Acknowledgements

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was stressed. Under your guidance, I was able to apply and successfully acquire grants and hope to publish my findings soon. It has been an absolute pleasure working with you.

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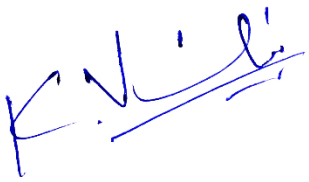

Virinchi Naga Sarma Kuchibhotla

Curriculum vitae

The author of this thesis was born on the 12th of July 1992 in Hyderabad, India. He completed his Bachelor's degree (B.Tech) in Biotechnology at the National Institute of Technology, Warangal (NITW), India, and graduated in first division with distinction in 2013. He then finished his Masters' degree (MSc.) in Biomedical Science from Cardiff Metropolitan University, United Kingdom and graduated with a distinction in 2015. He also received the prestigious Erasmus Mundus scholarship which supported his Master's studies. Later, he joined the group of 'Cellular Biomechanics' as a research intern, where he investigated the cell signalling pathways of mechanical compression-induced osteogenic differentiation of mesenchymal stromal cells (MSCs) under the supervision of Dr. Ansgar Petersen at the Julius Wolff Institute for Biomechanics and Musculoskeletal Regeneration, Berlin, Germany. After that, he commenced his doctoral studies in 2016 at the University of Groningen, Netherlands in with collaboration with University of Newcastle, Australia, under the supervision of Prof. Dr. Irene H. Heijink, Prof. Dr. Ir. Martijn Nawijn and Prof. Dr. Darryl Knight. Here, he worked on investigating the role of E-cadherin/β-catenin signalling in the development of an asthmatic airway epithelial phenotype.

List of publications

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Abbreviations

AB	Alcian blue
ADAM10	A disintegrin and metalloproteinase domain-containing protein 10
AHR	Airway hyperresponsiveness
AJ	Adherens junctions
ALI	Air-liquid interface
AM	Alveolar macrophage
APC	Adenomatous polyposis coli
A-SMA	alpha-smooth muscle actin
ATI	Alveolar type 1
ATII	Alveolar type 2
ATP	Adenosine triphosphate
AUC	Area under the curve
BAL	Bronchoalveolar lavage
BALF	Bronchoalveolar lavage fluid
BHR	Broncho hyperreactivity
Ca^{2+}	Calcium
cAMP	Cyclic adenosine monophosphate
CBF1	Centromere-binding protein 1
CBP	CREB binding protein
CCL	Chemokine (C-C motif) ligand
CCND1	Cyclin D1
CCSP	Club cell secretory protein
CD	Cytochalasin D
cDNA	complementary DNA
CHX	Cycloheximide
CK-1	Casein kinase-1
CLR	C-type lectin receptor
CRE	Cre recombinase
CREB	cAMP Response Element-Binding Protein

CSL	CBF1–Suppressor of Hairless–LAG1
D	Day
DAMP	Damage associated molecular patterns
DC	Dendritic cell
Der f	*Dermatophagoides farinae*
Der p	*Dermatophagoides pteronyssinus*
DLL	Delta like protein
DNA	Deoxyribonucleic acid
ECIS	Electric Cell-substrate Impedance Sensing
EDA	Extra Domain A
EGF	Epidermal growth factor
EGFR	Epidermal growth factor receptor
ELISA	Enzyme-linked immunosorbent assay
EMT	Epithelial-mesenchymal transition
EO	Eosinophil
EWAS	(epi)genome-wide analyses
qQTL	Expression quantitative trait loci
ER	Endoplasmic reticulum
ERK	Extracellular signal-regulated kinase
EV	Extracellular vesicle
FOXA2	Forkhead box protein A2
FOXJ1	Forkhead box protein J1
GM-CSF	Granulocyte-macrophage colony-stimulating factor
GSK-3β	Glycogen synthase kinase-3β
GWAS	Genome-wide association study
HBEC	Human bronchial epithelial cell
HDAC	Histone deacetylase
HDM	House dust mite
H & E	Hematoxylin and eosin
HES1	Hairy and enhancer of split 1
ICS	Inhaled corticosteroids

IFN	Interferon
IgE	Immunoglobulin E
IL	Interleukin
ILC	Innate lymphoid cell
IM	Interstitial macrophage
i.n	Intranasal
i.p	Intraperitoneal
JAG	Jagged
JAM	Junctional adhesion molecules
KLRG1	Killer cell lectin-like receptor G1
KO	Knockout
LABA	Long acting β2-agonists
LAG1	Longevity-assurance gene 1
LAMA	Long-acting muscarinic antagonists
LEF	Lymphoid enhancer factor
loxP	locus of x-over, P1
LPS	Lipopolysaccharide
MAML1	Mastermind-like transcriptional co-activator 1
MAPK	Mitogen-activate protein kinase
miRNA	Micro RNA
mRNA	messenger RNA
NK	Natural killer
MC	Mast cell
MUC	Mucin
NCID	Notch intracellular domain
NF-κB	Nuclear factor-kappa B
NHBE	Normal human bronchial epithelial cells
NLR	NOD-like receptors
NOD	Nucleotide-binding oligomerisation domain
OVA	Ovalbumin
PAMP	Pathogen-associated molecular patterns

PAR	Protease activated receptor
PAS	Periodic acid–Schiff
PAEC	Primary airway epithelial cell
PBEC	Primary bronchial epithelial cell
PBS	Phosphate buffered saline
PC2	Physical Containment 2
PCR	Polymerase chain reaction
PI3K	Phosphoinositide 3-kinases
PRR	Pattern recognition receptor
RANTES	Regulated on activation, normal T cell expressed and secreted
RBPJ	Recombination Signal Binding Protein For Immunoglobulin Kappa J Region (also known as CSL)
RIG	Retinoic acid-inducible gene
RLR	RIG-I-like receptor
RNA	Ribonucleic acid
ROS	Reactive oxygen species
RSV	Respiratory syncytial virus
rtTA	reverse tetracycline transactivator
RV	Rhinovirus
scRNA-Seq	single-cell RNA sequencing
SERCA	Sarco-endoplasmic reticulum Ca^{2+} ATPase
siRNA	small interfering RNA
SNP	Single nucleotide polymorphism
SP-C	Surfactant protein C
SPF	Specific pathogen-free
TAGC	Trans-National Asthma Genetic Consortium
TCF	T-cell factor
TDI	Toluene diisocyanate
TEER	Trans-epithelial electric resistance
tetO	Tet operator
TGF-β	Transforming growth factor-β

TRPM8	Transient receptor potential melastatin 8
Th	T helper
TJ	Tight junction
TLR	Toll-like receptor
Treg cell	Regulator T cell
TSLP	Thymic stromal lymphopoietin
tTA	tetracycline transactivator
VEGF	Vascular endothelial growth factor
Wnt	Wingless-related integration site
WT	Wildtype
ZO	Zona occludens