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# **Improvement of the Bioavailability of Buspirone Hydrochloride using Intranasal Delivery Systems**

**By**

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## **Dedication**

*I dedicate this thesis to my dear mother,  
brothers, sisters,  
and to the soul of my father.*

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## List of Abbreviations

<b>AB</b>	Absolute bioavailability
<b>AE</b>	Absorption enhancer
<b>AME</b>	Absorptive-mediated transport
<b>ANOVA</b>	Analysis of variance
<b>AUC</b>	Area under the curve
<b>BBB</b>	Blood brain barrier
<b>BCS</b>	Biopharmaceutical classification system
<b>BCSFB</b>	Blood cerebrospinal fluid barrier
<b>BH</b>	Buspirone hydrochloride
<b>BHME</b>	Buspirone hydrochloride microemulsion
<b>BHMME</b>	Buspirone hydrochloride mucoadhesive microemulsion
<b>BHS</b>	Buspirone hydrochloride solution
<b>cAMP</b>	Cyclic-adenosine monophosphate
<b>CD</b>	Cyclodextrin
<b>CD-BHMME</b>	Buspirone hydrochloride mucoadhesive microemulsion containing hydroxypropyl- $\beta$ -cyclodextrin
<b>CD-MME</b>	Mucoadhesive microemulsion containing hydroxypropyl- $\beta$ -cyclodextrin
<b>cm</b>	Centimeter
<b>cm<sup>2</sup></b>	Centimeter square
<b>C<sub>max</sub></b>	Maximum concentration of drug
<b>CNS</b>	Central nervous system
<b>cp</b>	Centipoise
<b>CPP</b>	Critical packing parameter
<b>CSF</b>	Cerebro-spinal fluid
<b>CTAB</b>	Hexadecyl (cetyl) trimethyl ammonium bromide

## List of Abbreviations

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<b>CV%</b>	Percent coefficient of variation
<b>° C</b>	Celsius temperature
<b>Da</b>	Dalton
<b>DDAB</b>	Didodecylammonium bromide
<b>DILT</b>	Diltiazem
<b>DNA</b>	Deoxyribonucleic acid
<b>DTE%</b>	Drug targeting efficiency
<b>DTP%</b>	Nose-to-brain direct transport percentage
<b>ECF</b>	Extracellular fluid
<b>FDA</b>	Food and drug administration
<b>FTIR</b>	Fourier transform infrared spectroscopy
<b>GIT</b>	Gastrointestinal tract
<b>GRAS</b>	Generally regarded as safe
<b>Grp</b>	Group
<b>HLB</b>	Hydrophile-lipophile balance
<b>HP-β-CD</b>	Hydroxypropyl-β-cyclodextrin
<b>HPLC</b>	High performance liquid chromatography
<b>hrs</b>	Hour
<b>IA</b>	Intra-arterial
<b>ICH</b>	International conference on harmonization
<b>IN</b>	Intranasal
<b>IPM</b>	Isopropyl myristate
<b>IS</b>	Internal standard
<b>IV</b>	Intravenous
<b>IVS</b>	Intravenous solution
<b>K</b>	Procedural constant

## List of Abbreviations

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<b>KDa</b>	Kilo Dalton
<b>kg</b>	Kilogram
<b>Labr</b>	Labrafac lipophile <sup>®</sup> WL 1349
<b>LOD</b>	Limit of detection
<b>LOQ</b>	Limit of quantitation
<b>µg</b>	Microgram
<b>µl</b>	Microliter
<b>µm</b>	Micrometer
<b>g</b>	Gram
<b>m<sup>2</sup></b>	Meter square
<b>MCC</b>	Mucociliary clearance
<b>ME</b>	Microemulsion
<b>mg</b>	Milligram
<b>min</b>	Minute
<b>ml</b>	Milliliter
<b>mm</b>	Millimeter
<b>MME</b>	Mucoadhesive microemulsion
<b>MRP</b>	Multi drug resistance associated protein
<b>MRT</b>	Mean residence time
<b>Mw</b>	Molecular weight
<b>NA</b>	Not applicable
<b>ng</b>	Nanogram
<b>nm</b>	Nanometer
<b>O/W</b>	Oil-in-water
<b>PB</b>	Phosphate buffer
<b>PBS</b>	Phosphate buffer saline

<b>PEG</b>	Polyethylene glycol
<b>PG</b>	Propylene glycol
<b>P-gp</b>	P-glycoprotein
<b>PIT</b>	Phase inversion temperature
<b>pKa</b>	Ionization constant
<b>PTS</b>	Peptide transport system
<b>QC</b>	Quality control
<b>R<sup>2</sup></b>	Coefficient of determination
<b>RB</b>	Relative bioavailability
<b>rpm</b>	Round per minute
<b>S<sub>mix</sub></b>	Surfactant/cosurfactant mixture
<b>s/n</b>	Signal-to-noise ratio
<b>SD</b>	Standard deviation
<b>SE</b>	Standard error
<b>t<sub>1/2</sub></b>	Half life
<b>T80</b>	Tween <sup>®</sup> 80
<b>TEM</b>	Transmission electron microscopy
<b>T<sub>max</sub></b>	Time of occurrence for maximum drug concentration
<b>UV</b>	Ultraviolet
<b>W/O</b>	Water-in-oil
<b>w/w</b>	Weight per weight
<b>v/v</b>	Volume per volume

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