

Dedicated to my beloved parents,

Mr. Lakshmi Ram Boro (Papa)

And

Mrs. Branerious Gabil Boro (Maa)

*for their blessings, love, endless support
and encouragement*

DECLARATION BY THE CANDIDATE

I hereby declare that the thesis "**Computational analysis of fibrinolytic serine proteases from *Bacillus spp* and characterization of a recombinant fibrinolytic enzyme from *Bacillus subtilis***" being submitted to Department of Molecular Biology and Biotechnology, Tezpur University, Tezpur, Assam in partial fulfillment for the award of the degree of Doctor of Philosophy in Molecular Biology and Biotechnology, has previously not formed the basis for the award of any degree, diploma, associateship, fellowship or any other similar title or recognition. Due to the unavailability of proper facilities at Tezpur University, the following experiments were carried out at other institutes:

1. *In vitro* cell cytotoxicity and *in vivo* experiments were performed at IASST, Guwahati 781035, India.

Date: 28.12.24

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CERTIFICATE OF SUPERVISOR

This is to certify that the thesis entitled “**Computational analysis of fibrinolytic serine proteases from *Bacillus spp* and characterization of a recombinant fibrinolytic enzyme from *Bacillus subtilis***” submitted to the School of Sciences, Tezpur University in requirement of partial fulfillment for the award of the degree of Doctor of Philosophy in Molecular Biology and Biotechnology is a record of research work carried out by Ms. Nitisha Boro under my supervision and guidance. All help received by her from various sources has been duly acknowledged. No part of this thesis has been submitted elsewhere for award of any other degree.

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Place: Tezpur

ACKNOWLEDGEMENTS

First and foremost, I offer my gratitude to the Almighty and thank Him for giving me the strength to pursue and successfully complete this journey.

I convey my respectful gratitude to my Ph.D. Supervisor, Prof. Ashis Kumar Mukherjee, for his supervision, advice, and guidance from the very early stage of this research. His relentless encouragement, persistent inspiration, treasured propositions, and unparalleled support throughout my Ph.D tenure have helped me to successfully complete my research work. I deeply respect his dynamic vision, sincerity, and devotion toward research, and it was a great privilege and honour to work under his guidance.

I offer my gratitude to Prof. Vinod K. Jain, the former Vice-Chancellor of Tezpur University, and Prof. Shambhu Nath Singh, the Vice-Chancellor of Tezpur University, respectively, for providing me to the opportunity to work in this esteemed University. I have always felt fortunate to be a part of this University, which has a perfect environment for research among the students.

I deeply acknowledge the Heads, Department of Molecular Biology and Biotechnology, Tezpur University for providing all possible facilities for carrying out my research work. I am also thankful to my Doctoral Committee members- Prof. Suvendra K. Ray, Dr. Rupak Mukhopadhyay, and Dr. Suman Dasgupta, Department of MBBT; all the members of the Departmental Research Committee and all the faculty members of the Department of MBBT for their valuable suggestions and inspiration throughout the course of this study.

I sincerely thank Tezpur University (Institutional Fellowship), and Council of Scientific & Industrial Research (CSIR), New Delhi for providing me the financial support for carrying out my research work.

I sincerely thank IASST, Guwahati for allowing me to conduct the in-vitro cell cytotoxicity and in-vivo experiments.

I also take this opportunity to thank Dr. K. K. Hazarika, Dr. N. K. Bordoloi, Mr. P. Mudoi, Mrs. Pranita S. Talukdar, Mr. Bijoy Mech, Mr. Guna Das, and all the non-teaching staff for all the help they have provided me during my Ph.D. tenure.

I also convey my thanks to Dr. Suman Dasgupta, Dept. of MBBT, Tezpur University for spectrofluorometric interaction study, and Prof. Pedro Alexandrino Fernandes, Professor of Chemistry and Biochemistry, University of Porto, Portugal for helping me writing a research article.

I sincerely thank my lab seniors (Dr. Debananda Gogoi, Dr. Bhargab Kalita, Dr. Sumita Dutta, Dr. Taufikul Islam, Dr. Abhishek Chanda, and Dr. Aparup Patra) for their guidance. My lab mates (Dr. Bhabana Das, Dr. Dev Madhubala, Upasana, and Hirak), and lab juniors (Anushree, Paran, Sushmita, Rosy, Rahul, and Bhagya lakhmi) for helping me in times I needed them most. I have enjoyed the research atmosphere of my lab and the unconditional support and love extended by my lab colleagues.

I also take this opportunity to thank Mandira di, Binu, Nyumpi, Plabita, Shristi, Mahari, Jyotirmoy, and all my seniors, juniors, and friends from Tezpur University whose company I enjoyed during my PhD tenure. I specially thank my friends Vashkar, Rasingja, Noymi, and Manita for their endless support during my research journey.

Last but not least, I thank my parents, and family members for their endless support and encouragement. Finally, I would like to thank all the people, whose direct and indirect support helped me complete my research work.

Place: Tezpur

Date: 28.12.24

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ABBREVIATIONS

Abbreviation	Full form
CVD	Cardiovascular Disease
WHO	World Health Organization
AMI	Acute Myocardial Infarction
BS	Brain Stroke
COPD	Chronic Obstructive Pulmonary Disease
t-PA	Tissue-Plasminogen Activator
PAF	Platelet-Activating Factor
uPA	Urokinase-Type Plasminogen
kDa	Kilo Dalton
APSAC	Purified Streptokinase Activator Complex
ECLT	Euglobulin Clot Lysis Time
PATT	Prolonged Partial Thromboplastin Time
PLG	Plasminogen
PAI-1	Plasminogen Activator Inhibitor-1
SK	Streptokinase
AA	Amino Acid
SK-PLG	Streptokinase-Plasminogen
FDA	Food and Drug Administration
GFD	Growth Factor Domain
KD	Kringle Domain
ATF	Amino-Terminal Fragment
VKA	Vitamin K Antagonist
INR	International Normalized Ratio
TGA	Therapeutic Goods Administration
NOAC	Novel Oral Anticoagulant
VTE	Venous Thromboembolism
LMW	Low-Molecular-Weight
UFH	Unfractionated Heparin
DVT	Deep Vein Thrombosis
ACS	Acute Coronary Syndrome
MI	Myocardial Infarction

vWF	von Willebrand Factor
PCI	Percutaneous Coronary Intervention
FDP	Fibrin Degradation Product
SDS-PAGE	Sodium Dodecyl-Sulfate Polyacrylamide Gel Electrophoresis
EDTA	Ethylenediaminetetraacetic Acid
PMSF	Phenylmethanesulfonyl Fluoride
EGTA	Ethylene Glycol Tetraacetic Acid
SDS	Sodium Dodecyl-Sulfate
PT	Prothrombin Time
aPTT	Activated Partial Thromboplastin Time
TT	Thrombin Time
CT	Clotting Time
I-TASSER	Iterative Threading ASSEmbly Refinement
HADDOCK	High Ambiguity Driven biomolecular DOCKing
SWISS-MODEL	Swiss Institute of Bioinformatics' Automated Modeling Server
SOPMA	Self-Optimized Prediction Method with Alignment
TMHMM	Transmembrane Helices Hidden Markov Model
PBS	Phosphate Buffered Saline
APS	Ammonium Persulfate
TEMED	Tetramethylethylenediamine
DTT	Dithiothreitol
IPTG	Isopropyl β -D-1-thiogalactopyranoside
kb	KiloBase
DMEM	Dulbecco's Modified Eagle Medium
FBS	Fetal Bovine Serum
DMSO	Dimethylsulfoxide
SGPT	Serum Glutamic Pyruvic Transaminase
SGOT	Serum glutamic-oxaloacetic transaminase
LDL	Low-Density Lipoprotein
HDL	High-Density Lipoprotein
NCBI	National Center for Biotechnology Information
PRALINE	Profile ALIgNement
pI	Isoelectric Point

EC	Extinction Coefficient
AI	Aliphatic Index
II	Instability Index
GRAVY	Grand Average of Hydropathicities
NPS@	Network Protein Sequence Analysis
CFC	Cell Free Culture
BSA	Bovine Serum Albumin
TSI	Triple Sugar Iron
MR-VP	Methyl Red-Voges Proskauer
TAE	Tris Acetate-EDTA
PCR	Polymerase Chain Reaction
UPGMA	Unweighted Pair Group Method with an Average
LB	Luria Bertani
Ni-NTA	Nickelnitriloacetic Acid
NIH	National Institutes of Health
TCA	Trichloroacetic Acid
Kd	Dissociation Constant
PPP	Platelet-Poor Plasma
PRP	Platelet Rich Plasma
NRK-52^E	Normal Rat Kidney cells
OECD/OCED	Organization for Economic Co-operation and Development
TP	Total Protein
TRIG	Triglycerides
CR	Creatinine
CH	Cholesterol
GPCRs	G protein-coupled receptors
ADME	Absorption, distribution, metabolism, and excretion
FDA	Food and Drug Administration
ERT	Enzyme Replacement therapy
TNF-α	Tumor Necrosis Factor-alpha
TM	Transmembrane
NMR	Nuclear Magnetic Resonance
GRAS	Generally Recognized as Safe
