

Supplementary Information

Green Synthesis of Biocompatible Silver Nanoparticles Using *Trillium govanianum* Rhizome Extract: Comprehensive Biological Evaluation and *In Silico* Analysis

Syed Ifrah Manzoor¹, Farhat Jabeen¹, Rajan Patel², M. Moshahid Alam Rizvi³, Khalid Imtiyaz³, Maqsood Ahmad Malik^{4,*}, Tanveer A. Dar^{1,*}

¹Department of Clinical Biochemistry, University of Kashmir, Srinagar-190006, Jammu and Kashmir, India

²Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi-110025, India

³Department of Biosciences, Faculty of Life Sciences, Jamia Millia Islamia, New Delhi--110025, India

⁴Department of Chemistry, Faculty of Sciences, Jamia Millia Islamia, New Delhi-110025, India

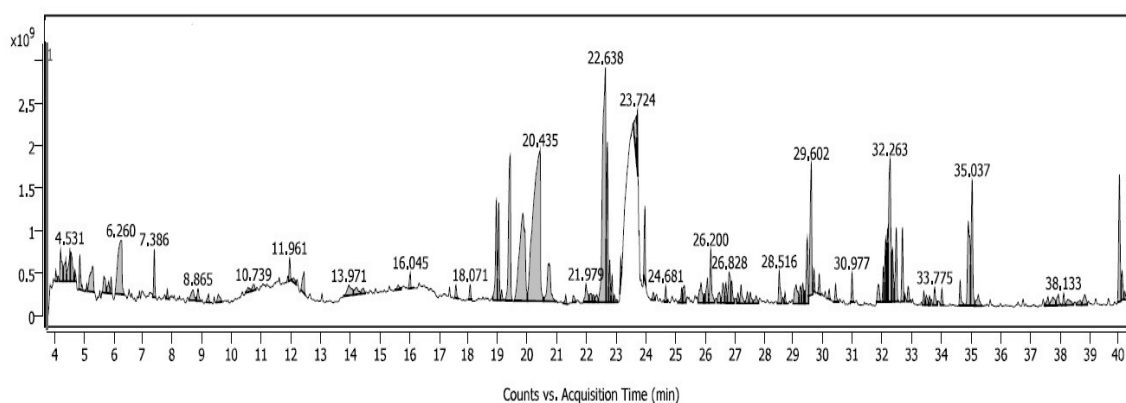


Figure S1: GC-MS chromatogram of *Trillium govanianum* rhizome extract.

Tables S1: GC/MS analysis of *Trillium govanianum* rhizome extract.

Compound name	Nature	Retention time	Area (%)
n-hexadecanoic acid	Fatty acid	20.435	100
9,12 -octadecenoic acid, methyl ester	Fatty acid ester	22.638	67.75
Palmitoleic acid	Fatty acid	19.484	45.76
9,12 octadecadienoic acid	Fatty acid ester	32.246	29
Hexadecanoic acid, 2-hydroxy -1- ethyl ester	Fatty acid ester	29.602	20.35
9-octadecadienoic acid, methyl ester (E)-	Fatty acid ester	22.73	20.15
11,14,17-Eicosatrienoic acid	Fatty acid	35.246	18.23
7,10,13 Eicosatrienoic acid, methyl ester	Fatty acid ester	32.175	18.1
Methy hexadec-9-enoate	Fatty acid	18.956	13.73
10,13-Eicosadienoic acid, methyl ester	Fatty acid ester	26.088	4.3
11-Eicosonoic acid	Fatty acid	26.200	4
Cis -13- eicosenoic acid	Fatty acid	26.908	3.03
Docosanoic acid	Fatty acid	30.422	2.28
Tetradecanoic acid	Fatty acid	16.045	1.89
Tetracosanoic acid	Fatty acid	33.40	1.6
Triacontane	Hydrocarbon	32.472	10.34
Pentacosane	Hydrocarbon	29.465	9.77
17-Pentatriacontane	Hydrocarbon	32.344	7.31
Gamma-sitosterol	Sterol	40.425	3.45
3, beta Myristoylolean-12-en-16 beta-ol	Sterol	38.849	2.75
Androstane-17, 19- diol	Sterol	27.125	1.45
pregnane	steriod	38.688	1.33
Beta-D-glucopyranoside	carbohydrate	13.971	4.28
lactose	carbohydrate	12.097	1.1
Diosgenin	saponin	40.075	17.6
Vanillin lactoside	glycoside	8.865	2.09
Alpha tocopherol-beta-D- mannoside	glycoside	38.133	35.3
astaxanthin	carotenoid	22.148	2.02

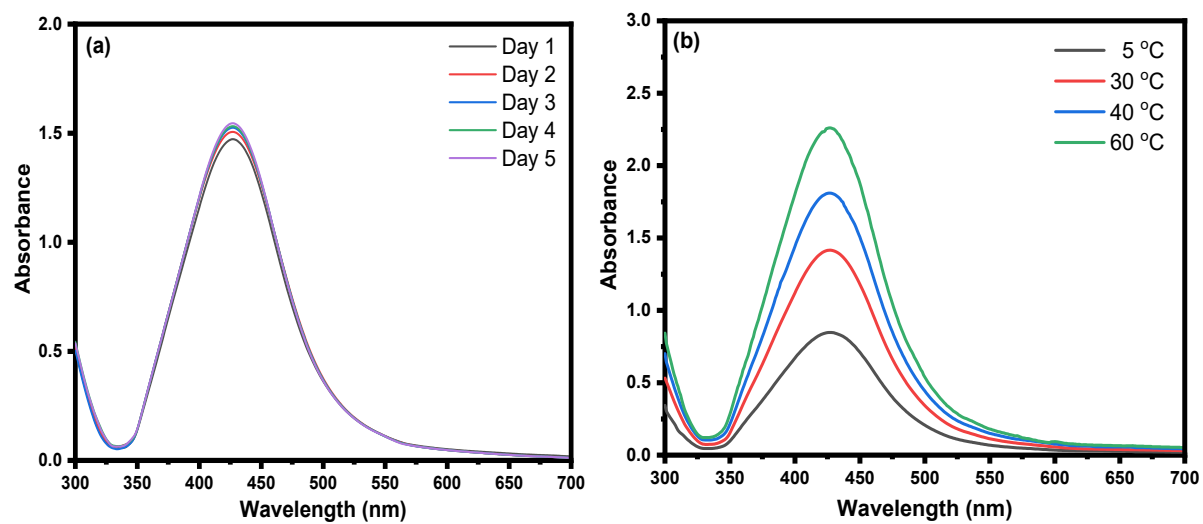


Figure S2. Stability assessment of TGRAgNPs with (a) UV-visible spectra of TGRAgNPs recorded up to 5 days and (b) UV-visible spectra of TGRAgNPs at different temperatures.

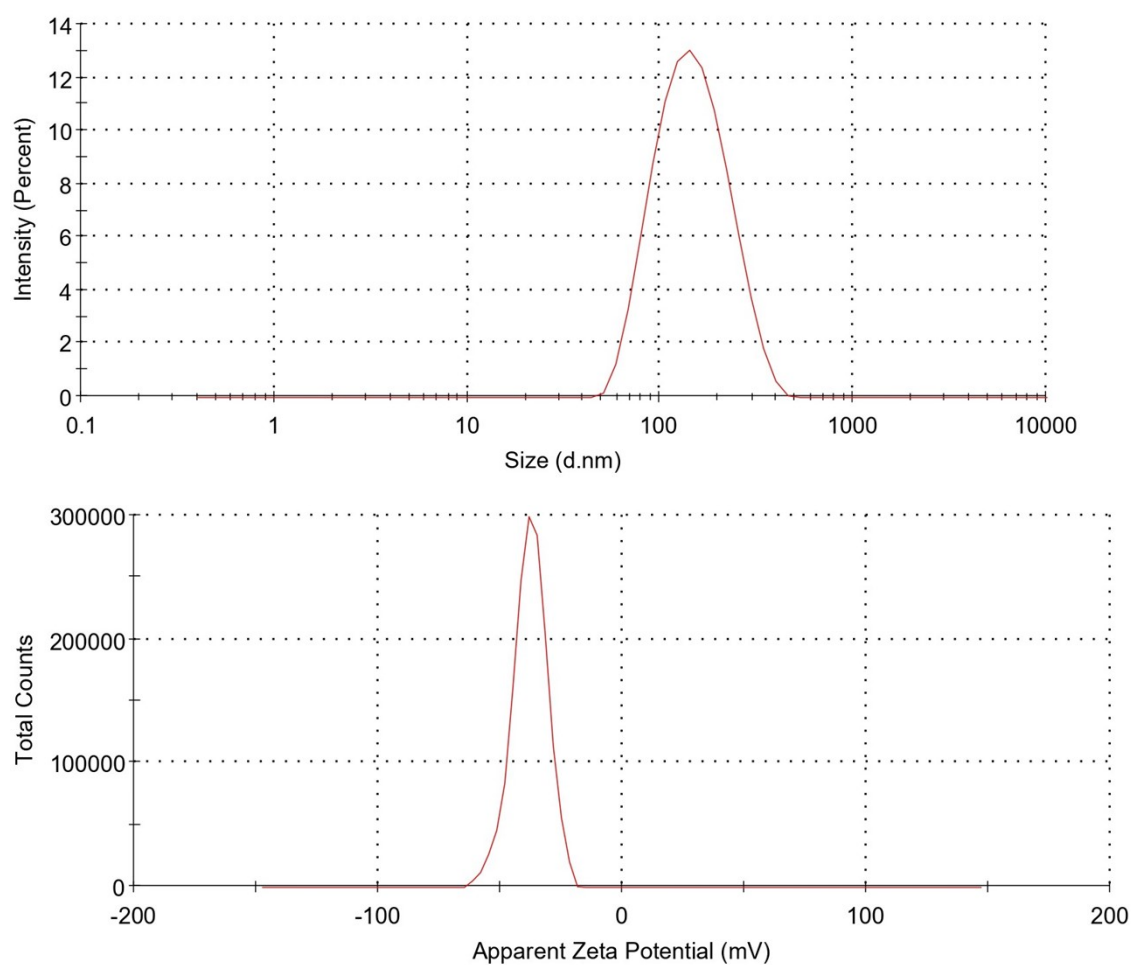


Figure S3: DLS analysis of ^{TGR}AgNPs wherein panel (a) represents size and PDI analysis while as panel (b) represents zeta potential.

Table S2: Comparative analysis of the biological activities of ^{TGR}AgNPs with other reported green synthesized nanoparticles

Name of plant/ Nanoparticle	Antioxidant activity		Cytotoxicity (IC ₅₀)	Anti-inflammatory		Hemocompatibility		DNA damage protection	Refs.
	% scav. activity	Conc. (mg/ml)	(mg/ml)	% denat. Inhibition	Conc. (mg/ml)	Hemolysis (%)	Conc. (mg/ml)	Conc. range (mg/ml)	
^{TGR} AgNPs*	85.7	0.25	0.17**	87.7	0.4	6	0.5	0.1 – 0.9	
<i>C. murale</i>	13	5	-- [#]	--	--	--	--	--	[74]
<i>N. leucophylla</i>	79	0.25	0.0652	--	--	--	--	--	[106]
<i>E. scaber</i>	85	0.5		--	--	--	--	--	[76,107]
<i>S. officinalis</i>	50	0.83	0.02	--	--	--	--	--	[108,109]
<i>L. reticulata</i>	64.81	0.5	0.02	--	--	--	--	--	[110]
<i>A. marina</i>	-- [#]	--	0.08	72	0.01	--	--	--	[88, 111]
<i>P. roxburghii</i>	--	--	0.5**	--	--	--	--	--	[87]
<i>A. perryi</i>	--	--	0.4	--	--	--	--	--	[112]
<i>M. Zapota</i>	--	--	0.025	--	--	--	--	--	[113]
<i>C. Pilcherrima</i>	50	0.664	0.0038**	--	--	--	--	--	[114]
<i>C. linum</i>	--	--	0.048**	--	--	--	--	--	[87]
<i>C. nudiflora</i>	--	--	0.01**	--	--	--	--	--	[84]
<i>A.accuminata</i>	50	0.16	0.0055	50	0.012	--	--	--	
<i>A. tribuloides</i>	47	0.5	0.5	69	0.5	--	--	--	[75,96]
<i>A.lycoctonum</i>	50	1.8	--	--	0.5	--	--	--	[97]
<i>J. Wynadenesis</i>	--	--	0.06	40	0.2	--	--	--	[99]
<i>M.longifolia</i>	29.66	0.5	--	53.15	0.5	--	--	--	[100]
<i>C. Sativa</i>	58.01	0.1	--	--	--	7	0.2	--	[79]
<i>A. katsumadai</i>	90	0.5	--	--	--	--	--	--	
<i>S.jambolanum</i>	81	0.025	0.000125	--	--	2.3	0.7	--	[85]
<i>C. roseus</i>	82	0.3	0.064	--	--	92	0.05	--	[115,116]
<i>A. muricala</i>	50	0.05	0.18	--	--	65.4	0.175	--	[117,118]
<i>A. reticulata</i>	--	--		--	--	13.8	0.5	--	[80]
<i>R. coriaria</i>	--	--	0.0143	--	--	--	--	0.25 – 1	[103,119]

*Synthesized in the present study

[#]Not determined so far

**These studies involved the same cell line, i.e., the HCT-116 used in the present study. For other reported values, different cell lines have been used.