## List of Figures

Fig. No.	Description	Page No.
2.1	Different layers of skin.	07
2.2	Clinical wound healing – (a) primary intention wound healing process, and (b) secondary intention wound healing process.	11
2.3	Different phases of wound healing.	15
2.4	The schematic diagram represents the multiple roles of ROS in hemostasis state during acute wound healing.	18
2.5	Summary of ROS types and sources, and action point of antioxidants.	20
2.6	Schematic representation of the electrospinning set up.	25
2.7	Chemical structure of ciprofloxacin hydrochloride monohydrate	31
2.8	Chemical structure of quercetin	35
2.9	Chemical structure of poly(ε-caprolactone)	39
2.10	A typical structure of gelatin	40
2.11	Chemical structure of PLGA	43
2.12	Hydrolysis of PLGA polymer in body fluid.	43
4.1	Overlay spectra of ciprofloxacin hydrochloride and quercetin.	52
4.2	Graphic demonstration of steps involved in the PCL-based electrospun nanofiber production.	58
4.3	Graphic demonstration of steps involved in the PCL-GE based electrospun nanofiber production.	60
4.4	Graphic demonstration of steps involved in the PLGA-GE based electrospun nanofiber production.	61
4.5	Overview of the hydroxyproline assay.	73
4.6	Calibration curve of hydroxyproline.	
5.1	Overlay spectra of ciprofloxacin hydrochloride and quercetin.	76
5.2	(a) Overlay spectra of a series of concentrations of ciprofloxacin hydrochloride and (b) its calibration curve in phosphate buffer (pH7.4).	77
5.3	(a) Overlay spectra of a series of concentrations of quercetin and (b) its calibration curve in phosphate buffer (pH7.4).	77
5.4	The HR-SEM micrograph of nanofibers and histogram of fiber diameter with respect to its distribution frequency: (a,b) PCL nanofibers (8% w/v), (c,d) PCL nanofibers (12% w/v), (e,f) PCL-CH nanofibers, and (g,h) PCL-CH-Que nanofibers.	83
5.5	Chemical characterization of ciprofloxacin hydrochloride, quercetin, PCL nanofibers, and drugs loaded PCL-based nanofibers via FT-IR.	85
5.6	Overlay XRD spectra of ciprofloxacin hydrochloride, quercetin, PCL and drug loaded PCL-based nanofibers.	86
5.7	Water droplet profile and quantitative value of contact angle for PCL $(100.1\pm2.285^{\circ})$ and PCL-CH-Que nanofiber $(80.73\pm2.656^{\circ})$ .	87

Fig. No.	Description	Page No.
5.8	<i>In-vitro</i> cumulative drug release profiles of ciprofloxacin hydrochloride and quercetin loaded nanofibers in phosphate buffer (pH 7.4).	89
5.9	Antimicrobial activity of nanofiber membranes against <i>S. aureus</i> : (a) inhibition zone on day 1, (b) inhibition zone on day 3, (c) graphical illustration showing the relationship between diameters of inhibition zone (mm) vs incubation time (days).	90
5.10	Free radical scavenging efficacies of the PCL, PCL-CH, and PCL-CH-Que nanofiber after 0.5h incubation with DPPH solution: (a) UV-Vis spectra; (b) histogram representing DPPH attenuation efficiencies of different scaffolds.	91
5.11	<i>In-vitro</i> hemocompatibility of PCL, PCL-CH and PCL-CH-Que nanofibers.	92
5.12	Viability of Swiss albino 3T6 fibroblast cells on nanofibrous scaff olds after different culture times.	93
5.13	Effect of formulations for the healing of full thickness wound: (a) representative images of wound healing on day 8 and 16, (b) percentage of wound area closed following treatment with gauze, CIPLOX cream and PCL-CH nanofibers on day 4, 8, 12 and 16.	95
5.14	Effect of nanofibers in the healing of full thickness wound: (a) representative images of wound healing on day 8 and 16, (b) percentage of wound area closed following treatment with gauze, PCL, PCL-CH and PCL-CH-Que nanofibers on day 4, 8, 12 and 16.	96
5.15	Haematoxylin—eosin stained slice showing histological changes in granulation tissue of gauze, PCL, PCL-CH and PCL-CH-Que nanofibers treated groups on day 8 and 16.	97
5.16	Biochemical assessment of granulation tissue harvested from wound area in terms of (i) SOD and (ii) catalase activity on day 8 <sup>th</sup> and 16 <sup>th</sup> .	99
5.17	Effect of different scaffold on hydroxyproline content in granulation tissue of rats on day 8 and 16 post-wounding.	100
5.18	The HR-SEM micrograph of nanofibers and histogram of fiber diameter with respect to its distribution frequency: (a,b) PCL-GE nanofibers (1:1), (c,d) PCL-GE-CH nanofibers, and (e,f) PCL-GE-CH-Que nanofibers.	103
5.19	Chemical characterization of ciprofloxacin hydrochloride, quercetin, PCL-GE nanofibers and drug loaded PCL-GE based nanofibers via FT-IR.	105
5.20	Overlay XRD spectra of ciprofloxacin hydrochloride, quercetin, PCL, gelatin and drug loaded PCL-GE based nanofibers.	106
5.21	Water droplet profile and quantitative value of contact angle for PCL ( $100.1\pm3.958^{\circ}$ ), PCL-GE ( $55.5\pm2.095^{\circ}$ ), and PCL-GE-CH-Que nanofibers ( $48.76\pm2.950^{\circ}$ ).	107
5.22	<i>In-vitro</i> release profile of quercetin and ciprofloxacin hydrochloride from PCL-GE based nanofibers in phosphate buffer (pH 7.4).	109
5.23	Antimicrobial activity of nanofiber membranes against S. aureus:	110

Fig.	Description	Page No.
	(a) inhibition zone on day 1, (b) inhibition zone on day 3, (c) graphical illustration showing the relationship between diameters of inhibition zone (mm) vs incubation time (days).	
5.24	Free radical scavenging efficacies of the PCL-GE, PCL-GE-CH, and PCL-GE-CH-Que nanofibers after 0.5h incubation with DPPH solution: (i) UV-Vis spectra; (ii)histogram representing DPPH attenuation efficiencies of different scaffolds.	112
5.25	<i>In-vitro</i> hemocompatibility of PCL-GE, PCL-GE-CH and PCL-GE-CH-Que nanofibers.	113
5.26	Viability of Swiss albino 3T6 fibroblast cells on nanofibrous scaff olds after 24h, 48h and 72h incubation times.	114
5.27	Effect of nanofibers for the healing of full thickness wound: (a) representative images of wound healing on day 8 and 16, (b) percentage of wound area closed following treatment with gauze, PCL-GE, PCL-GE-CH and PCL-GE-CH-Que nanofibers on day 4, 8, 12 and 16.	115
5.28	Histological changes in granulation tissue of gauze, PCL-GE, PCL-GE-CH and PCL-GE-CH-Que nanofibers treated groups on day 8 and 16.	117
5.29	Effect of treatment with different nanofibers on endogenous enzymes viz. (a) SOD and (b) catalase in granulation tissues on day 8 and 16.	118
5.30	Effect of different scaffold on hydroxyproline content in granulation tissue of rats on day 8 and 16 post-wounding.	119
5.31	The SEM micrograph of nanofibers and histogram of fiber diameter with respect to its distribution frequency: (a,b) gelatin nanofibers, (c,d) PLGA-GE nanofibers, (e,f) PLGA-GE-CH nanofibers, and (g,h) PLGA-GE-CH-Que nanofibers.	122
5.32	Chemical characterization of ciprofloxacin hydrochloride, quercetin, PLGA-GE nanofibers and drug loaded PLGA-GE based nanofibers via FT-IR.	124
5.33	Overlay XRD spectra of ciprofloxacin hydrochloride, quercetin, gelatin, PLGA and drug loaded PLGA-GE based nanofibers.	125
5.34	<i>In-vitro</i> release profile of ciprofloxacin hydrochloride and quercetin from PLGA-GE based nanofibers in phosphate buffer (pH 7.4).	127
5.35	Antimicrobial activity of nanofiber membranes against <i>S. aureus</i> : (a) inhibition zone on day 1, (b) inhibition zone on day 3, (c) graphical illustration showing the relationship between diameters of inhibition zone (mm) vs incubation time (days).	128
5.36	Free radical scavenging efficacies of the PLGA-GE, PLGA-GE-CH, and PLGA-GE-CH-Que nanofibers after 0.5h incubation with DPPH solution: (i) UV-Vis spectra; (ii) histogram representing DPPH attenuation efficiencies of different scaffolds.	130
5.37	<i>In-vitro</i> hemocompatibility of PLGA-GE, PLGA-GE-CH and PLGA-GE-CH-Que nanofibers.	131
5.38	Viability of Swiss albino 3T6 fibroblast cells on nanofibrous scaff olds	132

Fig. No.	Description	Page No.
	after 24h, 48h and 72h incubation times.	
5.39	Effect of nanofibers in the healing of full thickness wound: (a) representative images of wound healing on day 8 and 16, (b) percentage of wound area closed following treatment with gauze, PLGA-GE, PLGA-GE-CH and PLGA-GE-CH-Que nanofibers on day 4, 8, 12 and 16.	133
5.40	Histological changes in granulation tissue of gauze, PLGA-GE, PLGA-GE-CH and PLGA-GE-CH-Que nanofiber treated groups on day 8 and 16.	134
5.41	Effect of treatment with different nanofibers on endogenous enzymes viz. (a) SOD and (b) catalase in granulation tissues on day 8 and 16.	136
5.42	Effect of different scaffold on hydroxyproline content in granulation tissue of rats on day 8 and 16 post-wounding.	137