Regulated catalytic activity of peptide-nanoparticle conjugates

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Supporting Information

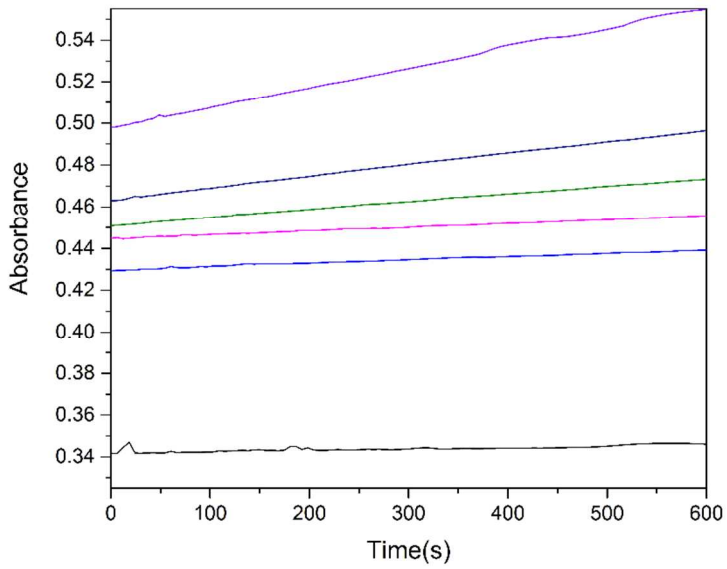

Figure S1. Time dependence of the absorption of formed *p*-nitrophenolat at a wavelength of 405 nm. Reactions were catalyzed by Au@E3H15 at 25 °C in Tris/HCl buffer pH 7.3 with 2 % acetonitrile and show the absorption at the used concentrations of 0.025, 0.075, 0.1, 0.2, 0.3 and 0.5 mM (from bottom to top).

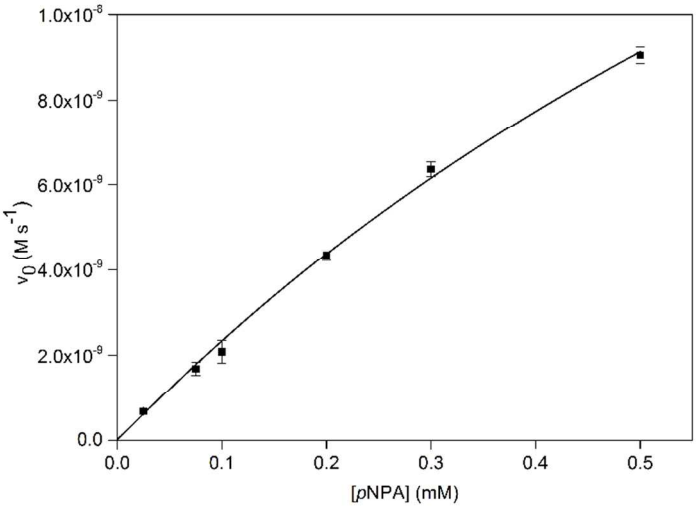

Figure S2. Uncorrected initial velocity against *p*NPA concentration of measured *p*NPA hydrolysis catalyzed by Au@E3H15.

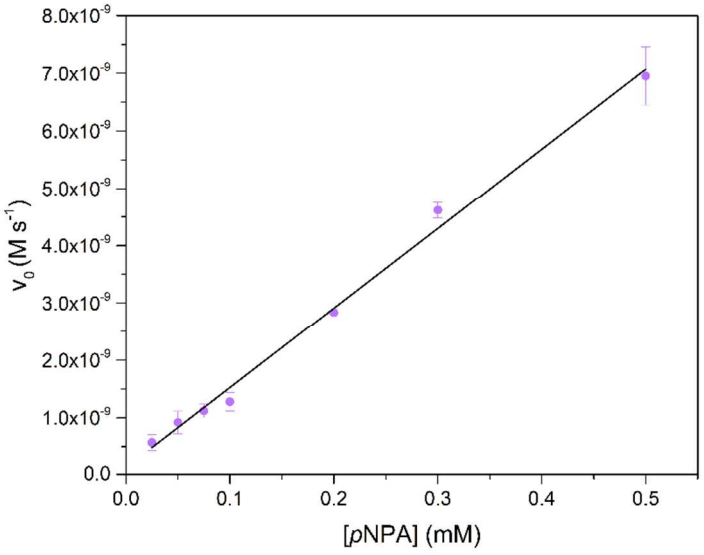

Figure S3. Initial velocity against *p*NPA concentration of measured *p*NPA hydrolysis blank reactions and corresponding linear fit.

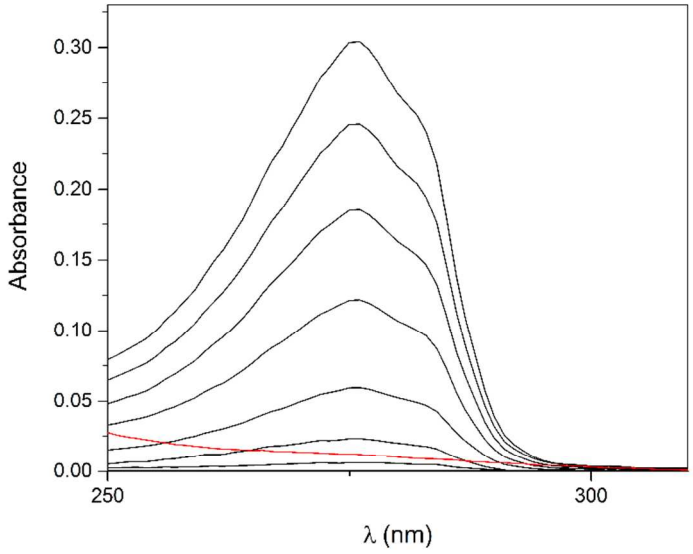

Figure S4. UV/vis-spectra of NH_2-CGGYE-OH (black) showing the absorption band of tyrosine (274 nm) at different concentrations of 0.35, 0.27, 0.21, 0.14, 0.07, 0.03 and 0.005 mM at pH 7.3 and supernatant of Au@E3H15 (red) after synthesis, showing the absence of tyrosine absorption.

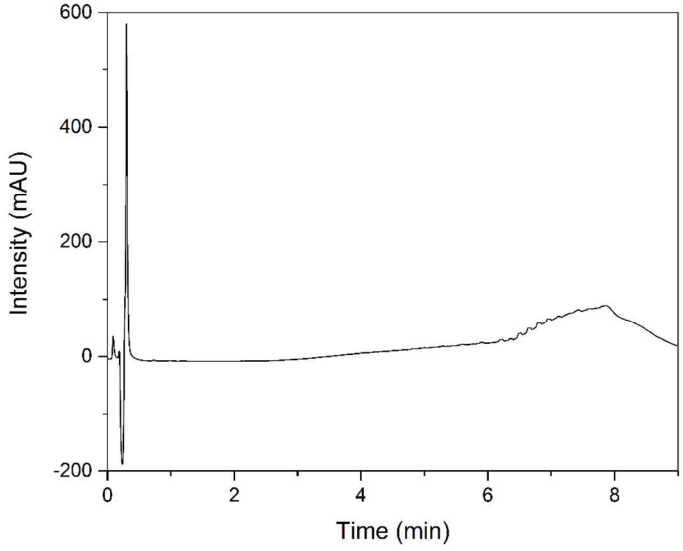

Figure S5. RP-HPLC chromatogram showing the absence of E3H15 in the supernatant of Au@E3H15 after synthesis. $t_{R(E3H15)} = 2.81$ min.

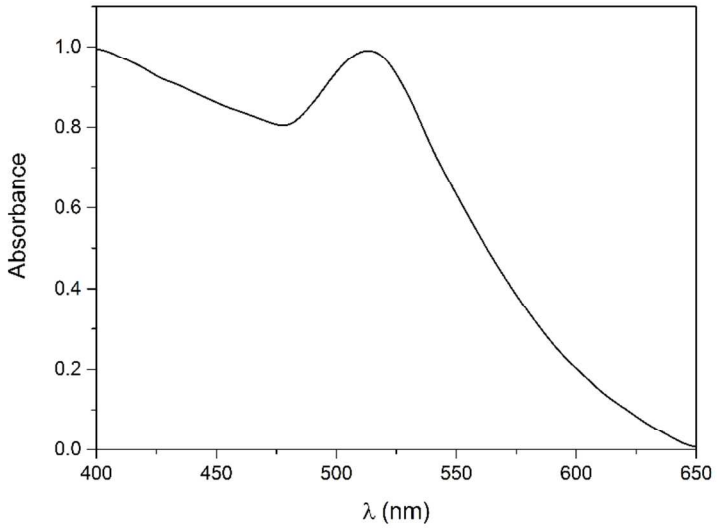

Figure S6. Normalized UV/Vis-Spectra of Au@E3H15 showing the surface plasmon resonance absorption maximum at 514 nm.

Calculation of gold nanoparticle concentration

Concentration of gold nanoparticle dispersion was calculated according to equations reported by Liu *et al.*[1] Short, the average size of gold nanoparticles (*D*) was determined by transmission electron microscopy (TEM). The average number of gold atoms per nanoparticle (*N*) was calculated using Eq. (1), which assumes spherical shaped particles and a uniform fcc structure by taking into account the density of fcc gold (ρ = 19.3 g/cm^3) and the atomic weight of gold (M_{Au} = 197 g/mol).

$$N = \frac{\pi \rho D^3}{6M} = 30.89602 D^3 \qquad (1)$$

Then, the molar concentration of the gold nanoparticle dispersion was calculated by dividing the initial amount of gold salt added to the reaction solution (which corresponds to the total number of gold atoms N_{total}) by the average number of gold atoms per gold nanoparticle (N) according to Eq. (2), where V is the total reaction volume and N_A is the Avogadro constant.

$$C = \frac{N_{total}}{NVN_A} \qquad (2)$$

The obtained molar concentrations were also in good agreement with reported methods to determine gold nanoparticle concentration by UV/vis-spectroscopy.[1,2]

References

(1) Liu, X.; Atwater, M.; Wang, J.; Huo, Q. *Colloids Surfaces B Biointerfaces* **2007**, *58* (1), 3–7.

(2) Haiss, W.; Thanh, N. T. K.; Aveyard, J.; Fernig, D. G. *Anal. Chem.* **2007**, *79* (11), 4215–4221.