Supporting Information

Assembly Kinetics of Nanocrystals via Peptide Hybridization

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1. Calculation of the Binding Kinetics Constants and Surface Coverage of QDots from SPR Experiments:

We used a single Langmuir adsorption model to calculate the adsorption, desorption and equilibrium constants as well as the Gibbs free energy of binding. The single isotherm is described by Equation (1).

$$\frac{d\theta}{dt} = k_a(1-\theta)C - k_d\theta \qquad (1)$$

Here, θ is the fraction of the available sites that are covered; k_a, and k_d are the association and dissociation rate constants, respectively; and C is the peptide concentration (molar units). The integration of Equation (1) then yields the description of the change in time-dependent monolayer coverage given in Equation (2).

$$\theta(\mathrm{t}) = \frac{C}{C + (\mathrm{k_d} / k_a)}[1 - \exp(-(k_a C + k_d)t)] \qquad (2)$$

In equation if we substitute

$$k_{obs} = k_a C + k_d \qquad (3)$$

k_{obs} is defined as the observed adsorption rate as a function of concentration which also includes a desorption term too. If we arrange the time dependent monolayer coverage equation and substitute with k_{obs} then we will obtain:

$$\theta(t-t_0) = \theta(\infty)[1-\exp(-k_{obs}(t-t_0))] \quad (4)$$

Using this single Langmuir equation we are able to calculate the kobs using least square curve fitting, we calculated kobs for three different concentrations and then we were able to solve the k_a, k_d values from equation (3). We calculated the surface coverage by using the following equation for a given concentration:

$$\theta(\mathrm{t}) = \frac{C}{C + (\mathrm{k_d} / k_a)} \quad (5)$$

2. Desorption Curve For SPR Data:

Here we present desorption curves for the SA-QDots for three different cases in SPR experiments. The data was normalized to be able to make a good comparison between the cases.

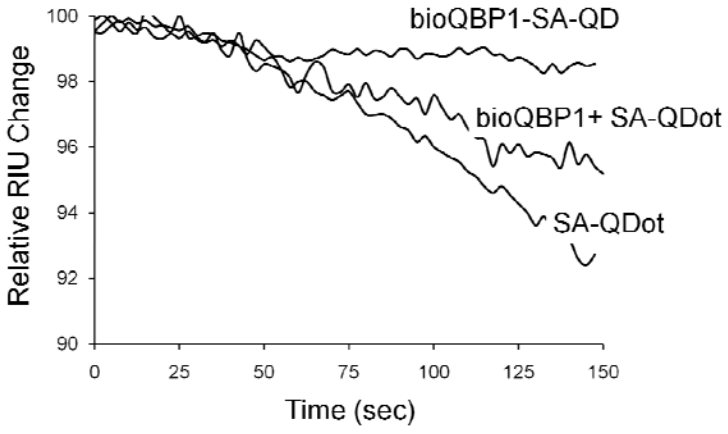

Figure S1. The desorption of SA-QDots from silica surface monitored using SPR , for washing from the surface only buffer solution was used.