

**A comprehensive investigation of the differential interaction of
Human Serum Albumin with Gold nanoparticles based on the
variation in morphology and surface functionalization**

Sruthi Ann Alex, Debolina Chakraborty, N. Chandrasekaran, Amitava Mukherjee*

Centre for Nanobiotechnology, VIT University, Vellore, India.

Supplementary Information

***Corresponding author**

Dr. Amitava Mukherjee

Senior Professor & Deputy Director

Centre for Nanobiotechnology

VIT University, Vellore - 632014

Email: amit.mookerjea@gmail.com

Phone: 91 416 2202620

Fax: 91-416-2243092

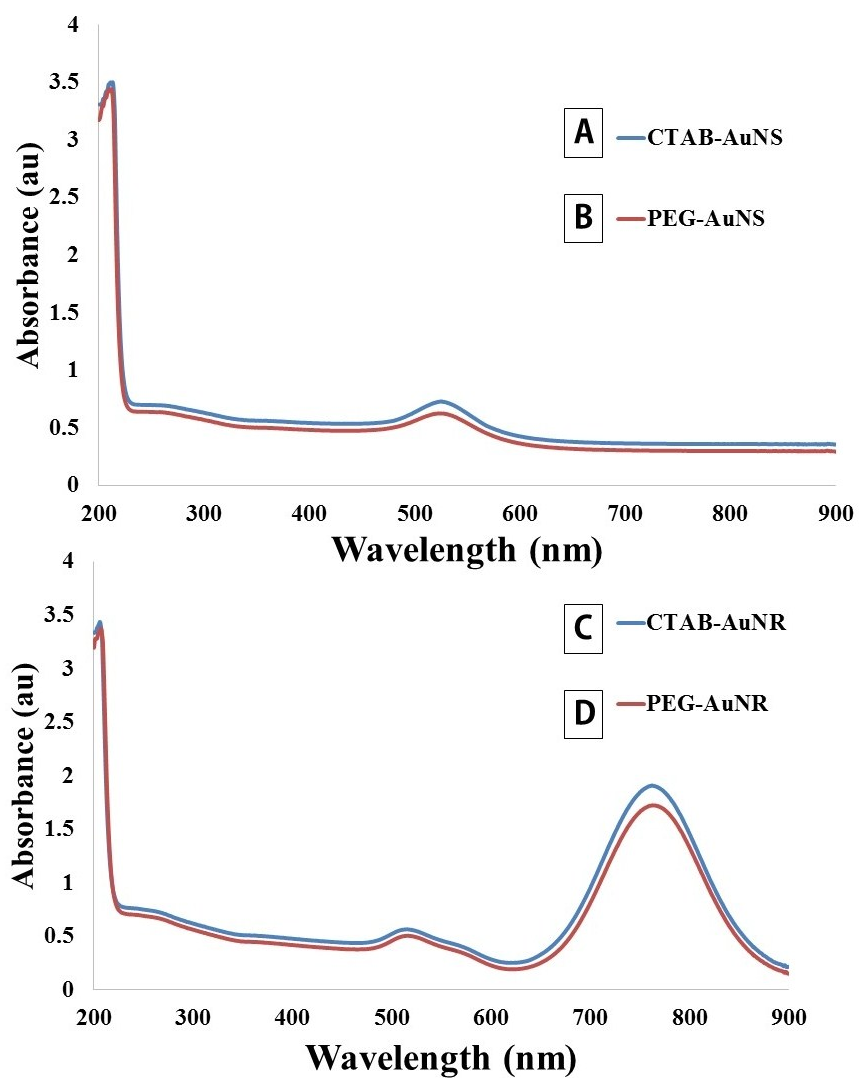


Figure S1 UV-visible spectra of (A) CTAB-AuNSs (B) PEG-AuNSs (C) CTAB-AuNRs (D) PEG-AuNRs.

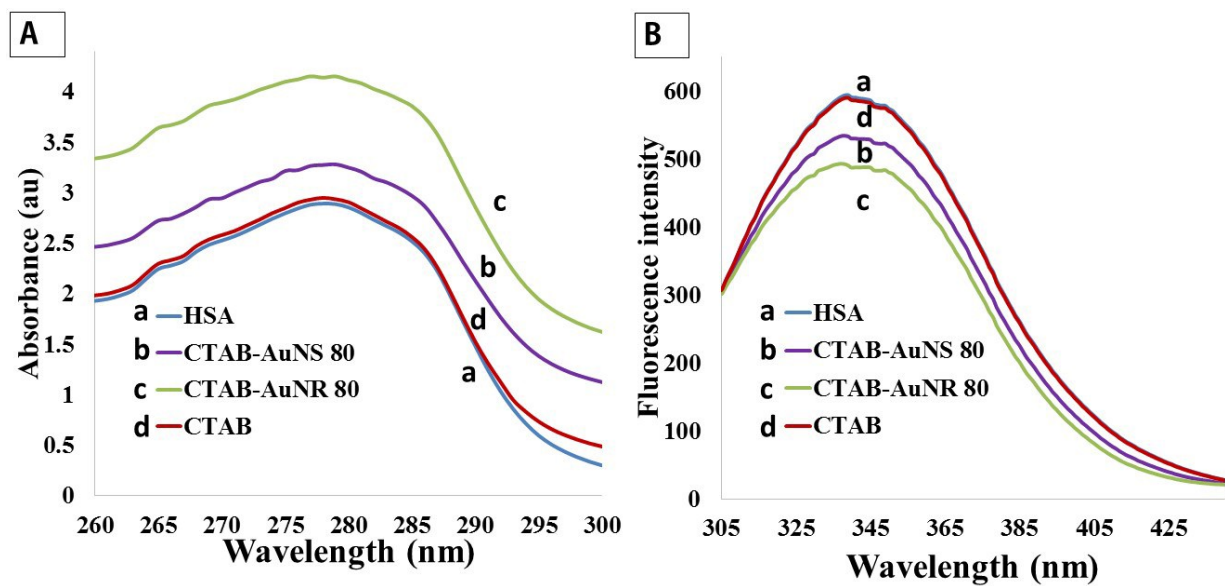


Figure S2 (A) UV-visible and **(B)** Fluorescence spectra for (a) HSA (b) HSA+CTAB-AuNSs 80 μ M (c) HSA+CTAB-AuNRs 80 μ M (d) CTAB

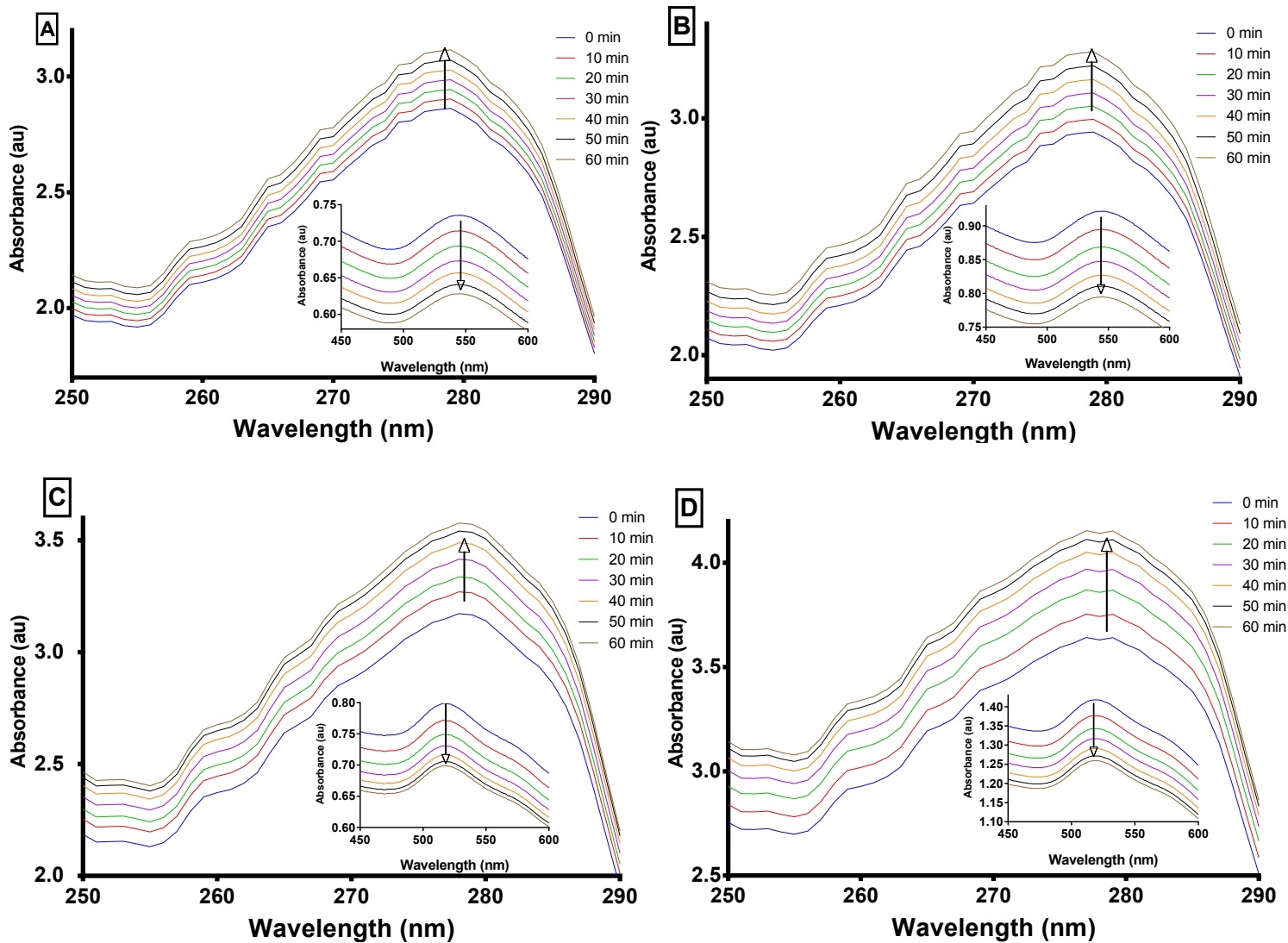


Figure S3 UV-visible spectra for (A) HSA+CTAB-AuNPs 40 μ M (B) HSA+CTAB-AuNPs 80 μ M (C) HSA+CTAB-AuNRs 40 μ M (d) HSA+CTAB-AuNRs 80 μ M (Main spectra shows increase in HSA peak; Inset shows decrease in AuNP peak upon nanoparticle consumption for complex formation).

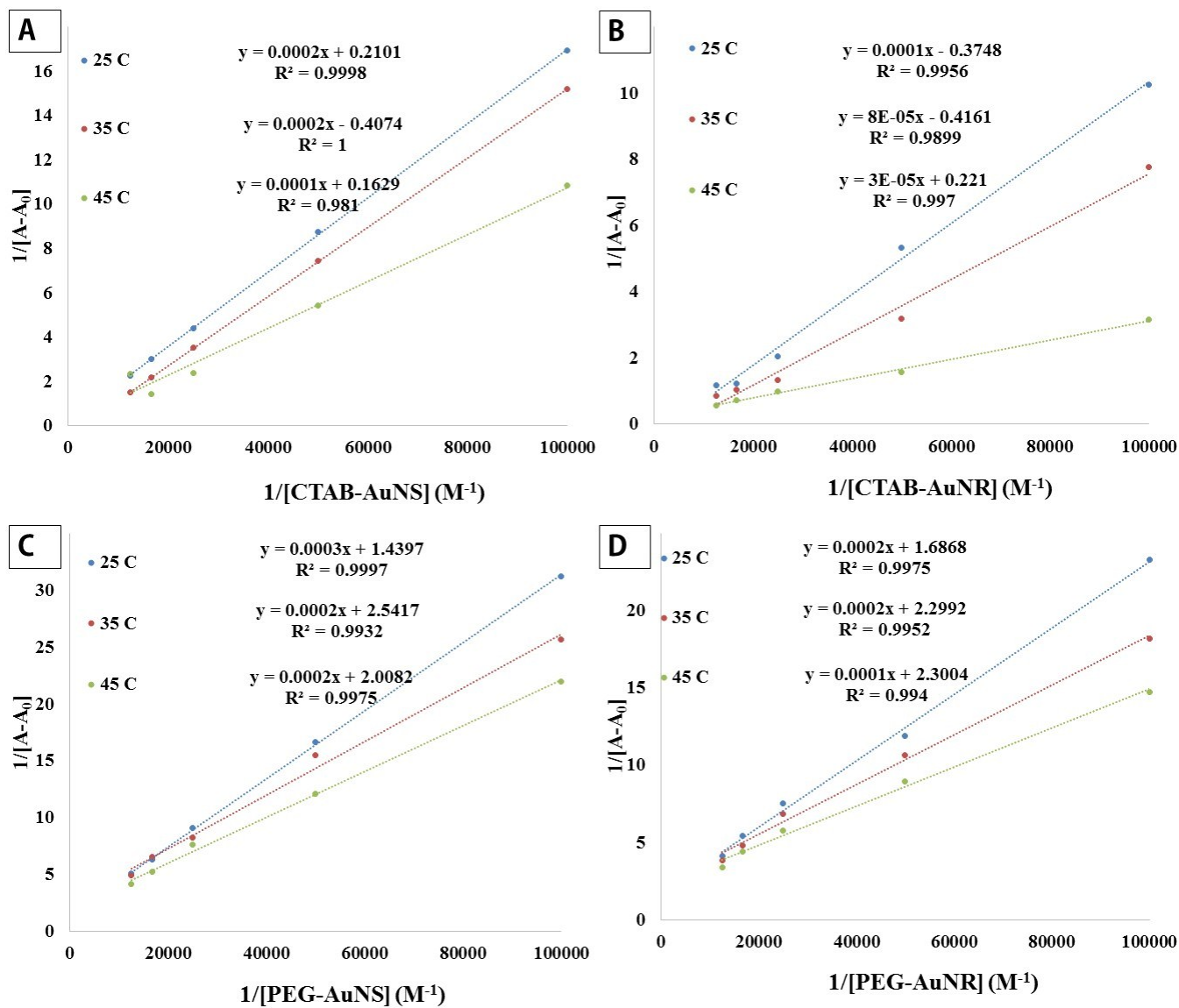


Figure S4 Plot showing the inverse of $A-A_0$ versus the inverse of nanoparticle concentration for (A) CTAB-AuNSs (B) CTAB-AuNRs (C) PEG-AuNSs (D) PEG-AuNRs.

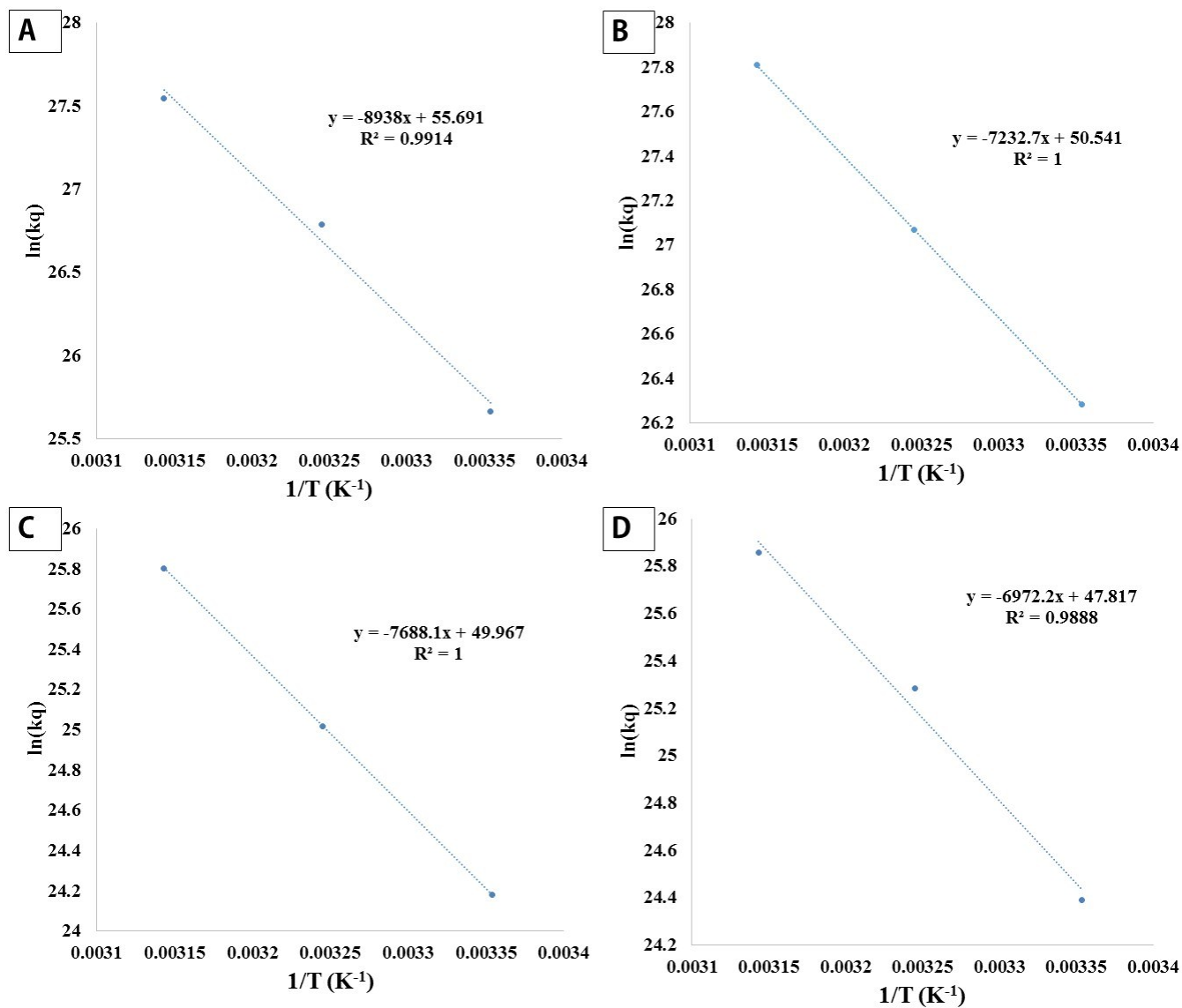


Figure S5 Arrhenius plot for (A) CTAB-AuNSs (B) CTAB-AuNRs (C) PEG-AuNSs (D) PEG-AuNRs.

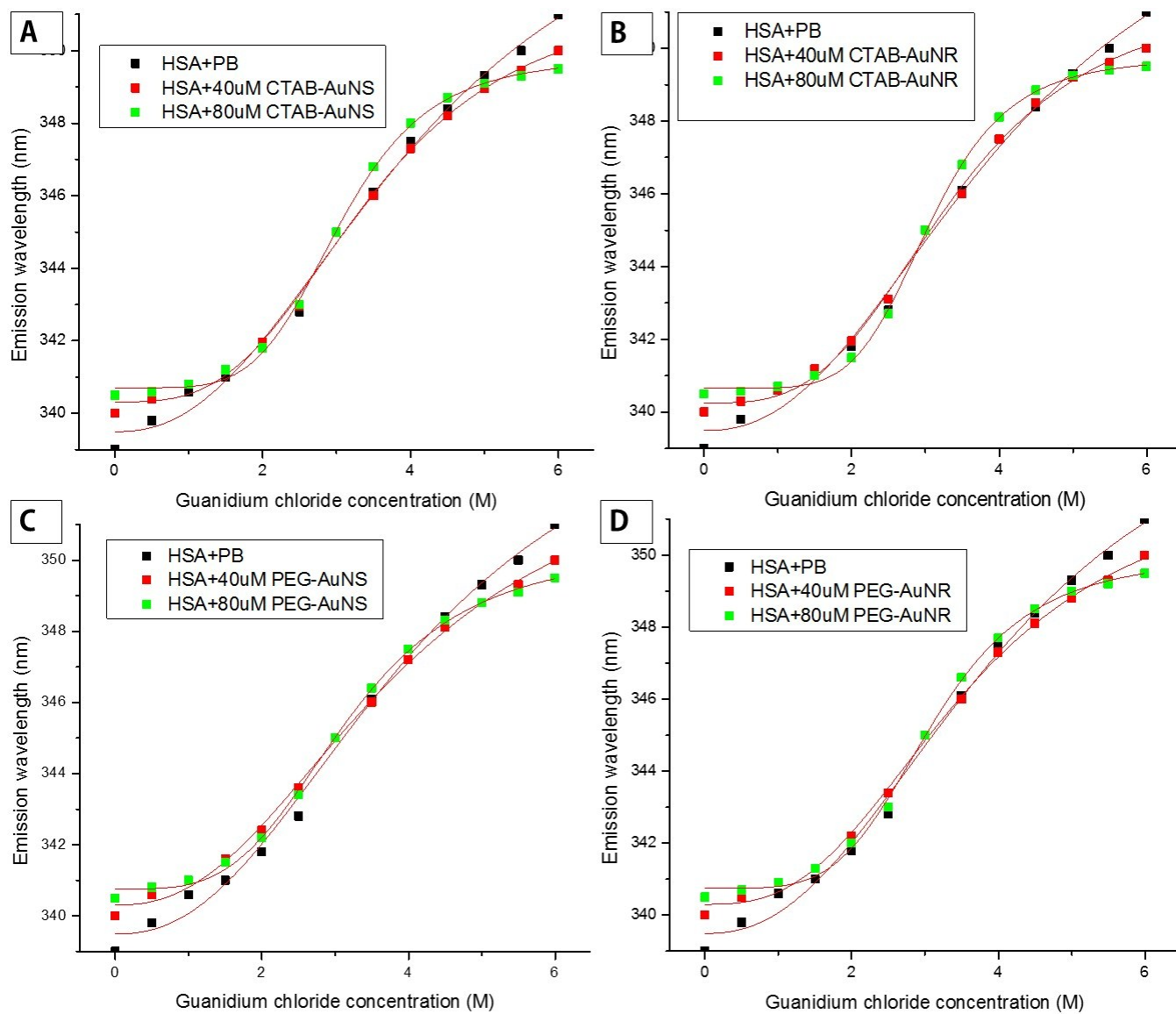


Figure S6 Effect of denaturant concentration on the emission wavelength of HSA before and after interaction with (A) CTAB-AuNSs (B) CTAB-AuNRs (C) PEG-AuNSs (D) PEG-AuNRs at 0, 40, and 80 μM .

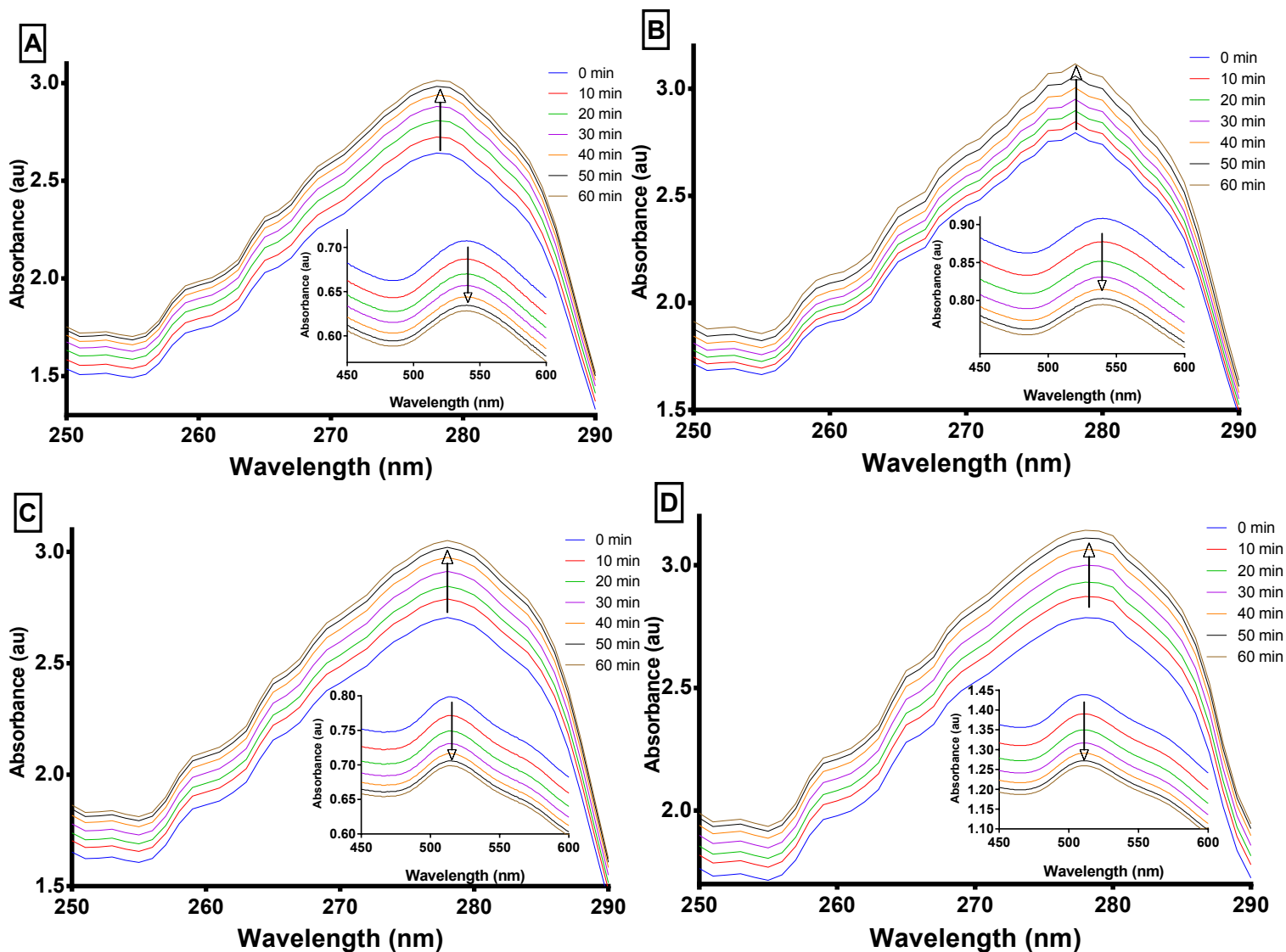


Figure S7 UV-visible spectra for (A) PEG-AuNSs 40 μ M (B) PEG-AuNSs 80 μ M (C) PEG AuNRs 40 μ M (d) PEG-AuNRs 80 μ M (Main spectra shows increase in HSA peak; Inset shows decrease in AuNP peak upon nanoparticle consumption for complex formation).

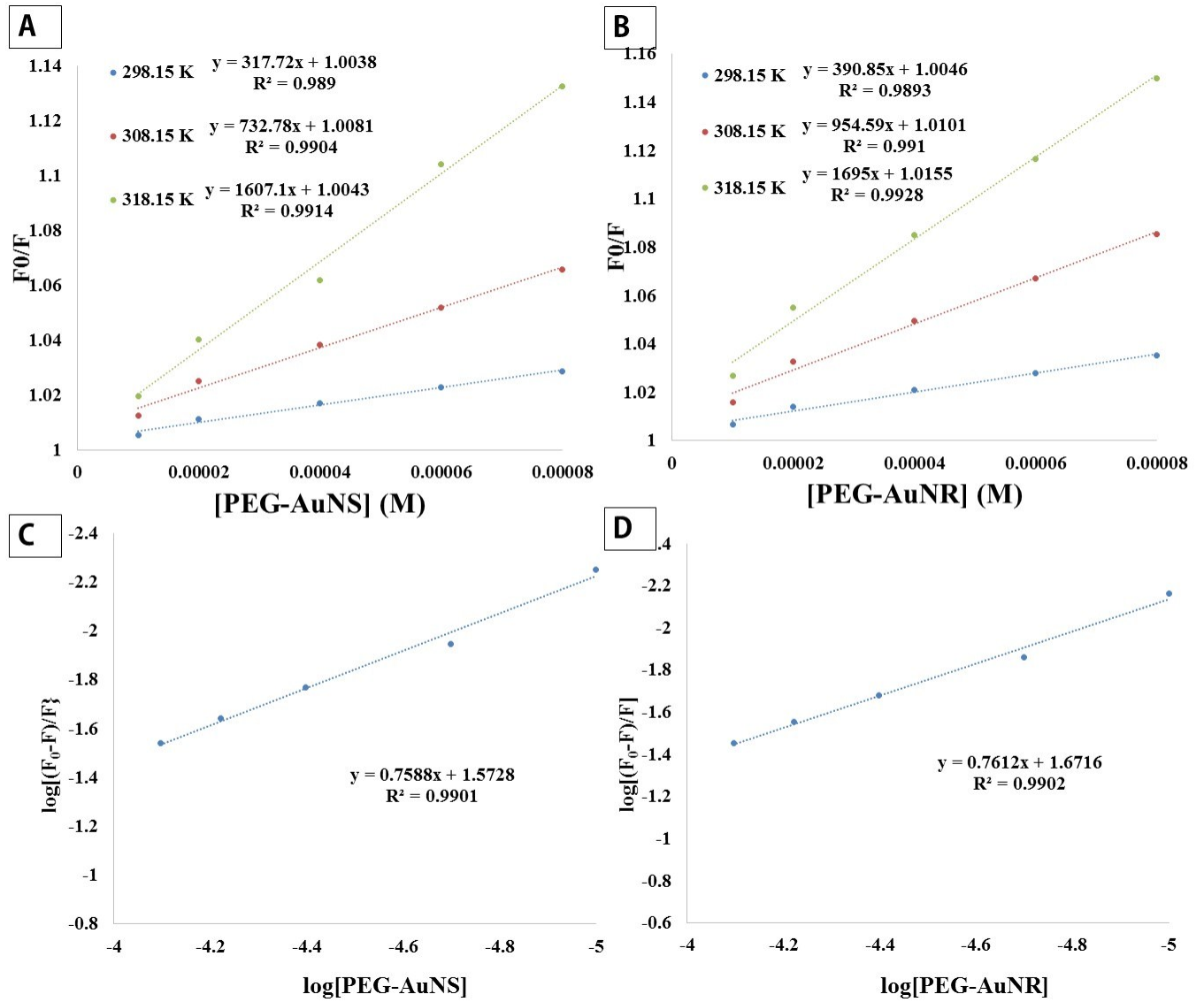


Figure S8 (A–B) Stern–Volmer plot (at 298, 308, and 318 K) and **(C–D)** double logarithmic plot (298 K) for HSA interacted with PEG-modified AuNSs and AuNRs.

Table S1: Protein concentrations in interacted samples before and after centrifugation

Sample	Reading 1^a (μM)	Reading 2^b (μM)	Reading 3^c (μM)	Reading 4^d (μM)
HSA control	99.0±0.7	93.3±1.7	5.7±1.2	–
CTAB AuNS 40	97.6±1.2	72.1±0.7	25.5±0.9	19.7±1.9
CTAB AuNS 80	97.2±0.8	70.7±0.4	26.5±0.4	20.8±1.3
CTAB AuNR 40	96.5±0.5	70.3±1.0	26.2±0.7	20.5±0.8
CTAB AuNR 80	97.2±0.5	66.8±0.8	30.4±1.1	24.7±1.2
PEG AuNS 40	99.3±0.4	85.3±0.6	14.0±0.6	8.3±0.7
PEG AuNS 80	98.3±0.8	84.6±0.5	13.7±0.4	7.9±1.4
PEG AuNR 40	98.1±0.4	80.9±0.3	17.2±0.3	11.5±1.2
PEG AuNR 80	98.4±1.1	80.2±0.5	18.1±1.4	12.4±1.1

a – Protein concentrations estimated in 1-h interacted sample before centrifuge

b – Protein concentrations estimated for supernatant in 1-h interacted sample before centrifuge

c – Protein concentration in pellet (c=a–b)

d – Protein concentration estimated to be involved in complex formation (d=Reading 3 for sample – Reading 3 for control)