

Supplementary Information

Albumin grafted coaxial electrospayed polycaprolactone-zinc oxide nanoparticle for sustained release and activity enhanced antibacterial drug delivery W. Pamoda Thavish D. Perera^{†§}, D. M. Ranga K. Dissanayake,^{* §[‡]} Janitha M. Unagolla[‡], Rangika T. De Silva[§], Sanjaya D. N. K. Bathige[§], , Lakshitha R. Pahalagedara[§]

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1. Drug Loading study

Cloxacillin, was grafted onto the surface of the ZnO using an overnight stirring process and a standard vacuum evacuation process. Initially, 1g of both Zinc oxide and Cloxacillin (1:1 ratio) were dispersed in 10 mL of distilled water and allowed to proceed grafting for 24 h at 500 rpm for 24h at room temperature. After that, the flask containing the resultant ZnO-Cloxacillin suspension was allowed to be evacuated using a vacuum pump for 30 minutes until the removal of air entrapments. After the fizzing stopped, the suspension was kept uninterrupted for 10 min to reach equilibrium, and the entire vacuum evacuation cycle was repeated for two times in order to facilitate the inclusion of cloxacillin onto the surface of the ZnO nanoparticles. At next, the suspension was centrifuged and washed twice using distilled water to eliminate the unbound cloxacillin. The encapsulated cloxacillin amount was determined by finding the difference in cloxacillin concentration in the aqueous solution before and after drug loading. Percentage of drug loading was calculated based on the cloxacillin calibration plotted using 20% DMSO baseline. The calibration curve for the quantification of cloxacillin is presented below, alongside the raw UV-Vis data used for its construction

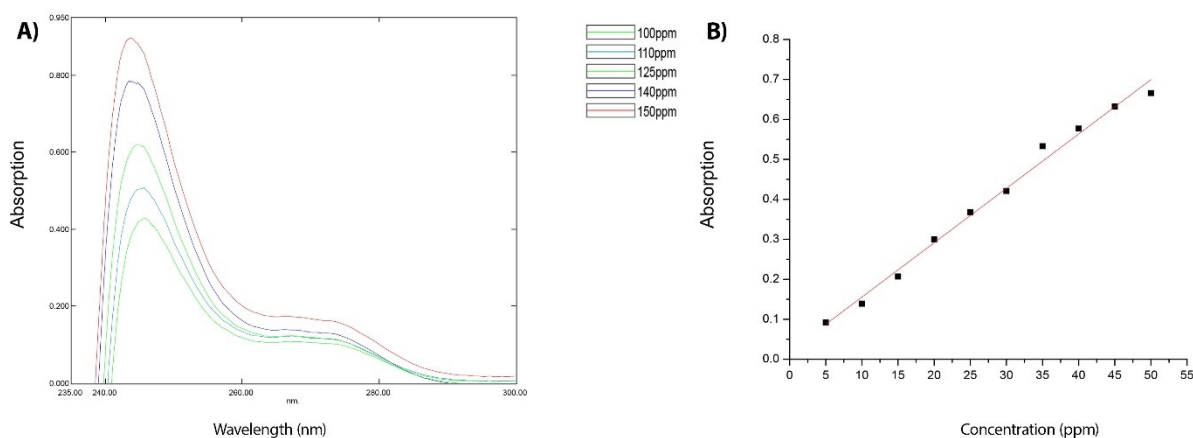


Figure S1- A) UV-Vis spectra of cloxacillin in different concentrations **B).** Calibration plot of cloxacillin

Table S.1: Cell viability percentages of day 1 and day 3

	Day 1			Day 1 Avg.	Day 3			Day 3 Avg.
	Trial 1	Trial 2	Trial 3		Trial 1	Trial 2	Trial 3	
ZnO	56	53	48	52.3±4.3	28	10	14	17.3±9.2
ZnO-CLOX	50	43	40	44.3±5.1	10	16	10	12.0±3.4
PCL	92	114	99	101.6±11.2	85	85	95	88.3±5.8
APCL-ZNO-CLOX	144	150	135	143.0±7.5	70	60	66	65.3±5.0
PCL-ZNO-CLOX	55	75	62	64.0±10.1	55	50	44	49.6±5.5

Table S.2: In vitro lung deposition study, retained particle percentages at each stages of Twin glass impinge

	Retain particle percentage			
	Trial 1	Trial 2	Trial 3	Avg.
Stage 1	18	14	12	14.7±3.1
Stage 2	64	72	73	69.7±4.9
Wall and inhaler	*	*	*	