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**Doctor of Philosophy**

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Department of Zoology  
Faculty of Science,  
The Maharaja Sayajirao University of Baroda

## CERTIFICATE

This is to certify that the Ph.D. thesis '**Elucidating the role of Cyclooxygenase-2 in the morphogenesis of craniofacial structures in domestic chick**' incorporates the results of experiments carried out by the candidate herself and analyzed at the Department of Zoology, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat.

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INTRODUCTION Craniofacial development has traditionally been a field of research in which many divergent views are expressed, and novel theories are put forward to explain observed normal and

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-Bhaval Parmar

# LIST OF ABBREVIATIONS

18S rRNA	18S Ribosomal RNA
APS	Ammonium Persulfate
BCIP-NBT	5-bromo-4-chloro-3-indolyl-phosphate – Nitro blue Tetrazolium
BMP	Bone Morphogenetic Protein
BPB	Bromophenol Blue
BSA	Bovine Serum Albumin
Cas9	CRISPR Associated Protein-9
CASP	Caspase
CDH	Cadherin
cDNA	Complimentary Deoxyribose Nucleic Acid
CHD	Congenital Heart Defects
CNCCs	Cranial Neural Crest Cells
COX	Cyclooxygenase
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeats
DAPI	4',6-Diamidino-2-phenylindole
DEPC	Diethyl Pyrocarbonate
DIG	Digoxigenin
DNases	Deoxyribonucleases
EDTA	Ethylenediamine Tetraacetate
EMT	Epithelial Mesenchymal Transition



FEZ	Frontal Ectodermal Zone
FGF	Fibroblast Growth Factor
FNP	Frontonasal Prominences
FOX	Forkhead Box
FZD	Frizzled
GAPDH	Glyceraldehyde-3-Phosphate Dehydrogenase
gRNA	Guide RNA
H&E	Haemotoxylin and Eosin
HAND	Heart and Neural Crest Derivatives
HH	Hamburger-Hamilton
HRP	Horseradish Peroxidase
IHC	Immunohistochemistry
KCL	Potassium Chloride
LAF	Laminar Air Flow
LB	Luria Broth
MABT	Maleic Acid Buffer with Tween
MCT	Microcentrifuge Tube
MgCl <sub>2</sub>	Magnesium Chloride
MITF	Microphthalmia Associated Transcription Factor
mRNA	Messenger RNA
MSX	Muscle Segment Homeobox

MYOCD	Myocardin
NaCl	Sodium Chloride
NCBI	National center for Biotechnology Information
NKX 2.5	NK2 Homeobox-5
NSAIDS	Non-Steroidal Anti-Inflammatory Drugs
OCT	Optimal Cutting Temperature
OD	Optical Density
OFT	Outflow Tract
OTX	Orthodenticle Homeobox
OV	Optic Vesicle
PAGE	Poly Acrylamide Gel Electrophoresis
PAX6	Paired Box Protein
PBS	Phosphate Buffer Saline
PBS-T	PBS-Triton
PCNA	Proliferating Cell Nuclear Antigen
PCR	Polymerase Chain Reaction
PFA	Paraformaldehyde
PGs	Prostaglandins
PVDF	Polyvinylidene fluoride
qPCR	Quantitative PCR
RNA	Ribonucleic Acid

RNases	Ribonucleases
RPE	Retinal Pigmented Epithelium
SDS	Sodium Dodecyl Sulfate
SEM	Standard Error of the Mean
SHH	Sonic Hedgehog
SIX	SIX Homeobox
SOX	SRY related HMG box gene
TBE	Tris-borate-EDTA
TBX	T-box transcription factor
TEMED	Tetramethyl ethylenediamine
TGF- $\beta$	Transforming Growth Factor Beta
VIM	Vimentin
Vsx	Visual System Homeobox
WNT	Wingless-related Integration site