SUPPORTING INFORMATION

APPLICATION OF RESPONSE SURFACE METHODOLOGY TOWARDS THE DEVELOPMENT OF PHENYLETHANOID-BASED NANOPARTICLE TARGETING MULTIFACETED BIOLOGICAL PROPERTIES

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Table S1- BBD matrix for different factors or independent variables

Run	Factor A: Concentration of $AgNO_3$ (mM)	Factor B: Concentration of Vb (mM)	Factor C: pH (Mol/L of H^+ ions)
1	3	5	10
2	5	3	10
3	5	3	4
4	1	5	7
5	1	3	4
6	3	3	7
7	3	1	4
8	3	1	10
9	1	3	10
10	5	1	7
11	5	5	7
12	3	3	7
13	3	5	4
14	3	3	7
15	1	1	7

Table S2- ANOVA analysis for the quadratic equation

Source	Sum of Squares	df	Mean Square	*F*-value	*p*-value	
Model	25009.10	5	5001.82	593.17	<0.0001	Significant
A: Concentration of $AgNO_3$	53.04	1	53.04	6.29	0.0334	
B: Concentration of Vb	488.28	1	488.28	57.91	<0.0001	
C: pH	22039.50	1	22039.50	2613.68	<0.0001	
BC	992.25	1	992.25	117.67	<0.0001	
C^2	1436.03	1	1436.03	170.30	<0.0001	
Residual	75.89	9	8.43			
Lack of Fit	67.89	7	9.70	2.42	0.3229	Not significant
Pure Error	8.00	2	4.00			
Cor Total	25085.00	12				

Table S3- Fit statistics for the quadratic model

Std. Dev.	**2.90**	**R^2**	**0.9970**
Mean	103.36	**Adjusted R^2**	0.9953
C. V. %	2.81	**Predicted R^2**	0.9902
		Adeq Precision	74.3102

Table S4- UV-Vis spectroscopic analysis of the different trials of Verbascoside reduced silver nanoparticles

Trial Number	Factor A: Concentration of $AgNO_3$ (mM)	Factor B: Concentration of Vb (mM)	Factor C: pH (Mol/L of H^+ ions)	SPR band (nm)
1	3	5	10	415
2	5	3	10	416
3	5	3	4	-
4	1	5	7	458
5	1	3	4	-
6	3	3	7	444
7	3	1	4	-
8	3	1	10	415
9	1	3	10	420
10	5	1	7	457
11	5	5	7	462
12	3	3	7	443
13	3	5	4	-
14	3	3	7	434
15	1	1	7	459

Table S5 – Zeta Potential of Verbascoside-derived silver nanoparticles at different pH

Trial Number	pH (Mol/L of H^+ ions)	Zeta Potential (mV)
1	10	-32.70 ±4.90
2	7	-22.40 ±5.20
3	4	-8.13 ±3.74

Table S6- Peaks obtained from FTIR analysis and their corresponding functional groups for Verbascoside and verbascoside-derived silver nanoparticles

Vb		**VbAgNP**	
Wavenumber (cm^{-1})	**Functional Group**	**Wavenumber (cm^{-1})**	**Functional Group**
3317.83	Stretching –OH and the presence of phenolic groups	3244.87	-OH stretching due to the presence of alcohols or phenols
2924.76	Medium strength band shows the presence of aldehyde where the C-H bond contains a sp^2 carbon	2919.29	Due to the presence of C-H bond stretching
2856.36	C-H stretch shows the presence of alkenes	1691.75	C=O bond stretching
1697.22	Medium band shows the presence of C=C bond stretching vibration and shows the presence of an aromatic group	1602.37	C=C stretching

1440.04	OH bending from carboxylic group	1518.47	C=C stretching within an aromatic ring (benzene)

Table S7 – Stability Study of Verbascoside reduced silver nanoparticles

Time	Average Particle Size (nm)	Zeta Potential (mV)	Poly Dispersity Index
0 month	51.79	-35.50	0.16
6 months	119.90	-19.10	0.29
12 months	182.20	-12.30	0.41