CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Highly stable PEGylated gold nanoparticles in water: applications in biology and catalysis
Authors	Rahme, Kamil;Nolan, Marie Therese;Doody, Timothy;McGlacken, Gerard P.;Morris, Michael A.;O'Driscoll, Caitríona M.;Holmes, Justin D.
Publication date	2013-08-21
Original Citation	Rahme, K., Nolan, M. T., Doody, T., McGlacken, G. P., Morris, M. A., O'Driscoll, C. and Holmes, J. D. (2013) 'Highly stable PEGylated gold nanoparticles in water: applications in biology and catalysis', RSC Advances, 3(43), pp. 21016-21024. doi: 10.1039/c3ra41873a
Type of publication	Article (peer-reviewed)
Link to publisher's version	https://pubs.rsc.org/en/content/articlepdf/2013/ra/c3ra41873a - 10.1039/c3ra41873a
Rights	© Royal Society of Chemistry 2013
Download date	2026-11-06 19:15:38
Item downloaded from	https://hdl.handle.net/10468/8160

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Electronic Supplementary Material (ESI) for RSC Advances
This journal is © The Royal Society of Chemistry 2013

Highly Stable PEGylated Gold Nanoparticles in Water: Applications in Biology and Catalysis

Kamil Rahme,* [a,b,c] Marie Therese Nolan,[d] Timothy Doody,[e] Gerard P. McGlacken[d] Michael A. Morris [a,b], Caitriona O'Driscoll,[e] and Justin D. Holmes [a,b]

[a]*Materials Chemistry and Analysis Group, Department of Chemistry and the Tyndall National Institute, University College Cork, Cork, Ireland.*

[b]*Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Trinity College Dublin, Dublin 2, Ireland.*

[c]*Department of Sciences, Faculty of Natural and Applied Science, Notre Dame University (Louaize), Zouk Mosbeh, Lebanon*

[d]*Organic and Pharmaceutical Chemistry Group Department of Chemistry and Analytical and Biological Chemistry Research Facility, UCC, Cork, Ireland*

[e]*Pharmocodelivery group, School of Pharmacie, University College Cork, Cork, Ireland.*

*To whom correspondence should be addressed: Fax:+961 9 225164; Tel:+961 9 218950

E-mail: kamil.rahme@ndu.edu.lb

† Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here].

This journal is © The Royal Society of Chemistry 2013

SUPPORTING INFORMATION.

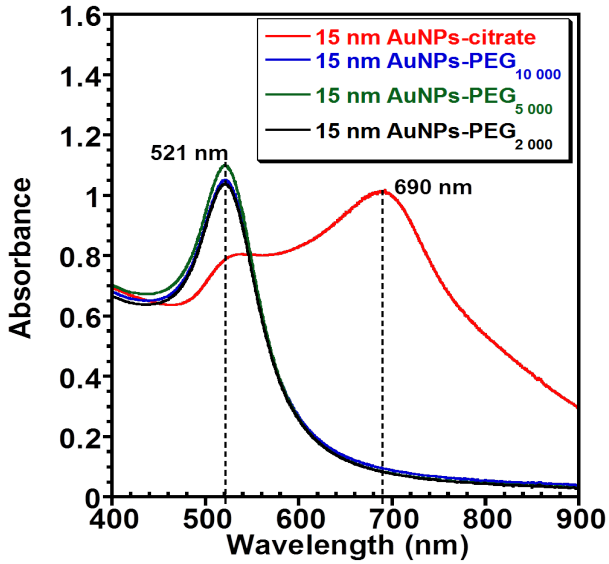


Figure S1. Uv-visible absorbance data showing the effect of salt (0.157 M NaCl) on: citrate-stabilised Au NPs, Au NPs stabilised with $mPEG_{2000}$-SH ligands, Au NPs stabilised with $mPEG_{5000}$-SH ligands and Au NPs stabilised with $mPEG_{10000}$ –SH ligands. Spectrum were taken 1 minute after adding NaCl.

Table S1. Physical and Chemical Properties of Au-PEG nanoparticles. Au-PEG NP's were complexed with pGL4 siRNA and pGL4siRNA:Protamine (MR1:2.5). A MR of 1:10 of AuNP:siRNA was used here. Particles were examined in H_2O and in DMEM (without Phenol Red).

		Size (nm)		Zeta Potential (mv)		PDI		UV-vis λ max (nm)	
		H_2O	DMEM	H_2O	DMEM	H_2O	DMEM	H_2O	DMEM
Au15nm-PEG2000	Alone	45.98 ± 0.55	37 ± 3.05	-11.23 ± 0.19	-2.21 ± .95	0.453	0.357	520-522	520-523
	+ siRNA	37.57 ± 2.28	36.24 ± 2.1	-6.14 ± 1.11	-3.54 ± 0.27	0.376	0.426	522	520
	+ protamine:siRNA	170.57 ± 6.9	no data	2.39 ± 0.16	no data	0.258	no data	522-523	520-525
Au15nm-PEG5000	Alone	48.16 ± 2.85	44.36 ±1.89	-3.5 ± 0.74	-1.08 ± 0.55	0.389	0.327	522	521
	+ siRNA	38.42 ± 1.8	37.01 ±1.11	-0.68 ± 0.33	-3.2 ± 0.99	0.267	0.27	520-523	520-522
	+ protamine:siRNA	106.8 ± 1.27	137 ± 5	32.43 ± 2.54	-0.77 ± 0.41	0.539	0.478	522	520-523
Au15nm-PEG10000	Alone	56.08 ± 1.15	53.61 ± 0.56	-0.07 ± 0.08	-1.73 ± 0.55	0.389	0.292	522	520
	+ siRNA	41.35 ± 0.79	41.06 ± 0.59	-12.47 ± 1.3	-1.43 ± 1.12	0.33	0.347	520-523	520-522
	+ protamine:siRNA	105.83 ± 2.28	81.27 ± 5.49	30.5 ± 2.46	-0.97 ± 0.26	0.522	0.618	522	523
Au15nm-PEG20000	Alone	50.21 ± 2.83	83.25 ± 6.14	-8.89 ± 1.07	-3.28 ± 0.76	0.442	0.398	520-521	522-524
	+ siRNA	56.29 ± 3.73	63.89 ± 0.46	-9.73 ± 0.36	-1.75 ± 0.71	0.421	0.401	520	520-522
	+ protamine:siRNA	167.93 ± 4.32	122.63 ± 0.46	24.93 ± 0.44	-1.1 ± 0.17	0.578	0.476	522-528	523-527
Au30nm-PEG10000	Alone	85.47 ± 0.15	81.39 ± 0.09	-0.18 ± 0.29	-2.15 ± 0.39	0.194	0.154	520-521	529
	+ siRNA	80.14 ± 0.28	77.47 ± 0.55	-15.2 ± 0.32	-1.62 ± 1	0.169	0.165	528-530	529
	+ protamine:siRNA	83.80 ± 0.11	86.73 ± 0.25	18.67 ± 0.72	-0.81 ± 0.35	0.18	0.195	522-528	528-531
Au60nm-PEG10000	Alone	88.66 ± 0.46	87.74 ± 0.33	-19.3 ± 1.27	-1.47 ± 0.9	0.176	0.169	538-542	540
	+ siRNA	86.71 ± 0.2	83.72 ± 0.32	-16.27 ± 0.47	-0.42 ± 0.43	0.161	0.184	540	538-542
	+ protamine:siRNA	87.63 ± 0.25	89.28 ± 0.18	11.37 ± 0.35	-1.05 ± 0.25	0.16	0.182	539-541	538-541