

LIST OF FIGURES

Figure No.	Figure Cap ions	Page No.
Figure 2.1	Molecular structure of <i>trans</i> resveratrol (3,5,4'-trihydroxy stilbene).	09
Figure 2.2	Molecular structure of TPGS showing hydrophilic and lipophilic portion.	20
Figure 2.3	Schema c diagram of (a) conventional liposomes (b) PEG-coated liposomes and (c) TPGS-coated liposomes.	26
Figure 2.4	Schema c diagram of (a) multifunctional nontargeted liposomes (b) multifunctional folate receptor targeted liposomes.	27
Figure 2.5	Schema c diagram of (a) TPGS micelles encapsulating docetaxel (b) TPGS and Pluronic mixed micelles encapsulating camptothecin (c) TPGS micelles encapsulating iron oxide (d) folate-targeted TPGS 2k micelles encapsulating docetaxel.	30
Figure 2.6	Schema c diagram of (a) Non-targeted PLA-TPGS nanoparticles using TPGS as emulsifier (b) targeted PLA-TPGS nanoparticles emulsified with folate targeting.	33
Figure 4.1	Schema c diagram of RSV-TPGS-SLN and RSV-PEG-SLN showing molecular arrangement of drug and other SLN components.	50
Figure 4.2	Schema c diagram of RSV-PLGA-BNPs showing molecular arrangement of RSV, PLGA and TPGS	53
Figure 4.3	Schema c diagram of RSV-TPGS-HNPs and RSV-PEG-HNPs showing molecular arrangement of drug and other nanoparticle components	56

Figure 4.4	Schema c diagram of RSV-TPGS-Lipo and RSV-PEG-Lipo showing molecular arrangement of RSV and other liposomal components	59
Figure 5.1	HPLC chromatogram of RSV in plasma and calibra on curve in plasma, mobile phase, brain, lungs, liver, spleen and kidney	73
Figure 5.2	Par cle size of various batches of RSV-TPGS-SLN.	75
Figure 5.3	Entrapment e ciency of various batches of RSV-TPGS-SLN.	77
Figure 5.4	Transmission electron microscope images of op mized batch of (a) RSV-TPGS-SLN (b) RSV-PEG-SLN.	79
Figure 5.5	<i>In vitro</i> release pro le of RSV-TPGS-SLN and RSV-PEG-SLN.	81
Figure 5.6	Fourier transformed infra red (FT-IR) spectra of (a) RSV (b) RSV-TPGS-SLN and (c) RSV-PEG-SLN	82, 83
Figure 5.7	Di eren al scanning calorimetric thermograms of RSV, phospho dylcholine, tristearin, TPGS, DSPE PEG 2000, RSV-TPGS-SLN and RSV-PEG-SLN.	85
Figure 5.8	X-ray di rac on pa ern of RSV, RSV-TPGS-SLN and RSV-PEG-SLN.	86
Figure 5.9	<i>In vitro</i> cytotoxicity of RSV, RSV-TPGS-SLN, Placebo-TPGS-SLN. RSV-PEG-SLN and Placebo-PEG-SLN.	88
Figure 5.10	Cellular internaliza on of COU-TPGS-SLN (a, b and c) and COU-PEG-SLN (d, e and f) in C6 glioma cancer cells assessed by confocal laser scanning microscopy (CLSM).	90
Figure 5.11	Percentage of haemolysis at di erent me intervals in whole blood samples a er addi on of (a) 10 (b) 50 (c) 100 µg/mL RSV-TPGS-SLN and (d) 10 (e) 50 (f) 100 µg/mL of RSV-PEG-SLN.	92

Figure 5.12	Amount of LDH release after treating with RSV-TPGS-SLN at (a) 1, (b) 4 and (c) 8 hours and RSV-PEG-SLN at (d) 1, (e) 4 and (f) 8 hours.	94
Figure 5.13	(a) Number of platelets after addition of PBS, RSV, Placebo-TPGS-SLN and RSV-TPGS-SLN at 10, 50 and 100 µg/mL. (b) Number of platelets after addition of PBS, RSV, Placebo-PEG-SLN and RSV-PEG-SLN at 10, 50 and 100 µg/mL.	96, 97
Figure 5.14	Light microscopy images of Leishman's stained whole blood samples after treating with different concentration PBS, RSV, Placebo-TPGS-SLN, Placebo-PEG-SLN, RSV-TPGS-SLN and RSV-PEG-SLN.	98
Figure 5.15	Comparative plasma concentration profile of (a) RSV-TPGS-SLN and (b) RSV-PEG-SLN with RSV up to 24 hours after <i>i.v.</i> administration of 2 mg/kg dose.	102
Figure 5.16	Comparative <i>in vivo</i> biodistribution of RSV, RSV-TPGS-SLN and RSV-PEG-SLN in brain, lungs, liver, spleen and kidney after <i>i.v.</i> administration of 2 mg/kg dose.	106
Figure 5.17	Particle size of various batches of RSV-PLGA-BNPs.	110
Figure 5.18	Entrapment efficiency of various batches of RSV-PLGA-BNPs.	113
Figure 5.19	Transmission Electron Microscope (TEM) image of RSV-PLGA-BNPs	114
Figure 5.20	<i>In vitro</i> drug release profile of RSV-PLGA-BNPs.	116
Figure 5.21	Fourier transform infra red (FTIR) spectra of (a) RSV and (b) RSV-PLGA-BNPs.	117
Figure 5.22	Differential scanning calorimetric (DSC) thermograms of RSV, PLGA, TPGS and RSV-PLGA-BNPs	118
Figure 5.23	X-Ray diffraction pattern of RSV and RSV-PLGA-BNPs.	119
Figure 5.24	<i>In vitro</i> cytotoxicity of RSV, RSV-PLGA-BNPs and Placebo-PLGA-BNPs.	121

Figure 5.25	Cellular internalization of COU-PLGA-BNPs in C6 glioma cancer cells assessed by confocal laser scanning microscopy	122
Figure 5.26	Percentage of haemolysis at different time intervals after treating with RSV, Placebo-PLGA-BNPs and RSV-PLGA-BNPs at (a) 10 (b) 50 and (c) 100 µg/mL; Amount of LDH release after treating with PBS, RSV, Placebo-PLGA-BNP and RSV-PLGA-BNPs at (d) 1, (e) 4 and (f) 8 hours (g) Number of platelets after addition of PBS, RSV, Placebo-PLGA-BNPs and RSV-PLGA-BNPs.	123
Figure 5.27	Light microscopy images of Leishman's stained whole blood samples after treating with different concentration of PBS, RSV, Placebo-PLGA-BNPs and RSV-PLGA-BNPs.	126
Figure 5.28	Comparative plasma concentration profile of RSV and RSV-PLGA-BNPs up to 36 hours after <i>i.v.</i> administration of 2 mg/kg dose.	129
Figure 5.29	Comparative <i>in vivo</i> biodistribution of RSV and RSV-PLGA-BNPs in brain, lungs, liver, spleen and kidney after <i>i.v.</i> administration of 2 mg/kg dose.	132
Figure 5.30	Particle size of various formulations of RSV-TPGS-HNPs.	136
Figure 5.31	Entrapment efficiency of various batches of RSV-TPGS-HNPs.	138
Figure 5.32	Transmission electron microscope images of (a) RSV-TPGS-HNPs and (b) RSV-PEG-HNPs.	139
Figure 5.33	<i>In vitro</i> release profile of RSV-TPGS-HNPs and RSV-PEG-HNPs.	140
Figure 5.34	Fourier transform infra red (FTIR) spectra of (a) RSV (b) RSV-TPGS-HNPs and (c) RSV-PEG-HNPs	143
Figure 5.35	Differential scanning calorimetric (DSC) thermograms of RSV, phosphatidylcholine, TPGS, DSPE PEG 2000, RSV-TPGS-HNPs and RSV-PEG-HNPs.	145

Figure 5.36	X-Ray diffraction (XRD) pattern of RSV, RSV-TPGS-HNPs and RSV-PEG-HNPs	146
Figure 5.37	<i>In vitro</i> cytotoxicity of RSV, RSV-TPGS-HNPs, Placebo-TPGS-HNPs, RSV-PEG-HNPs and Placebo-PEG-HNPs.	148
Figure 5.38	Cellular internalization of COU-TPGS-HNPs (a, b and c) and COU-PEG-HNPs (d, e and f) in C6 glioma cancer cells assessed by confocal laser scanning microscopy (CLSM).	150
Figure 5.39	Percentage of haemolysis at different time intervals in whole blood samples after addition of (a) 10 (b) 50 (c) 100 µg/mL of RSV-TPGS-HNPs and (d) 10 (e) 50 (f) 100 µg/mL of RSV-PEG-HNPs.	151
Figure 5.40	Amount of LDH release after treating with RSV-TPGS-HNPs at (a) 1, (b) 4 and (c) 8 hours and RSV-PEG-HNPs at (d) 1, (e) 4 and (f) 8 hours.	153
Figure 5.41	(a) Number of platelets after addition of PBS, RSV, Placebo-TPGS-HNPs and RSV-TPGS-HNPs at 10, 50 and 100 µg/mL. (b) Number of platelets after addition of PBS, RSV, Placebo-PEG-HNPs and RSV-PEG-HNPs at 10, 50 and 100 µg/mL.	155
Figure 5.42	Light microscopy images of Leishman's stained whole blood samples after treating with different concentration PBS, RSV, Placebo-TPGS-HNPs, Placebo-PEG-HNPs, RSV-TPGS-HNPs and RSV-PEG-HNPs.	157
Figure 5.43	Comparative plasma concentration profile of (a) RSV-TPGS-HNPs and (b) RSV-PEG-HNPs with RSV up to 48 hours after <i>i.v.</i> administration of 2 mg/kg dose.	161
Figure 5.44	Comparative <i>in vivo</i> biodistribution of RSV, RSV-TPGS-HNPs and RSV-PEG-HNPs in brain, lungs, liver, spleen and kidney after <i>i.v.</i> administration of 2 mg/kg dose.	165

Figure 5.45	Vesicular size of various batches of RSV-TPGS-Lipo.	170
Figure 5.46	Entrapment efficiency of various batches of RSV-TPGS-Lipo.	172
Figure 5.47	Transmission electron microscope images of optimized batch of (a) RSV-TPGS-Lipo (b) RSV-PEG-Lipo and (c) RSV-Lipo	174
Figure 5.48	<i>In vitro</i> drug release of RSV-Lipo, RSV-TPGS-Lipo and RSV-PEG-Lipo.	176
Figure 5.49	Fourier transformed infra red (FTIR) spectra of (a) RSV (b) RSV-TPGS-Lipo and (c) RSV-PEG-Lipo	179
Figure 5.50	Differential scanning calorimetric thermograms of RSV, phosphatidylcholine, cholesterol, TPGS, DSPE PEG 2000, RSV-TPGS-Lipo and RSV-PEG-Lipo.	181
Figure 5.51	X-ray diffraction pattern of RSV, RSV-TPGS-Lipo and RSV-PEG-Lipo.	182
Figure 5.52	<i>In vitro</i> cytotoxicity of RSV, RSV-Lipo, RSV-TPGS-Lipo and RSV-PEG-Lipo.	183
Figure 5.53	Cellular internalization of COU-TPGS-Lipo (a, b and c) and COU-PEG-Lipo (d, e and f) in C6 glioma cancer cells assessed by confocal laser scanning microscopy (CLSM).	185
Figure 5.54	Percentage of haemolysis at different time intervals in whole blood samples after addition of (a) 10 (b) 50 (c) 100 µg/mL RSV-TPGS-Lipo and (d) 10 (e) 50 (f) 100 µg/mL of RSV-PEG-Lipo.	186
Figure 5.55	Amount of LDH release after treating with RSV-TPGS-Lipo at (a) 1, (b) 4 and (c) 8 hours and RSV-PEG-Lipo at (d) 1, (e) 4 and (f) 8 hours.	188
Figure 5.56	(a) Number of platelets after addition of PBS, RSV, RSV-Lipo, Placebo-TPGS-Lipo/RSV-TPGS-Lipo at 10, 50 and 100 µg/mL. (b) Number of platelets after addition of PBS, RSV, RSV-Lipo, Placebo-PEG-Lipo/RSV-PEG-Lipo at 10, 50 and 100 µg/mL.	190, 191

Figure 5.57	Light microscopy images of Leishman's stained whole blood samples after treating with different concentrations of PBS, RSV, Placebo-TPGS-Lipo, Placebo-PEG-Lipo, RSV-TPGS-Lipo and RSV-PEG-Lipo.	192
Figure 5.58	Comparative plasma concentration profile of (a) RSV-TPGS-Lipo and (b) RSV-PEG-Lipo with RSV and RSV-Lipo up to 48 hours after <i>i.v.</i> administration of 2 mg/kg dose.	196
Figure 5.59	Comparative <i>in vivo</i> biodistribution of RSV, RSV-Lipo, RSV-TPGS-Lipo and RSV-PEG-Lipo in brain, lungs, liver, spleen and kidney after <i>i.v.</i> administration of 2 mg/kg dose.	199