Electronic Supplementary Information

Enzyme switch by complementary polymer pair system (CPPS)

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The lack of an effect of the identically charged polymers and the monomers of charged polymers

The enzyme activity of RNase A, lysozyme, cellulase, and α-amylase was fully maintained in the presence of the identically charged polymers and the monomers of charged polymers (Fig. S1). The monomers of charged polymers also have no effect on recovery of the activity of these enzymes (Fig. S2).

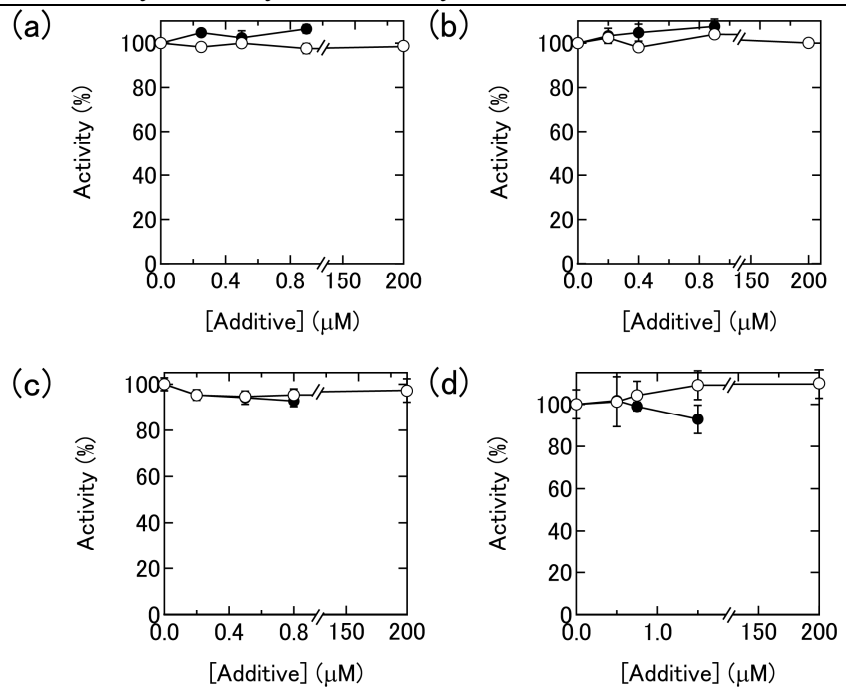

Fig.S1 The effect of the identically charged polymers and the monomers of charged polymers on enzyme activity. The enzyme activity of 2.0 μM RNase A (a), lysozyme (b), cellulase (c), and α-amylase (d) in the presence of the identically charged polymers and the monomers of charged polymers were measured. PAA, closed circles; ProAc, open circles (a, b). PAAc, closed circles; ProAm, open circles (c, d).

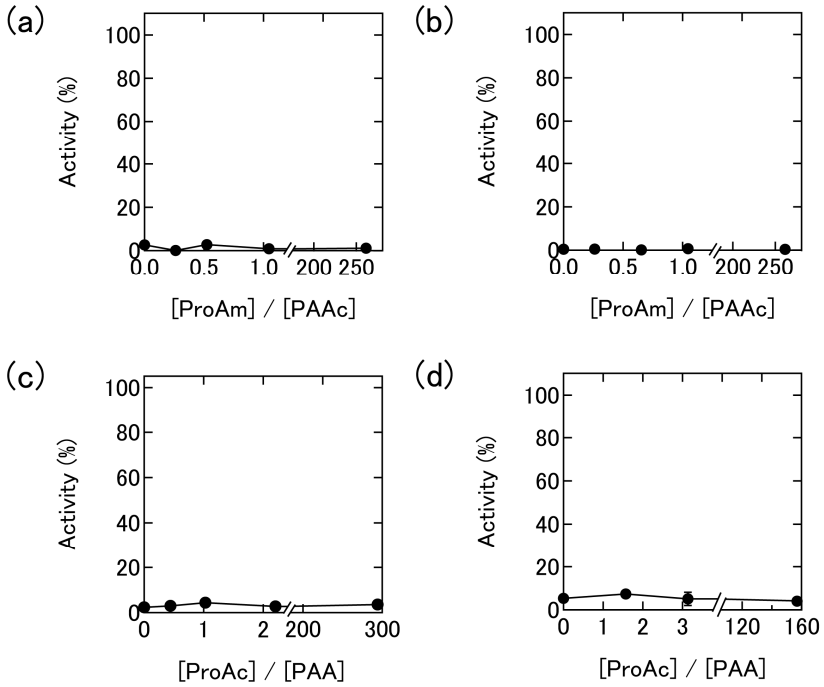

Fig.S2 The effect of the monomers of charged polymers on recovery of enzyme activity. Various concentrations of ProAm (a, b) and ProAc (c, d) were added to solutions containing 2.0 μM RNase A and 0.9 μM PAAc (a), 2.0 μM lysozyme and 0.9 μM PAAc (b), 2.0 μM cellulase and 0.8 μM PAA (c), 2.0 μM α-amylase and 1.5 μM PAA (d) after incubated for 2 h.

The retention of secondary structure of RNase A and lysozyme in the process of inactivation and recovery

The far-UV CD spectrum of inactivated RNase A and lysozyme was insignificantly changed, and the CD feature became essentially same when the enzyme was recovered by PAA, indicating that the secondary structure of RNase A and lysozyme was retained after inactivation and recovery by polymers (Fig. S3).

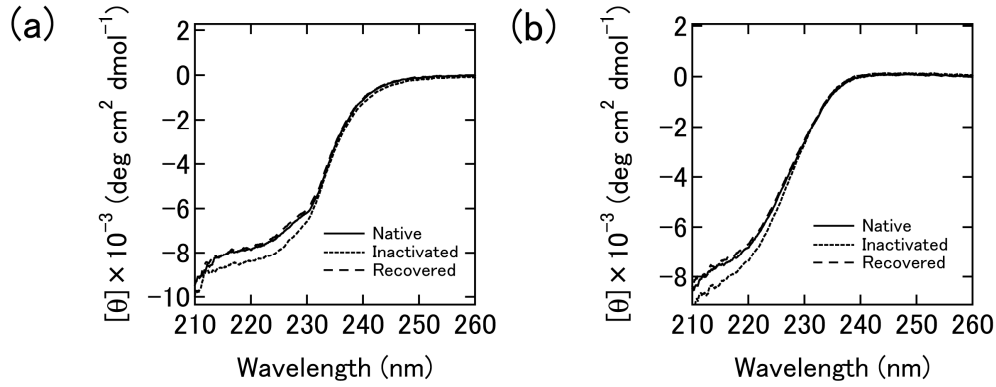

Fig.S3. CD spectra of RNase A and lysozyme in the processes of inactivation and recovery. 2.0 μM RNase A (a) and lysozyme (b) were inactivated by 0.9 μM PAAc, and then recovered by 0.8 μM PAA. Native enzyme, solid line; inactivated enzyme, dotted line; recovered enzyme, broken line.