Electronic Supplementary Information

Ultrasensitive Fluorescent Detection of Trypsin on the Basis of

Surfactant-Protamine Assembly with Tunable Emission Wavelength

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Fig. S1 Plot of the I₆₃₀ as a function of pH in SDS/protamine assemblies, [SDS] = 0.3 mM, [protamine]= 60 µg·mL⁻¹.



Fig. S2 Fluorescence emission spectra of NR with different concentrations of SDS.



Fig. S3 Fluorescence enhancement of a) SDS–protamine; b) SDS–Arg₈ with increasing concentrations of protamine and Arg₈, respectively.



Fig. S4 Fluorescence emission spectra of a) NR; b) SDS-NR.responding to different protein including 1: BSA, 2: protamine, 3: lysozyme, 4: papain, 5: pepsin, 6: trypsin. The concentration of each protein was 0.05 mg mL⁻¹.



Fig. S5 TEM image of SDS/Protamine/NR assemblies after incubating with trypsin for 30 min.

Sample	Sample concentration	Zeta potential
SDS	0.3mM	-15.7±0.84 mV
SDS/Protamine	0.3mM/0.06mg mL ⁻¹	-23.7±1.36 mV
SDS/Protamine	0.3mM/0.3 mg mL ⁻¹	-23.8±0.44 mV
SDS/Protamine	0.3mM/0.6 mg mL ⁻¹	$-10.5 \pm 1.02 \text{ mV}$
SDS/Protamine	0.3mM/3 mg mL ⁻¹	$-3.91 \pm 0.04 \text{ mV}$
SDS/Protamine/Trypsin	0.3mM/0.06mg mL ⁻¹	-16.6±0.98 mV
	/0.05 mg mL ⁻¹	
SDS/Trypsin	$0.3 mM / 0.05 mg mL^{-1}$	-11.9±1.07 mV

SDS-Arginine 1.2x10⁷ PL intensity(a.u.) 1.0x10⁷ 9.9% 8.0x10⁶ +Trypsin 6.0x10⁶ 4.0x10 2.0x10 0.0 700 600 650 750 Wavelength (nm)

Fig. S6 Fluorescence emission spectra of $SDS/Arg_8/NR$ and $SDS/Arg_8/NR$ + trypsin. The concentrations of SDS, Arg_8 and trypsin are 0.3 mM, 0.2 mg mL⁻¹, and 0.05 mg mL⁻¹, respectively.



Fig. S7 Fluorescence emission spectra of different hydrophobic dyes in SDS/protamine assemblies with varying concentrations of trypsin, a) Coumarin 6 and b) pyrene, respectively.

Table S1 Zeta potential of different samples