Supporting Information

Organic crystal–binding peptides: Morphology control and one-pot formation of protein-displaying organic crystals

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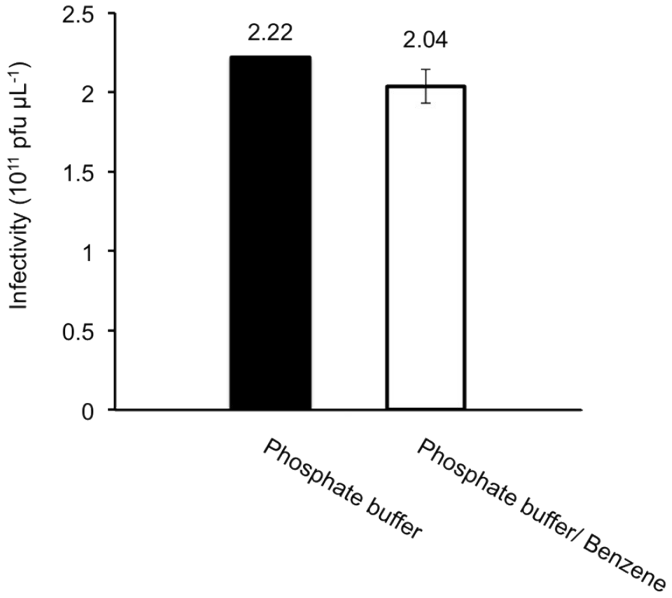

Fig. S1 Survival of phages in the liquid–liquid extraction process. 1 mL benzene and 1 mL M13 phage solution (50 mM sodium phosphate, 150 mM NaCl, pH 7.5) was mixed and inverted for 10 min at room temperature. The mixture was centrifuged to induce phase separation, and then the phage titer in the aqueous phase was calculated as output. Correspondingly, initial M13 phage titer as input was also calculated. Each titer was executed three times and the presented results correspond to average with error bar.

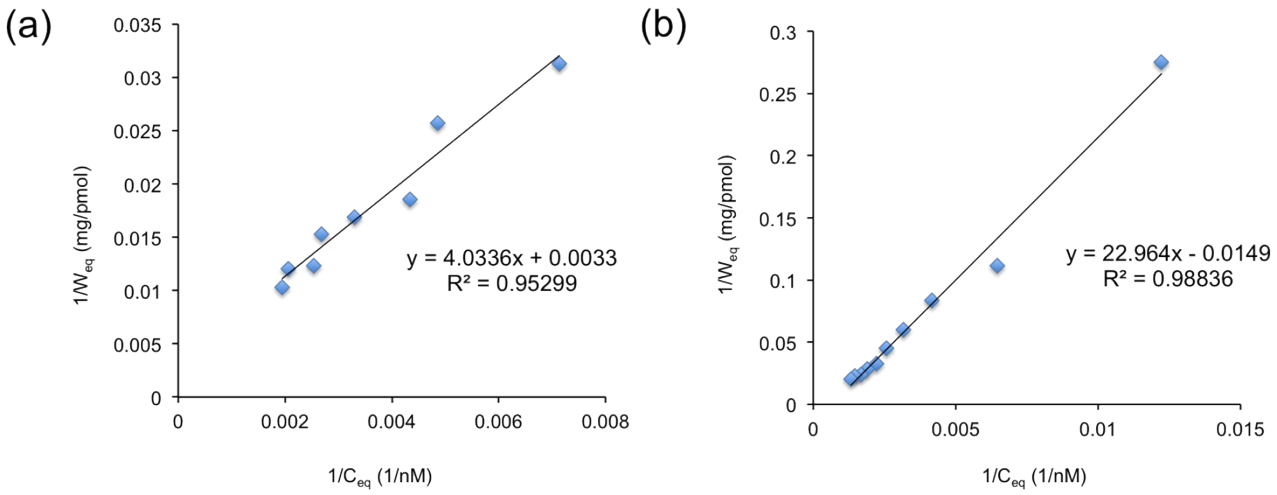

Fig. S2 Langmuir plots of the adsorption isotherm for binding of $PeryBP_{b1}$ (a) and of $PeryBP_{b1}$-fused DsRed-Monomer (b) to perylene crystals. The K_d values were calculated from Langmuir plots with Langmuir adsorption isotherm equation (Eq. 1).

$$\frac{1}{W_{eq}} = \frac{K_d}{W_s}\frac{1}{C_{eq}} + \frac{1}{W_s} \qquad \text{(Eq. 1)}$$

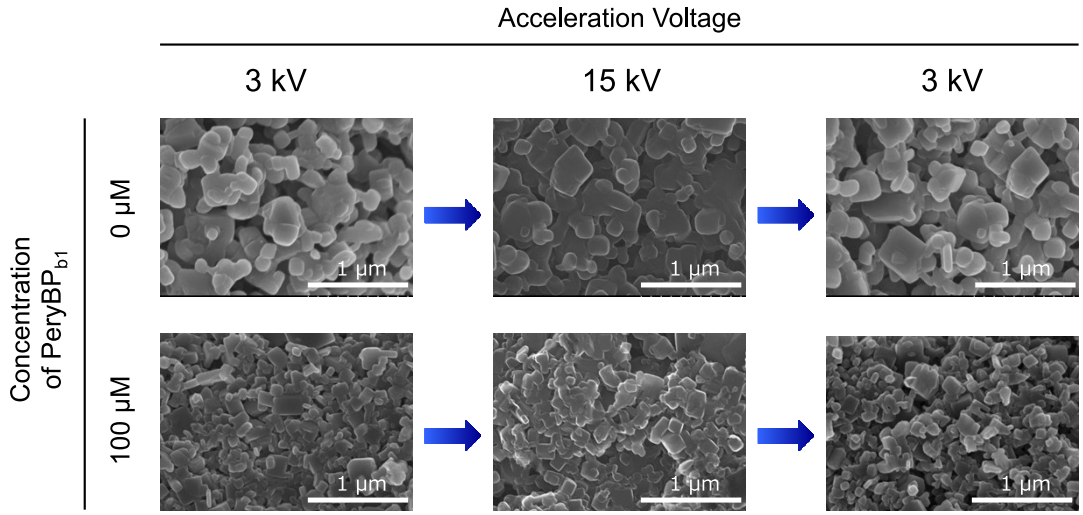

Fig. S3 Effect of acceleration voltage for perylene crystals. We evaluated the effect of electron beam for perylene crystals. First, we measured SEM images with the acceleration voltages of 3 kV, and then the same crystals were measured with that of 15 kV. Finally, the same crystals were measured again with that of 3 kV.

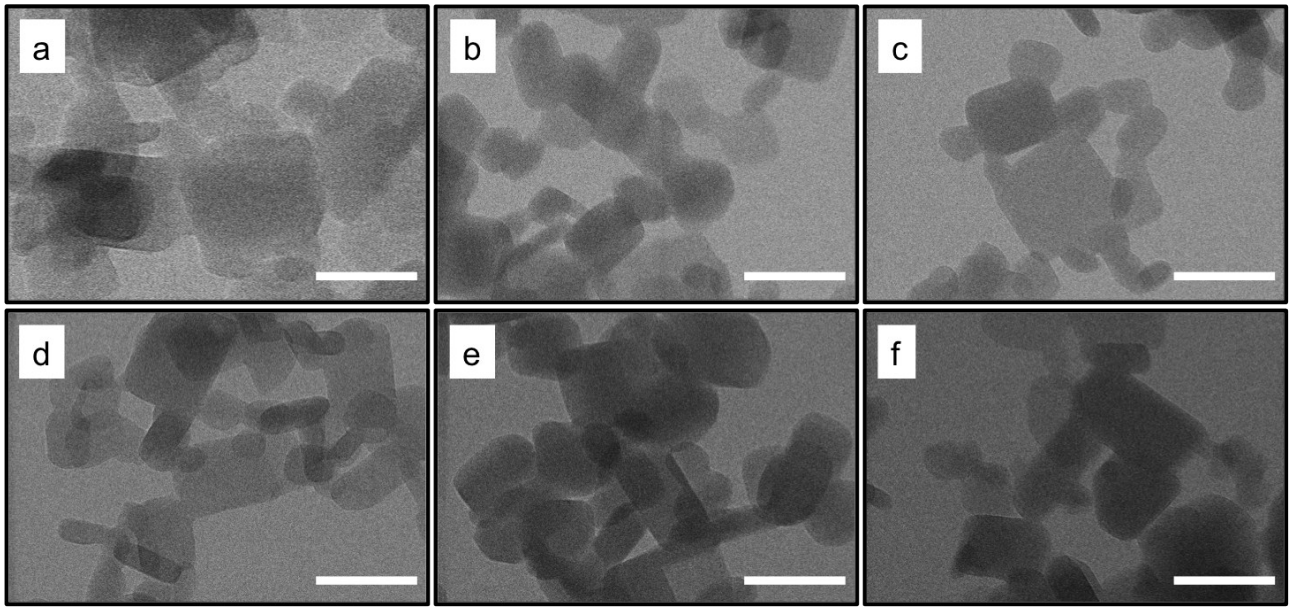

Fig. S4 TEM images of the perylene crystals. Each particle was formed at the $PeryBP_{b1}$ concentration of 0 μM (a), 5 μM (b), 12.5 μM (c), 25 μM (d), 50 μM (e), and 100 μM (f). The images were measured at acceleration voltages of 80 kV. Scale bars = 150 nm.

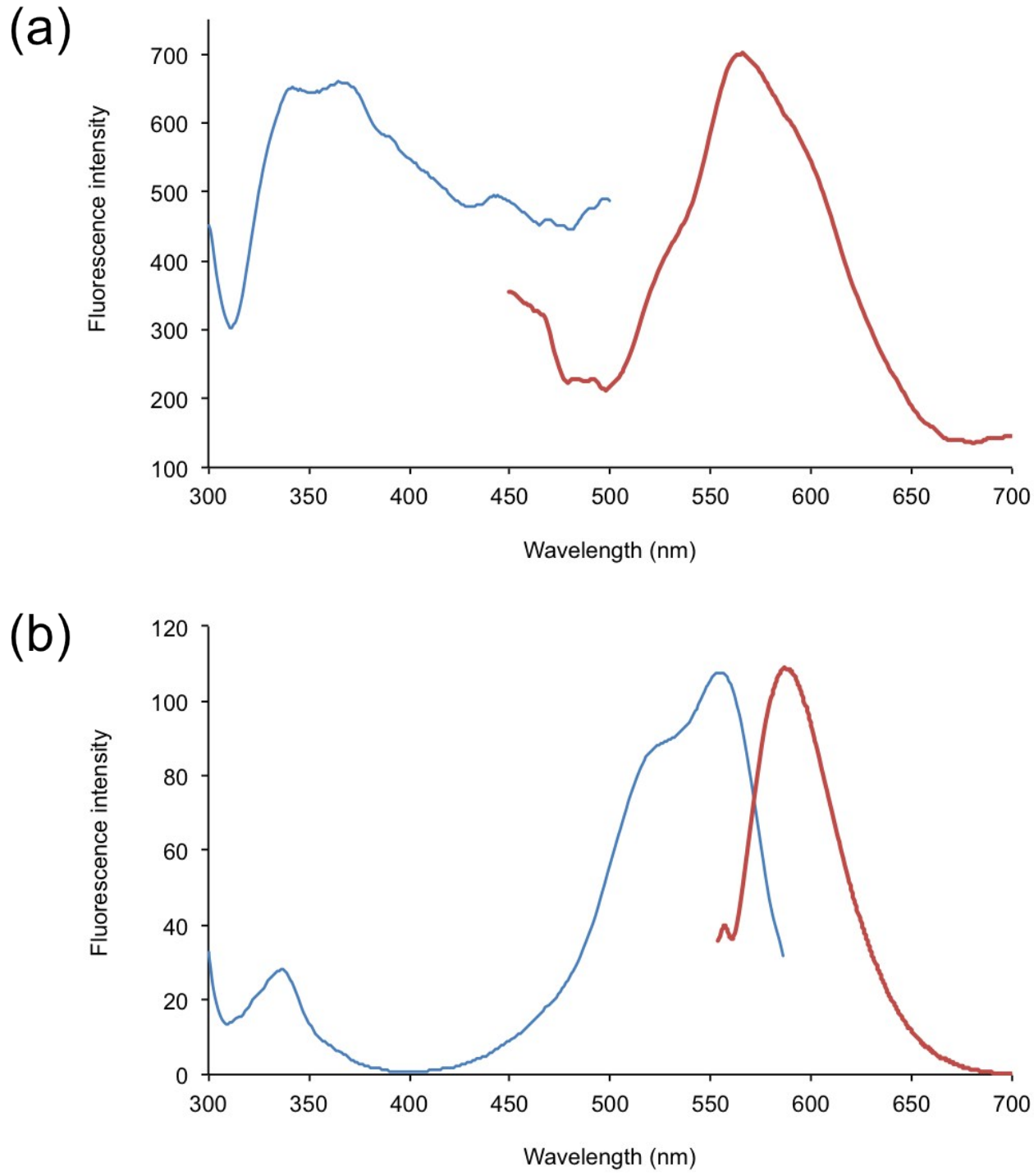

Fig. S5 Fluorescence spectra of perylene crystals (a) and DsRed-Monomer (b). Excitation spectra are shown with blue lines, and emission spectra with red lines. Perylene crystals and DsRed-Monomer were excited at 365 and 556 nm, respectively.

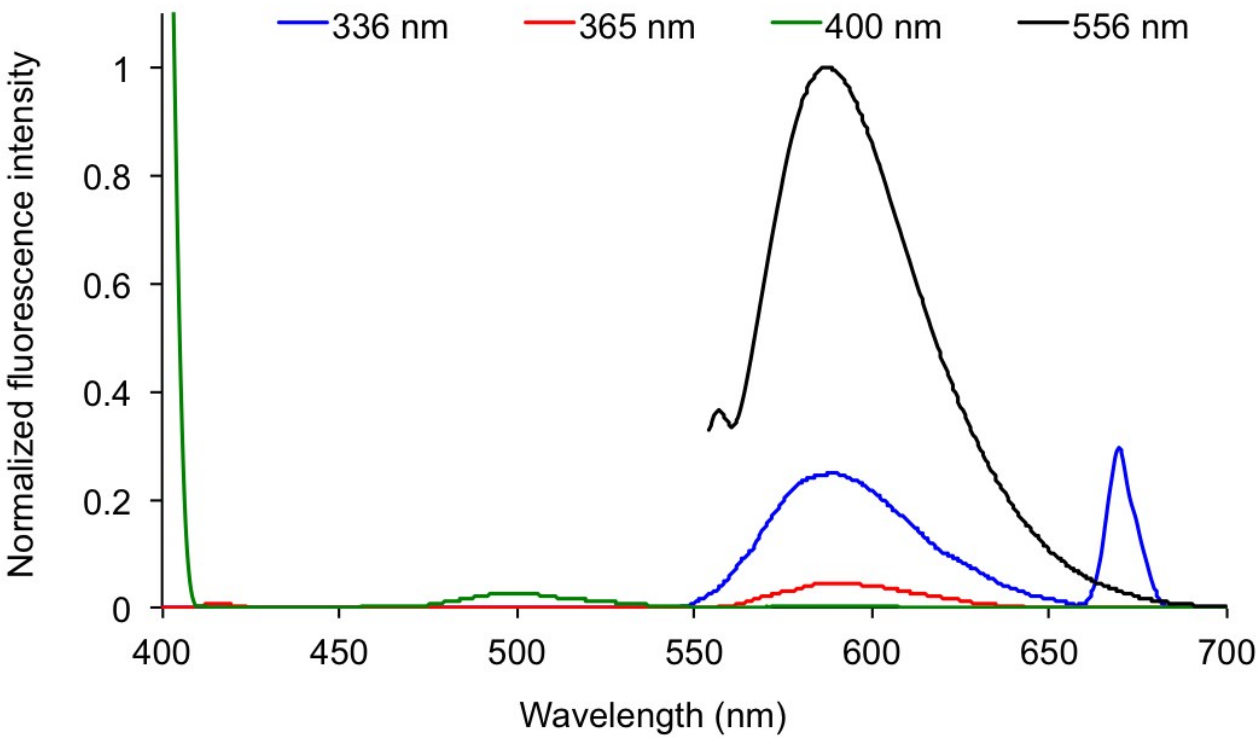

Fig. S6 Emission spectra of DsRed-Monomer at excitation wavelengths of 336 nm (blue), 365 nm (red), 400 nm (green), and 556 nm (black).

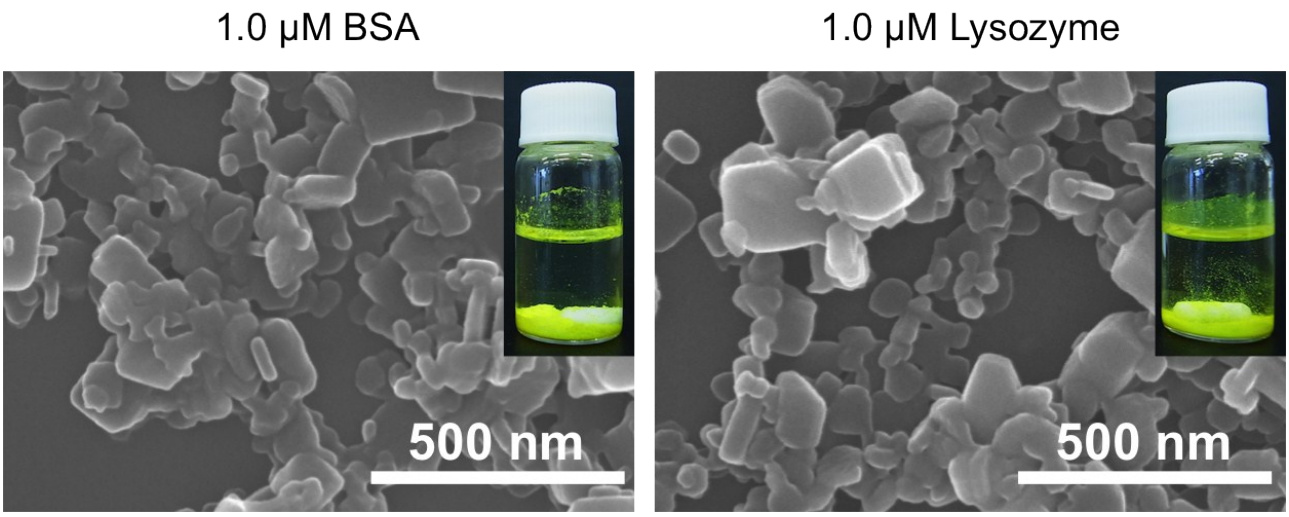

Fig. S7 SEM images of the perylene crystals prepared by reprecipitation method with 1.0 μM bovine serum albumin (BSA) and 1.0 μM lysozyme. Insets: optical image of the perylene crystal solutions with BSA or lysozyme, respectively.