Electronic Supplementary Material (ESI) for RSC Advances.

A Fluorescence Enhanced Inorganic Probe to Detect the Peptide and Capsid Protein of Human Papillomavirus *in Vitro*

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(ESI)

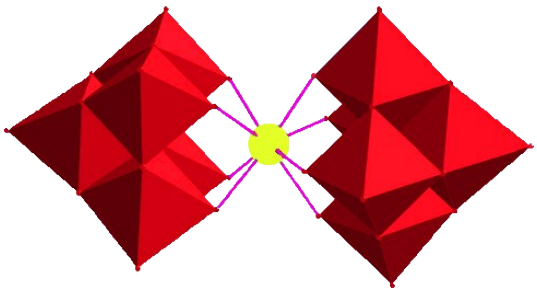

Fig. S1 The structure of EuW10 represent by coordination polyhedral. Red polyhedron represents WO_6 and the yellow ball represents Eu atom.

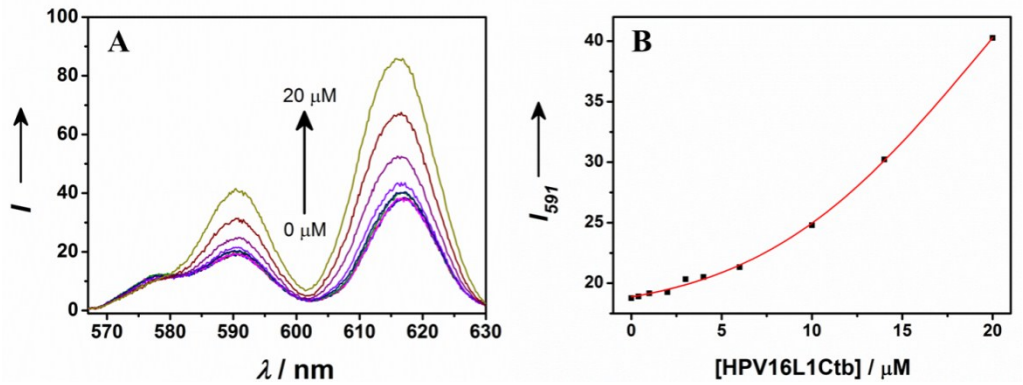

Fig. S2 The (A) fluorescence spectra and (B) corresponding intensity at 591 nm of EuW10 (30.0 μM) in buffer A solution upon gradual addition of HPV16L1Ctb, where a limit of detection (LOD) at 1.9 μM was obtained for 16L1Ctb.

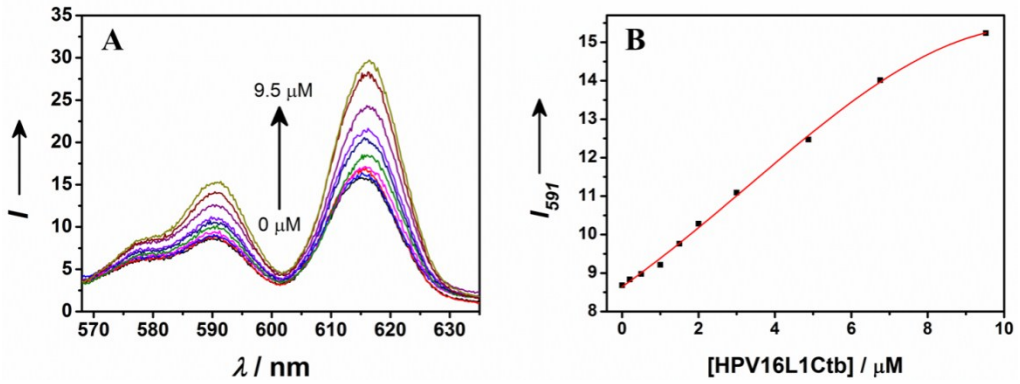

Fig. S3 The (A) fluorescence spectra and (B) corresponding intensity at 591 nm of EuW10 (10.0 μM) in buffer A solution upon gradual addition of HPV16L1Ctb, where a much lower limit of detection (LOD) at 0.5 μM was obtained for 16L1Ctb.

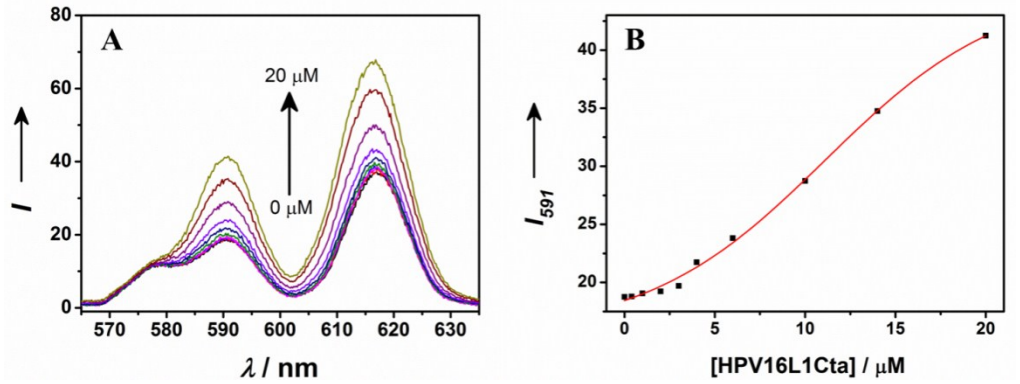

Fig. S4 The (A) fluorescence spectra and (B) corresponding intensity at 591 nm of EuW10 (30.0 μM) in buffer A solution upon gradual addition of HPV16L1Cta, where a limit of detection (LOD) at 1.0 μM was obtained for 16L1Cta.

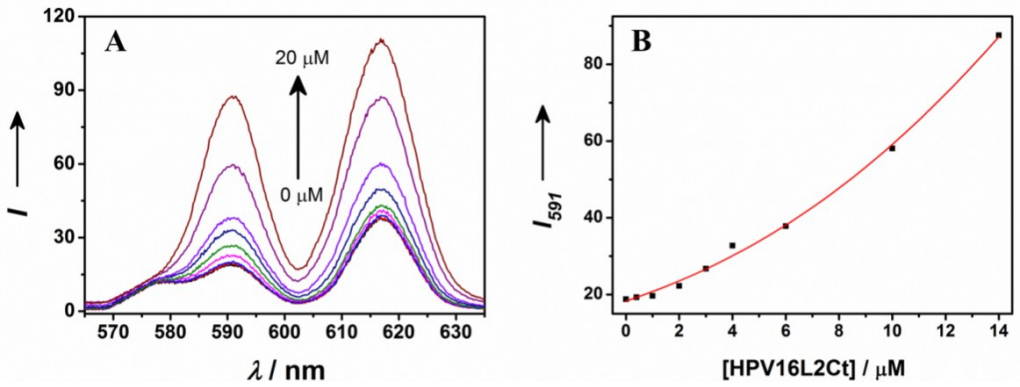

Fig. S5 The (A) fluorescence spectra and (B) corresponding intensity at 591 nm of EuW10 (30.0 μM) in buffer A solution upon gradual addition of HPV16L2Ct, where a limit of detection (LOD) at 0.6 μM was obtained for 16L2Ct.

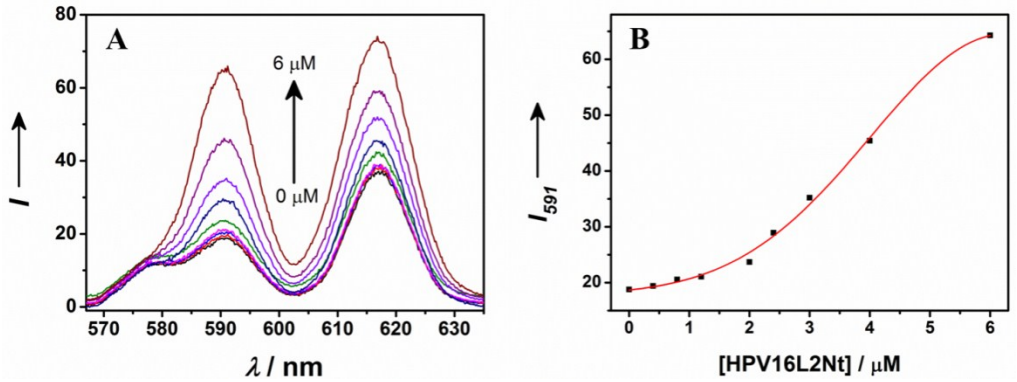

Fig. S6 The (A) fluorescence spectra and (B) corresponding intensity at 591 nm of EuW10 (30.0 μM) in buffer A solution upon gradual addition of HPV16L2Nt, where a limit of detection (LOD) at 0.4 μM was obtained for 16L2Nt.

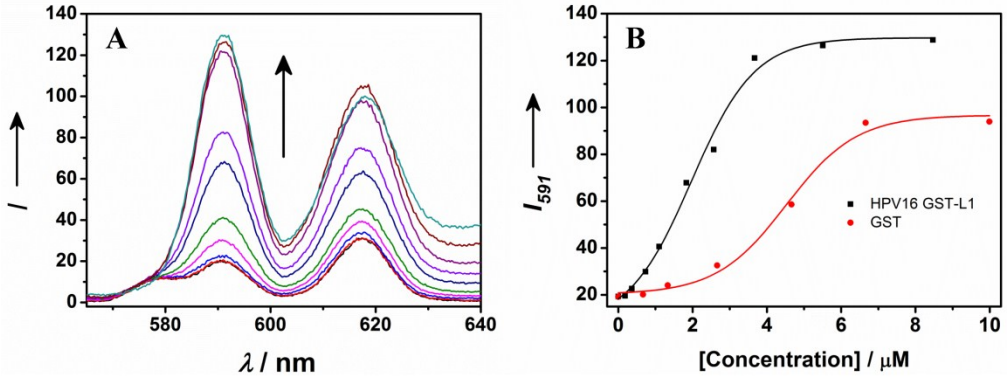

Fig. S7 The fluorescence spectra of EuW10 (30.0 μM) in buffer A solution upon the gradual addition of (A) HPV16 GST-L1, and (B) the intensity comparison of EuW10 at 591 nm upon the titration of HPV16 GST-L1 and GST, respectively.

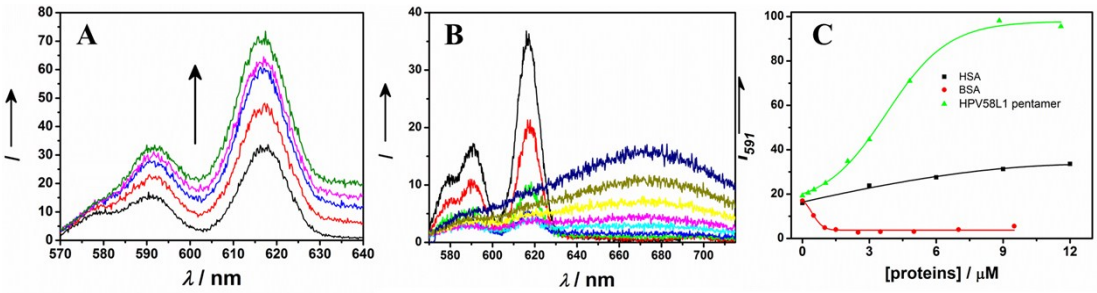

Fig. S8 The fluorescence spectra of EuW10 (30.0 μM) in buffer A solution upon the gradual addition of (A) HSA, and (B) BSA; (C) the intensity comparison of EuW10 at 591 nm upon the titration of HSA, BSA and HPV58L1 pentamer, respectively.

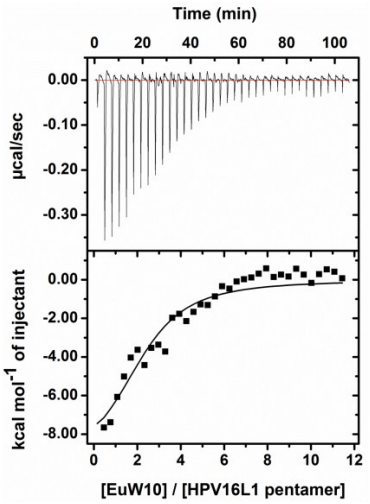

Fig. S9 The titration isotherm for the interaction of EuW10 with HPV16L1ΔN4ΔC30: HPV16L1ΔN4ΔC30 (10 μM, in the cell) is titrated by 800 μM EuW10 (in the syringe), and the measurement is in buffer A solution at 25 °C. The integrated heat and fitted lines of the reactions are listed in the bottom pane.

Table S1 Lifetimes and component ratios of the EuW10 (30.0 μM) before and after binding with the four peptides.

Lifetimes & Ratios Components		τ_1/μs	a_1	τ_2/μs	a_2
30.0 μM EuW10		250	100%	_	_
30.0 μM EuW10	+ 90 μM HPV16L1Cta	339	23.46%	1860	76.54%
	+ 90 μM HPV16L1Ctb	419	8.79%	2419	91.21%
	+ 90 μM HPV16L2Ct	772	18.16%	4093	81.84%
	+ 90 μM HPV16L2Nt	818	15.11%	4204	84.89%

Table S2 The thermodynamic parameters for the binding of EuW10 with HPV16L1ΔN4ΔC30 in buffer A solution at 25 °C.

POM	Temp / °C	*n*	K_b / M^{-1}	ΔH/ (Kcal·mol^{-1})	ΔG/ (Kcal·mol^{-1})	$T\Delta S$/ (Kcal·mol^{-1})
EuW10	25	2.33 ± 0.33	(1.09 ± 0.45)×10^5	-9.84 ± 1.83	-6.42 ± 1.83	-3.42