

Supporting Information
**Chitosan-*s*-triazinyl-*bis*(2-aminomethylpyridine) and chitosan-*s*-
triazinyl-*bis*(8-oxyquinoline) derivatives: **New reagents for silver
nanoparticles preparation and their antimicrobial evaluation****

Kholood A. Dahlous, Hessa H. Al-Rasheed, Essam N. Sholkamy, Sameh M. Osman,
Omar H. Abd-Elkader, Ayman El-Faham*

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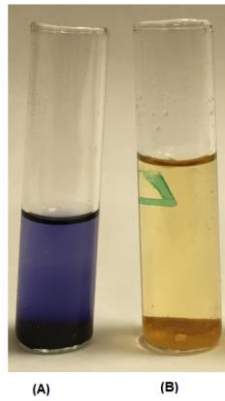


Figure S1: Ninhydrine test: A) **Chitosan**; B) **Modified** chitosan; Ch-TC2

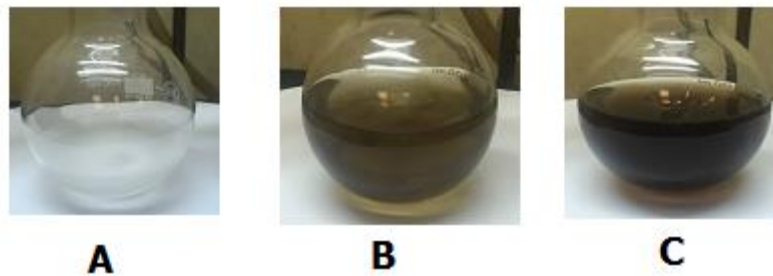


Figure S2: Preparation of AgNPs using modified chitosan Ch-TQ.

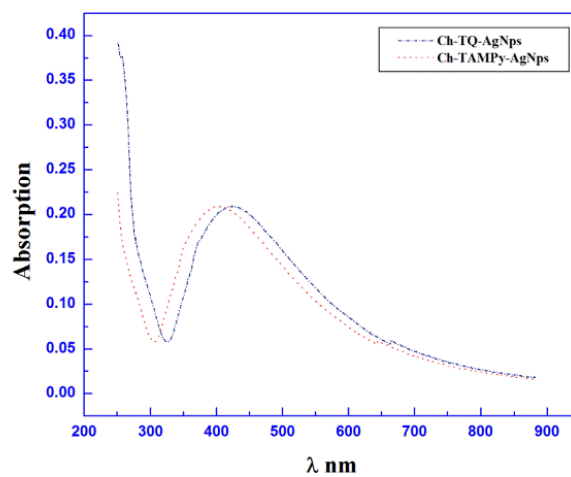


Figure S3: UV-Vis spectra of silver nanoparticles solutions of Ch-TQ-AgNPs and Ch-TAMPy-AgNPs.

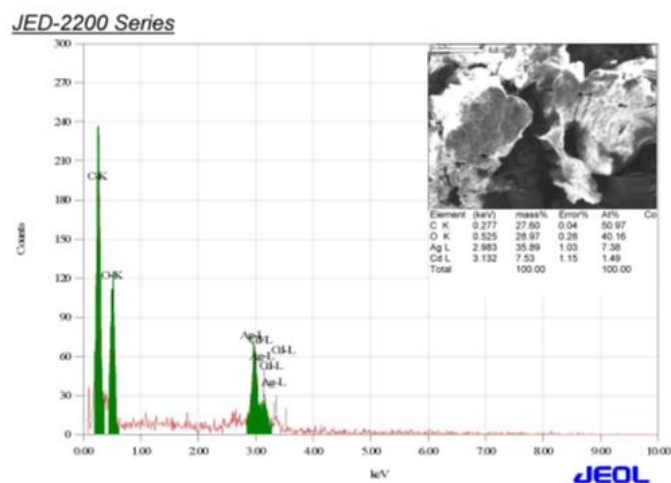


Figure S4A: Energy dispersive X-ray spectra (EDX) of the prepared silver nanoparticles from Ch-TQ.

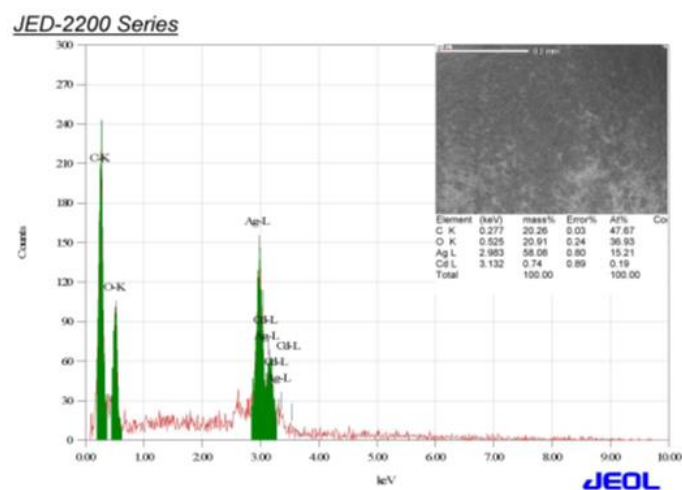


Figure S4B: Energy dispersive X-ray spectra (EDX) of the prepared silver nanoparticles from Ch-TAMPy.

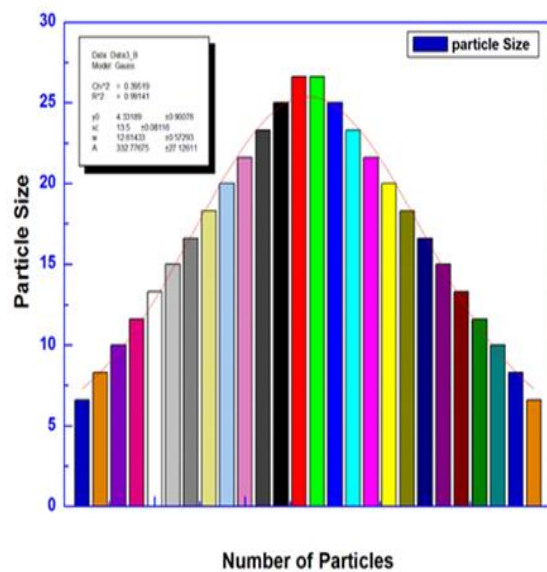


Figure S5A: AgNPs from Ch-TQ and their particles diagram.

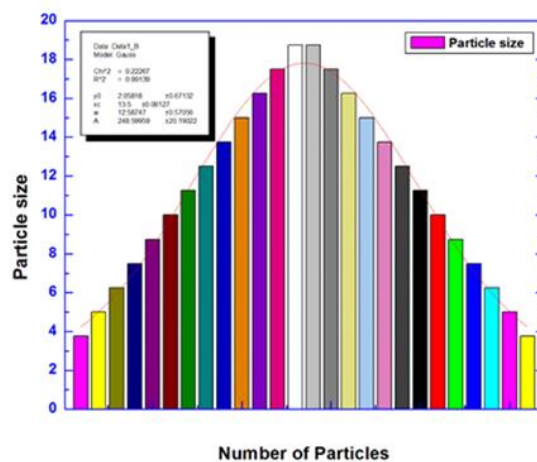


Figure S5B: AgNPs from Ch-TAMPY and their particles diagram.

Table S1: Information derived from TG curves for thermal degradation of copolymers

Cpd. No	Stage	T_{range} (°C)	Mass loss (%)	DTG (°C)	T_{onset} (°C)	T_{50} (°C)	Residue* (%)
Ch; 2	I	36 – 167	7.7	96	274	390	25.6
	II	290 - 450	49.3	355			
Ch-TQ; 5	I	34 – 167	7.8	97	274	389	32.1
	II	287 - 449	49.3	356			
Ch-TAMPy; 6	I	23 – 187	9.5	92	234	415	29.9
	II	255 - 425	39.8	315			

*Calculated at 800°C

Table S2: 2θ and d spacing for AgNPs calculated and observed by Ch-TQ and Ch-TAMPy

h	k	l	2θ (Observed)	2θ (Calculated)	Difference	d spacing
Ch-TQ.						
1	1	1	37.3800	37.7573	0.3773	2.3776
0	0	2	43.6300	43.8781	0.2481	2.0591
0	2	2	63.9200	63.792	0.1280	1.4560
1	1	3	77.0700	76.570	0.4992	1.2417
Ch-TAMPy						
1	1	1	37.490	37.928	-0.438	2.3990
0	0	2	43.750	44.079	-0.329	2.0692
0	2	2	64.140	64.102	0.038	1.4528
1	1	3	77.070	76.964	0.106	1.2375

Table S3: Lattice parameters, unit cell volume and space group for AgNPs by Ch-TQ and Ch-TAMPy

Cpd	a	b	c	alpha	beta	gamma	Volume	Space Group
Ch-TQ	4.1269	4.1269	4.1269	90.00	90.00	90.00	70.287	FM3M
Ch-TAMPy	4.1090	4.1090	4.1090	90.00	90.00	90.00	70.050	FM3M

Table S4: Average grain size (D), dislocation density (δ), and the strain (ϵ) of the AgNPs.

Cpd.	D nm	δ lines/ nm ²	ϵ
Ch-TQ.	40.70	6.03 x 10 ⁻⁴	0.028
Ch-TAMPy	44.68	5.009 x 10 ⁻⁴	0.0025

The average grain size (D), dislocation density (δ), and the strain (ϵ) of the AgNPs were calculated using the following equations:

$$D = \frac{0.9\lambda}{\beta \cos \theta} \quad (1)$$

$$\delta = \frac{1}{D^2} \quad (2)$$

$$\epsilon = \frac{\beta \cos \theta}{4} \quad (3)$$