

Improvement of Seed-Mediated Growth of Gold Nanoparticle Labels for DNA Membrane-Based Assays

Galina V. Presnova ¹, Gleb A. Zhdanov ¹, Luibov Yu. Filatova ¹, Mariya M. Ulyashova ¹,
Denis E. Presnov ^{2,3,4} and Maya Yu. Rubtsova ^{1,*}

¹ Department of Chemistry, Lomonosov Moscow State University, 119991 Moscow, Russia

² D.V. Skobeltsyn Institute of Nuclear Physics, M.V. Lomonosov Moscow State University, 119991 Moscow, Russia

³ MSU Quantum Technology Centre, 119991 Moscow, Russia

⁴ Cryoelectronics Lab, Faculty of Physics, M.V. Lomonosov Moscow State University, 119991 Moscow, Russia

* Correspondence: mrubtsova@gmail.com

Table S1. Sequences of the oligonucleotides used in this work.

Name	Sequence, 5'→3'
Capture oligonucleotide probe	TTTTTTTTTTTTTGGATTGGACGAGTCAGGAGC
Non-complementary oligonucleotide probe	TTTTTTTTTTTTTCTAGACAGCCACTCATA
Model target oligonucleotide	Biotin-GCTCCTGACTCGTCCAATC
Capture oligonucleotide probe for TEM type beta-lactamase	TTTTTTTTTTTTTGCTTCCCGGCAACAATTAATAGACTGGATGGAGGC

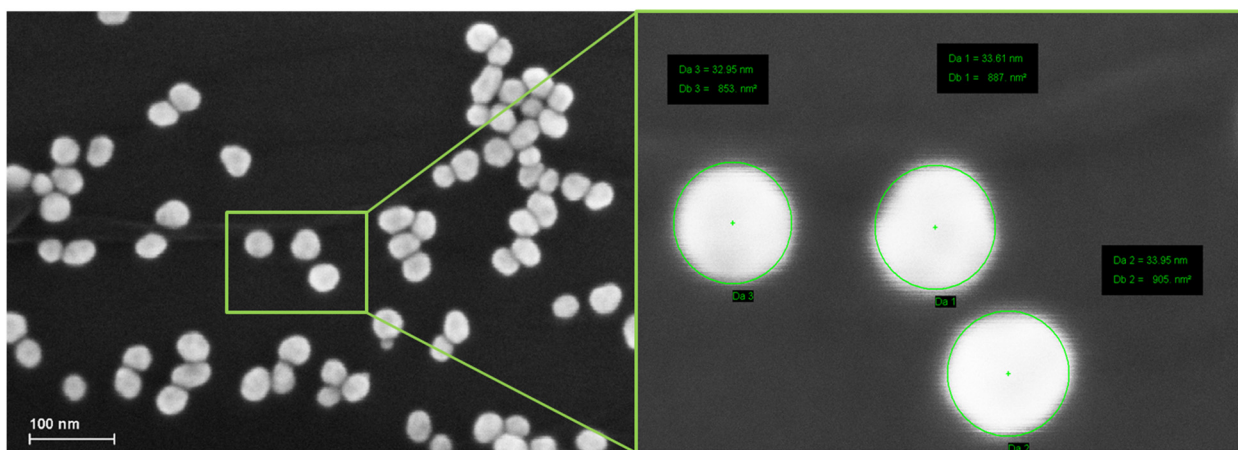


Figure S1. SEM images of gold nanoparticles prepared by reduction of tetrachloroauric acid with sodium citrate.

Table S2. Characteristics of the spectra of suspensions of gold nanoparticles before and after the enhancement in solution.

pH value	Parameter	Without amplification	Reaction time		
			2 min	5 min	10 min
2.0	λ	529	550	555	-
	Peak value	1.20	0.87	0.97	0.74
	The area under the curve in the range of 400-700 nm	173.73	234.68	263.66	203.99
3.0	λ	529	541	550	550
	Peak value	1.20	0.96	1.07	0.74
	The area under the curve in the range of 400-700 nm	173.73	242.89	286.13	208.82
3.5	λ	529	532	533	532
	Peak value	1.20	1.43	1.87	1.62
	The area under the curve in the range of 400-700 nm	173.73	265.41	345.76	299.76
4.0	λ	529	535	534	532
	Peak value	1.20	2.11	2.04	2.01
	The area under the curve in the range of 400-700 nm	173.73	353.42	354.87	348.96
5.0	λ	529	536	535	534
	Peak value	1.20	2.18	2.13	2.06
	The area under the curve in the range of 400-700 nm	173.73	364.29	389.15	390.28
6.0	λ	529	534	538	537
	Peak value	1.20	2.08	2.01	1.98
	The area under the curve in the range of 400-700 nm	173.73	386.94	416.33	415.96
7.0	λ	529	550	550	551
	Peak value	1.20	2.00	1.48	1.15
	The area under the curve in the range of 400-700 nm	173.73	444.19	358.09	295.63
8.0	λ	529	550	550	550
	Peak value	1.20	1.39	1.09	1.05
	The area under the curve in the range of 400-700 nm	173.73	354.26	295.02	279.96

Table S3. Characteristics of the spectra of suspensions of gold nanoparticles in a conjugate with streptavidin before and after the enhancement in solution.

pH value	Parameter	Without amplification		Amplification time		
		GNPs	Str-GNPs	2 min	5 min	10min
3.0	λ	529	531	536	548	548
	Peak value	1.20	1.32	1.27	1.58	1.84
	The area under the curve in the range of 400-700 nm	173.73	185.67	196.33	299.93	354.65
4.5	λ	529	531	546	546	546
	Peak value	1.20	1.32	1.19	1.51	1.81
	The area under the curve in the range of 400-700 nm	173.73	185.67	233.12	305.60	376.60
6.0	λ	529	531	556	556	556
	Peak value	1.20	1.32	1.54	1.72	1.77
	The area under the curve in the range of 400-700 nm	173.73	185.67	368.67	425.41	440.17