Supplementary Dataset 1. Summary of reported optical imaging probes for H_2S detection in vivo.

Probe [a]	Emission [nm]	Turn-on ratio (fold)	LOD [b]	Reaction Kinetics [c]	Detection of H_2S in mice [d]			Refs.
					Model	Administration method	Endogenous	
NIR-II@Si	900	N.D.[f]	37 nM	5 min (10 equiv. of H_2S in PBS)	Mouse tumor	Intratumoral injection (i.t.)	Yes	1
NIR-H_2S	830	58	270 nM	60 min (100 equiv. H_2S in PBS)	Mouse tumor	i.t.	Yes	2
BSOHS@Si300	717/534 [e]	15	53 nM	3 min (10 equiv. H_2S in PBS)	Mouse tumor	i.t.	Yes	3
Probe **1**	796	87	39.6 nM	25 min (60 equiv. H_2S in PBS containing 10% DMSO); $k_2 = 14.9\ M^{-1}\ s^{-1}$	Mouse tumor	i.t.	Yes	4
NIR-Az	720	200	0.26 μM	30 min (20 equiv. H_2S in PBS);	Mouse intraperitoneal cavity	Intraperitoneal injection (i.p.)	No	5
NIR-HS	723	50	38 nM	30 min (10 equiv. H_2S in PBS containing 5% CH_3CN)	Mouse intraperitoneal cavity	i.p.	No	6
Probe **1**	670	65	3.05 μM	10 min (50 equiv. H_2S in PBS containing 50% DMSO)	Mouse back	Skin-popping injection (s.p.)	No	7
Azidoluciferin	Bioluminescence	8	0.1 μM	60 min (10 equiv. H_2S in PBS)	Mouse tumor	Intravenous injection (i.v.)	Yes	8
Probe **1**	Bioluminescence	8	N.D. [f]	20 min (250 equiv. H_2S in Tris-HCl buffer)	Mouse body	i.p.	No	9
NanoPT	950	N.D. [f]	106 nM	20 min (5 equiv. H_2S in PBS)	Mouse tumor	i.t.	Yes	10
Probe **1**	542	N.D. [f]	1 μM	15 min (7 equiv. H_2S in PBS containing 1% acetone)	Mouse intraperitoneal cavity	N.D. [f]	Yes	11
Mito-HS	540	21	N.D. [f]	60 min (25 equiv. H_2S in PBS with 1% DMSO)	Mouse tumor	s.p.	Yes	12
Ru-MDB	612	86	45 nM	50 min (10 equiv. H_2S in PBS)	Mouse legs	s.p.	Yes	13
1-H_2S	635	7	47 μM	15 min (50 equiv. H_2S in PBS with 20% DMSO)	Mouse intraperitoneal cavity	i.p.	No	14

CHC1-UCNPs	541	16.2	0.13 μM	120 s (0.05 mg/mL probe with 60 μM H_2S in HEPES buffer)	Resected mouse livers	i.v.	Yes	15
CHS-3	Chemiluminescence	12	N.D. [f]	10 min (5 equiv. H_2S in PBS containing 20% Emerald II Enhancer)	Mouse intraperitoneal cavity	i.p.	No	16
Probe **1**	500	N.D. [f]	0.52 μM	3 min (150 equiv. H_2S in PBS containing 50% DMSO)	Mouse intraperitoneal cavity	i.p.	No	17
TMSDNPOB	592	30	1.27 μM	20 min (10 equiv. H_2S in HEPES buffer containing 50% DMSO)	Mice liver slices	N.D. [f]	Yes	18
Cy-PBA	725	N.D. [f]	21 nM	2 min (2 equiv. H_2S in PBS buffer containing 50% DMSO)	intraperitoneal cavity	i.p.	No	19
$\mathbf{1}^{2+}$-SNP830-FA	830	15	0.70 μM	10 min (6.25 equiv. H_2S in PBS buffer); k_2 = ~91.6 M^{-1} s^{-1}	Mouse liver Mouse tumor	i.v.	Yes	20
$\mathbf{F1}^{2+}$-ANP	Afterglow	122	0.1 μM	1 min (3.5 equiv. H_2S in PBS buffer); k_2 = 1563 ± 141 M^{-1} s^{-1}	Mouse tumor	i.v.	Yes	This work

[a] The name of each probe is the one shown in each ref. [b] LOD: limitation of detection. [c] Second-order reaction rate. If there is no value reported, we just list the time to achieve the maximum activation. We also list the buffer for the reaction. [d] The probe was used to detect H_2S in mice. [e] Ratiometric fluorescent probe. [f] N.D.: Not Determined.

Supplementary References

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