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Abbreviations

A20	Tumor necrosis factor alpha-induced protein 3
aa	Amino acid
AD	Alzheimer's disease
AKT	Protein kinase B
ALK	Activin receptor-like kinases
ALP	Alkaline phosphatase
AMH	Anti-müllerian hormone
AP-1	Activator protein
APC	Adenomatous polyposis coli
ARKADIA	Ring finger protein 111A
BMP	Bone morphogenetic protein
BSP	Bone sialoprotein
β -TrCP	Beta-transducin repeat-containing protein
ca	Constitutively active
CC domain	Coiled coil domain
CCL2	C-C motif chemokine 2
CK1	Casein kinase 1
CM	Conditioned medium
Colla1	Collagen type I alpha 1
Cys	Cysteine
Dab1	Disabled-1
DKK1	Dickkopf-1
DUBs	Deubiquitinating enzymes
Dvl	Disheveled
E1	Ubiquitin-activating enzyme
E2	Ubiquitin-conjugating enzyme
E3	Ubiquitin ligase
EGF	Epidermal growth factor
EMT	Epithelial-mesenchymal transition
FBS	Fetal bovine serum
FL	Full length
Fzd/Fz	Frizzled
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
GDFs	Growth and differentiation factors
GSK3 β	Glycogen synthase kinase 3 beta
GTPase	Guanine triphosphatase
HA	Human influenza hemagglutinin
HECT	Homologous to the E6-AP Carboxyl Terminus

IB	Immunoblot
IBMX	3-isobutyl-1-methylxanthine
IKK	Inhibitor of I κ B α
IL-1 β	Interleukin-1 beta
IL-6	Interleukin-6
IP	Immunoprecipitation
IRAK	Interleukin-1 receptor-associated kinase
I κ B	Inhibitor of κ B
I κ B α	NF- κ B inhibitor alpha
JAMMs	JAB1/MPN/Mov34 proteases
JNK	C-Jun N-terminal kinase
k0	Lysine deficient
LDLR	Low-density lipoprotein receptor
LEF	Lymphoid enhancer factor
LPS	Lipopolysaccharide
LRP	Low-density lipoprotein receptor-related protein
Lys	Lysine
MAPK	Mitogen-activated protein kinase
MCPIP1	Monocyte chemotactic protein-induced protein 1
MEF	Mouse embryonic fibroblast
MJDs	Machado-Joseph disease proteases
MyD88	Myeloid differentiation primary response gene (88)
NEM	N-Ethylmaleimide
NF- κ B	Nuclear factor κ -light-chain-enhancer of activated B cells
Ni-NTA	Nickel pull down
NOS2	Nitric oxide synthase, inducible
NS	Non-specific control shRNA
OCN	Osteocalcin
OPPG	Osteoporosis-pseudoglioma syndrome
OPN	Osteopontin
OTUs	Ovarian tumor proteases
PEI	Polyethylenimine
PI3K	Phosphatidylinositol-3-kinase
pLV	pLV-bc-CMV-puro lentivirus
PPSP	Proline-proline-proline-serine-proline
PTB	Phosphotyrosine-binding
QRT-PCR	Quantitative real-time PCR
RF	RING finger domain
RING	Really Interesting New Gene
RNF12	Ring finger protein 12
RunX2	Runt-related transcription factor 2
Ser	Serine

shRNA	Short hairpin RNA
siRNA	Small interfering RNA
SMAD	Small Mothers Against Decapentaplegic
SMURF	SMAD ubiquitination-related factor
T3	Triiodothyronine
TAB	TAK1 and MAP3K7-binding protein
TAK1	TGF- β -associated kinase 1
TAP	Tandem affinity purification
TCF/LEF	T-cell factor/lymphoid enhancer factor
TCL	Total cell lysate.
TGF- β	Transforming growth factor beta
Thr	Threonine
TIR	Toll-IL-1 receptor
TLR	Toll-like receptor
TNF- α	Tumor necrosis factor alpha
TNFR	TNF receptor
TRAF	TNF receptor associated factor
TRIF	TIR-domain-containing adapter-inducing interferon- β
UBC	Ubiquitin-conjugating
UBC13	Ubiquitin-conjugating enzyme E2 N
UBE2O	Ubiquitin-conjugating enzyme E2 O
ubi-SMAD6	Monoubiquitinated SMAD6
UCHs	Ubiquitin C-terminal hydrolases
Uev1a	Ubiquitin-conjugating enzyme E2 variant 1A
USPs	Ubiquitin-specific proteases
VLDLR	Very-low-density lipoprotein receptor
WT	Wild-type
WWP1	WW domain-containing protein 1
YWTD	Tyrosine-tryptophan-threonine-aspartate
ZnF	Zinc-finger

Curriculum Vitae

Xiaofei Zhang was born on the 28th of May 1983 in Tangchi, Anhui, China. He was admitted to Tangchi Middle School in 1994 and graduated there in 2001. From 2001 to 2005, he did his Bachelor in the department of Plant Protection, Anhui Agriculture University. In 2005 he started as a joint-training student in University of science and technology of China and Guangzhou Institutes of Biomedicine and Health (GIBH), CAS. From September 2006 until December 2008 he did a master degree at the lab of Prof. Duanqing Pei at GIBH. During that time he studied the roles of novel regulators for maintaining pluripotency of embryonic stem cells. On December 2008, he got this master degree in cell biology with topic named Esrrb activates Oct4 transcription and sustains self-renewal and pluripotency in embryonic stem cells. This study stimulated his interest in studying regulation of signal transduction. Therefore, he moved to the lab of Prof. Peter ten Dijke to study signal transduction in 2009. The aim of his research is to find novel regulators for signaling pathway such as TGF- β , IL-1 β /LPS and Wnt, and to investigate how the regulator functions. The results described in this thesis were performed in this period. Xiaofei will move back to GIBH after he gets his ph.D degree.

List of Publications

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* equal contribution

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