Supporting Information

Responsive hybrid block co-polymer conjugates of proteins – controlled architecture to modulate substrate specificity and solution behaviour.


Figure S1: PGSE NMR showing temperature dependence of the hydrodynamic radii for trypsin (triangles), precursor (squares) and hybrid I (circles) (left panel) and hybrid II (right panel) in D$_2$O.
Figure S2: SANS graphs for (PEGMA-EE-246)$_{85}$-stat-PEGMA-ME-475)$_{15}$ (Co-Polymer 1) (top row) and [(PEGMA-EE-246)$_{85}$-stat-PEGMA-ME-475)$_{15}$]-graft-(PEGMA-ME-475)$_{50}$ (Co-Polymer 2) (bottom row). Left column D2O. Right column 0.3 M Na$_2$SO$_4$. Blue trace 20°C, Green trace 35°C and Red trace 50°C.
Figure S3: SANS graphs for Hybrid I (top row) and Hybrid II (bottom row) in D2O (left column) and PBS (right column) at stated temperatures.
Figure S4 – BCA calibration curve made from bovine serum albumin standards.

Absorbance of solution A: 0.5847, Protein concentration in sample = 0.444 mg/mL.
Percentage of protein in A = 14.82 %.

Absorbance of solution B: 0.5847, Protein concentration in sample = 0.274 mg/mL.
Percentage of protein in B = 9.14 %.

Figure S5 – MALDI TOF (Matrix-assisted laser desorption/ionization – time of flight)

Native trypsin (Blue trace). ATRP initiator functionalised trypsin (Red trace).
M<sub>r</sub> molecular weight difference = 2460 Da. 5.12 initiators per trypsin molecule on average (Range 3-8).
Figure S6 – Selected AFM topography images of Hybrid I and Hybrid II. The system was heated to 30°C (top panel), then to 40°C (middle panel) before being cooled to 30°C (bottom panel). Scale bars are 100 nm. Vertical scale is 8 nm for Hybrid I at 40°C and 2 nm for the other images.

Dynamic light scattering (DLS)

Figure S7 - DLS analysis of Hybrid I in PBS a) PBS buffer at 25°C (below LCST) – Intensity model. b) PBS buffer at 25°C (below LCST) – number model. c) PBS buffer at 40°C (above LCST) – Intensity model. d) PBS buffer at 40°C (above LCST) – number model.
Figure S8 - DLS analysis of Hybrid I in Tris a) Tris buffer at 25°C (below LCST) – Intensity model. b) Tris buffer at 25°C (below LCST) – number model. c) Tris buffer at 40°C (above LCST) – Intensity model. d) Tris buffer at 40°C (above LCST) – number model.

Figure S9 - DLS analysis of Hybrid II in PBS a) PBS buffer at 25°C (below LCST) – Intensity model. b) PBS buffer at 25°C (below LCST) – number model. c) PBS buffer at 40°C (above LCST) – Intensity model. d) PBS buffer at 40°C (above LCST) – number model.
Figure S10- DLS analysis of Hybrid II in Tris a) Tris buffer at 25°C (below LCST) – Intensity model. b) Tris buffer at 25°C (below LCST) – number model. c) Tris buffer at 40°C (above LCST) – Intensity model. d) Tris buffer at 40°C (above LCST) – number model.