Dedicated to Ema & Epa

Declaration

I hereby declare that the thesis entitled "**Characterization of antibody and cellular response to Dengue virus infection to determine cytokine/chemokines markers of inflammation and serological diagnosis of Dengue virus infection.**" is an authentic work carried out by me under the supervision of Prof. Shashi Baruah, Department of Molecular Biology and Biotechnology, Tezpur University, Assam-784028. No part of this has been presented for any other degree or diploma earlier.

Place: Tezpur

Date : 26-03-2025 (Sushmita Singha)

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CERTIFICATE OF SUPERVISOR

This is to certify that the thesis entitled **"Characterization of antibody and cellular response to Dengue virus infection to determine cytokine/chemokines markers of inflammation and serological diagnosis of Dengue virus infection."** submitted to the School of Sciences, Tezpur University in requirement of partial fulfilment 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. Sushmita Singha** 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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List of Abbreviations

DENV- Dengue virus
DENV1- Dengue virus serotype 1
DENV2- Dengue virus serotype 2
DENV3- Dengue virus serotype 3
DENV4- Dengue virus serotype 4
WHO- World Health Organisation
DHF- Dengue Hemorrhagic Fever
DSS- Dengue shock syndrome
DF- Dengue Fever
SD- Severe Dengue
E- Envelope
NS1- Non- structural 1
C- Capsid
M- Membrane
prM- Premembrane
ER- Endoplasmic reticulum
CYD-TDV - Chimeric yellow fever–dengue virus (DENV) tetravalent dengue vaccine
IgM- Immunoglobulin M
IgG- Immunoglobulin G
ADE- Antibody-Dependent Enhancement
IL6- Interleukin-6
IL8- Interleukin-8
IL10- Interleukin-10
IL1β- Interleukin-1β
IL12p70- Interleukin-12p70
IFN-γ- Interferon-gamma
CCL2- C-C Motif Chemokine Ligand 2
CCL5- C-C Motif Chemokine Ligand 5
CXCL9- C-X-C motif chemokine ligand 9
CXCL10- C-X-C motif chemokine ligand 10
ELISA- Enzyme-Linked immunosorbent Assay

NAAT- Nucleic acid amplification tests

RDT- Rapid Diagnostic Test

LFA- Lateral Flow Assay

SARS-COV-2- Severe Acute Respiratory Syndrome Coronavirus 2

CBA- Cytometric Bead Array

J.E- *Japanese encephalitis*

IEDB- Immune Epitope Database and Analysis Resource

SP- Synthetic Peptide

CDR- Complementarity-determining region

DC- Dendritic cell

NK- Natural Killer Cell

CTL- Cytotoxic T Lymphocyte

HTL- Helper T Lymphocyte

CD- Cluster of differentiation

LC- Langerhans cells

DC-SIGN- Dendritic cell-specific ICAM-grabbing non-integrin

MR- Mannose receptor

GAG- Glycosaminoglycans

HSP- Heat Shock Protein

MHC- Major histocompatibility complex

HLA- Human Leukocyte Antigen

MIG- Monokine induced by interferon-γ

CXCR3- C-X-C Motif Chemokine Receptor 3

GMCH- Gauhati Medical College and Hospital

TMCH- Tezpur Medical College and Hospital

AA - Austro-Asiatic and

IE- Indo-European

TB- Tibeto-Burman

PCA- Principal Component Analysis

PBS- Phosphate Buffer Saline

OD- Optical Density

SD- Standard Deviation

TMB- 3,3',5,5'-Tetramethylbenzidine

A.U- Arbitrary Unit

E1P- Dengue virus 1 envelope protein peptide

EP- Dengue virus 2 envelope protein peptide

E3P- Dengue virus 3 envelope protein peptide

NSP- Dengue virus 2 non-structural 1 protein peptide

NS3P- Dengue virus 3 non-structural 1 protein peptide

NP- Nucleoprotein

HA- Hemagglutinin

CAI- Codon Adaptation Index

RMSD- Root Mean Square Deviation

RMSF- Root Mean Square Fluctuation

TLR3- Toll-like receptor 3

NAb- Neutralising antibody

HRP- Horse Raddish Peroxidase

pI- Isoelectric point

GRAVY- Grand average of hydropathicity