

Biological Evaluation of Pillar[5]arene-Isatin Inclusion Complexes to Combat Wound Infections

Thesis Submitted in partial fulfillment of the degree of

Doctor of Philosophy in Biochemistry

By

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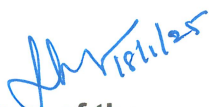
Department of Biochemistry, Biotechnology and Bioinformatics

**Avinashilingam Institute for Home Science and Higher Education
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CERTIFICATE

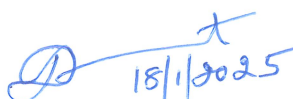
I certify that the thesis entitled “**Biological Evaluation of Pillar[5]arene-Isatin Inclusion Complexes to Combat Wound Infections**” submitted to the Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-641043, for the award of **Doctor of Philosophy in Biochemistry**, by **Mrs. Jothi Nayaki S** is the record of research work carried out by her during the period of study under my guidance and supervision, and this work has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other Titles in this Institute or any other University or Institution of Higher Learning.

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DECLARATION

I declare that the thesis entitled “**Biological Evaluation of Pillar[5]arene-Isatin Inclusion Complexes to Combat Wound Infections**” submitted to the Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-641043, for the award of **Doctor of Philosophy in Biochemistry** is the record of work carried out by me during the period of study under the guidance of **Dr. D. Kavitha**, Assistant Professor (SS), Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, and has not formed the basis for the award of any Degree/ Diploma/ Associateship/ Fellowship or other Titles in this Institute or any other University or Institution of Higher Learning

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LIST OF ABBREVIATIONS

(COX)-2	Cyclooxygenase
ADMET	Absorption, Distribution, Metabolism, Excretion, Toxicity
AMR	Antimicrobial Resistance
BBB	Blood-Brain Barrier
BEA	Pillar[4]arene[1]quinone derivative with ethanolamine unit
BH	Benesi-Hildebrand
CAN	Ceric Ammonium Nitrate
CDC	Centers for Disease Control and Prevention
CDCl ₃	Deuterated chloroform
CFZ	CeFaZolin
CIP	ciprofloxacin
CLSI	Clinical and Laboratory Standards Institute
CNS	Central Nervous System
Cryo-TEM	Cryogenic Transmission Electron Microscopy
CS-g-GEL	Chitosan -g- gelatin
CYP	Cytochrome P450
DCM	Dichloromethane
DMSO	Dimethyl sulfoxide
DPBS	Dulbecco's Phosphate Buffered Saline
ELISA	enzyme-linked immunosorbent assay
EPS	Extracellular Polymeric Substances
FESEM	Field Emission Scanning Electron Microscopy
FICI	Fractional Inhibitory Concentration Index

Fu	Fraction Unbound
GAQ	Glycyrrhizic Acid and Quercetin
HSLs	HomoSerine Lactones
LD50	Lethal Dose, 50%
LOAEL	Low Adverse Effect Level
MBC	Minimum Bactericidal Concentration
MBEC	Minimum Biofilm Eliminating Concentration
MBIC50	Minimum Biofilm Inhibitory Concentration
MDR	Multi-Drug Resistance
MIC	Minimum Inhibitory Concentration
MMPs	Matrix Metallo Proteinases
M-SCN	Thiocyanate
MTT	3- (4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
NAR	Naringin
NCCLS	National Committee for Clinical Laboratory Standards
NMR	Nuclear Magnetic Resonance Spectroscopy
P[5]A	Decamethoxy Pillar[5]arene
PBS	Phosphate-Buffered Saline
PL	Plaunotol
PPE	Personal Protective Equipment
PPM	Parts Per Million
SAR	Structure-Activity Relationship
SMILES	Simplified Molecular Input Line Entry Specification
SSIs	Surgical Site Infections
TFPP-QA	Quaternary Ammonium-Functionalized Tetra Fluorophenyl Porphyrin

THF	TetraHydroFuran
TMA-Cl nor TMA-Br	Tetramethylammonium Chloride nor Bromide
TMS	Tetra Methyl Silane
TSA	Tryptic Soy Agar
TSB	Tryptic Soy Broth
VD _{ss}	Volume of Distribution at steady state
WHO	World Health Organization
ZOI	Zone of Inhibition
β-CDx	Beta-Cyclodextrin