

Supporting Information:

Manganoporphyrin-Polyphenol Multilayer Capsules as Radical and ROS Scavengers

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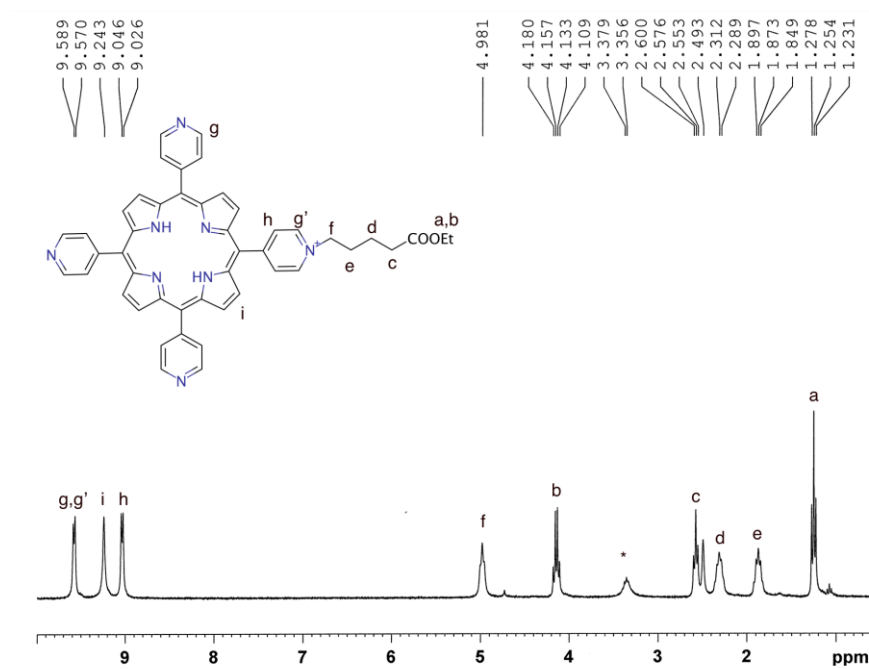


Figure S1. ^1H NMR spectrum for compound 2 (*water in DMSO)

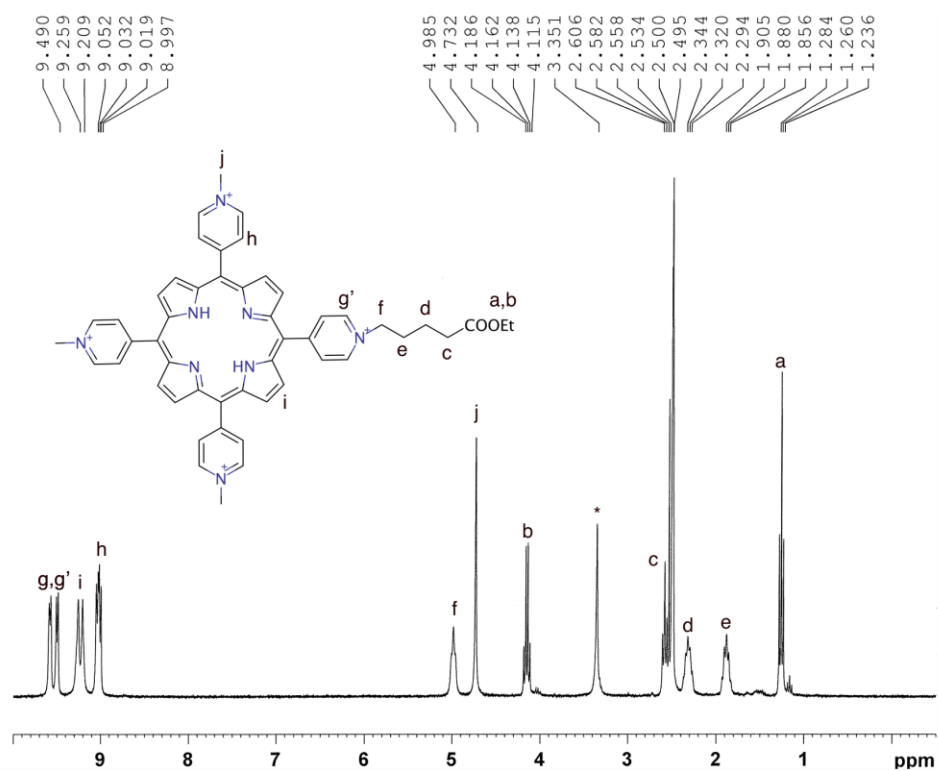


Figure S2. ^1H NMR spectrum for compound **3** (*water in DMSO)

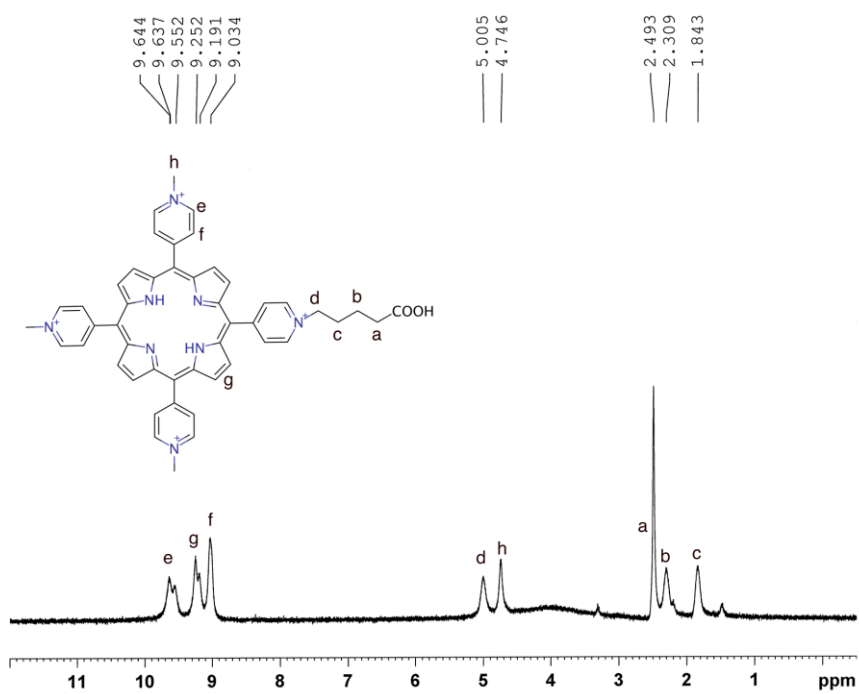


Figure S3. ^1H NMR spectrum for compound 4.

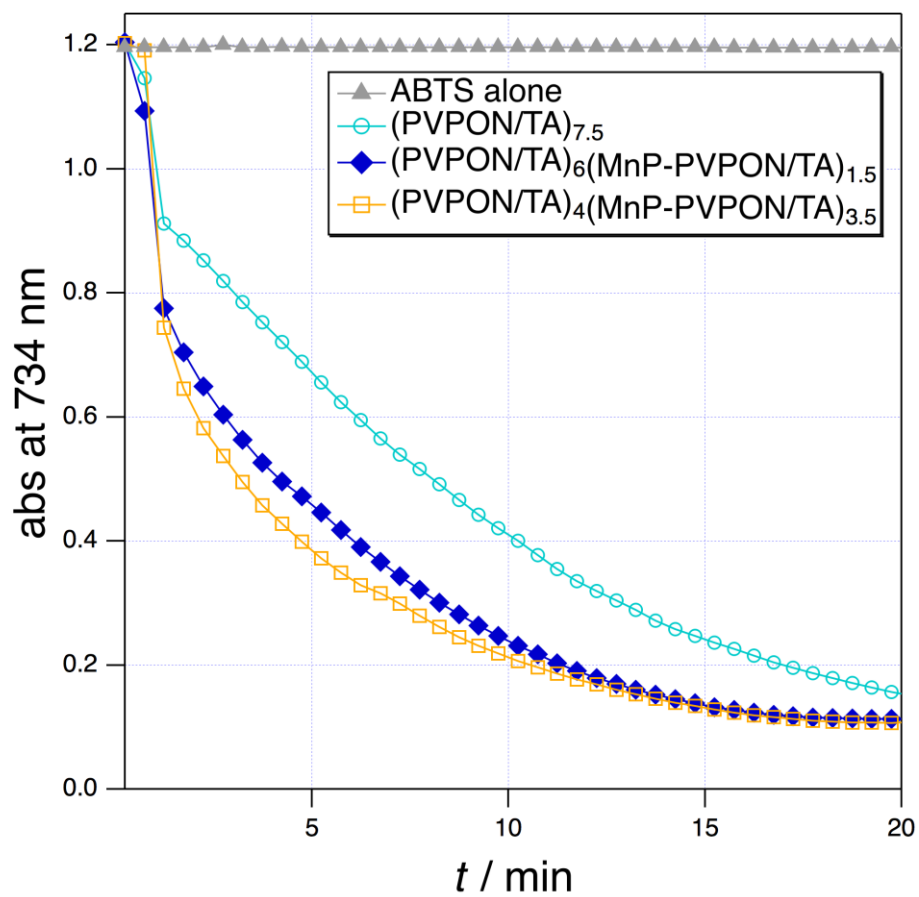


Figure S4. UV-vis spectra of ABTS⁺ decolorization by (PVPON/TA)_{7.5}, (PVPON/TA)₆(MnP-PVPON/TA)_{1.5}, and (PVPON/TA)₄(MnP-PVPON/TA)_{3.5} capsules measured for 20 min at $\lambda = 734$ nm.

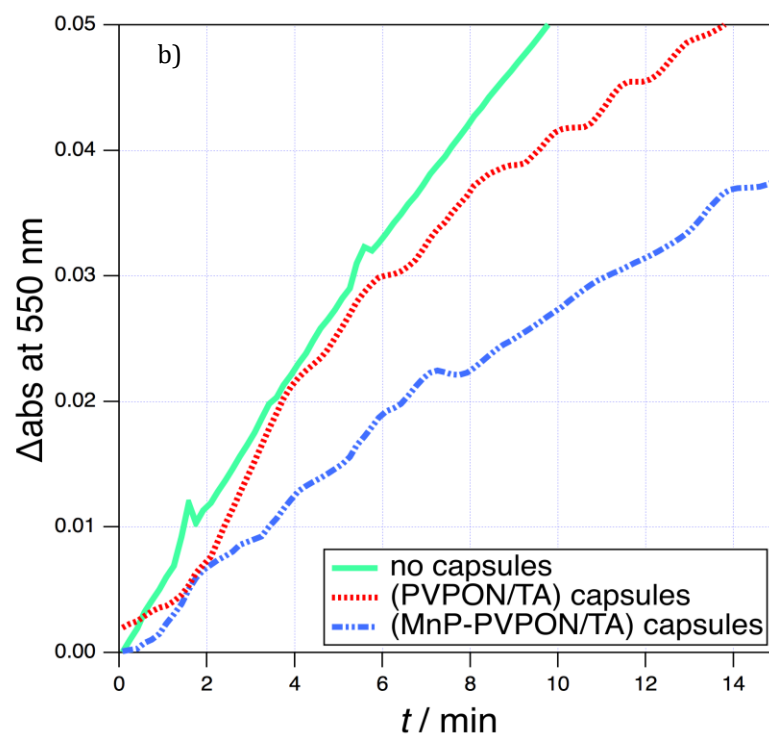


Figure S5. Cytochrome C assay for (PVPON/TA)_{5.5} (labeled as PVPON/TA) and (PVPON/TA)₄(MnP-PVPON/TA)_{1.5} (labeled as MnP-PVPON/TA) capsules in the absence of catalase.

Table S1. SANS model parameters for (PVPON/TA)_{5.5} capsules before ABTS treatment.

Parameter	Value	$W\sigma$
Scale	0.04189888	0
Shell Thickness (δ) (Å)	181.01	1.516424227
Polydispersity of Thickness (0,1)	0.90920791	0.009720238
SLD shell (Å ⁻²)	3.97E-06	0.003735086
SLD solvent (Å ⁻²)	4.13E-06	0.003735089
Background (cm ⁻¹)	0.009165115	4.47E-05
Reduced χ^2	1.56	

Table S2. SANS model parameters for (PVPON/TA)_{5.5} capsules after ABTS treatment.

Parameter	Value	$W\sigma$
Scale	0.000824393	0
Shell Thickness (δ) (Å)	110.011	0.70027147
Polydispersity of Thickness (0,1)	0.98	0
SLD shell (Å ⁻²)	4.81E-06	3.11E-10
SLD solvent (Å ⁻²)	6.03E-06	3.11E-10
Background (cm ⁻¹)	0.005	0.000105174
Reduced χ^2	7.29	

Table S3. SANS model parameters for (PVPON/TA)₄(MnP-PVPON/TA)_{1.5} capsules before ABTS treatment.

Parameter	Value	$W\sigma$
Scale	0.000199736	0
Shell Thickness (δ) (Å)	152.78	1.440568096
Polydispersity of Thickness (0,1)	0.671286802	0.012447488
SLD shell (Å ⁻²)	1.89E-06	0.003867379
SLD solvent (Å ⁻²)	3.80E-06	0.005586294
Background (cm ⁻¹)	0.010648118	3.56E-05
Reduced χ^2	1.60	

Table S4. SANS model parameters for (PVPON/TA)₄(MnP-PVPON/TA)_{1.5} capsules after ABTS treatment.

Parameter	Value	$W\sigma$
Scale	0.000228364	0
Shell Thickness (δ) (Å)	140.84	1.097048584
Polydispersity of Thickness (0,1)	0.64706398	0.009723314
SLD shell (Å ⁻²)	1.77E-06	0.002732288
SLD solvent (Å ⁻²)	3.92E-06	0.003898266
Background (cm ⁻¹)	0.028858531	7.43E-05
Reduced χ^2	1.44	

Table S5. Ellipsometric measurements on dry films of TA/MnP-PVPON at the pH of assembly (5) and below the pKa of tannic acid (2.5).

pH 5	Layer	Total thickness (nm)	SD (nm)	Layer thickness (nm)
	SiO ₂	2.3	0.1	
	TA	4.1	0.2	1.8
	MnP-PVPON	6.8	0.2	2.7
pH 2.5	MnP-PVPON	6.4	0.2	2.3

Figure S6. A proposed mechanism of CAT-like activity of the porphyrin.

