

*Supplementary data:*

**Surface functionalization of PLGA nanoparticles for potential oral vaccine delivery targeting intestinal immune cells.**

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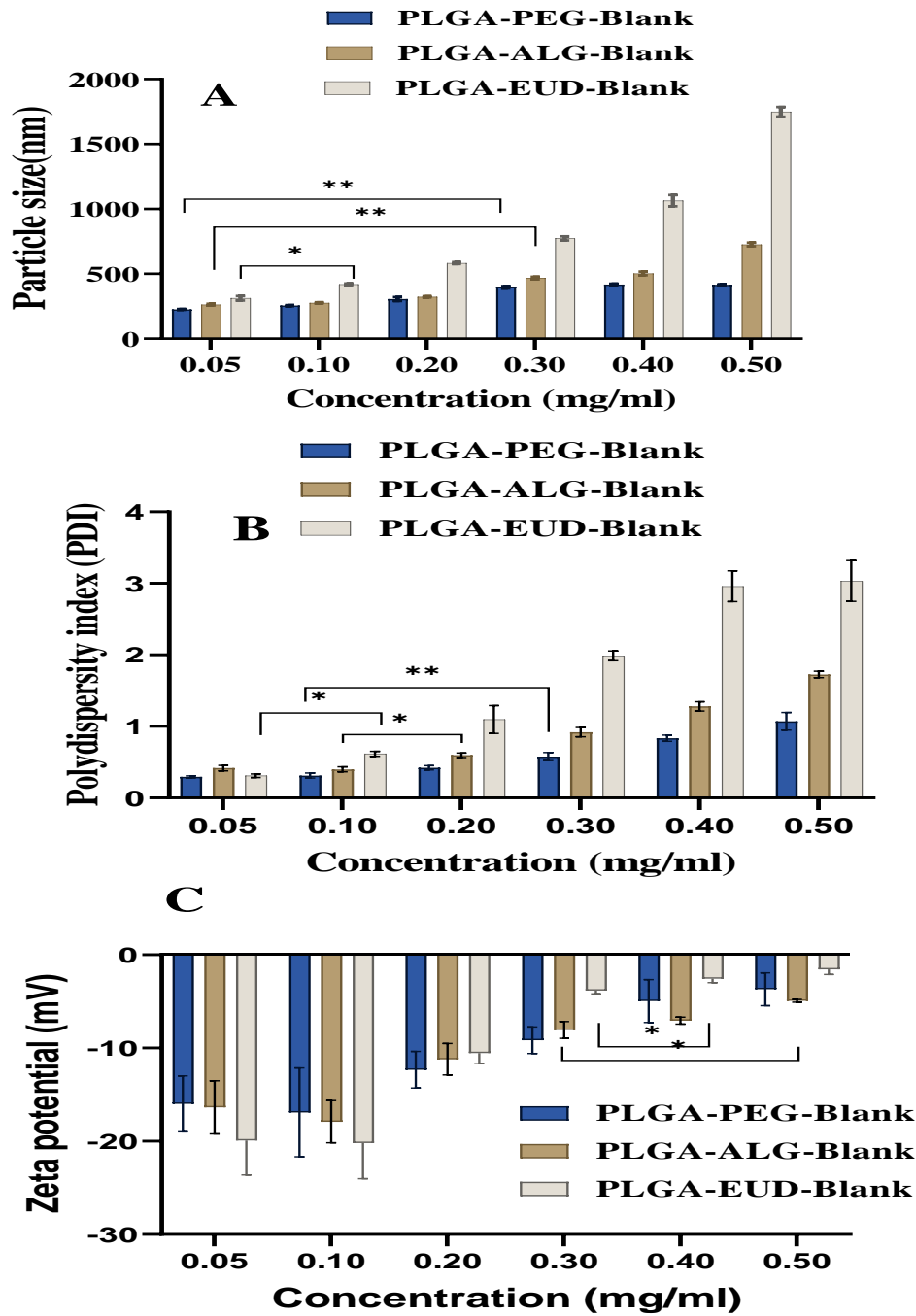


Figure S1: Representative size, PDI and zeta potential profiles of blank PLGA nanoparticles (NPs) surface modified with different concentrations of polyethylene glycol (PEG), sodium alginate (ALG) and Eudragit (EUD).

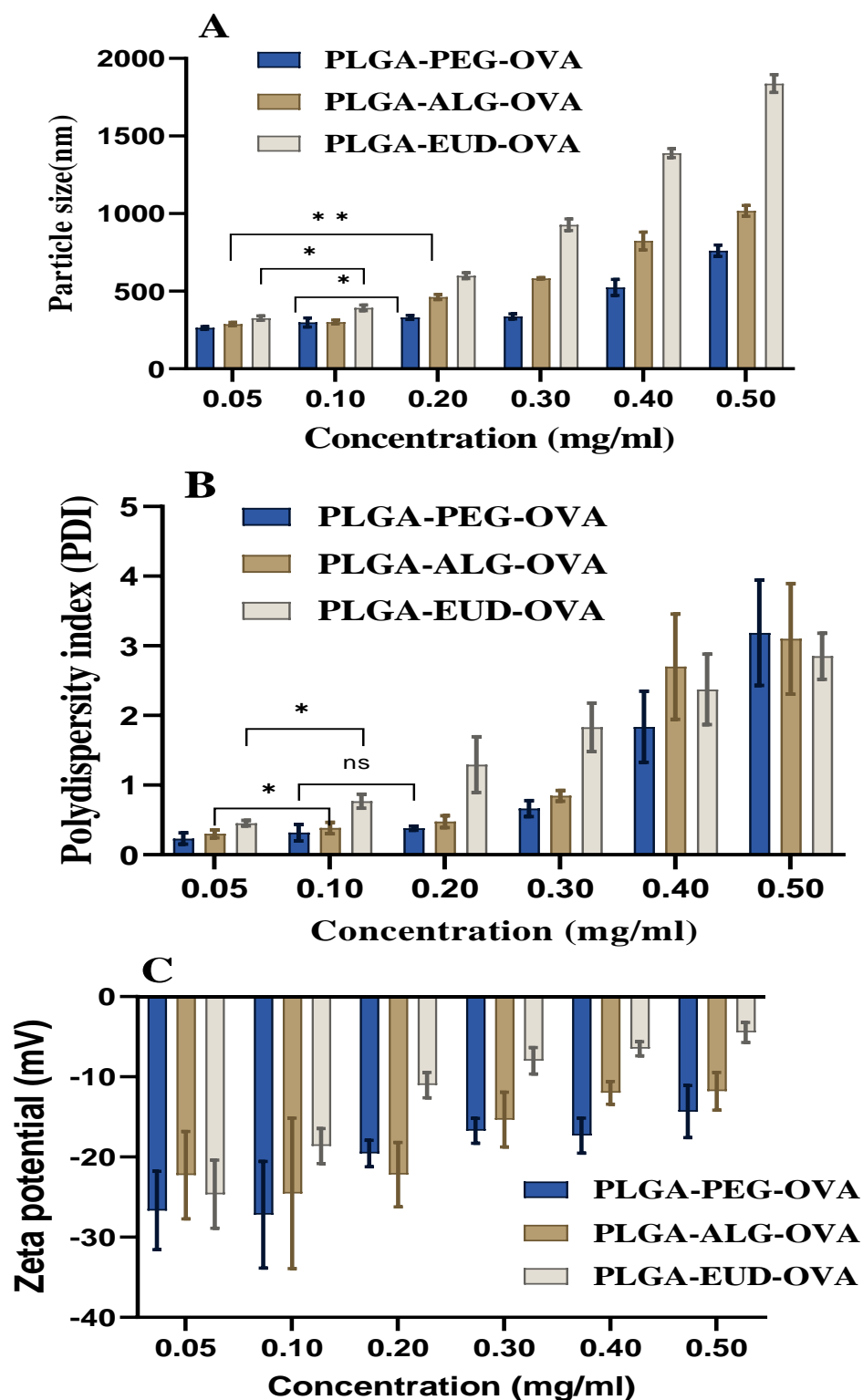


Figure S2: Representative DLS (size, PDI and zeta potential) profiles of OVA loaded PLGA NPs surface modified with different concentrations of coating polymers (PEG, ALG and EUD).

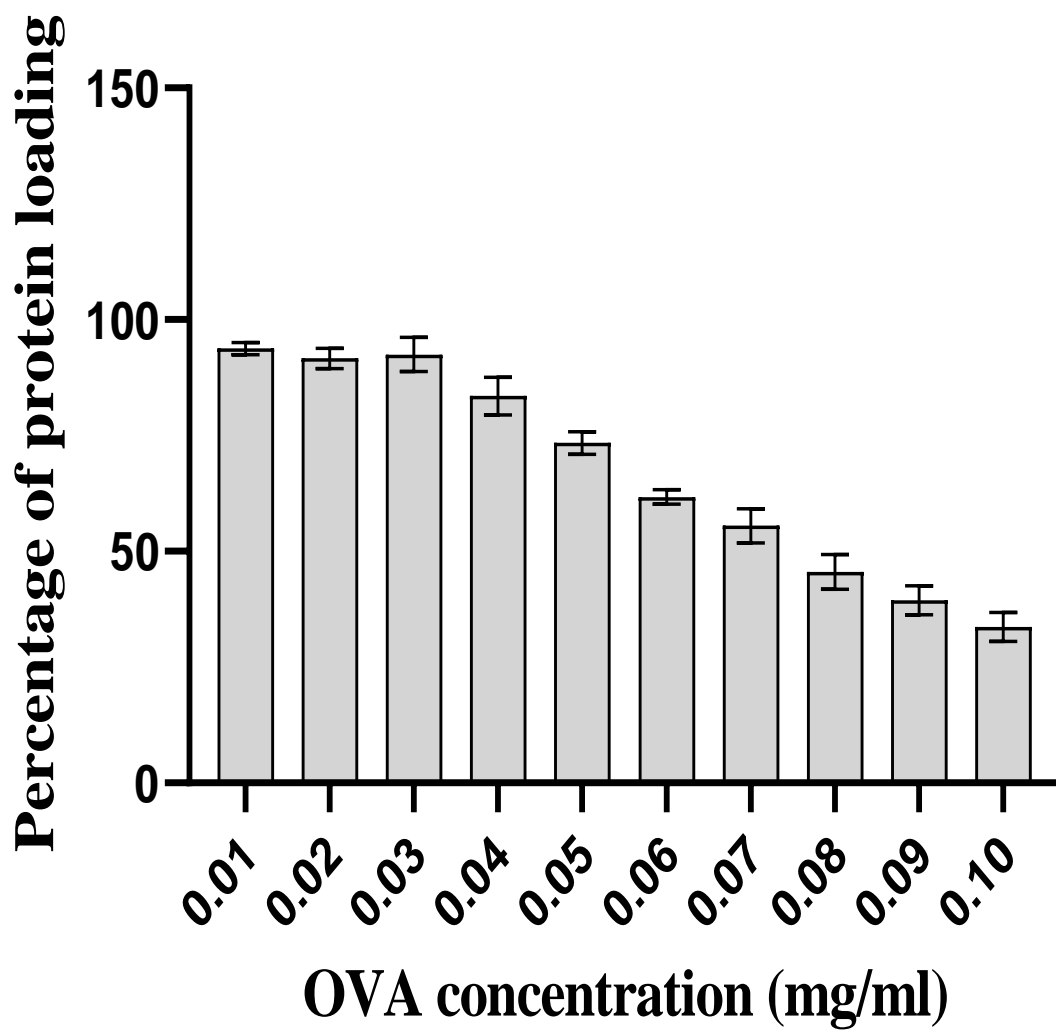


Figure S3: OVA loading efficiency into uncoated PLGA NPs.

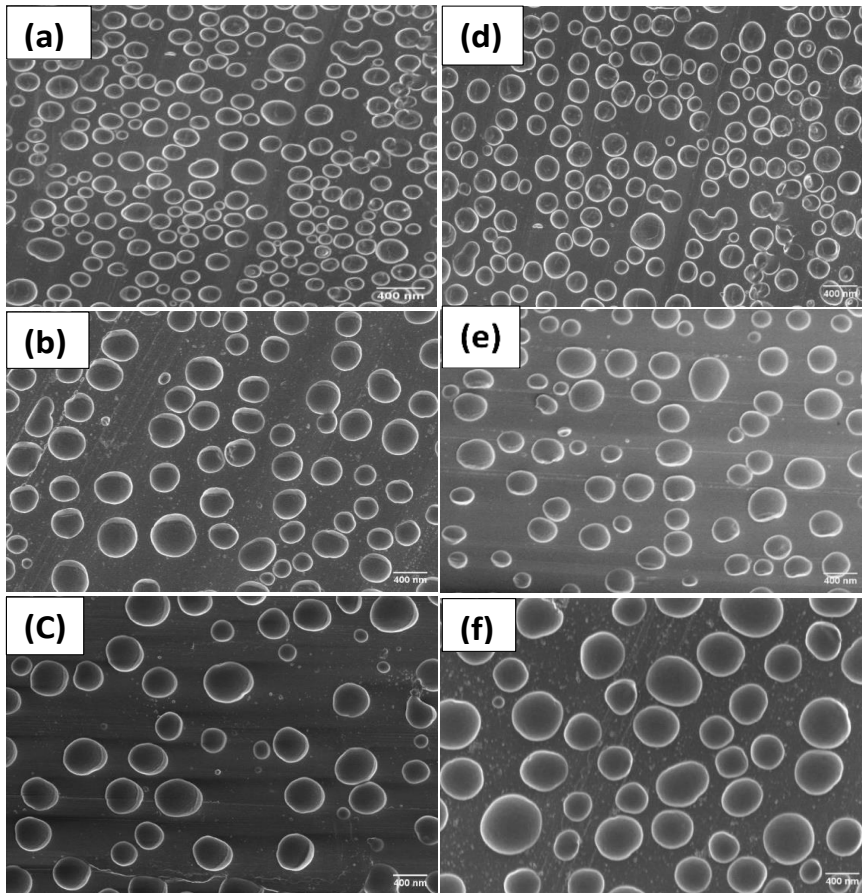


Figure S4: Representative SEM images of blank and OVA loaded PLGA NPs: (a) PLGA-Uncoated-Blank, (b) PLGA-ALG-Blank (c) PLGA-EUD-Blank (d) PLGA-OVA (e) PLGA-ALG-OVA (f) PLGA-EUD-OVA

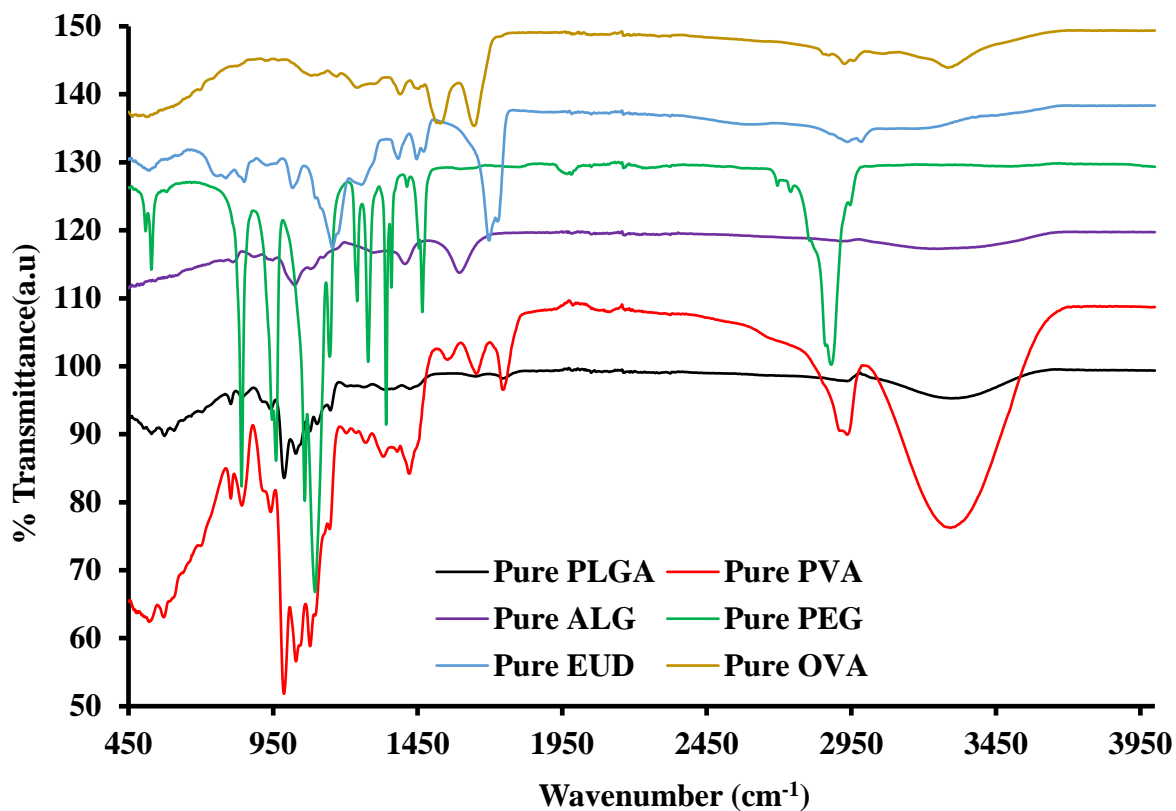


Figure S5: FTIR spectra of pure starting materials.

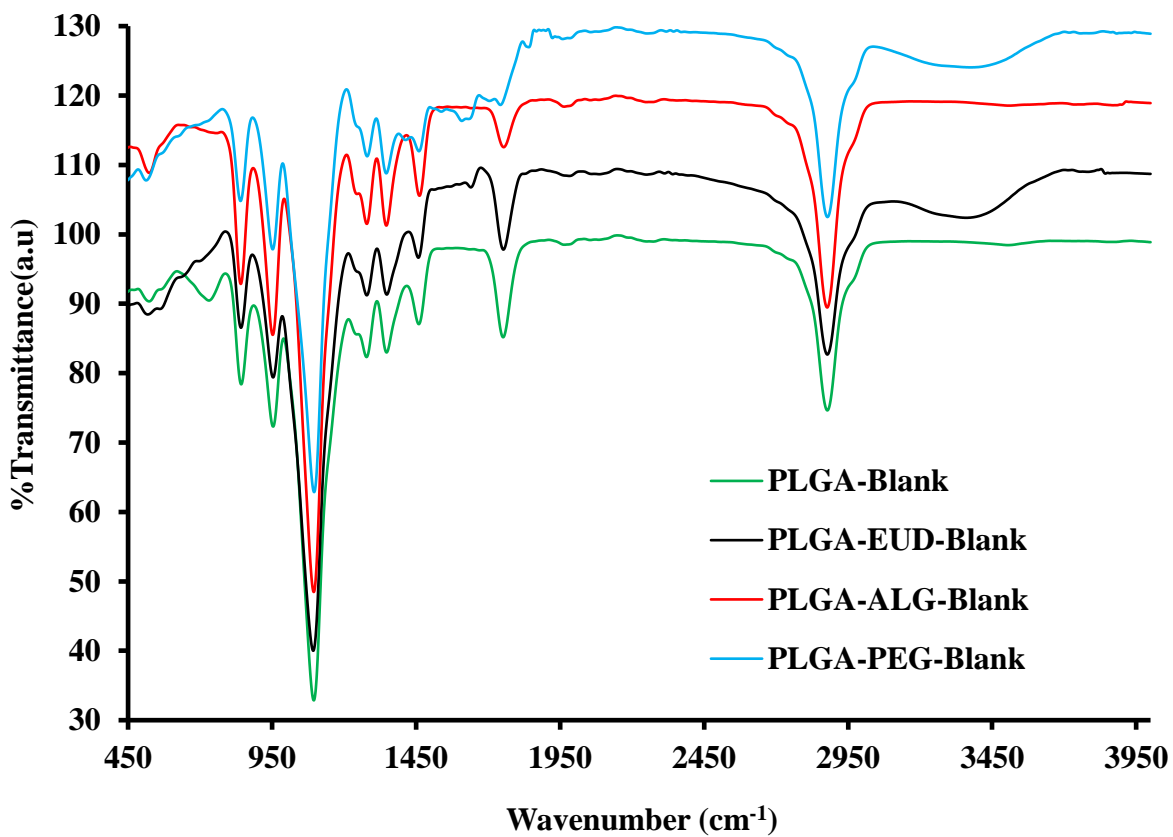


Figure S6: FTIR spectra of blank PLGA NPs.

Table S1: Summary GPC data derived from Figure 2 (A, B) in the main manuscript

Sample name	$M_n$ (Da)	$M_w$ (Da)	$D_m$
PEG + H <sub>2</sub> O	57402	69256	1.20
PLGA + DCM + PVA	33176	37300	1.12
EUD + 7% Methanol	61734	77253	1.25
ALG + H <sub>2</sub> O	216	336	1.55
PLGA (uncoated)	22235	26309	1.18
PLGA-PEG	25245	33015	1.30
PLGA-ALG	19025	24763	1.30
PLGA-EUD	16553	21445	1.29

$M_n$ = Number- average molecular weight;  $M_w$ = Weight average molecular weight;  $D_m$ = Molecular weight dispersity.

$$M_n = \sum_i m_i \varphi_i \dots\dots\dots (i)$$

$$M_w = \frac{\sum M_i^2 \varphi_i}{\sum M_i \varphi_i} \dots\dots\dots (ii)$$

$$D_m = \frac{M_w}{M_n} \dots\dots\dots (iii)$$

Where,  $\varphi_i$  is the molar fraction of the polymer and  $i$  is the polymeric component with mass  $M_i$

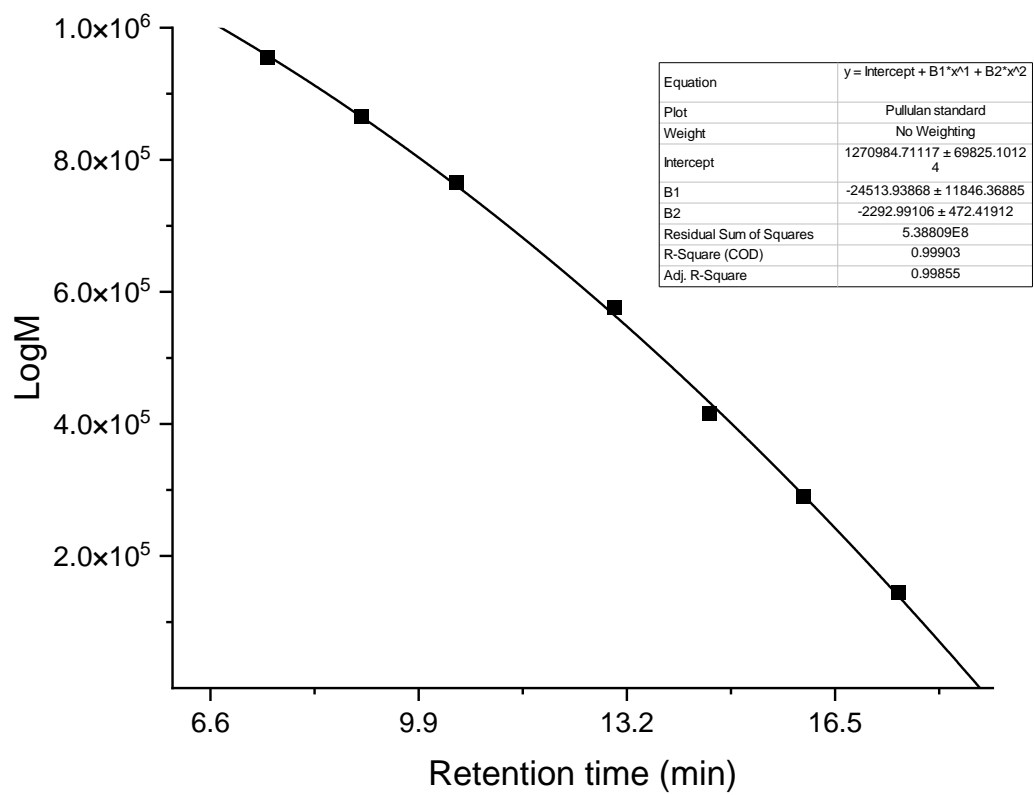


Figure S7: Gel permeation chromatography calibration curve (pullulan standard) fitted by the logarithmic normal distribution.



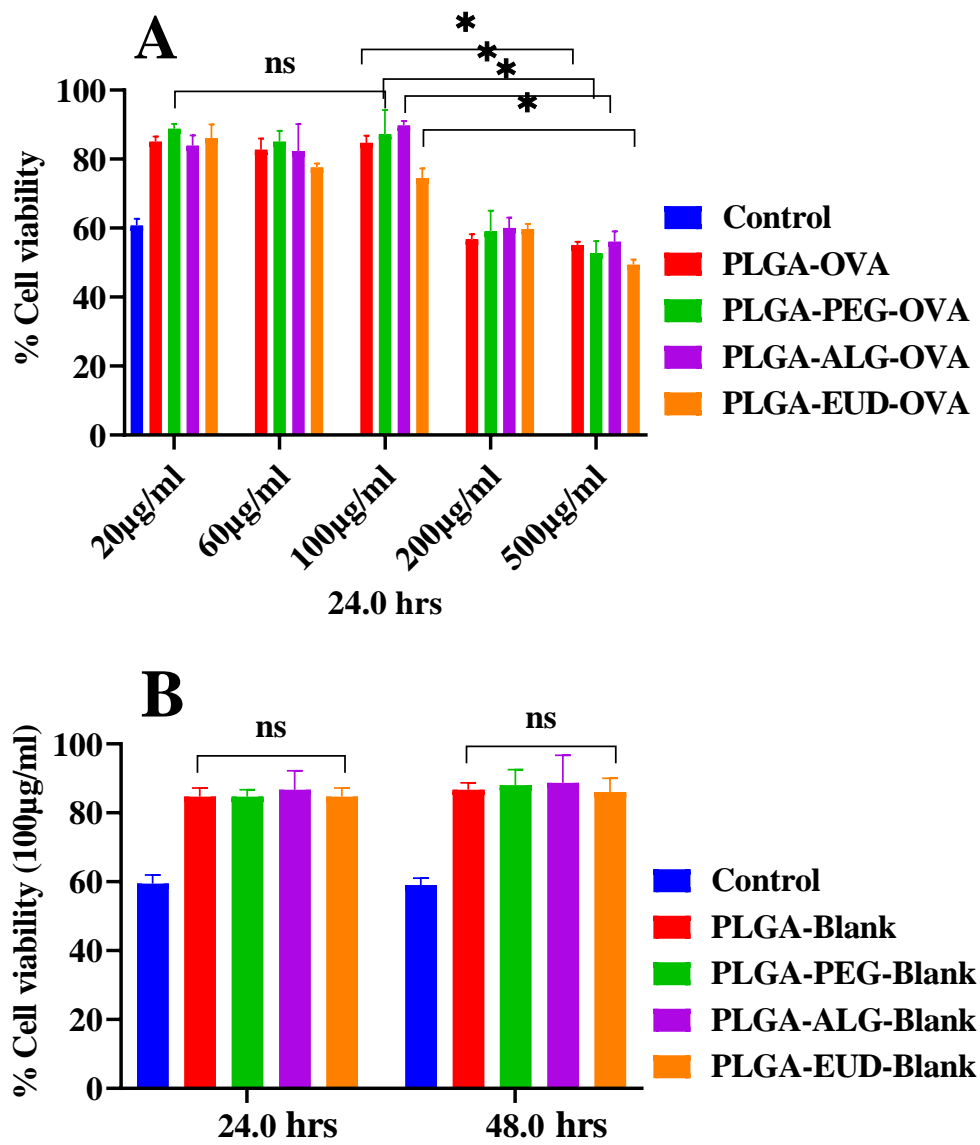


Figure S8: *In vitro* cell cytotoxicity profiles of the NPs against Jurkat cells.