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Micro/Nanocomposite Drug Delivery Systems for Targeting Lung Cancer

A Thesis Submitted for Partial Fulfillment of the Requirements for the Master Degree of Pharmaceutical Sciences (Pharmaceutics)

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Appendix I

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Arabic Summary

List of Abbreviations

Ac.A	**Acetic acid**
A549	Human lung cancer cells
AE%	Association efficiency
AM	Alveolar macrophages
Asp.A	Aspartic acid
Chl	Chloroform
CI	Compressibility Index
Conc	Concentration
CS	Chitosan
d_A	Aerodynamic diameter
d_g	Geometric diameter
DMEM	Dulbecco's Modified Eagle's medium
DMSO	Dimethyl sulfoxide
DPI	Dry powder inhalers
DPPC	Dipalmitoyl phosphatidylcholine
DPPG-Na	1,2-Dipalmitoyl-sn-glycero-3-phosphoglycerol, sodium salt
DSC	Differential scanning calorimetry
DSPC	Distearoyl-phosphatidylcholine

ECM	Extracellular matrix
ED	Emitted dose
EE	Encapsulation efficiency
EF	Emitted fraction
EGF	Epidermal growth factor
EGFR	Epidermal growth factor receptor
EI	Effective inhalation index
EPC-3	Hydrogenated egg phosphatidylcholine
EPC-S	Egg phosphatidylcholine
EtOH	ethanol
FBS	Fetal bovine serum
FPF	Fine particle fraction
FT-IR	Fourier transform infrared spectroscopy
GRP	Gastrin-releasing peptide
h	hour
HBEC	Human bronchial epithelial cell
HCl	Hydrochloric acid
HR	Hausner ratio
IC_{50}	The half maximal inhibitory concentration
ILGF-1	Insulin-like growth factor 1

Leu	Leucine
Mag	Magnolol
MCC	Mucociliary clearance
MMAD	Mass median aerodynamic diameter
MP	microparticles
MSCI	Multistage cascade impactor
MTT	3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-tetrazolium bromide
NEM	nano-embedded-in-microparticles
NF	Nanofibers
NP	Nanoparticles
NSCLC	Nonsmall cell lung cancer
OD_c	The mean optical density of untreated wells
OD_t	The mean optical density of wells treated with the test sample
PA	Phosphatidic acid
PBS	Phosphate buffered saline
PE	Phosphatidylethanolamine
PEG	Polyethylene glycol
PG	Phosphatidylglycerol
PI	Phosphatidylinositol
PLGA	Poly(lactic-co-glycolic acid)

PLP	phospholipids
pMDI	Pressurized metered dose inhalers
PS	Particle size
PVA	Polyvinyl alcohol
Rb	Retinoblastoma
RH	Relative humidity
RP	Respirable particle fraction
RT	Respiratory tract
SCLC	Small cell lung cancer
SD	Spray dried
sd	Standard deviation
SD-MP	Spray dried microparticles
SEM	Scanning electron microscopy
TBHP	Tert-butylhydroperoxide
Temp.	temperature
TFA	Trifluoroacetic acid
TGA	Thermogravimetric analysis
TSI	Twin stage impinger
UV	Ultraviolet
VMD	Volume mean diameter

XRPD	X -ray powder diffraction
θ	Angle of repose
λ_{max}	The wavelength of maximum absorption

List of Equations

No.	Equation	Page
I	$\mathrm{dA(Stokes)} \cong \mathrm{dv}\sqrt{\frac{\rho}{\chi\rho 0}}$	**4**
II	$\sigma \cong 15.6\,\phi^4\,\frac{W}{d_v}$	**4**
1	$tan\,\theta\ =\ 2\,h/\,d$	**36**
2	$CI\ =\ 100\ \times\ [(V0 - Vf\ )\ /\ V0]$	**37**
3	$HR\ =\ Vo\ /Vf$	**37**
4	AE % = [Actual Mag amount/Theoretical Mag amount] × 100	**38**
5	$Span = \frac{Dv(90) - Dv(10)}{Dv(50)}$	**39**
6	$MMAD = d\sqrt{\frac{\rho}{\rho_\circ}}$	**39**
7	$EF = \frac{(m\,full - m\,empty)}{m\,powder} \times 100$	**43**
8	$\mathrm{RP\%} = (\mathrm{St2/EF}) \times 100$	**43**
9	$\mathrm{EI\%} = \sqrt{\mathrm{St2} \times \mathrm{EF}}$	**43**
10	% cell viability $= [1 - (\mathrm{ODt/ODc})] \times 100\%$	**45**
11	$\eta 1 = \eta 2\,\frac{t1}{t2}$	**131**
12	$EE\ \%\ =\ [Actual\ Mag\ amount/Theoretical\ Mag\ amount] \times 100$	**133**

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