Table 1S. Characterization of covalent hemin-EAD2 conjugates by mass-spectrometry.

N/N	Conjugate* 5'⟶3'	Mr (calculated)	Mr (experimental)
1	Hemin-T_{15}-EAD2	11075.9	11067.4
2	Hemin-T_{10}-EAD2	9554.9	9548.1
3	Hemin-T_5-EAD2	8033.9	8027.8
4	Hemin-EAD2	6512.9	6507.5
5	EAD2-T_{15}-Hemin	11105.8	11097.3
6	EAD2-T_{10}-Hemin	9584.9	9578.1
7	EAD2-T_5-Hemin	8063.9	8057.8
8	EAD2-Hemin	6542.9	6537.5
9	Hemin-Prd_{10}-EAD2	7893.5	7887.6
10	EAD2-Prd_{10}-Hemin	7893.5	7887.7

*Symbol d in the notation of oligothymidilate spacers is omitted.

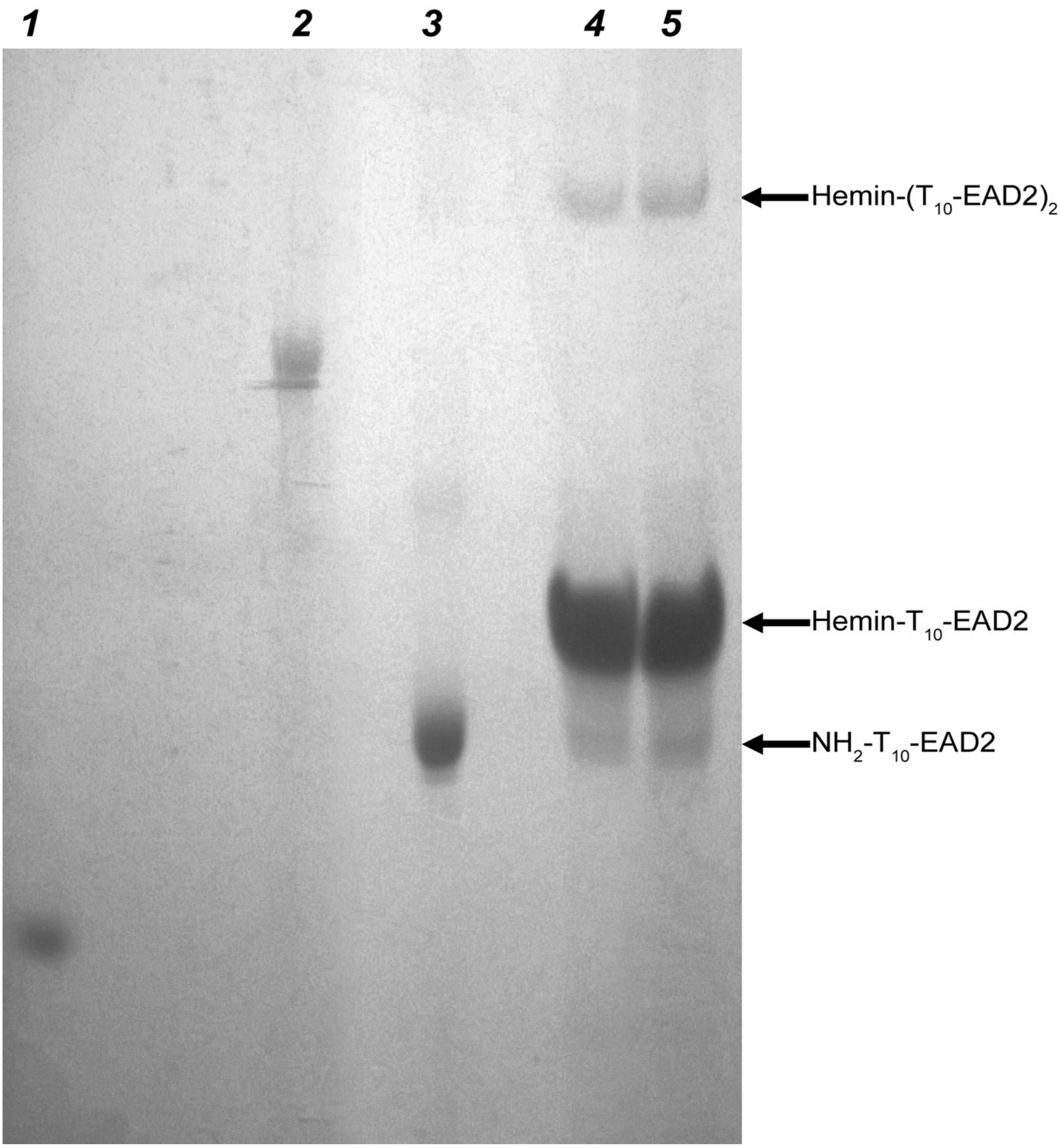

Figure S1. Purification of PMDNAzyme(T_{10}) by gel electrophoresis in 20% PAAG, 7 M urea with UV visualization. Lanes: ***1*** - xylene cyanol marker; ***2*** – random 40-mer DNA as a length control; ***3*** - initial NH_2-T10-EAD2; ***4,5*** - products of hemin conjugation to NH_2-T_{10}-EAD2. Only conjugate hemin-T_{10}-EAD2 was isolated from the gel.

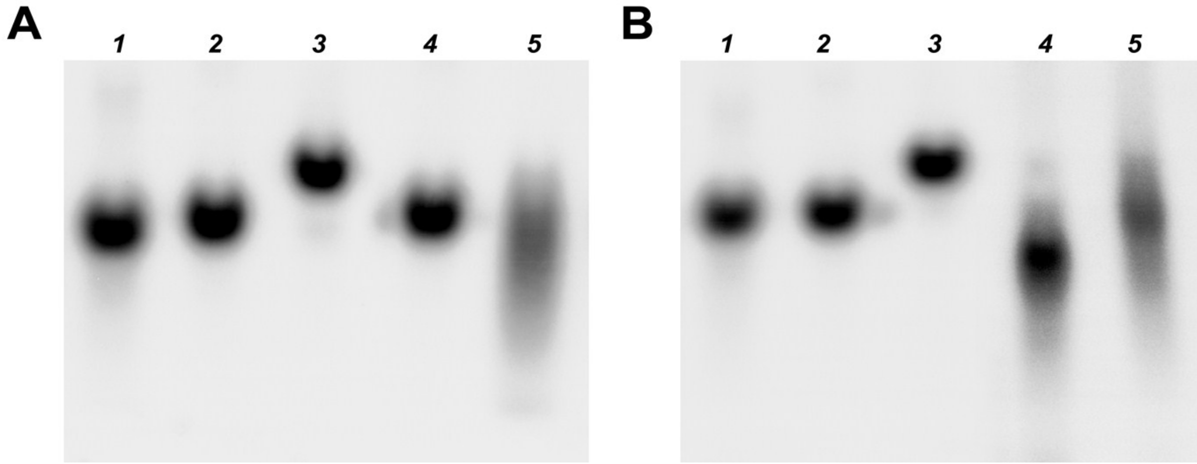

Figure 2S. Analysis of the electrophoretic mobility of EAD2-T_{10}-Hemin and EAD2-T10-NH_2 in the presence of 200 mM CH_3COONa (**A**) or 200 mM CH_3COONa and 20 mM CH_3COOK (**B**). Lanes: ***1*** - control random DNA 25-mer, ***2*** - 28-mer, ***3*** - 35-mer, ***4*** - EAD2-dT_{10}-NH_2, ***5*** - EAD2-dT_{10}-Hemin. All oligonucleotides were 5'-end ^{32}P-labelled. A blurred band in the lane 5 (A) may result from a partial destruction of the quadruplex structure under nonequilibrium electrophoresis conditions. Electrophoresis was performed in 20% acrylamide native gels at 4◦C in 100 mM TBE (Tris⁄boric acid⁄EDTA) buffer, pH 8.0.

Optimization of experimental conditions for chemiluminescent determination of PMDNAzyme(T_{10}) measured towards luminol.

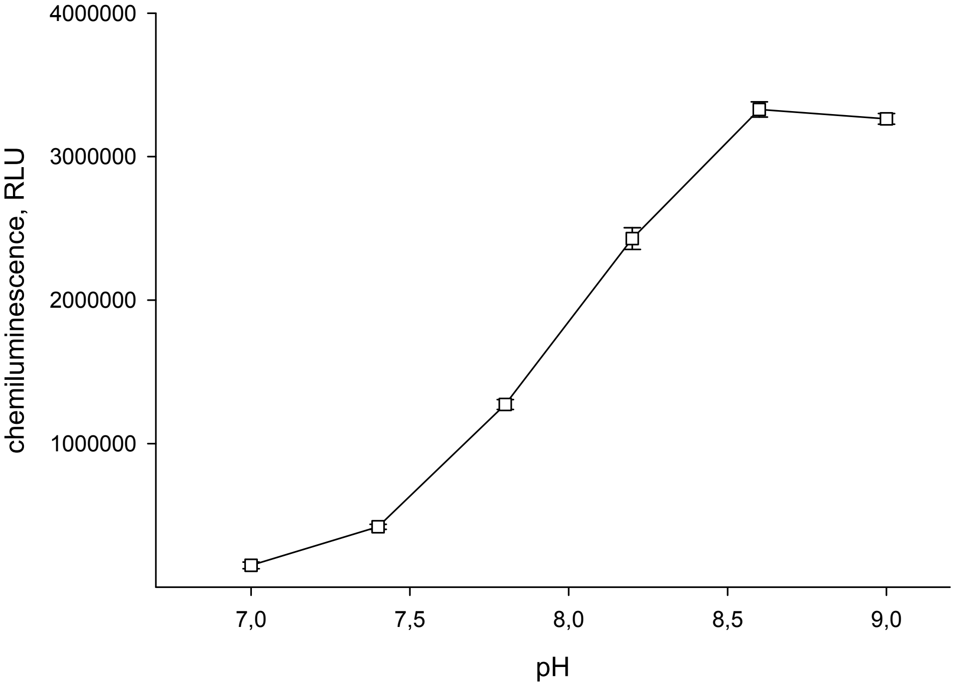

Figure S3. pH-Dependence of activity of PMDNAzyme(T_{10}) measured towards luminol. Experimental conditions: 25 mM Tris buffer with 20 mM KCl, 200 mM NaCl, and 0.1% Triton X100; [H_2O_2] = 1.3 mM; [luminol] = 5μM; [PMDNAzyme(T_{10})] = 6 x 10^{-8} M.

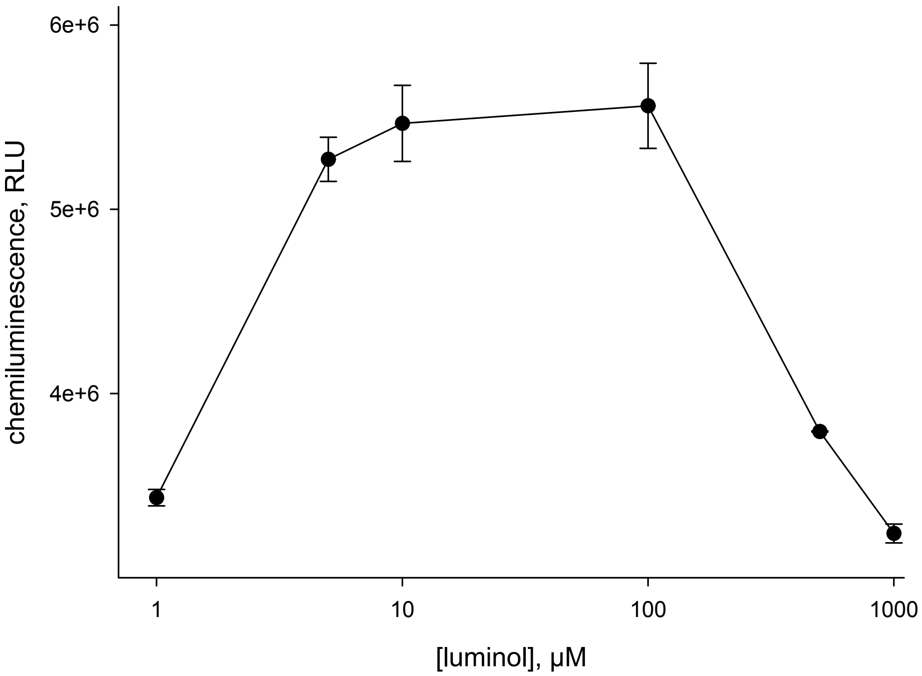

Figure S4. Effect of luminol concentration on chemiluminescence intensity produced upon PMDNAzyme(T_{10}) -catalyzed oxidation of luminol. Experimental conditions: 25 mM Tris buffer, pH 8.6 with 20 mM KCl, 200 mM NaCl, and 0.1% Triton X100; [H_2O_2] = 1.3 mM; [PMDNAzyme(T_{10})] = 6×10^{-8} M.

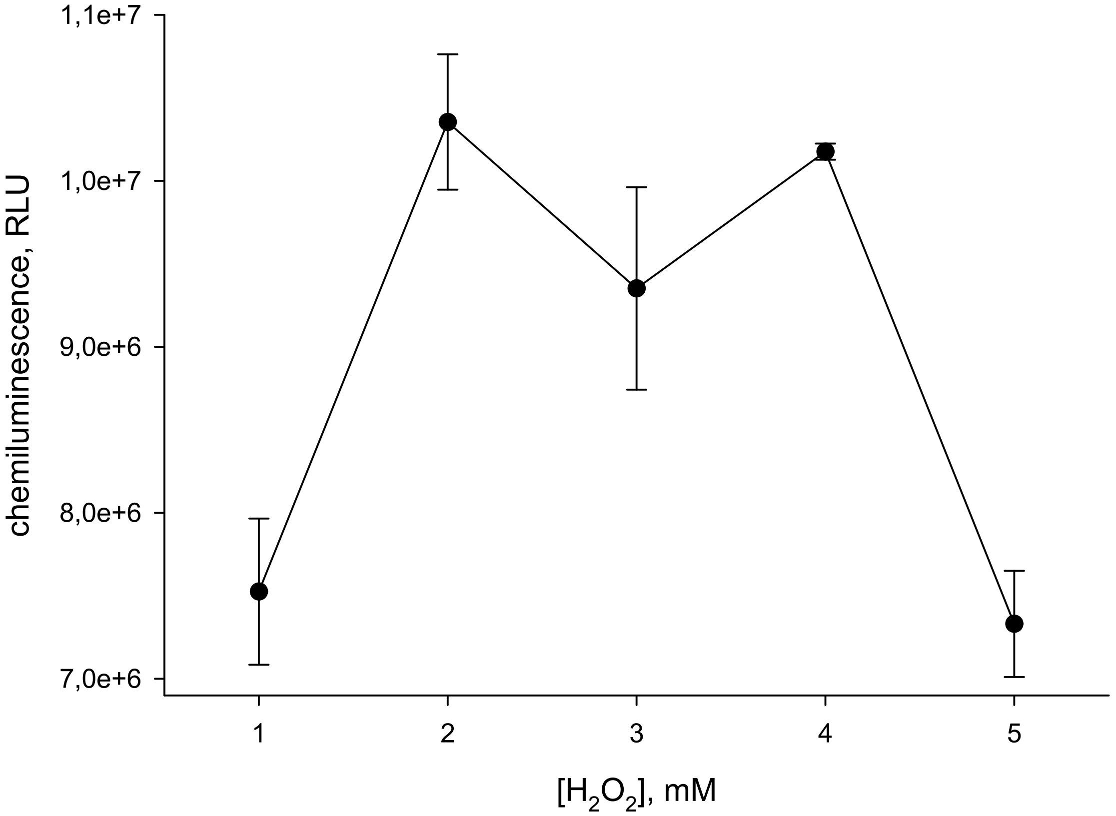

Figure S5. Effect of hydrogen peroxide concentration on chemiluminescence intensity produced upon PMDNAzyme(T_{10})-catalyzed oxidation of luminol. Experimental conditions: 25 mM Tris buffer, pH 8.6 with 20 mM KCl, 200 mM NaCl, and 0.1% Triton X100; [luminol] = 5 μM; [PMDNAzyme(T_{10})] = 4 x 10^{-8} M.

Optimization of experimental conditions for colorimetric determination of PMDNAzyme(T_{10}) measured towards ABTS.

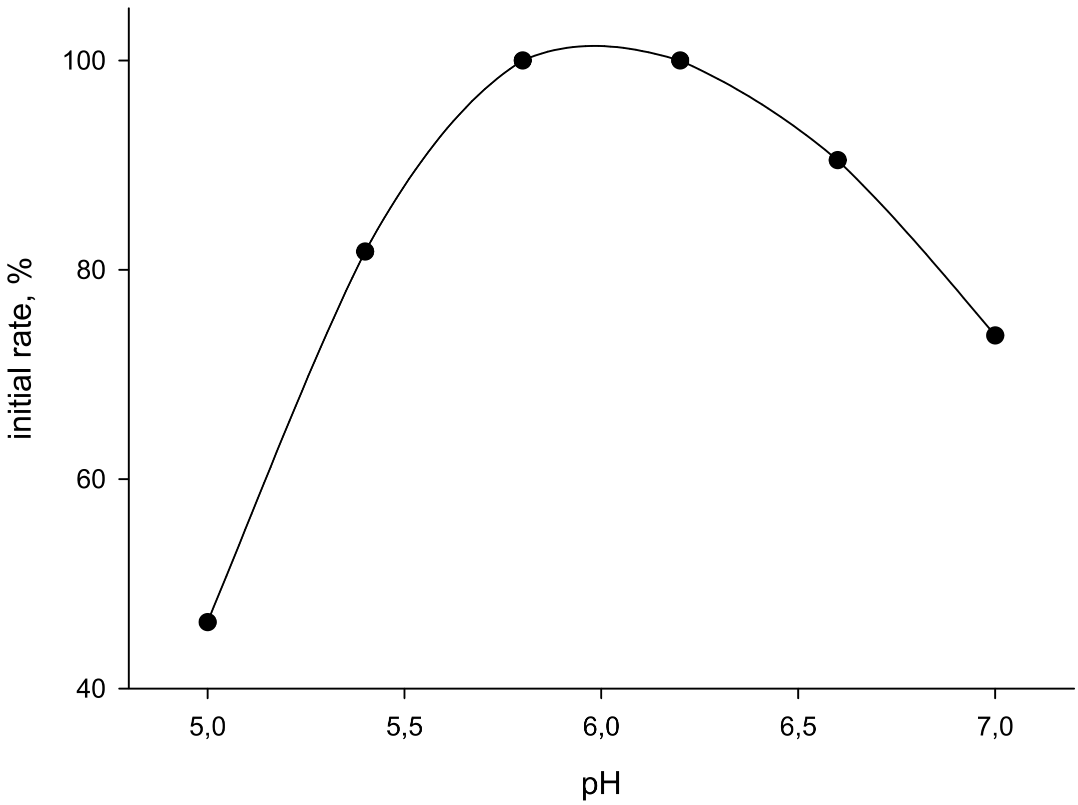

Figure S6. Dependence of initial rate of PMDNAzyme(T_{10})-catalyzed oxidation of ABTS as a function of pH. Experimental conditions: 25 mM citrate-phosphate buffer with 20 mM KCl, 200 mM NaCl, and 0.1% Triton X100; [H_2O_2] = 3 mM; [ABTS] = 3mM; [PMDNAzyme(T_{10})] = 3 x 10^{-8} M.

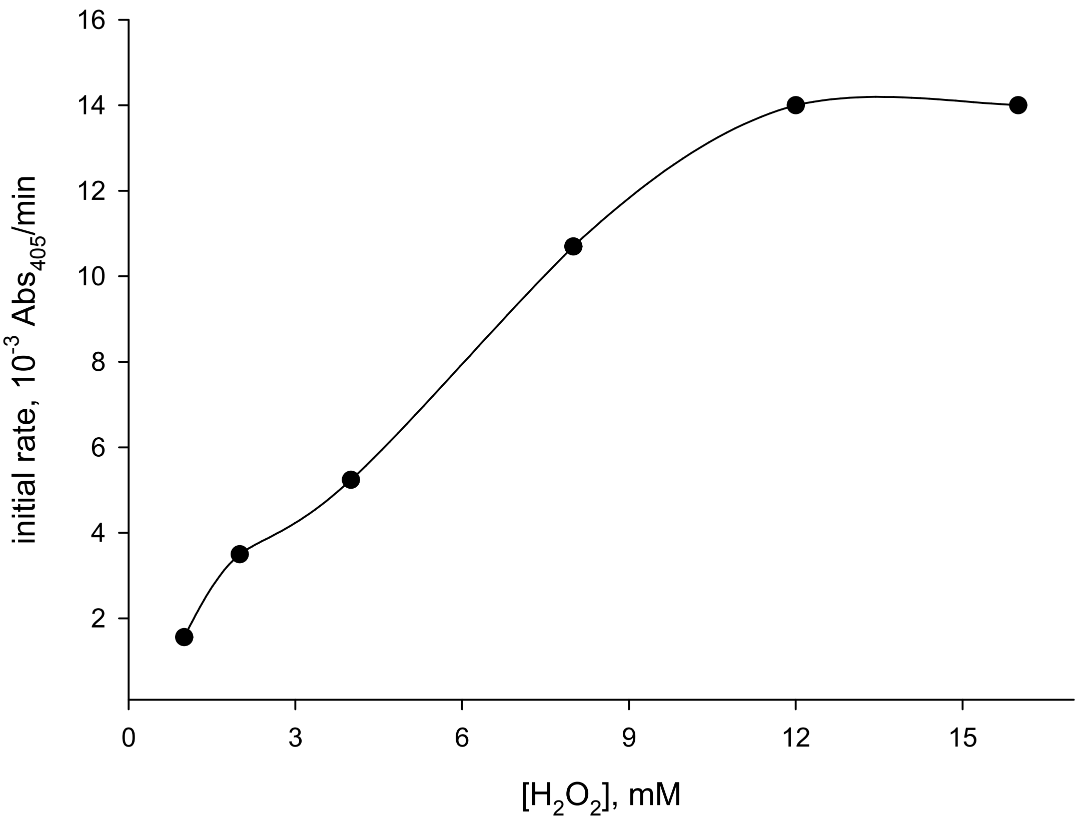

Figure S7. Dependence of initial rate of PMDNAzyme(T_{10})-catalyzed oxidation of ABTS on concentration of hydrogen peroxide. Experimental conditions: 25 mM citrate-phosphate buffer, pH 6.0 with 20 mM KCl, 200 mM NaCl, and 0.1% Triton X100; [ABTS] = 3mM; [PMDNAzyme(T_{10})] = 1×10^{-7} M.

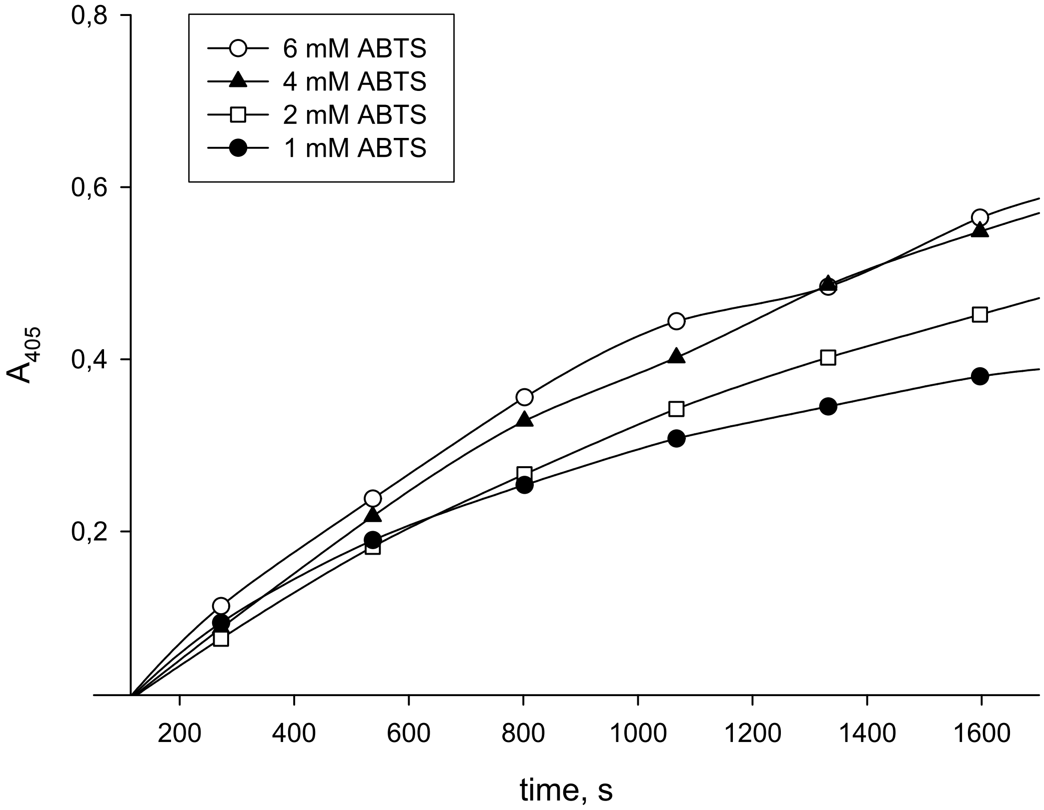

Figure S8. Kinetics of PMDNAzyme(T_{10})-catalyzed oxidation of ABTS in the presence of different ABTS concentration. Experimental conditions: 25 mM citrate-phosphate buffer, pH 6.0 with 20 mM KCl, 200 mM NaCl, and 0.1% Triton X100; [H_2O_2] = 12 mM; [PMDNAzyme(T_{10})] = 1×10^{-7} M.