

Supplementary Materials: Design and investigation of new water-soluble forms of α -tocopherol with antioxidant and antiglycation activity using amphiphilic copolymers of N-vinylpyrrolidone

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Table S1. Concentrations of reagents and conditions for TP encapsulation in CPL1

[CPL1] in IPA/mg mL ⁻¹	[TP] in IPA/mg mL ⁻¹	Volume ratios of solutions copolymer and TP/mL	TP content per CPL1/%	[CPL1] in water buffer/mg mL ⁻¹	[TP]×10 ⁴ in water buffer/M
0.35	0.057	4 : 0	0	0.175	0
		4 : 0.3	1.2		0.1
		4 : 0.6	2.4		0.2
		4 : 1.2	4.8		0.4
		4 : 1.8	7.3		0.6
		4 : 2.4	9.6		0.8

Table S2. Concentrations of reagents and conditions for TP encapsulation in CPL2

[CPL2] in IPA/ mg mL ⁻¹	[TP] in IPA/mg mL ⁻¹	Volume ratios of solutions copolymer and TP/mL	TP content per CPL2/%	[CPL2] in water buffer/mg mL ⁻¹	[TP] ×10 ⁵ in water buffer/M
0.17	0.21	4:0	0	0.085	0
		4:0.05	1.5		0.6
		4:0.1	3.0		1.2
		4:0.15	4.5		1.8
		4:0.2	6.0		2.4
		4:0.25	7.5		3.0
		4:0.3	9.0		3.7

Table S3. Concentrations of reagents and conditions for TP encapsulation in CPL2

[CPL2] in IPA/ mg mL ⁻¹	[TP] in IPA/mg mL ⁻¹	Volume ratios of solutions copolymer and TP/mL	TP content per CPL2/%	[CPL2] in water buffer/mg mL ⁻¹	[TP] ×10 ⁵ in water buffer/M
0.17	0.47	4:0	0	0.085	0
		4:0.05	3.5		1.4
		4:0.1	6.9		2.7
		4:0.15	10.4		4.1
		4:0.2	13.8		5.5

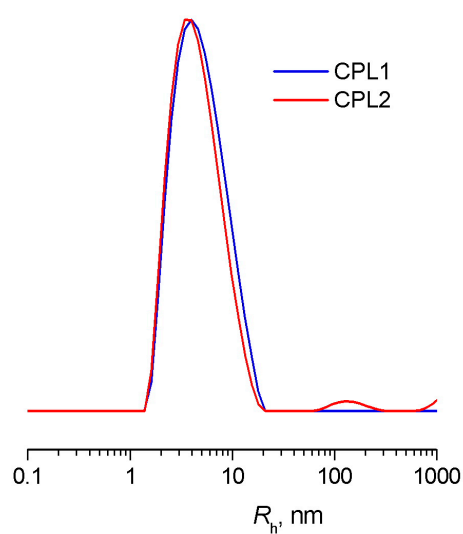


Figure S1. Intensity of light scattering distribution curves by IPA solution of CPL1 and CPL2 at 25 °C. The copolymers concentrations were 7 mg mL⁻¹.

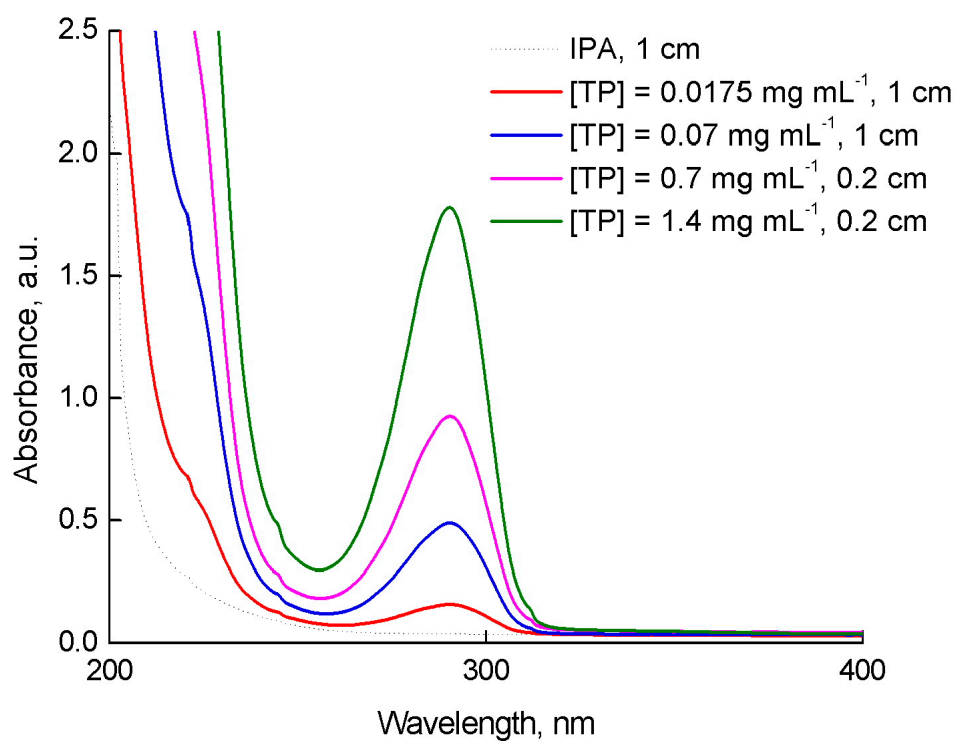


Figure S2. Absorption spectra of TP solutions in IPA. Cuvettes were 0.2 or 1 cm.

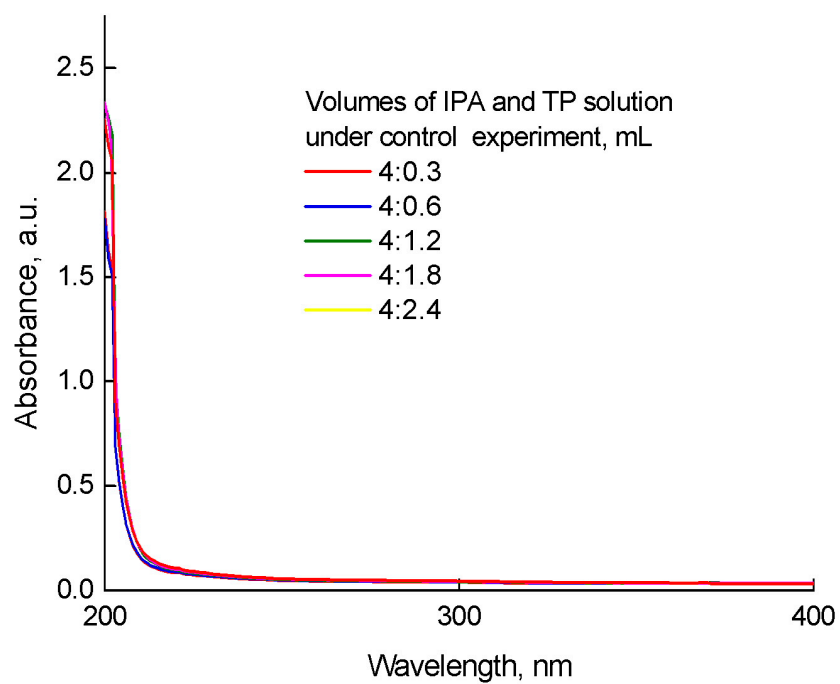


Figure S3. Absorption spectra of aqueous buffer solution in control experiments performed without a copolymer. Cuvette is 1 cm.

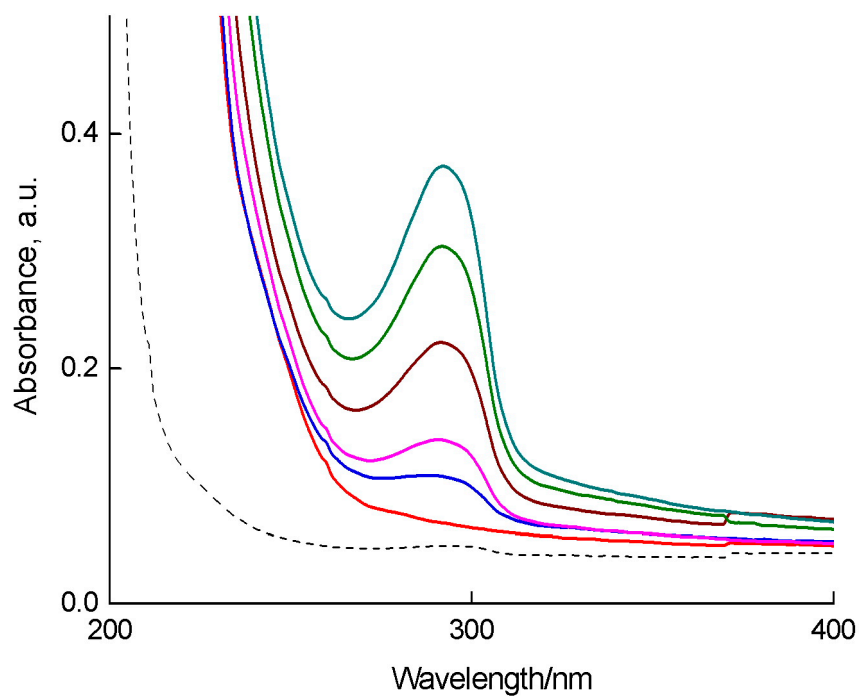
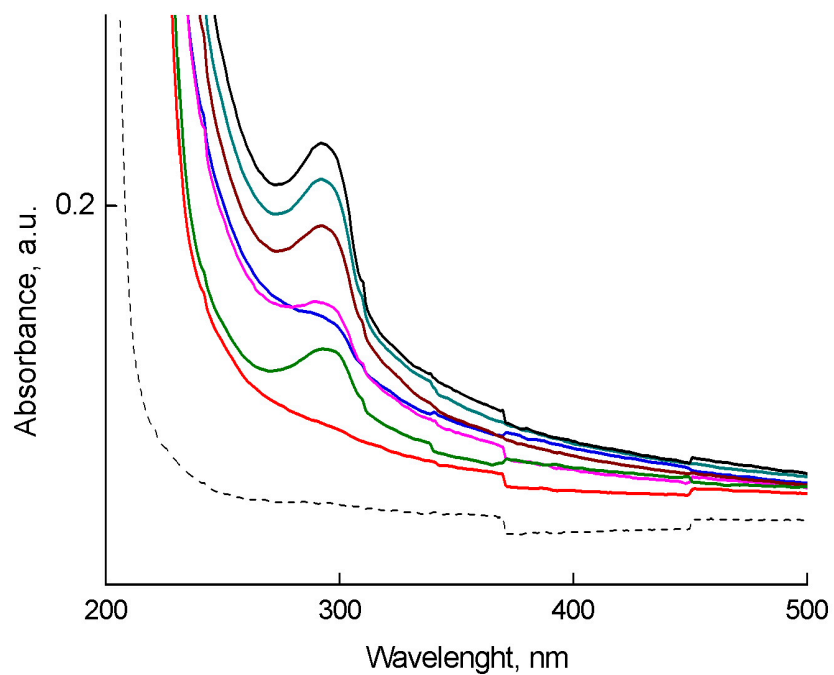
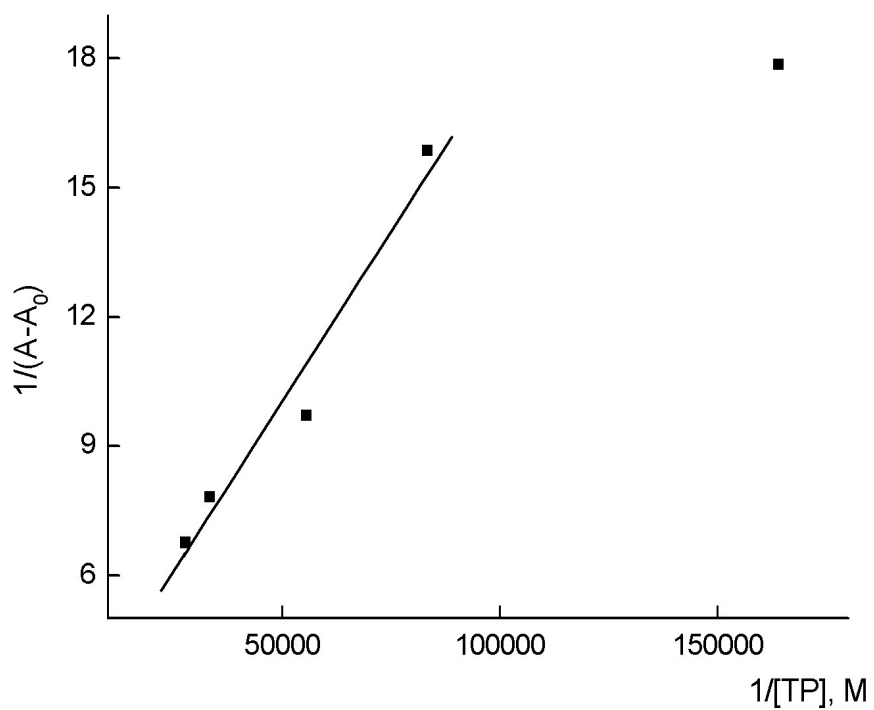


Figure S4. Absorption spectra of CPL1-TP in aqueous buffer solution (pH 7.2-7.4), the curves correspond to the data in Table S1. The spectrum of the water buffer is shown with a dotted line. Cuvette is 1 cm.



(a)



(b)

Figure S5. Absorption spectra (a) of CPL2-TP in aqueous buffer solution (pH 7.2-7.4), cuvette is 1 cm; curves correspond to the data in Table S2 (the spectrum of PBS is shown with a dotted line); and dependence of the optical density of the absorption band of TP on the initial concentration of TP (b) in the coordinates of the Connors equation.

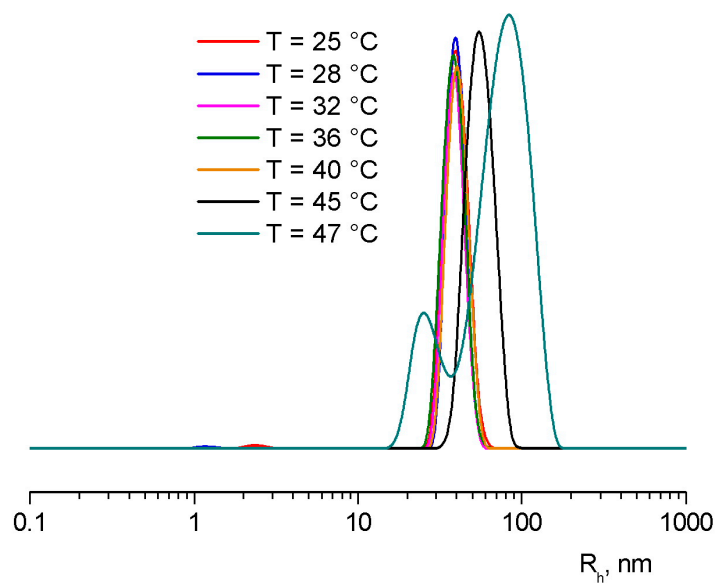
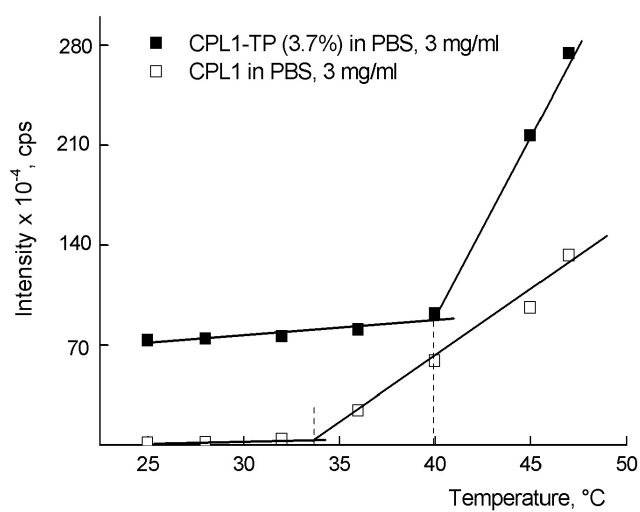
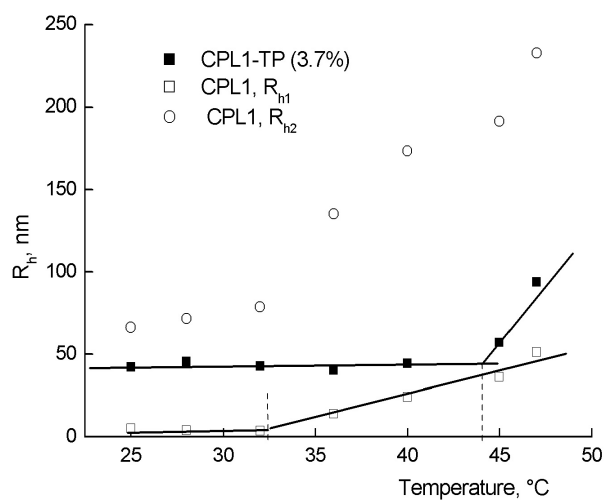


Figure S6. Intensity of light scattering distribution curves of CPL1-TP in PBS over the hydrodynamic radii of scattering centers in the temperature range of 25-47 °C. [CPL1-TP] = 3 mg/mL.



(a)



(b)

Figure S7. Dependencies of the light scattering intensity (a) and hydrodynamic radius (b) of scattering centers of CPL1-TP and the initial CPL1 on temperature.

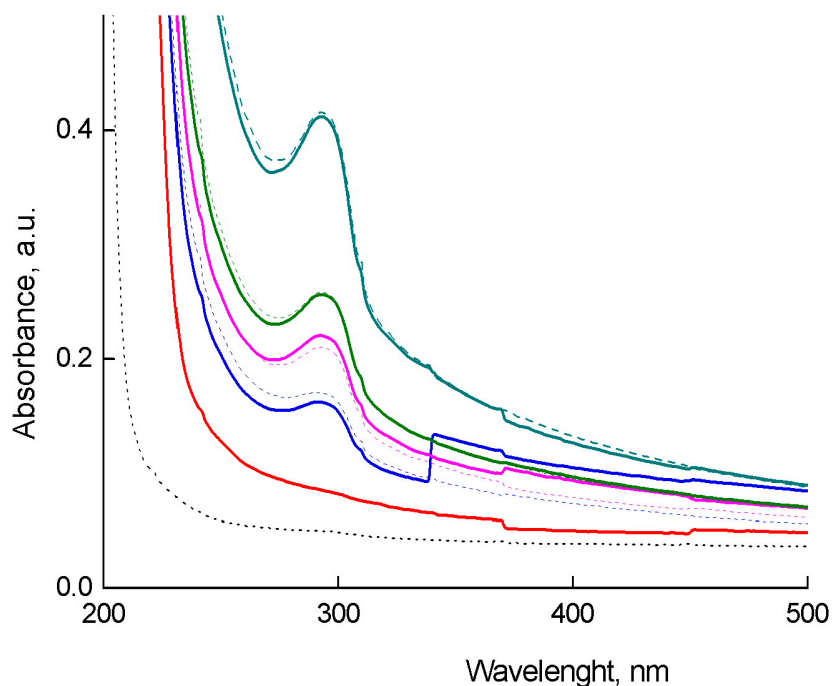


Figure S8. Absorption spectra of freshly prepared aqueous buffer solutions of CPL2-TP (solid line) and after storage for 3 days at room temperature (dotted line). Spectra correspond to the data in Table S3.

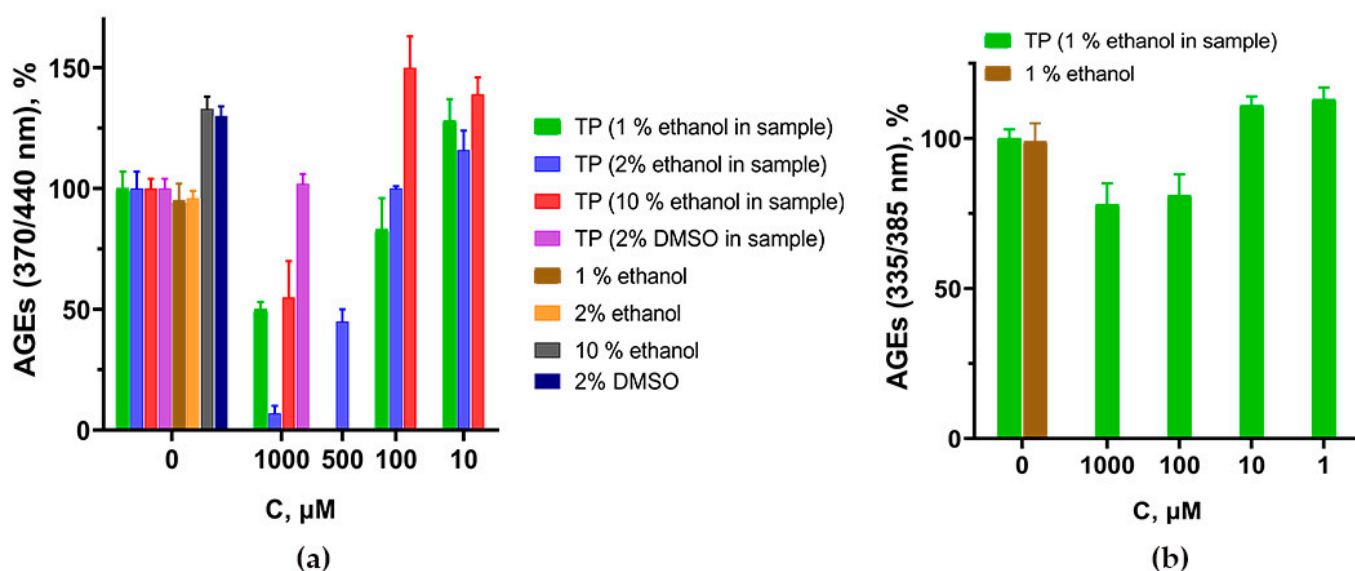


Figure S9. Effect of α -tocopherol and solvents on vesperlysines-like AGEs (a) and pentosidine-like AGEs (b) formation during BSA glycation. $\lambda_{exc/em}=370/440$ nm for vesperlysines-like AGEs and $\lambda_{exc/em} = 335/385$ nm for pentosidine-like AGEs. Data are presented as value \pm SEM.