

Interaction of estrogen receptors and the
TGF- β signal transduction pathway – impact
on migration of human breast cancer cells

Dissertation

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4-OHT	4-hydroxytamoxifen
ADP	adenosine diphosphate
AF	trans-activation function
ALK	activin receptor-like kinase
AMH	anti-Mullerian hormone
AP-1	activator protein -1
Aqua bidest.	aqua bidestillata
AR	androgen receptor
ARE	activin response element
ATCC	American Type Culture Collection
ATF-2	activating transcription factor
BAECs	bovine aortic endothelial cells
BMP	bone morphogenetic protein
bp	base pair
BSA	bovine serum albumin
BSA-E2	BSA-conjugated 17 β -estradiol
cAMP	cyclic adenosine mono phosphate
CAS	p130Cas
cDNA	copy DNA
CK	cytokeratine
CNS	central nervous system
COS	monkey kidney cells
Co-Smad	common mediator Smad
ct-FCS	charcoal treated fetal calf serum
CTX	cholera toxin
dATP	deoxyadenosine triphosphate
DBD	DNA binding domain
dCTP	deoxycytosine triphosphate
DEPC	diethylpyrocarbonate
dGTP	deoxyguanosine triphosphate
DMEM	Dulbecco`s Modified Eagle`s Medium
DMSO	dimethyl sulfoxide
DNA	deoxyribonucleic acid
dNTP	deoxynucleotid triphosphate

DPC4	deleted in pancreatic carcinoma locus 4
dsRNA	double stranded ribonucleic acid
DTT	dithiothreitol
dTTP	deoxythymine triphosphate
E. coli	Escherichia coli
E1	estrone
E2	17 β -estradiol
E3	estriol
ECM	extracellular matrix
EDTA	ethylenediaminetetraacetic acid
EGF	epidermal growth factor
EGFR	EGF receptor
EGTA	ethyleneglycol-bis(2-aminoethylether)-N, N, N', N'-tetraacetic acid
EMEM	Eagle`s Minimal Essential Medium
EMT	epithelial-to-mesenchymal transition
eNOS	endothelial nitric oxide synthase
ER α/β	estrogen receptor α/β
ERE	estrogen response element
ERK	extracellular regulated kinase
FAK	focal adhesion kinase
FAST	forkhead activin signal transducer
FCS	fetal calf serum
FITC	fluorescein isothiocyanate
GABA	γ -amino butyric acid
GAPDH	glycerine aldehyde phosphate dehydrogenase
GDP	guanosine diphosphate
GPCR	G-protein coupled receptor
GR	glucocorticoid receptor
GS-domain	glycine and serine rich region
GTP	guanosine triphosphate
GTPases	guanosine triphosphate (GTP)-binding proteins
h	hour
HB-EGF	heparan-bound epidermal growth factor

HDAC6	histone deacetylase 6
HEC1A	Human endometrial cancer cells
HEK293T	human embryonic kidney cells
Her-2/neu	human epithelial growth factor receptor type 2/neu
HRP	horse radish peroxidase
HSP90	heat shock protein 90
ICI182,780	7 α -[9-(4,4,5,5,5-pentafluoro-pentylsulphinyl)nonyl]estra-1,3,5(10)-triene-3,17 β -diol
IGF	insulin like growth factor
IgG	immunoglobulin G
IL	interleukin
I-Smad	inhibitory Smad
JNK	c-Jun N-terminal kinase
kDa	kilodalton
LAP	TGF- β latency associated protein
LAR	luciferase assay reagent
LBD	ligand binding domain
LTBP	latent TGF- β binding protein
luc	luciferase gene
mA	milliampere
MAD	mother against decapentaplegic
MAPK	mitogen activated protein kinase
MCF-7	Michigan cancer foundation -7
MEK	mitogen activated protein kinase kinase
mAR	membrane androgen receptor
mER	membrane estrogen receptor
MH domain	Mad homology domain
min	minute
MMP	matrix metalloproteinase
MOPS	morpholinepropanesulfonic acid
mRNA	Messenger RNA
MTOC	microtubule organising centre
na-mER	non-activated mER
NLS	nuclear localisation signal

NO	nitric oxide
PBS	phosphate buffered saline
PCR	polymerase chain reaction
PD098,059	2'-Amino-3'-methoxyflavone
PDGF	platelet-derived growth factor
PI3K	phosphatidyl inositol 3-kinase
PIPES	piperazine-N,N'-bis(2-ethanesulfonic acid)
PKA	protein kinase A
PKC	protein kinase C
PMSF	phenylmethylsulfonylfluoride
POMC	proopiomelanocortin
PP2A	protein phosphatase 2A
PR	progesterone receptor
PTEN	phosphatase and tensin homologue deleted on chromosome ten
PTX	pertussis toxin
PVDF	polyvinylidene fluoride
RAL	raloxifen
RIPA	radioimmunoprecipitation assay
RISC	RNA induced silencing complex
RLU	relative light units
R-Smad	receptor regulated Smad
RT	reverse Transcriptase
RTK	receptor tyrosine kinase
S1P	sphingosine 1-phosphate
SAPK	stress activated protein kinase
SARA	Smad anchor for receptor activation
SBE	Smad binding element
Scr	Scr tyrosine kinase
SD	standard deviation
SDS	sodium dodecyl sulfate
SDS-PAGE	SDS-polyacrylamide gelelectrophoresis
sec	second
SERM	selective estrogen receptor modulator
Shc	Src-homology and collagen-homology

siRNA	small interfering ribonucleic acid
Sma	small body size
SMURF	Smad ubiquitin regulatory factor
SnoN	Ski-related novel protein N
SphK1	sphingosine kinase 1
SSVMS	serine-serine-valin-methionin-serine
TAM	tamoxifen
Taq-polymerase	thermoprime plus polymerase
TATA-box	base pair sequence 5'-TATAAA-3'
TBE	Tris, boric acid, EDTA
TBP	TATA-binding protein
TBS	Tris buffered saline
TBST	Tween in Tris buffered saline
TE	Tris, EDTA
Temed	N, N, N', N'-Tetramethylethylenediamine
TF	transcription factor
TFF-1	trefoil factor family -1
TGF- α	transforming growth factor - α
TGF- β	transforming growth factor - β
TNF- α	tumour necrosis factor - α
Tris	Trishydroxymethylaminomethan
T β RI	type I TGF- β receptor
T β RII	type II TGF- β receptor
T β RIII	type III TGF- β receptor
U2OS	human osteosarcoma cells
UAECs	uterine artery endothelial cells
uPA	urokinase plasminogen activator
V	volt
VDR	vitamin D3 receptor