	3,56

For imaging of kinase activity	Protein kinase D	DKAR	57
	epidermal growth factor receptor (EGFR)	EGFR reporter	58
	Abl	Crk-based reporter	58
	ABI, EGFR	Picchu	59
	Src	Src reporter	60
	Insulin Receptor	Phocus	61
	ATM	ATOMIC	62
	Extracellular signal-regulated kinase (ERK)	EAS; Erkus	63,64
For imaging of other enzyme activities	Aurora B kinase	aurora B sensor	65
	various proteases	donor FP-substrate-acceptor FP	66
	histone lysine methylation	K9 reporter; K27 reporter	67
	O-GlcNAc transferase	O-GlcNAc sensor	68
	protein phosphatase (calcineurin)	CaNAR1	69
For imaging of redox and voltage	voltage	VSFP2, Mermaid	70,71
	redox	HSP-FRET; CY-RL5,6	72,73
For imaging of protein activation and conformational changes	Rho family GTPase activation	Raichu-Ras, -Rap1, -Rac, -Cdc42; RhoA biosensor	74-76
	MAP kinase-activated protein kinase 2 conformation	GMB	77
	Akt conformation	GFP-Akt-YFP; ReAktion	78,79
	PKB conformation	GFP-PKB-RFP	80
	Wiskott -Aldrich syndrome protein (WASP) conformation	Cdc42-GEF sensors	81
	CaMKII conformation	Camu α ; CYCaMII α	82,83
	Estrogen receptor ligand binding domain conformation	CEY	84
	ERK conformation	Miu2	85
	activation of plasma membrane Ca ²⁺ pump	BFP-PMCA-GFP	86
	Annexin A4 self-association	CYNEX4	87

The references provided are not necessarily the primary report of the biosensor. In some cases we have identified recent representative papers that contain references to the earlier work.

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