Supporting Information

Time-Dependent Enzyme Activity Dominated by Dissociation of J-Aggregates Bound to Protein Surface

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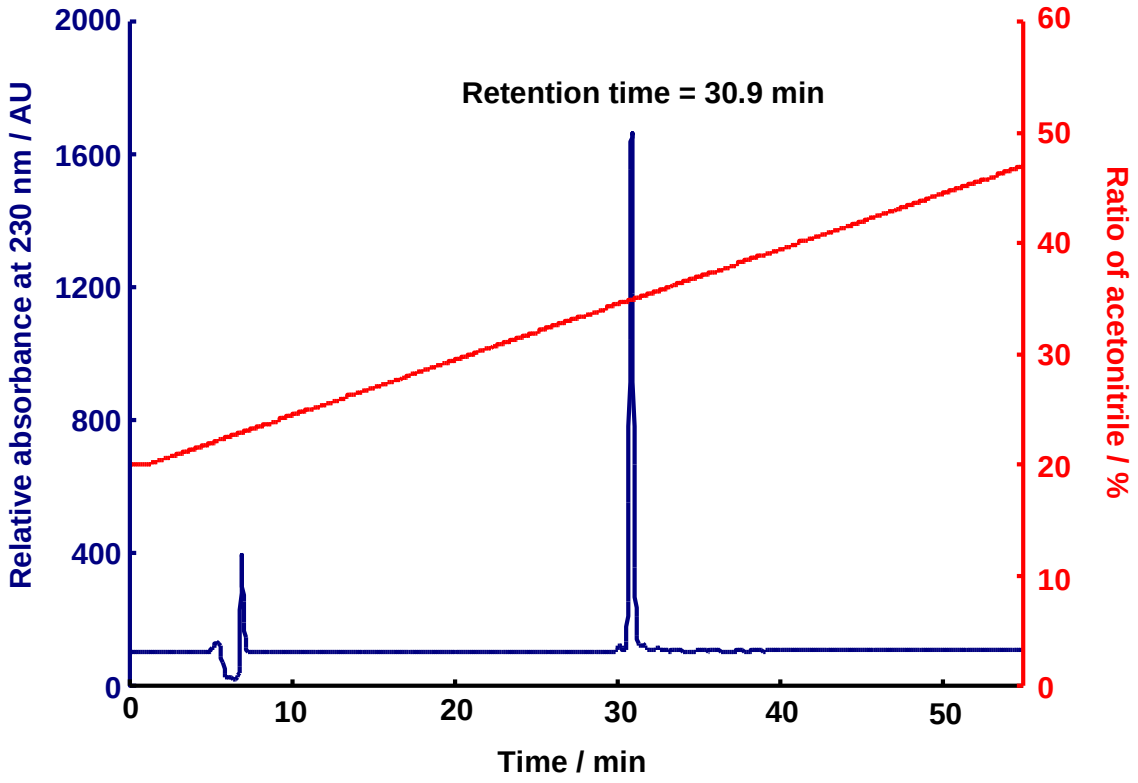

Figure S1. FPLC profile of SPNA3G3E recorded at 230 nm. Red solid line represents the ratio of acetonitrile in the eluent (acetonitrile/water containing 0.1 v/v% TFA). A COSMOSIL 5C18-AR-II (4.6 mm x 250 mm) column (Nacalai Tesque, Kyoto Japan) was used for the analysis. Flow rate of the eluent was 0.5 mL/min.

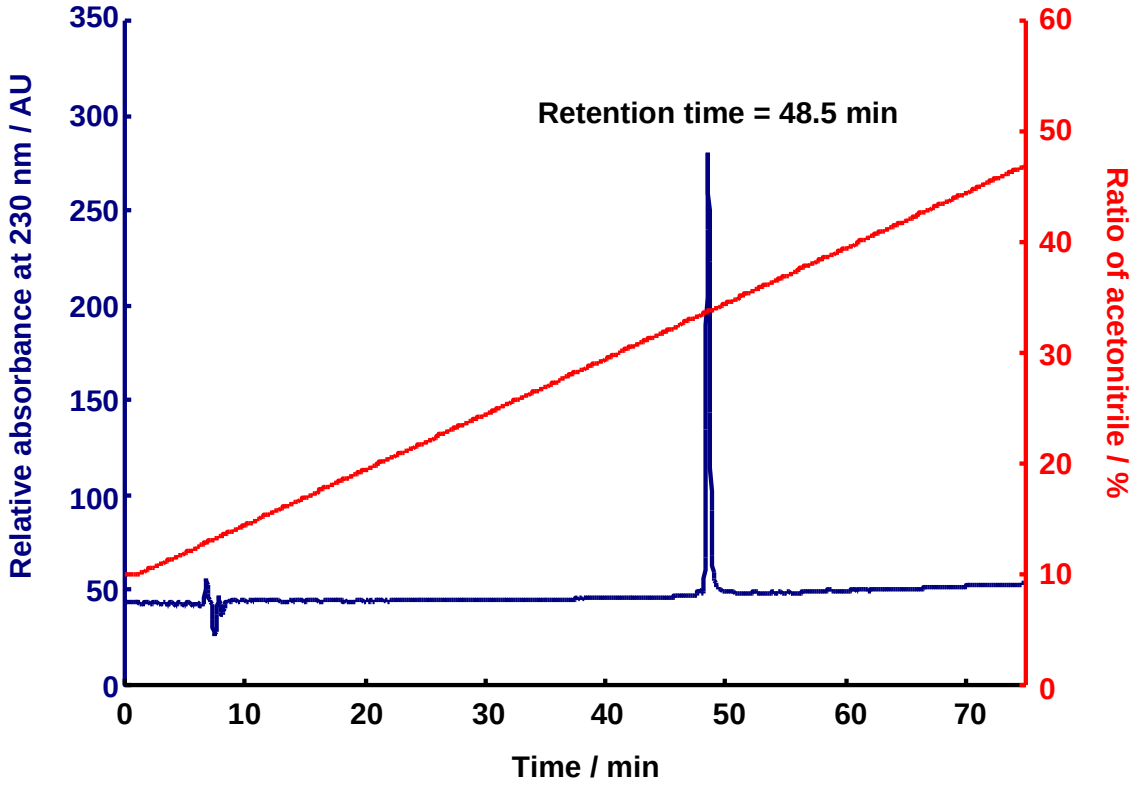

Figure S2. FPLC profile of SPNA3G3S recorded at 230 nm. Red solid line represents the ratio of acetonitrile in the eluent (acetonitrile/water containing 0.1 v/v% TFA). A COSMOSIL 5C18-AR-II (4.6 mm x 250 mm) column (Nacalai Tesque, Kyoto Japan) was used for the analysis. Flow rate of the eluent was 0.5 mL/min.

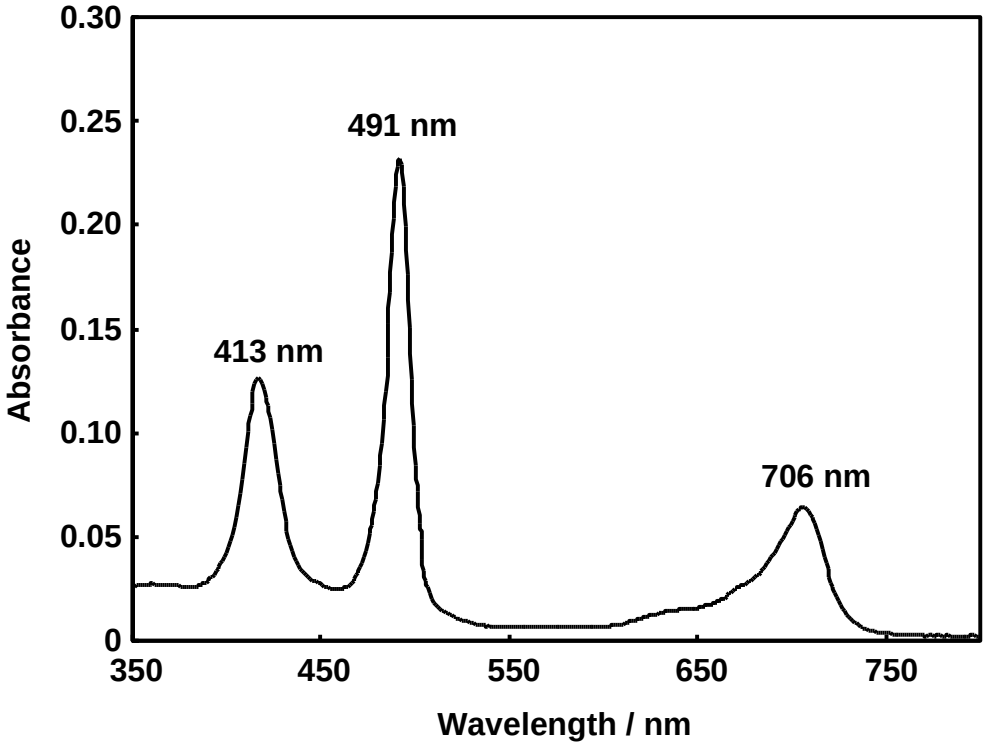

Figure S3. UV-visible spectrum of a sample prepared by injecting a stock solution of J-aggregates of H_4TPPS^{2-} (2.0 μL, 2.0 x 10^{-3} M) into 4 mL of phosphate buffer (pH 7.0, 1.0 x 10^{-2} M) containing ChT (1.0 x 10^{-4} M) at 25 ^{o}C. The total concentration of the porphyrin in the system was 1.0 x 10^{-6} M.

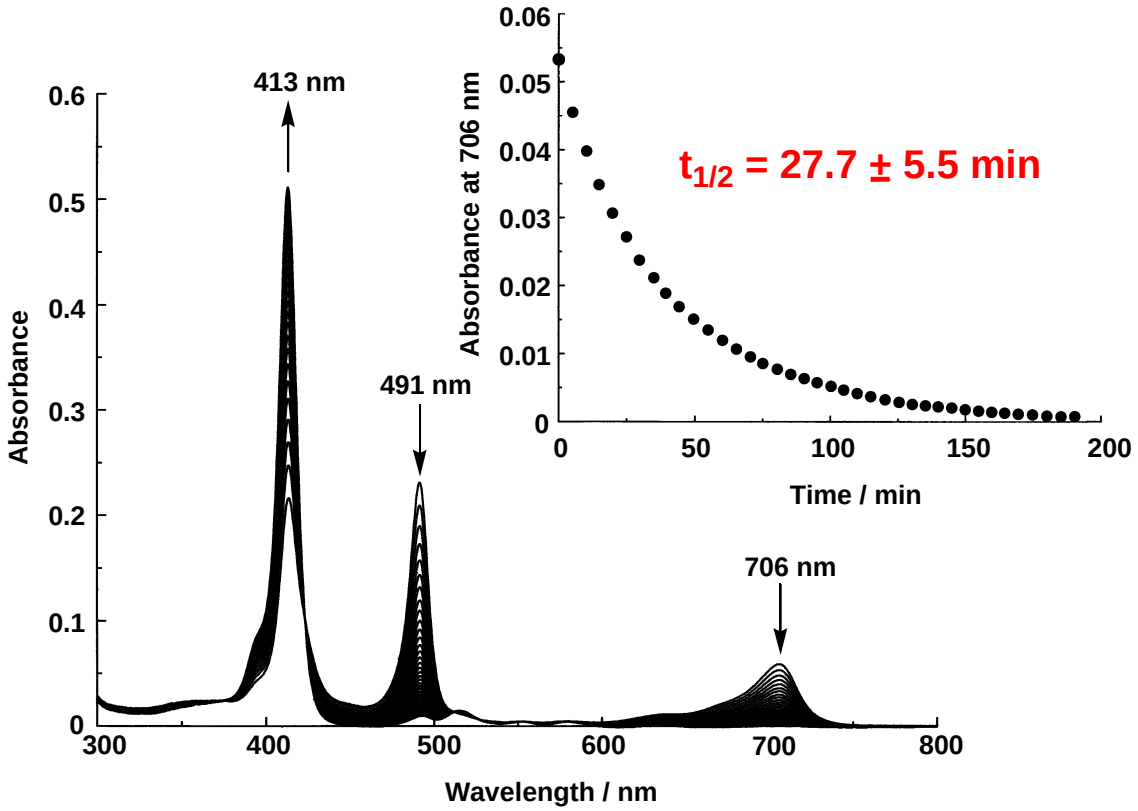

Figure S4. Progressive absorption spectral change for decomposition of J-aggregates of H_4TPPS^{2-} bound to ChT (1.0 x 10^{-6} M) into the monomers of H_2TPPS^{4-} in phosphate buffer (pH 7.0, 1.0 x 10^{-2} M) at 25 ^{o}C. Inset: Time-course of the absorbance of the J-aggregates at 706 nm. The total concentration of the porphyrin in the system was 1.0 x 10^{-6} M.

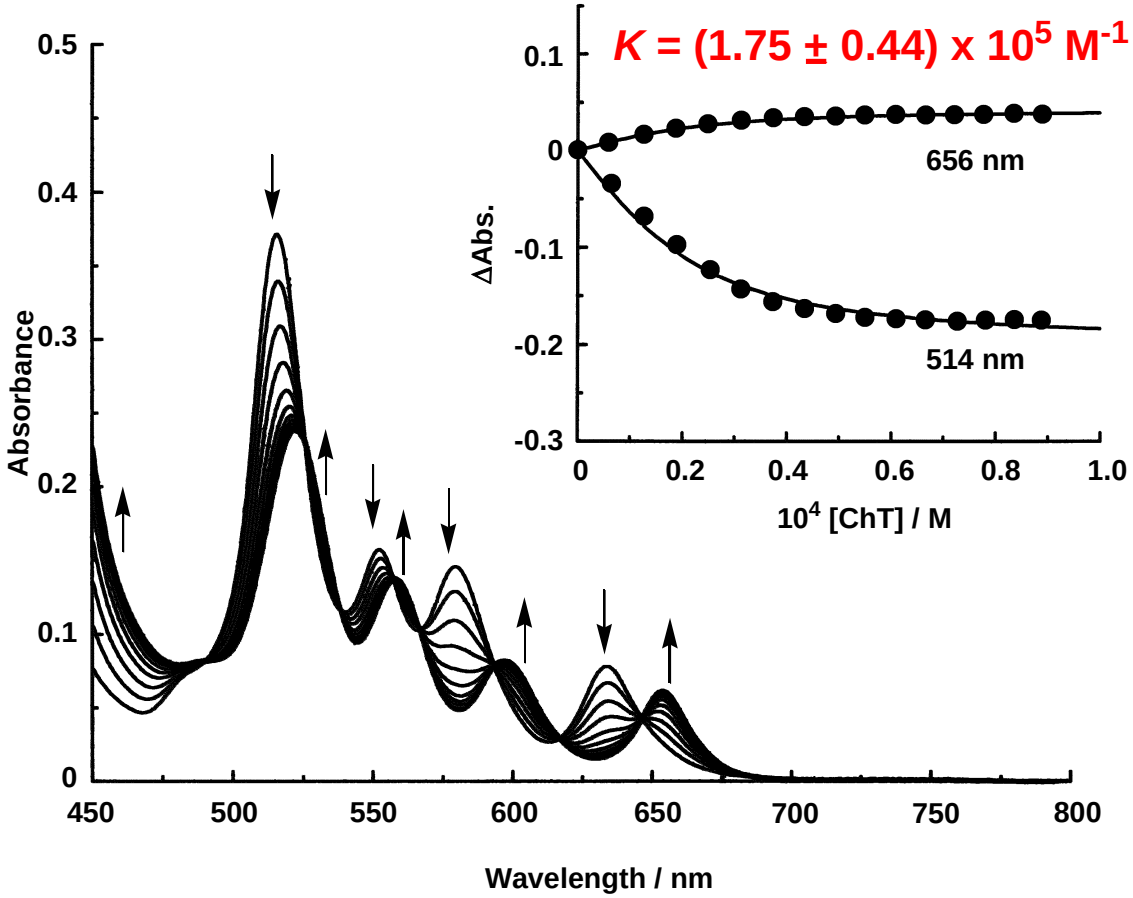

Figure S5. UV-visible spectral change of H_2TPPS^{4-} (2.0×10^{-5} M) upon addition of ChT in phosphate buffer (pH 7.0, 1.0×10^{-2} M) at 25 ^{o}C. Inset: Plots of absorbance changes as a function of [ChT] at 514 nm and 656 nm. The solid lines represent the best fits of the data to an equation for 1:1 complexation for determining *K* value.

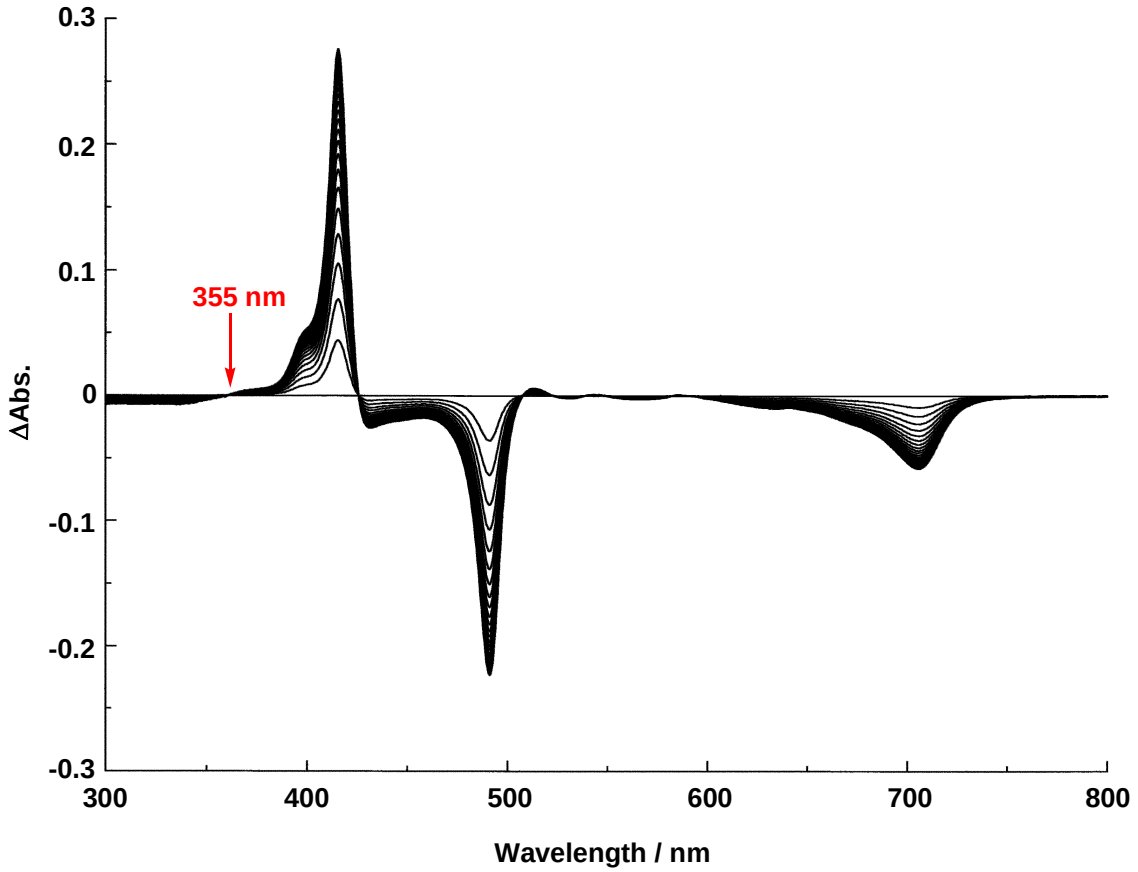

Figure S6. Differential spectral change for decomposition of J-aggregates of H_4TPPS^{2-} bound to ChT (1.0×10^{-6} M) into the H_2TPPS^{4-}/TMe-β-CD inclusion complex in phosphate buffer (pH 7.0 and 1.0×10^{-2} M) containing TMe-β-CD (8.0×10^{-6} M) at 25 ^{o}C. The total concentration of the porphyrin in the system was 1.0×10^{-6} M.

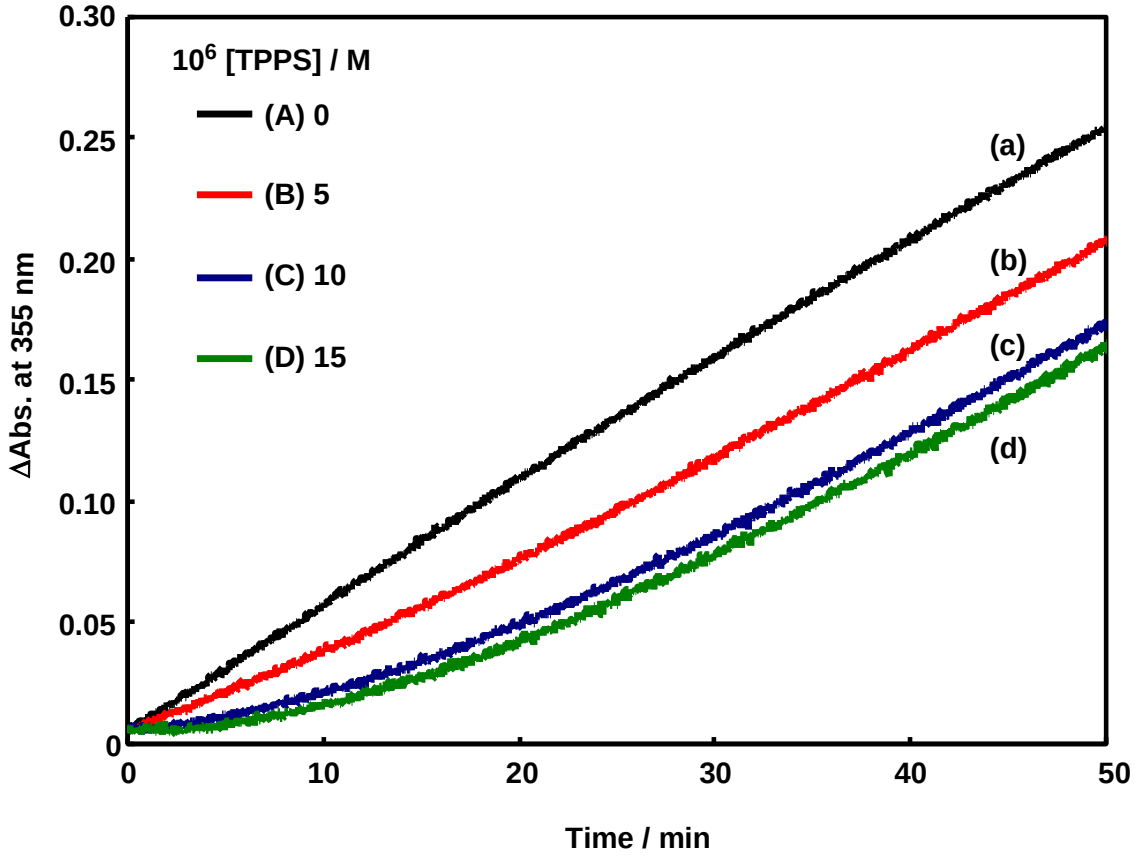

Figure S7. Effects of the amount of J-aggregates on hydrolysis of SPNA3G3E (3.0 x 10^{-4} M) catalyzed by ChT (1.0 x 10^{-6} M) in phosphate buffer (pH 7.0, 1.0 x 10^{-2} M) containing TMe-β-CD (1.2 x 10^{-4} M) at 25 ^{o}C. [TPPS] = 0 M (A); 5.0 x 10^{-6} M (B); 1.0 x 10^{-5} M (C); 1.5 x 10^{-5} M (D.