9 Index

9.1 Figure index

9.2 Abbreviations

miscellaneous abbreviations	
Å	Ångstrom
aa	Amino acids
APS	ammonium persulfate
BrdU	5-bromo-2'-deoxyuridine
BSA	bovine serum albumin
C	cytosine
CCCP	Carbonyl cyanide 3-chlorophenylhydrazone
CFSE	Carboxy fluorescein diacetate succinimidyl ester
Ci	Curie
dGDP	desoxy Guanosine Di-Phosphate
dGTP	desoxy Guanosine Tri-Phosphate
DMEM	Dulbecco modified Eagle Serum
DMSO	dimethylsulfoxide
DTT	dithioerythreitol
ECM	extra cellular matrix
E.coli	*Escherichia coli*
EDTA	ethylene diamine tetra acetic acid
e.g.	for example (latin: 'exempli gratia')
EGF	epidermal growth factor
EGTA	ethylene glycol tetra acetic acid
ELISA	enzyme linked immunosorbent assay
FACS	fluorescence activated cell sorter
FCS	Fetal calf serum
G_1/G_2	gap phase 1/ gap phase 2
HBS	Hanks' balanced salt solution
HEPES	(N-/2-hydroxyethyl) piperazin-N'-2-ethansulfon acid
IB / IF	Immunoblot / Immunofluorescence
IM	mitochondrial inner membrane
IMS	mitochondrial inner membrane space
IPTG	isopropylthiogalactosid
IRES	internal ribosomal entry side
k.d.	knockdown
KRAB	Krüppel-associated box
mAb	Monoclonal antibody
MeOH	methanol
MMP	mitochondrial membrane potential

miscellaneous abbreviations	
MOI	multiplicity of infection
MTOC	microtubule organizing center
N	Nucleotide (A, C, G or T)
OD	optic density
OM	mitochondrial outer membrane
o/n	over night
pAb	Polyclonal antibody
p.i.	
p.i.	
PFA	para fromaldehyde
PI	propidium iodide
PMA	phorbol 12-myristate 13-acetate
PVDF	polyvinylidenfluoridmembrane
qRT-PCR	quantitative reverse transcriptase polymerase chain reaction
R	restriction point
RPMI	Roswell park memorial institute
RT	room temperature
^{35}S	isotope 35 of sulfur
S / S-phase	synthesis phase
SDS	sodium dodecyl sulfate
siRNA	small interfering RNA
shRNA	small hairpin RNA
SNP	single nucleotide polymorphism
SSC	side scatter
T	thymine
TAE	Tris acetic acid EDTA
TBS	Tris-buffered saline w/ EGTA
TBS-T	Tris-buffered saline with 0.05% Tween 20
TCA	Trichloroacetic acid
TEMED	N, N, N', N',-tetramethylendiamin
TMRE	Tetramethylrhodamine ethyl ester
TNF	tumor necrosis factor
TU	transduction units
UTR	untranslated region
w/	with

abbreviations of genes and proteins	
Bap37	B-cell associated protein 37kDa-prohibitin
Ccp1p	yeast – cyctochrome *c* peroxidase protein
CDKC	cyclin dependent kinase (CDK) complex
CIP	CDK inhibitor protein
Cobp	yeast - cytochrome *b*
Cox1p	yeast - cytochrome *c* oxidase
Drp1	dynamin-related GTPase
E2F	gene regulatory protein
EGFR	epidermal growth factor receptor
ErbB2	v-erb-b2 erythroblastic leukemia viral oncogene homolog 2
Erk	extracellular signal regulated protein kinase
GAPDH	glycerinaldehyd-3-phosphat-dehydrogenase
GEF	guanine exchange factor
Grb2	growth factor receptor-bound protein 2
GST	glutathione-S-transferase
GTPase	guanosine tri-phosphatase
Her2	human epidermal growth receptor 2
Hsp60	heat shock protein 60 kDa
i-AAA	inner membrane space ATP associated with diverse cellular acivity (AAA) protease
IgM	immunoglobulin M
m-AAA	matrix ATP associated with diverse cellular acivity (AAA) protease
Mfn	mitofusin
MEK	MAPK/Erk kinase
Mgm1p	yeast ortholog to OPA1
OPA1	optic atrophy type 1
PARL	presenilin-associated rhomboid-like
PHB	prohibitin
Phb1p / Phb2p	yeast –prohibitin 1 protein / yeast –prohibitin 2 protein
Raf	ras-activated factor
Ras	rat sarcoma
Rbd1p	yeast ortholog to PARL
REA	repressor of estrogen receptor acitivity –prohibitin 2
RTK	receptor tyrosin kinase
Tim23	translocase of the inner mitochondrial membrane (23kDa)
Yta10p	yeast homolog to paraplegin protein
Yta12p	yeast homolog to AFG3L2 protein

9.3 List of constructs

	construct name	vector name	domain/mutation
pCla001		pLL3.7	shRNA
pCla002	pLL3.7-shPHB	pLL3.7	shRNA
pCla018	PHB1-272-GST	pGex4T3	aa 1-272
pCla019	PHB1-243-GST	pGex4T3	aa 1-243
pCla028	PHB1-272 His	pET28c	aa 1-272
pCla030	PHB1-243 His	pET28c	aa 1-243
pCla036	PHB-eGFP	pEGFP-N1	aa 1-272
pCla043	pLL3.7-shPHBx	pLL3.7	shRNA
pCla044	pLL3.7-shPHBy	pLL3.7	shRNA
pCla045	pLL3.7-shPHBz	pLL3.7	shRNA
pCla046	pLL3.7-shPHB2-0	pLL3.7	shRNA
pCla047	pLL3.7-shPHB2-1	pLL3.7	shRNA
pGB001	pLVPT-shLuci	pLVPT-tTRKRAB	shRNA
pGB002	pLVPT-shPHB2-0	pLVPT-tTRKRAB	shRNA
pGB003	pLVPT-shPHB2-1	pLVPT-tTRKRAB	shRNA
pGB004	pLVPT-shPHBy	pLVPT-tTRKRAB	shRNA
pGB005	pLVPT-shPHBz	pLVPT-tTRKRAB	shRNA
pGB006	pLVPT-shPHB	pLVPT-tTRKRAB	shRNA
	C-Raf-HA	pcDNA3	
	C-Raf-GST	pGex3T3	
	HeLa-PHB 3'UTR	pGL3-control	PHB 3'UTR
	HT1080-PHB 3'UTR	pGL3-control	PHB 3'UTR
	IF6-PHB 3'UTR	pGL3-control	PHB 3'UTR
	CapanI-PHB 3'UTR	pGL3-control	PHB 3'UTR
	IMR-E1A-PHB 3'UTR	pGL3-control	PHB 3'UTR

Publications

Rajalingam, K., Wunder, C., Brinkmann, V., Churin, Y., Hekman, M., Sievers, C., Rapp, U.R. and Rudel, T. Prohibitin is required for Ras induced Raf-MEK-ERK activation and epithelial cell migration. Nat Cell Biol. 2005 Aug; 7(8): 837-43

Rubinson, D.A., Dillon, C.P., Kwiatkowski, A.V., Sievers, C., Kopinja, J., McManus, M.T., Gertler, F.B., Scott, M., and Van Parijs, L. Functional and stable gene silencing in transgenic mice and primary mammalian cells by lentivirus-induced RNA interference. Nat Genet. 2003 Mar;33(3):401-6

Presentation

Using RNAi to dissect apoptosis pathways. Sievers, C., Dillon, C.P., Rubinson, D.A. and Van Parijs, L. Presented at New England Immunology Conference. Nov. 16th, 2002.

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