Supporting information

Engineering highly effective antimicrobial selenium nanoparticles through control of particle size

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Table S1 Reaction conditions for the fabrication of different sizes of Se NPs and resulting particle properties

Sample ID	Reagent concentrations			Reaction time	Mean NP size (nm)	PDI	Zeta potential (mV)
	PVA (mg/mL)	SeO_2 (mM)	$Na_2S_2O_3$ (mM)				
A	5	2.5	300	5 min	43	0.098	-6.1 ± 2.2
B	5	2.5	200	2 h	81	0.027	-6.7 ± 4.5
C	5	2.5	75	2 h	124	0.008	-5.8 ± 3.4
D	5	2.5	37.5	3.5 h	161	0.003	-4.9 ± 2.7
E	5	2.5	10	4 h	205	0.03	-4.18 ± 0.04

* The zeta potential data are expressed as mean± standard deviation (s.d.).

Table S2 The conversion table between number and weight concentrations of Se NPs tested against *S. aureus*

Number concentration (number/ml)	Weight concentration (μg/ml)		
	43 nm	**81 nm**	**124 nm**
1.28×10^{10}	2.000	12.50	70.00
2.56×10^{10}	4.000	25.00	140.0

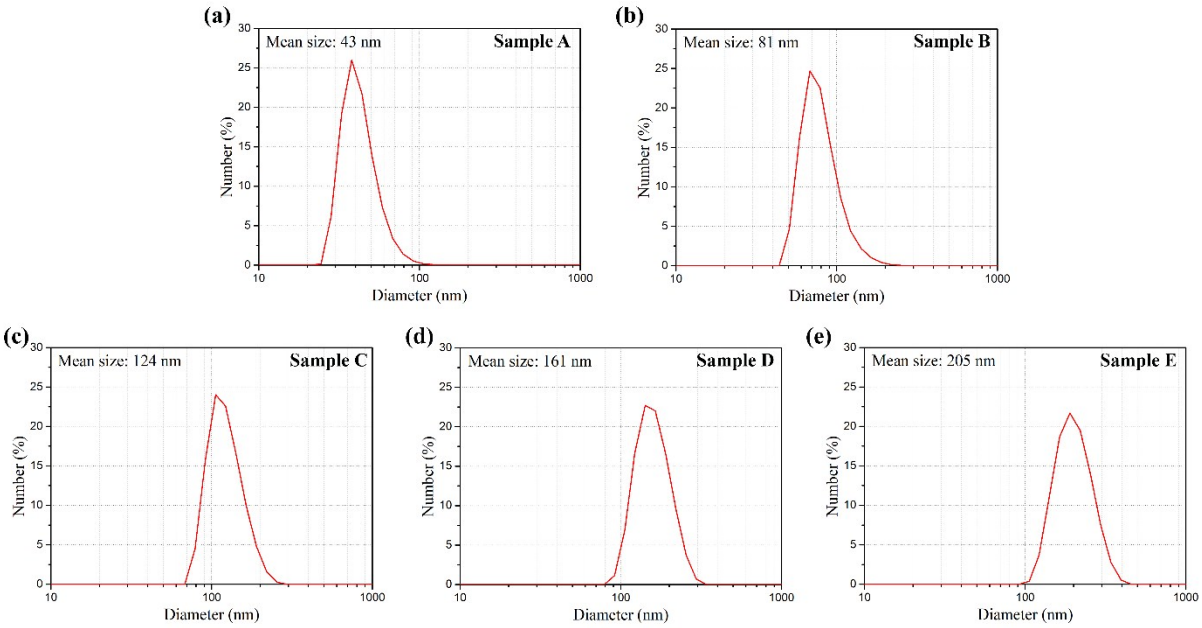

Fig. S1 Size distributions of Se nanoparticles determined by dynamic light scattering using a Zetasizer.

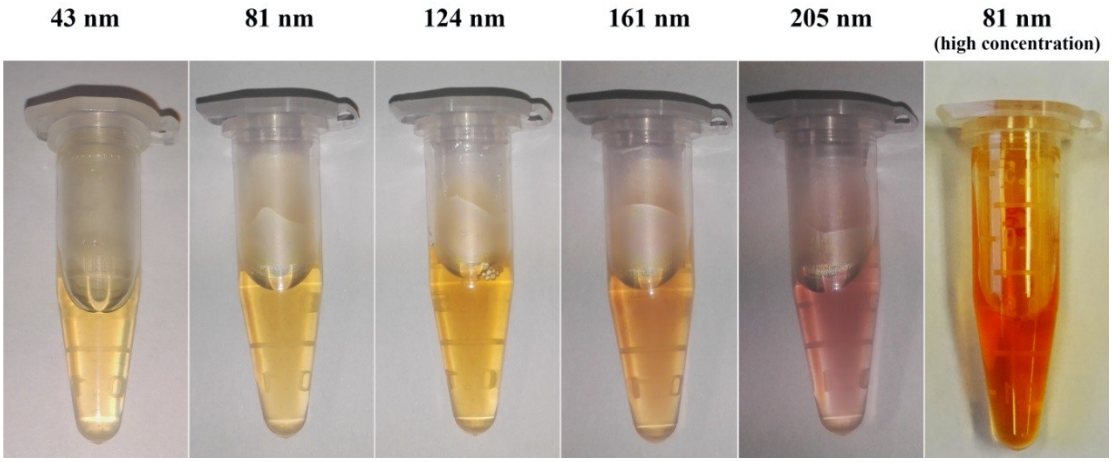

Fig. S2 Photographic images of suspensions of Se nanoparticles with six different mean sizes.

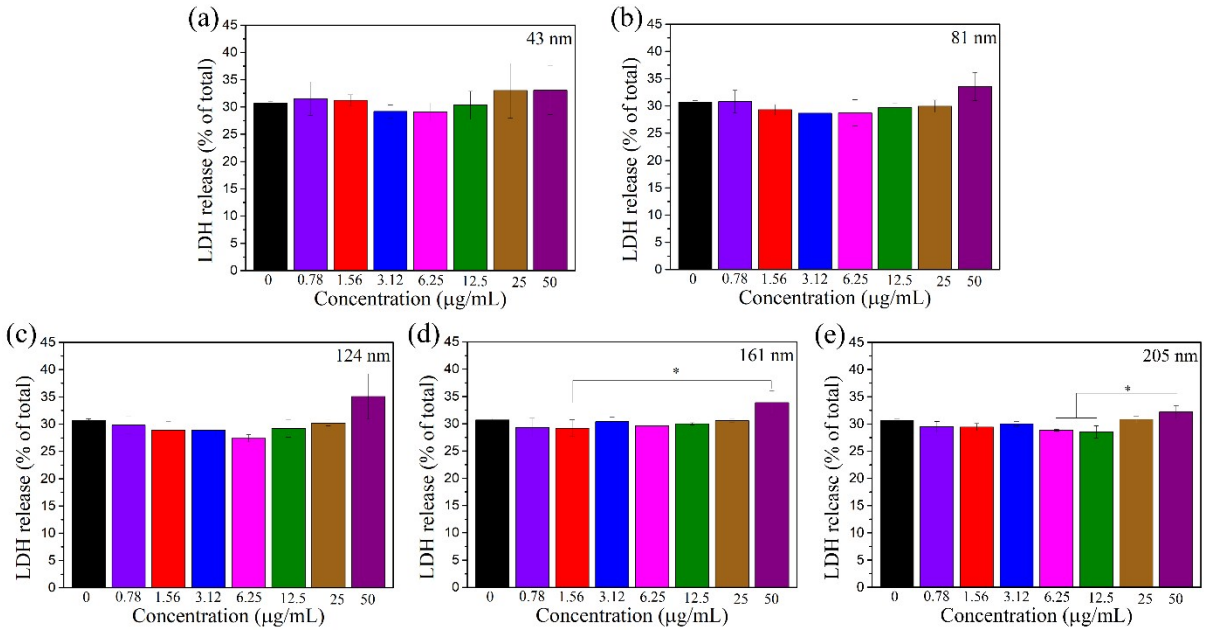

Fig. S3 Lactate dehydrogenase (LDH) assay results on HDFs with different concentrations and sizes of Se NPs. A One-Way ANOVA followed by a Tukey's Post Hoc Test was used to compare the means of the experimental groups, * p-value < 0.05.

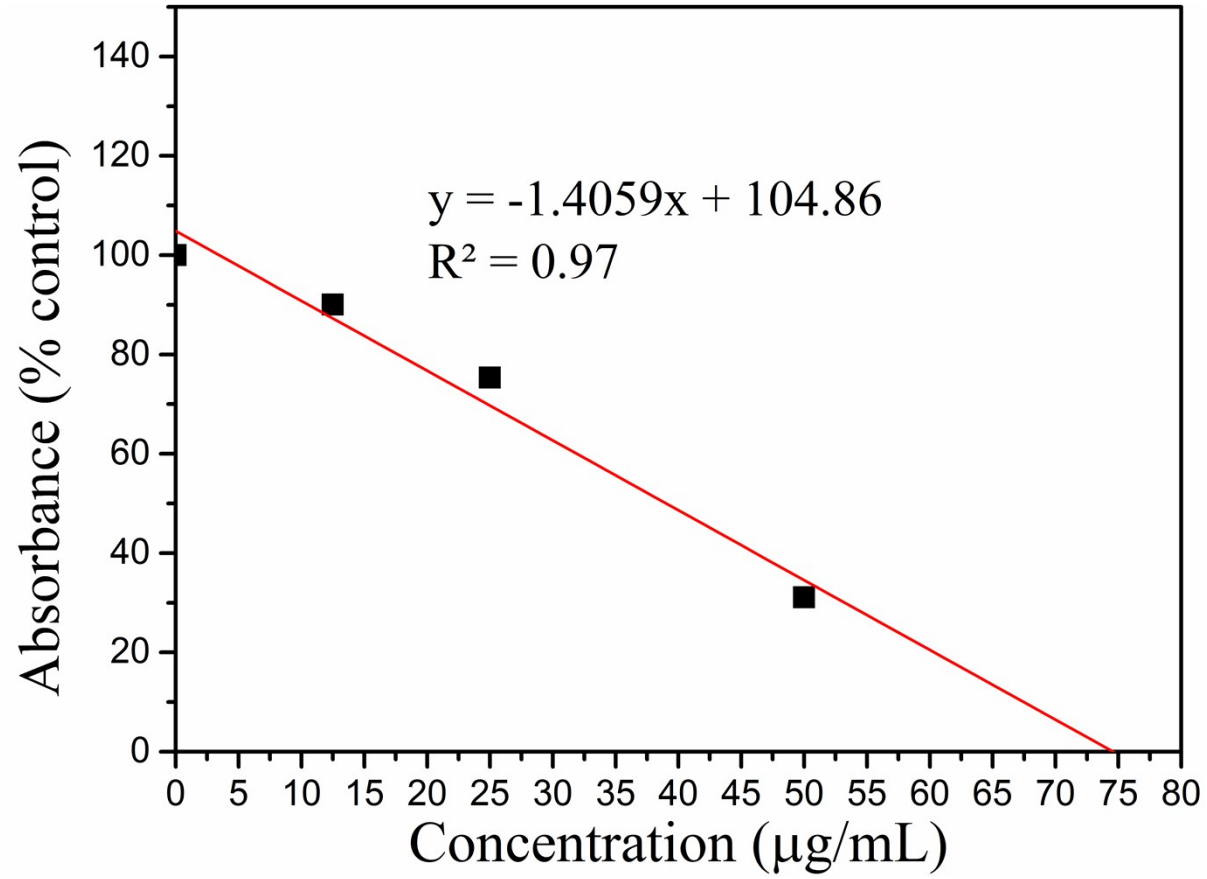

Fig. S4 Method for MIC determination. Sample concentration-absorbance (% control) and linear regression analysis used to determine MIC values. MIC was determined as the concentration at which absorbance (% control) becomes zero. The example shown was based on experimental data obtained for 43 nm Se NPs against *S. aureus* in MHB. The MIC value calculated was 74.59 µg/mL. The average values were taken from two independent tests.

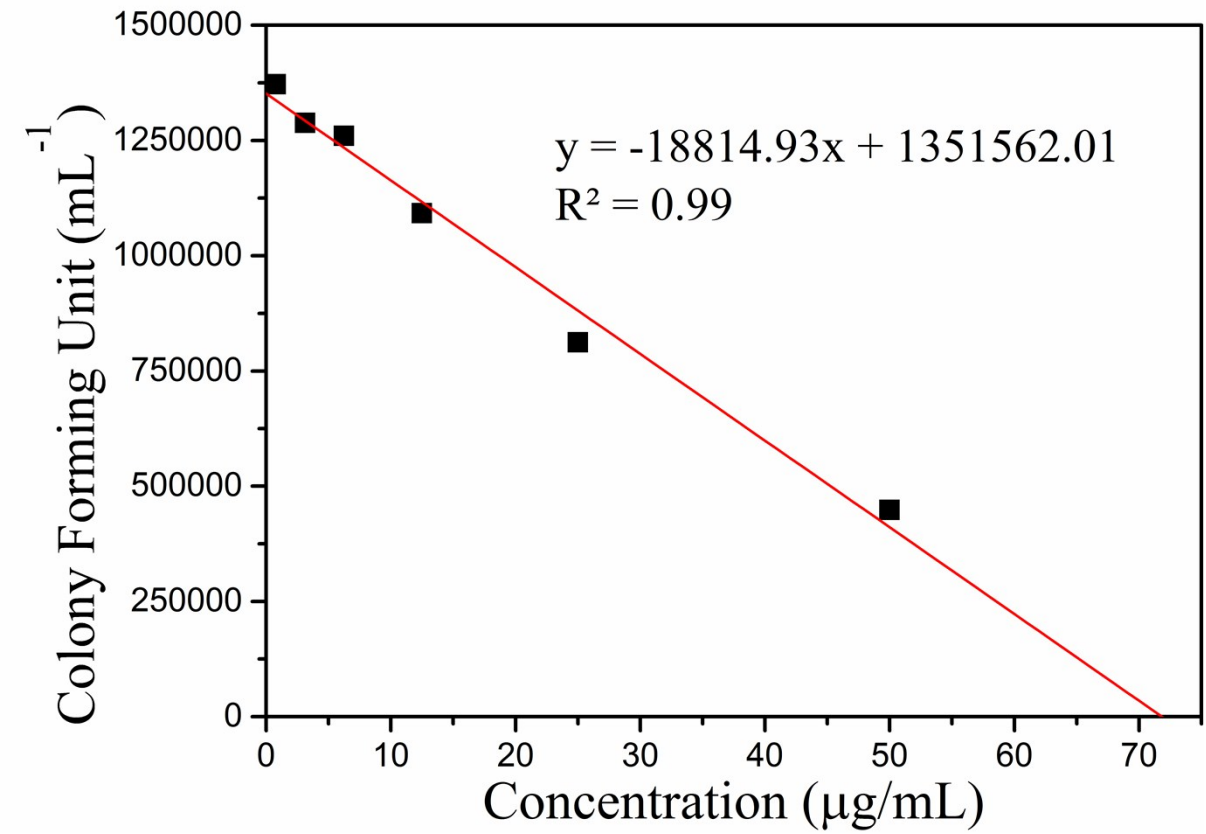

Fig. S5 Method for MBC determination. Sample concentration-killing curves and linear regression analysis used to determine MBC values. MBC was determined as the concentration at which colony-forming unit (CFU)/mL becomes zero. The example shown was based on experimental data obtained for 43 nm Se NPs against *S. aureus* in MHB. The MBC value calculated was 71.83 µg/mL. The average values were taken from two independent tests.