List of Figures

Figure no.	Description	Page no.
Figure 2.1	Chemical structure of Silver Silfadiazine	36
Figure 5.1	Calibration curve of SSD in water for UV spectrophotometry	56
Figure 5.2	Calibration curve of SSD in phosphate buffer pH 6.8 for UV spectrophotometry	57
Figure 5.3	Software generated 3D plot expressing the effect of various factors on the PS and %EE.	60
Figure 5.4	SEM micrograph of optimized SSD-SLNs	61
Figure 5.5	<i>In-vitro</i> drug release profile of SSD-SLNs in phosphate buffer pH 6.	62
Figure 5.6	FT-IR peaks corresponding to the functional groups of the SSD	63
Figure 5.7	Overlapped FT-IR spectrum of SSD, compritol 888 ATO, Lutrol F 68, and SSD-SLNs	63
Figure 5.8	DSC thermograms of SSD, physical mixture and SSD-SLNs showing effect of excipients and formulation on melting of SSD	64
Figure 5.9	X-ray diffraction patterns of SSD, physical mixture, and SSD-SLNs	65
Figure 5.10	The graph indicates the comparative inhibition of established <i>P. aeruginoas</i> biofilm after three consecutive dosing (once a day) of pure SSD or encapsulated SSD (18.75 μ g/mL) with or without DNase-I (20 μ g/mL). A repeated measure two way ANOVA was performed (*, P<0.05, versus non-treated biofilms (0 h); #, P<0.05, versus SSD-SLNs+DNase-I on 72 h). The viable counts 2.3 \times 10 ⁹ \pm 9.1 \times 10 ⁷ cfu/mL in untreated biofilm was taken as hundred percent	68
Figure 5.11	CLSM images of P. aeruginosa biofilm treated with	69

	fluorescent (SYTO9) cell indicated the Live bacterial cell and red fluorescent (PI) for dead cell. (i) Untreated <i>P. aeruginosa</i> biofilm, (ii) pure SSD, (iii) SSD+DNase-I, (iv) SSD-SLNs (v) SSD-SLNs+DNase-I. (SSD equivalent to 18.75µg/mL and DNase-I equivalent to 20 µg/mL)	
Figure 5.12	Bar graph represents the percentage viable dermal fibroblast incubated with varying concentration of pure and encapsulated SSD after 24 h. A repeated measure two way ANOVA was performed (a, P<0.05, vs pure SSD; b, P<0.05, vs SSD+DNase-I)	70
Figure 5.13	(A) Comparative burn wound healing images of rats after 21 days; & (B) Histopathology of re-epithelialized rat skin after 21 days treatment showing at 10X magnification; The treatment group includes: (i) Untreated (diseased control); (ii) SSD marketed cream; (iii) SSD-SLNs chitosan gel; (iv) SSD-SLNs+DNase-I chitosan gel	73
Figure 6.1	Calibration curve of ciprofloxacin in water for UV spectrophotometry	86
Figure 6.2	Calibration curve of ciprofloxacin in phosphate buffer saline pH 6.8 for UV spectrophotometry	87
Figure 6.3	% free amino groups remained after conjugation in AgLase-CIPR-CH-NPs	88
Figure 6.4	% hydrolytic activity of the AgLase-CIPR-CH-NPs after conjugation compared to pure AgLase	88
Figure 6.5	SEM micrograph of the CIPR-CH-NPs	90
Figure 6.6	SEM micrograph of AgLase-CIPR-CH-NPs	90
Figure 6.7	Comparative <i>in vitro</i> release profile of CIPR-CH-NPs and CIPR	92
Figure 6.8	Schematic representation of FTIR peaks on the ciprofloxacin structure	93
Figure 6.9	FTIR spectra of the different test samples	93

different test sample (40X magnification). Green

Figure 6.10	XRD diffraction pattern of the different formulation	94
Figure 6.11	The comparative findings of the MBIC after 24 h treatment	97
Figure 6.12	The comparative findings of the MBIC after 48 h treatment	98
Figure 6.13	Antimicrobial studies. A and B represents the MBIC after 24 and 48 h. The microbial count in control group was $1.8 \times 10^8 \pm 9.8 \times 10^6$ CFU/ml after 24 h and $2.9 \times 10^9 \pm 1.9 \times 10^8$ CFU/ml after 48h. Moreover, C and D illustrated the results of MBEC study showing reduction of 48 h grown P. aeruginosa biofilm on single dose at different CIPR concentrations and on repeated dosing of formulations (0.125µg/ml) for three consecutive days respectively. Two way ANOVA was performed (where * representing p<0.05; other groups vs AgLase-CIPR-CH-NPs). The viable count in the controlled experiments without any treatment was $2.45 \times 10^9 \pm 1.23 \times 10^8$ CFU/ml	100
Figure 6.14	CLSM images of biofilm showing the relative density of biofilm. Where A, B, C, D, E and F denote Control or untreated, CIPR, CIPR+AgLase, CIPR-CH-NPs, CIPR-CH-NPs+AgLase and AgLase-CIPR-CH-NPs treated biofilm of <i>P. aeruginosa</i> , respectively	102
Figure 6.15	Bar graph elaborates the findings of the in vitro cytotoxicity study	103
Figure 6.16	% haemolysis after incubating the processed blood sample with formulations.	104
Figure 6.17	Platelet count in blood after treatment with different formulation at different concentration (0.0625, 0.125 and 0.25 $\mu g/ml$)	105
Figure 6.18	Leishman's stained microscopic images of whole blood samples after treating with PBS equivalent to 0.0625, 0.125, and 0.25μg/ml of test sample (a, b and c resp.); CIPR at 0.0625, 0.125, and 0.25μg/ml concentration (d, e and f resp.); AgLase at 10, 50 and 100μg/ml concentration (g, h and I resp.); CIPR-CH-NPs equivalent	106

to 0.0625, 0.125, and 0.25 μ g/ml CIPR concentration (j, k and 1 resp.) and: AgLase-CIPR-CH-NPs equivalent to 0.0625, 0.125, and 0.25 μ g/ml CIPR concentration (m, n and o resp.)

Figure 6.19 HE stained histological images of animal lungs treated for 7 consecutive days with different formulations. a)
Untreated; b) CIPR treated; c) AgLase treated; d) CIPR-CH-NPs treated and; e) AgLase-CIPR-CH-NPs treated

107