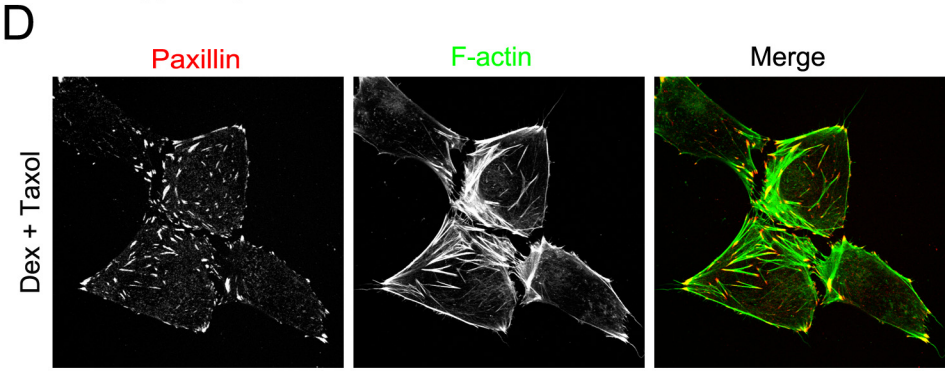
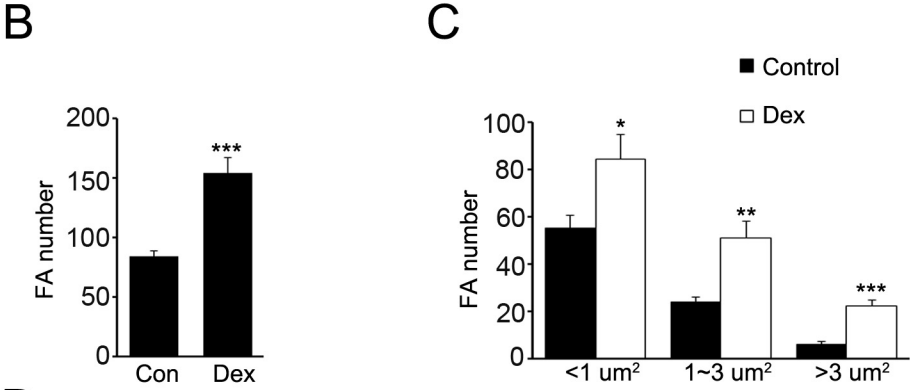
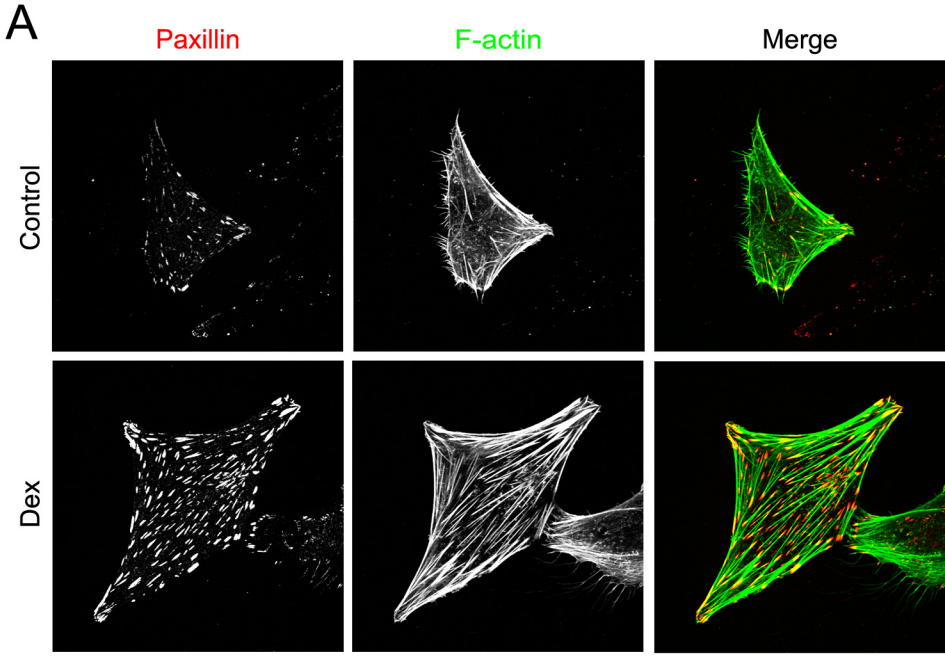
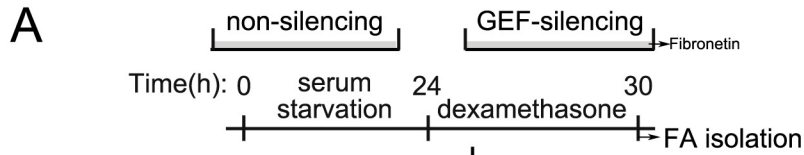


Huang_Fig. S1



Huang_Fig. S2



FA isolation

- (1) remove culture medium and wash
- (2) 3 mins hypotonic shock (2.5 mM triethanolame buffer)
- (3) collect isolated FAs in RIPA buffer
- (4) acetone precipitation

Protein identification by proteomic analysis

- (1) reduction and alkylation
- (2) trypsin digestion
- (3) LC/MS-MS analysis (LTQ Orbitrap-XL) of peptides
- (4) protein identification by Mascot software

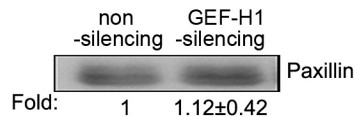
Protein quantification in the reproducible list

- (1) assemble the reproducible list (presence in ≥ 2 replicate runs)
- (2) normalize the spectrum counts of individual protein in the reproducible list

Normalization between experimental runs

$$\frac{\text{spectrum counts of individual protein}}{\text{spectrum counts of all proteins}} \times 1000$$

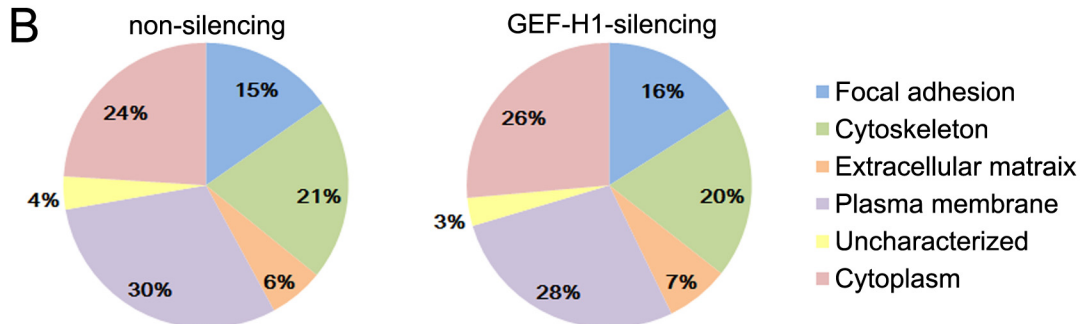
Normalization between experimental conditions



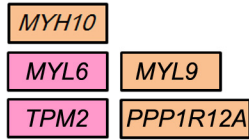
$$\text{Spetrum counts of individual protein in GEF-H1-silencing FA fraction} \times \frac{\text{spectrum counts of paxillin in control FA fraction}}{\text{spectrum counts of paxillin in GEF-H1-silencing FA fraction}}$$

- (3) assemble the GEF-H1-modulated FA proteome

$$\text{Ratio of protein abundance} = \frac{\text{Normalized spectrum counts in control FA fraction}}{\text{Normalized spectrum counts in GEF-H1-silencing FA fraction}}$$



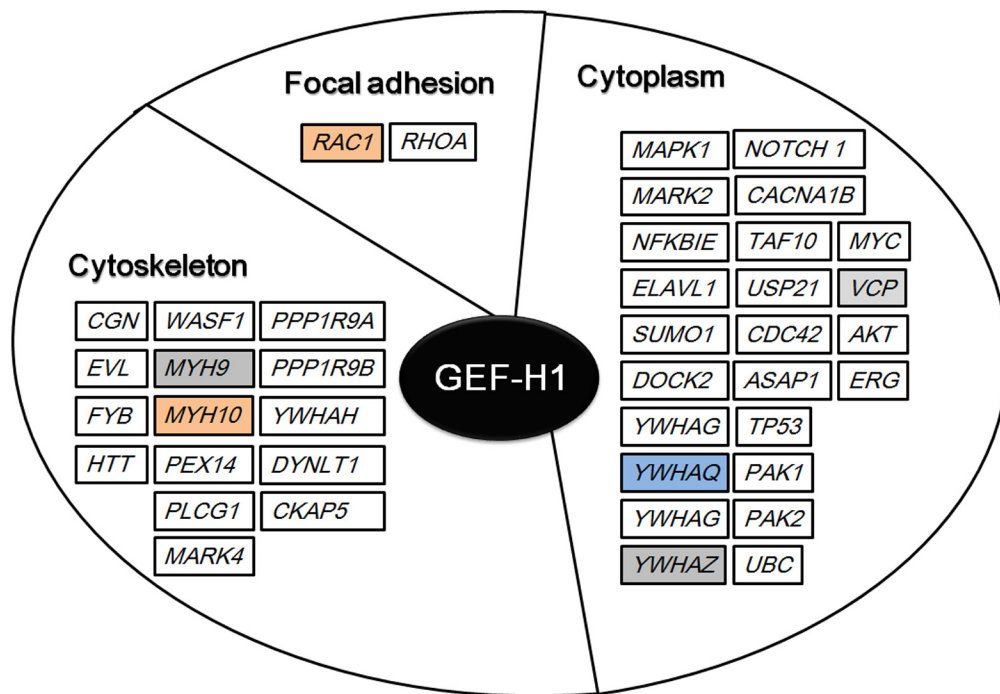
A Positive regulators of actin mechanics



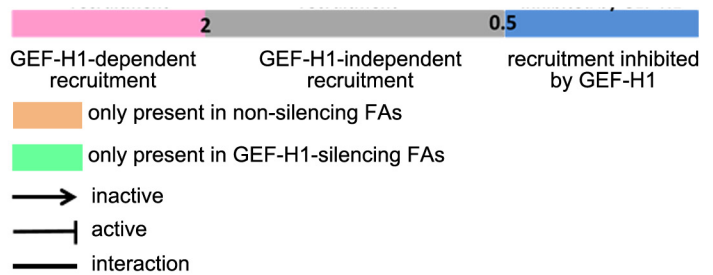
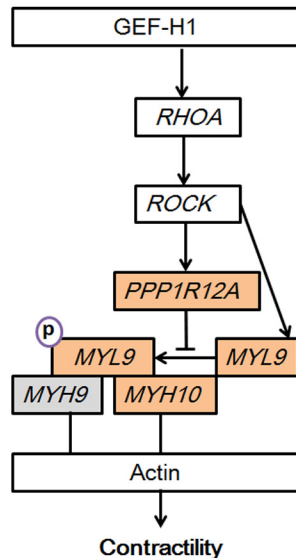
Negative regulators of actin mechanics



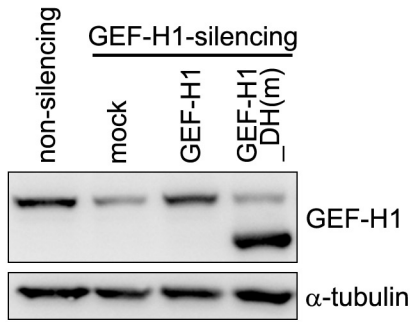
B



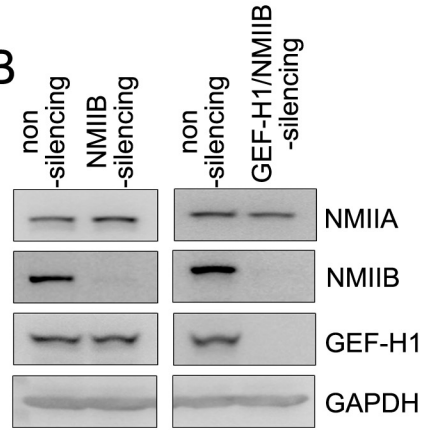
C



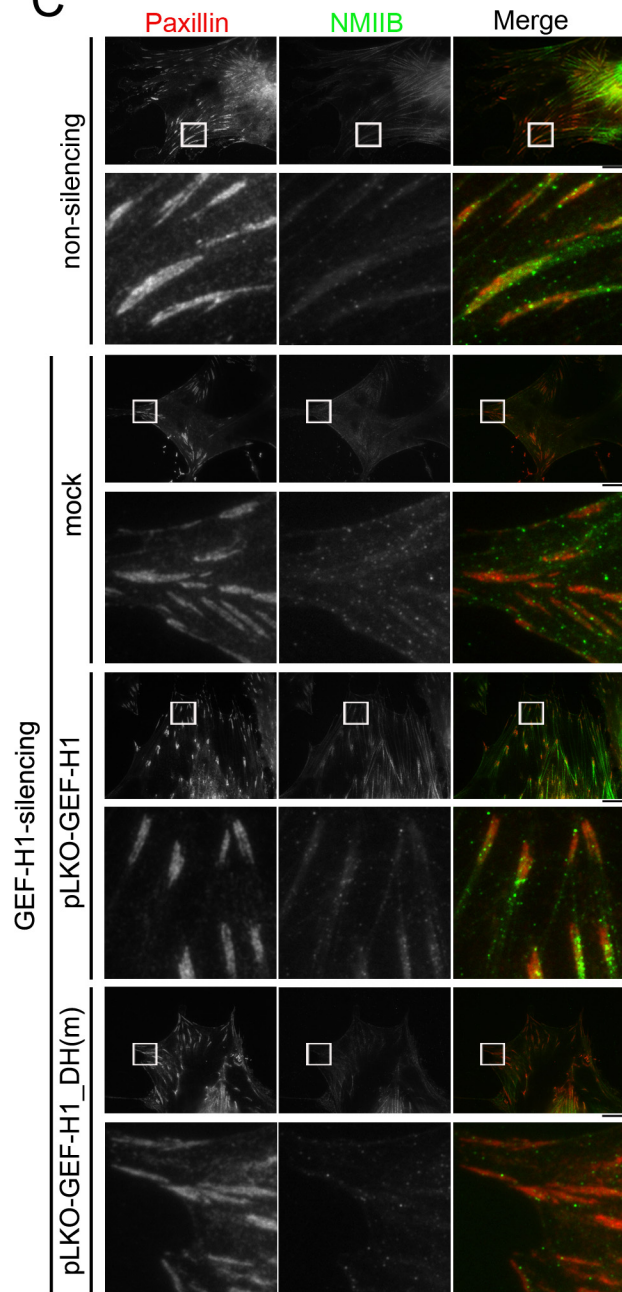
A



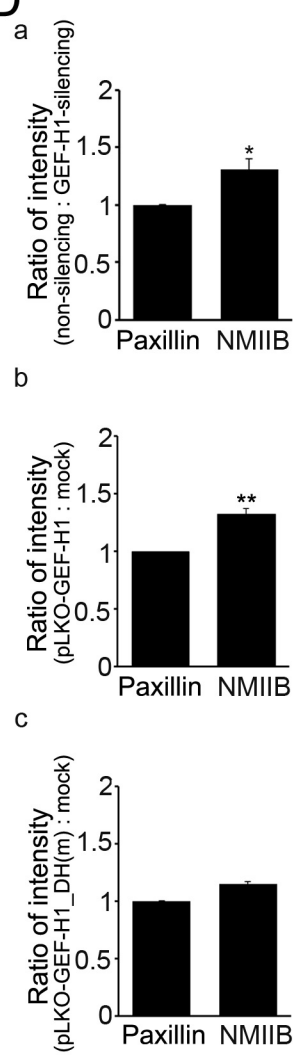
B



C



D



Huang_Supplemental figure legends

Fig. S1. Effects of microtubule stabilization on Dex-induced stress fiber formation and FA maturation.

(A) Serum-starved MSCs treated with ethanol (control) or Dex (0.1 μ M, 6h) were immunostained with FITC-phalloidin, to localize F-actin (green), and paxillin, to localize FAs (red). Bar, 20 μ m. (B) The number of segmented paxillin-marked FAs of MSCs, as described in (A). Data are mean \pm s.e.m (Con, n=25 cells; Dex, n=22 cells). ***p<0.0001 (compared with control). (C) Size distribution of segmented paxillin-marked FAs of MSCs, as described in (A). Data are mean \pm s.e.m. (Control, n=25 cells/2354 FAs; Dex, n=22 cells/3440 FAs). *p<0.05; **p<0.005; ***p<0.0001 (compared with control). (D) Serum-starved MSCs treated with Dex (0.1 μ M) and taxol (20 μ M) for 6h were immunostained with FITC-phalloidin, to localize F-actin (green), and paxillin, to localize FAs (red). Bar, 20 μ m.

Fig. S2. A quantitative proteomic workflow for the GEF-H1-regulated FA proteome.

(A) Flow diagram of the procedure to isolate and prepare FAs from non-silencing and GEF-H1-silencing MSC-3A6 cells for protein identification by proteomic analysis, and for calculating the changes in abundance of identified proteins in FAs in response to GEF-H1 expression. In detail, Serum-starved non-silencing and GEF-H1-silencing MSC-3A6 cells were treated with Dex (0.1 μ M) for 6h. FAs were then isolated, collected, precipitated, solubilized, reduced, alkylated, and trypsin digested. The resulting peptides were analyzed by one-dimensional LC-MS/MS. Tandem mass spectra were generated and searched against those peptides derived from proteins in a human protein database using the MASCOT program. Each protein was identified by one or more peptides, with the false positive identification rate set at \leq 1%. To derive the reproducible lists from non-silencing and GEF-H1-silencing FA fractions, only proteins that were reproducibly identified at least two out of five replicate runs (five independent experimental runs for each condition) were included. To quantify the relative levels of individual FA protein isolated from non-silencing and GEF-H1-silencing MSC-3A6 cells and assemble the GEF-H1-modulated FA proteome, the spectrum counts of individual protein (the number of peptides matched to each identified protein during mass spectrometric database search) was used as a rough estimate of the abundance of that protein in a complex mixture. Before further calculation,

the raw spectrum count of each protein was normalized to correct the variations between experimental runs and experimental conditions. To correct for run-to-run variation, the raw spectrum count of a protein was divided by the total spectrum count of the run and multiplied by 1000 to obtain a readable number. Subsequently, variation resulting from sample preparation due to experimental conditions (isolated FA fractions of non-silencing versus GEF-H1-silencing MSC-3A6 cells) was normalized with the spectrum counts of an internal control, paxillin. Finally, the ratio of protein abundance (normalized non-silencing spectrum counts/normalized GEF-H1-silencing spectrum counts) was calculated to represent the relative abundance of each protein in FAs, and to form the GEF-H1-modulated FA proteome. Bottom inset: western blot of paxillin abundance in FAs isolated from non-silencing and GEF-H1-silencing MSC-3A6 cells treated with Dex (0.1 μ M, 6h). Fold enrichment (fold) of paxillin in isolated FAs was determined by western blotting (equal total protein loaded). Data are mean \pm s.e.m (n=3 experiments). (B) Pie diagrams showing the percentage of proteins in six categories. In non-silencing FAs, the reproducibly identified proteins (321 proteins) were categorized: focal adhesion (49 proteins; 15%), cytoskeleton (66 proteins; 21%), extracellular matrix (20 proteins; 6%), plasma membrane (97 proteins; 30%), cytoplasm (77 proteins; 24%), and uncharacterized (12 proteins; 4%). In GEF-H1-silencing FAs, the reproducibly identified proteins (250 proteins) were categorized: focal adhesion (40 proteins; 16%), cytoskeleton (49 proteins; 20%), extracellular matrix (18 proteins; 7%), plasma membrane (69 proteins; 28%), cytoplasm (66 proteins; 26%) or uncharacterized (8 proteins; 3%).

Fig. S3. Collective modulation by GEF-H1 of the FA-associated abundant proteins in biological pathways.

Greater than two-fold difference in protein abundance (ratio of protein abundance < 0.5 or > 2) was considered significant. Proteins with white boxes were not detected. The detected proteins were represented by color-coded boxes based on the magnitude of the ratio. The scale was indicated at the bottom. (A) GEF-H1 promotes the recruitment of proteins that serve as positive regulators of actin mechanics, but reduces the recruitment of negative regulators in actin mechanics. (B) GEF-H1 mediates the enrichment of GEF-H1-interacting proteins in FAs. (C) GEF-H1 regulates FA enrichment of proteins in the signaling pathway of RhoA-mediated actomyosin contractility.

Fig. S4. GEF-H1 mediates the recruitment of NMIIB in FAs under osteogenic induction condition.

(A) Cell lysate from non-silencing and GEF-H1-silencing MSCs expressing pLKO-vector (mock), pLKO-GEF-H1, or pLKO-GEF-H1_DH(m) were analyzed by western blotting. (B) Cell lysate from non-silencing, NMIIB-silencing, and GEF-H1/NMIIB-silencing MSCs were analyzed by western blotting. (C) TIRF microscopy images of immunolocalized paxillin (red) and NMIIB (green) in non-silencing and GEF-H1-silencing MSCs expressing pLKO-vector (mock), pLKO-GEF-H1, or pLKO-GEF-H1_DH(m) and treated with OIM for 48h. Bar, 20 μm . The 20 μm x 20 μm area indicated in the top images are magnified in the images below. (D) Ratio of average density (intensity per μm^2) of paxillin or NMIIB within segmented FAs of non-silencing MSCs relative to GEF-H1-silencing MSCs expressing mock (a), GEF-H1-silencing MSCs expressing pLKO-GEF-H1 relative to mock (b) or GEF-H1-silencing MSCs expressing pLKO-GEF-H1_DH(m) relative to mock (c) (n=10 cells for each condition). Data are mean \pm s.e.m. *p<0.05, **p<0.005.

Huang_Supplemental tables

Table S1: Categorization of proteins reproducibly identified from non-silencing MSC-3A6 cells.

Cellular Component	Gene Name	Entry Name	Common Protein Name
focal adhesion	<i>ACTB</i>	ACTB	Actin, cytoplasmic 1
focal adhesion	<i>ACTN1</i>	ACTN1	Alpha-actinin-1
focal adhesion	<i>CFL1</i>	COF1	Cofilin-1
focal adhesion	<i>CSRP1</i>	CSRP1	Cysteine and glycine-rich protein 1
focal adhesion	<i>CTTN</i>	SRC8	Src substrate cortactin
focal adhesion	<i>ENAH</i>	ENAH	Protein enabled homolog
focal adhesion	<i>EPHA2</i>	EPHA2	Ephrin type-A receptor 2
focal adhesion	<i>EZR</i>	EZR1	Ezrin
focal adhesion	<i>FBLIM1</i>	FBLI1	Filamin-binding LIM protein 1
focal adhesion	<i>FERMT2</i>	FERM2	Fermitin family homolog 2
focal adhesion	<i>FHL2</i>	FHL2	Four and a half LIM domains protein 2
focal adhesion	<i>FLNA</i>	FLNA	Filamin-A
focal adhesion	<i>HRAS</i>	RASH	GTPase HRas
focal adhesion	<i>HSPB1</i>	HSPB1	Heat shock protein beta-1
focal adhesion	<i>ILK</i>	ILK	Integrin-linked protein kinase
focal adhesion	<i>ITGA2</i>	ITA2	Integrin alpha-2
focal adhesion	<i>ITGA3</i>	ITA3	Integrin alpha-3
focal adhesion	<i>ITGA5</i>	ITA5	Integrin alpha-5
focal adhesion	<i>ITGA6</i>	ITA6	Integrin alpha-6
focal adhesion	<i>ITGA7</i>	ITA7	Integrin alpha-7
focal adhesion	<i>ITGAV</i>	ITAV	Integrin alpha-V
focal adhesion	<i>ITGB1</i>	ITB1	Integrin beta-1
focal adhesion	<i>ITGB5</i>	ITB5	Integrin beta-5
focal adhesion	<i>LASP1</i>	LASP1	LIM and SH3 domain protein 1
focal adhesion	<i>LIMD1</i>	LIMD1	LIM domain-containing protein 1
focal adhesion	<i>LIMS2</i>	LIMS2	LIM and senescent cell antigen-like-containing domain protein 2
focal adhesion	<i>LPP</i>	LPP	Lipoma-preferred partner
focal adhesion	<i>LRP1</i>	LRP1	Prolow-density lipoprotein receptor-related protein 1
focal adhesion	<i>MACF1</i>	MACF1	Microtubule-actin cross-linking factor 1, isoforms 1/2/3/5
focal adhesion	<i>MARCKS</i>	MARCS	Myristoylated alanine-rich C-kinase substrate
focal adhesion	<i>MSN</i>	MOES	Moesin
focal adhesion	<i>NEXN</i>	NEXN	Nexilin

focal adhesion	<i>PALLD</i>	PALLD	Palladin
focal adhesion	<i>PDLIM2</i>	PDLI2	PDZ and LIM domain protein 2
focal adhesion	<i>PFN1</i>	PROF1	Profilin-1
focal adhesion	<i>PLEC</i>	PLEC	Plectin
focal adhesion	<i>PRNP</i>	PRIO	Major prion protein
focal adhesion	<i>PVR</i>	PVR	Poliovirus receptor
focal adhesion	<i>PXN</i>	PAXI	Paxillin
focal adhesion	<i>RAC1</i>	RAC1	Ras-related C3 botulinum toxin substrate 1
focal adhesion	<i>TENC1</i>	TENC1	Tensin-like C1 domain-containing phosphatase
focal adhesion	<i>TGFB111</i>	TGF11	Transforming growth factor beta-1-induced transcript 1 protein
focal adhesion	<i>TLN1</i>	TLN1	Talin-1
focal adhesion	<i>TNS1</i>	TENS1	Tensin-1
focal adhesion	<i>TRIP6</i>	TRIP6	Thyroid receptor-interacting protein 6
focal adhesion	<i>VASP</i>	VASP	Vasodilator-stimulated phosphoprotein
focal adhesion	<i>VCL</i>	VINC	Vinculin
focal adhesion	<i>VIM</i>	VIME	Vimentin
focal adhesion	<i>ZYX</i>	ZYX	Zyxin
cytoskeleton	<i>ACTN4</i>	ACTN4	Alpha-actinin-4
cytoskeleton	<i>ADD1</i>	ADDA	Alpha-adducin
cytoskeleton	<i>AGRN</i>	AGRIN	Agrin
cytoskeleton	<i>AKAP12</i>	AKA12	A-kinase anchor protein 12
cytoskeleton	<i>ALDOA</i>	ALDOA	Fructose-bisphosphate aldolase A
cytoskeleton	<i>ARHGEF2</i>	ARHG2	Rho guanine nucleotide exchange factor 2
cytoskeleton	<i>ARPC5</i>	ARPC5	Actin-related protein 2/3 complex subunit 5
cytoskeleton	<i>BASP1</i>	BASP1	Brain acid soluble protein 1
cytoskeleton	<i>CALD1</i>	CALD1	Caldesmon
cytoskeleton	<i>CALM1</i>	CALM	Calmodulin
cytoskeleton	<i>CDC42EP3</i>	BORG2	Cdc42 effector protein 3
cytoskeleton	<i>CEP170</i>	CE170	Centrosomal protein of 170 kDa
cytoskeleton	<i>CFL2</i>	COF2	Cofilin-2
cytoskeleton	<i>CKAP4</i>	CKAP4	Cytoskeleton-associated protein 4
cytoskeleton	<i>CNN2</i>	CNN2	Calponin-2
cytoskeleton	<i>CNN3</i>	CNN3	Calponin-3
cytoskeleton	<i>CNP</i>	CN37	2',3'-cyclic-nucleotide 3'-phosphodiesterase
cytoskeleton	<i>CORO1C</i>	COR1C	Coronin-1C
cytoskeleton	<i>CSRP2</i>	CSRP2	Cysteine and glycine-rich protein 2
cytoskeleton	<i>DBN1</i>	DREB	Drebrin

cytoskeleton	<i>DBNL</i>	DBNL	Drebrin-like protein
cytoskeleton	<i>DSTN</i>	DEST	Destrin
cytoskeleton	<i>FKBP4</i>	FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4
cytoskeleton	<i>FLNB</i>	FLNB	Filamin-B
cytoskeleton	<i>FLNC</i>	FLNC	Filamin-C
cytoskeleton	<i>FLOT1</i>	FLOT1	Flotillin-1
cytoskeleton	<i>GAPDH</i>	G3P	Glyceraldehyde-3-phosphate dehydrogenase
cytoskeleton	<i>HNRNPA1</i>	ROA1	Heterogeneous nuclear ribonucleoprotein A1
cytoskeleton	<i>INA</i>	AINX	Alpha-internexin
cytoskeleton	<i>LIMA1</i>	LIMA1	LIM domain and actin-binding protein 1
cytoskeleton	<i>LMNA</i>	LMNA	Prelamin-A/C
cytoskeleton	<i>MYH10</i>	MYH10	Myosin-10
cytoskeleton	<i>MYH9</i>	MYH9	Myosin-9
cytoskeleton	<i>MYL12A</i>	ML12A	Myosin regulatory light chain 12A
cytoskeleton	<i>MYL6</i>	MYL6	Myosin light polypeptide 6
cytoskeleton	<i>MYL9</i>	MYL9	Myosin regulatory light polypeptide 9
cytoskeleton	<i>MYO1C</i>	MYO1C	Unconventional myosin-1c
cytoplasm	<i>PDIA3</i>	PDIA3	Protein disulfide-isomerase A3
cytoskeleton	<i>PDLIM4</i>	PDLI4	PDZ and LIM domain protein 4
cytoskeleton	<i>PFN2</i>	PROF2	Profilin-2
cytoskeleton	<i>PPP1R12A</i>	MYPT1	Protein phosphatase 1 regulatory subunit 12A
cytoskeleton	<i>PPP1R18</i>	PPR18	Phostensin
cytoplasm	<i>PRKCSH</i>	GLU2B	Glucosidase 2 subunit beta
cytoskeleton	<i>RAI14</i>	RAI14	Ankyrin-14
cytoplasm	<i>RRBP1</i>	RRBP1	Ribosome-binding protein 1
cytoskeleton	<i>S100A11</i>	S10AB	Protein S100-A11
cytoskeleton	<i>SEPT2</i>	SEPT2	Septin-2
cytoskeleton	<i>SEPT7</i>	SEPT7	Septin-7
cytoskeleton	<i>SEPT9</i>	SEPT9	Septin-9
cytoplasm	<i>SERPINH1</i>	SERPH	Serpin H1
cytoskeleton	<i>SNTB2</i>	SNTB2	Beta-2-syntrophin
cytoskeleton	<i>SPTAN1</i>	SPTN1	Spectrin alpha chain, non-erythrocytic 1
cytoskeleton	<i>SPTBN1</i>	SPTB2	Spectrin beta chain, non-erythrocytic 1
cytoskeleton	<i>STMN1</i>	STMN1	Stathmin
cytoskeleton	<i>STOM</i>	STOM	Erythrocyte band 7 integral membrane protein
cytoskeleton	<i>TAGLN2</i>	TAGL2	Transgelin-2
cytoskeleton	<i>TLN2</i>	TLN2	Talin-2

cytoskeleton	<i>TMOD3</i>	TMOD3	Tropomodulin-3
cytoskeleton	<i>TPM2</i>	TPM2	Tropomyosin beta chain
cytoskeleton	<i>TPM3</i>	TPM3	Tropomyosin alpha-3 chain
cytoskeleton	<i>TPM4</i>	TPM4	Tropomyosin alpha-4 chain
cytoskeleton	<i>TRIOBP</i>	TARA	TRIO and F-actin-binding protein
cytoskeleton	<i>TUBA1A</i>	TBA1A	Tubulin alpha-1A chain
cytoskeleton	<i>TUBB2A</i>	TBB2A	Tubulin beta-2A chain
cytoskeleton	<i>UACA</i>	UACA	Uveal autoantigen with coiled-coil domains and ankyrin repeats
cytoskeleton	<i>UTRN</i>	UTRO	Utrophin
extracellular matrix	<i>ADAMTSL1</i>	ATL1	ADAMTS-like protein 1
extracellular matrix	<i>AHSG</i>	FETUA	Alpha-2-HS-glycoprotein
extracellular matrix	<i>COL1A1</i>	CO1A1	Collagen alpha-1(I) chain
extracellular matrix	<i>COL1A2</i>	CO1A2	Collagen alpha-2(I) chain
extracellular matrix	<i>COL6A3</i>	CO6A3	Collagen alpha-3(VI) chain
extracellular matrix	<i>EMILIN1</i>	EMIL1	EMILIN-1
extracellular matrix	<i>FBLN1</i>	FBLN1	Fibulin-1
extracellular matrix	<i>FBLN2</i>	FBLN2	Fibulin-2
extracellular matrix	<i>FN1</i>	FINC	Fibronectin
extracellular matrix	<i>HAPLN1</i>	HPLN1	Hyaluronan and proteoglycan link protein 1
extracellular matrix	<i>HAPLN3</i>	HPLN3	Hyaluronan and proteoglycan link protein 3
extracellular matrix	<i>LOX</i>	LYOX	Protein-lysine 6-oxidase
extracellular matrix	<i>LOXL1</i>	LOXL1	Lysyl oxidase homolog 1
extracellular matrix	<i>LTBP2</i>	LTBP2	Latent-transforming growth factor beta-binding protein 2
extracellular matrix	<i>LTBP4</i>	LTBP4	Latent-transforming growth factor beta-binding protein 4
extracellular matrix	<i>MGP</i>	MGP	Matrix Gla protein
extracellular matrix	<i>PCOLCE</i>	PCOC1	Procollagen C-endopeptidase enhancer 1
extracellular matrix	<i>TGFB2</i>	TGFB2	Transforming growth factor beta-2
extracellular matrix	<i>VCAN</i>	CSPG2	Versican core protein
extracellular matrix	<i>VTN</i>	VTNC	Vitronectin
plasma membrane	<i>ADAM9</i>	ADAM9	Disintegrin and metalloproteinase domain-containing protein 9
plasma membrane	<i>ADRM1</i>	ADRM1	Proteasomal ubiquitin receptor ADRM1
plasma membrane	<i>ALCAM</i>	CD166	CD166 antigen
plasma membrane	<i>ANXA1</i>	ANXA1	Annexin A1
plasma membrane	<i>ANXA2</i>	ANXA2	Annexin A2
plasma membrane	<i>AP2A1</i>	AP2A1	AP-2 complex subunit alpha-1
plasma membrane	<i>AP2M1</i>	AP2M1	AP-2 complex subunit mu
plasma membrane	<i>APOC3</i>	APOC3	Apolipoprotein C-III

plasma membrane	<i>APOE</i>	APOE	Apolipoprotein E
plasma membrane	<i>APOH</i>	APOH	Beta-2-glycoprotein 1
plasma membrane	<i>APP</i>	A4	Amyloid beta A4 protein
plasma membrane	<i>ATP1A1</i>	AT1A1	Sodium/potassium-transporting ATPase subunit alpha-1
plasma membrane	<i>ATP2B4</i>	AT2B4	Plasma membrane calcium-transporting ATPase 4
plasma membrane	<i>ATP5A1</i>	ATPA	ATP synthase subunit alpha, mitochondrial
plasma membrane	<i>ATP5O</i>	ATPO	ATP synthase subunit O, mitochondrial
plasma membrane	<i>BCAM</i>	BCAM	Basal cell adhesion molecule
plasma membrane	<i>BSG</i>	BASI	Basigin
plasma membrane	<i>CCDC80</i>	CCD80	Coiled-coil domain-containing protein 80
plasma membrane	<i>CD151</i>	CD151	CD151 antigen
plasma membrane	<i>CD44</i>	CD44	CD44 antigen
plasma membrane	<i>CD55</i>	DAF	Complement decay-accelerating factor
plasma membrane	<i>CD59</i>	CD59	CD59 glycoprotein
plasma membrane	<i>CD99</i>	CD99	CD99 antigen
plasma membrane	<i>CDC42EP1</i>	BORG5	Cdc42 effector protein 1
plasma membrane	<i>CDH2</i>	CADH2	Cadherin-2
plasma membrane	<i>CLIC1</i>	CLIC1	Chloride intracellular channel protein 1
plasma membrane	<i>CLTA</i>	CLCA	Clathrin light chain A
plasma membrane	<i>CSDA</i>	DBPA	DNA-binding protein A
plasma membrane	<i>CTGF</i>	CTGF	Connective tissue growth factor
plasma membrane	<i>CTNNA1</i>	CTNA1	Catenin alpha-1
plasma membrane	<i>CTNNB1</i>	CTNB1	Catenin beta-1
plasma membrane	<i>CTNND1</i>	CTND1	Catenin delta-1
plasma membrane	<i>DKK1</i>	DKK1	Dickkopf-related protein 1
plasma membrane	<i>EDIL3</i>	EDIL3	EGF-like repeat and discoidin I-like domain-containing protein 3
plasma membrane	<i>EEF1A1</i>	EF1A1	Elongation factor 1-alpha 1
plasma membrane	<i>EFEMP2</i>	FBLN4	EGF-containing fibulin-like extracellular matrix protein 2
plasma membrane	<i>EGFR</i>	EGFR	Epidermal growth factor receptor
plasma membrane	<i>EHD1</i>	EHD1	EH domain-containing protein 1
plasma membrane	<i>EHD4</i>	EHD4	EH domain-containing protein 4
plasma membrane	<i>EPB41L2</i>	E41L2	Band 4.1-like protein 2
plasma membrane	<i>EPHB2</i>	EPHB2	Ephrin type-B receptor 2
plasma membrane	<i>EPS15L1</i>	EP15R	Epidermal growth factor receptor substrate 15-like 1
plasma membrane	<i>EPS8</i>	EPS8	Epidermal growth factor receptor kinase substrate 8
plasma membrane	<i>ERBB2IP</i>	LAP2	Protein LAP2
plasma membrane	<i>ESYT1</i>	ESYT1	Extended synaptotagmin-1

plasma membrane	<i>F5</i>	FA5	Coagulation factor V
plasma membrane	<i>GNAI2</i>	GNAI2	Guanine nucleotide-binding protein G(i) subunit alpha-2
plasma membrane	<i>GNAI3</i>	GNAI3	Guanine nucleotide-binding protein G(k) subunit alpha
plasma membrane	<i>GNAS</i>	GNAS1	Guanine nucleotide-binding protein G(s) subunit alpha isoforms XLas
plasma membrane	<i>GNG12</i>	GBG12	Guanine nucleotide-binding protein G(l)/G(S)/G(O) subunit gamma-12
plasma membrane	<i>GSK3B</i>	GSK3B	Glycogen synthase kinase-3 beta
plasma membrane	<i>HNRNPM</i>	HNRPM	Heterogeneous nuclear ribonucleoprotein M
plasma membrane	<i>HSPA5</i>	GRP78	78 kDa glucose-regulated protein
plasma membrane	<i>HSPA8</i>	HSP7C	Heat shock cognate 71 kDa protein
plasma membrane	<i>HSPA9</i>	GRP75	Stress-70 protein, mitochondrial
plasma membrane	<i>HSPD1</i>	CH60	60 kDa heat shock protein, mitochondrial
plasma membrane	<i>HSPG2</i>	PGBM	Basement membrane-specific heparan sulfate proteoglycan core protein
plasma membrane	<i>ICAM1</i>	ICAM1	Intercellular adhesion molecule 1
plasma membrane	<i>IGF2</i>	IGF2	Insulin-like growth factor II
plasma membrane	<i>KIRREL</i>	KIRR1	Kin of IRRE-like protein 1
plasma membrane	<i>LGALS1</i>	LEG1	Galectin-1
plasma membrane	<i>LIN7C</i>	LIN7C	Protein lin-7 homolog C
plasma membrane	<i>MARCKSL1</i>	MRP	MARCKS-related protein
plasma membrane	<i>MCAM</i>	MUC18	Cell surface glycoprotein MUC18
plasma membrane	<i>MRC2</i>	MRC2	C-type mannose receptor 2
plasma membrane	<i>MYADM</i>	MYADM	Myeloid-associated differentiation marker
plasma membrane	<i>MYOF</i>	MYOF	Myoferlin
plasma membrane	<i>NRP1</i>	NRP1	Neuropilin-1
plasma membrane	<i>NUMB</i>	NUMB	Protein numb homolog
plasma membrane	<i>PIP4K2A</i>	PI42A	Phosphatidylinositol 5-phosphate 4-kinase type-2 alpha
plasma membrane	<i>PKM</i>	KPYM	Pyruvate kinase isozymes M1/M2
plasma membrane	<i>PLP2</i>	PLP2	Proteolipid protein 2
plasma membrane	<i>PLSCR3</i>	PLS3	Phospholipid scramblase 3
plasma membrane	<i>PLXNB2</i>	PLXB2	Plexin-B2
plasma membrane	<i>PPFIBP1</i>	LIPB1	Liprin-beta-1
plasma membrane	<i>PRSS12</i>	NETR	Neurotrypsin
plasma membrane	<i>PTK7</i>	PTK7	Inactive tyrosine-protein kinase 7
plasma membrane	<i>RAB13</i>	RAB13	Ras-related protein Rab-13
plasma membrane	<i>RFTN1</i>	RFTN1	Raftlin
plasma membrane	<i>RPL7A</i>	RL7A	60S ribosomal protein L7a
plasma membrane	<i>SDPR</i>	SDPR	Serum deprivation-response protein
plasma membrane	<i>SERBP1</i>	PAIRB	Plasminogen activator inhibitor 1 RNA-binding protein

plasma membrane	<i>SERPINE1</i>	PAI1	Plasminogen activator inhibitor 1
plasma membrane	<i>SLC1A5</i>	AAAT	Neutral amino acid transporter B(0)
plasma membrane	<i>SLC39A14</i>	S39AE	Zinc transporter ZIP14
plasma membrane	<i>SLC7A5</i>	LAT1	Large neutral amino acids transporter small subunit 1
plasma membrane	<i>SNAP29</i>	SNP29	Synaptosomal-associated protein 29
plasma membrane	<i>STEAP3</i>	STEA3	Metalloreductase STEAP3
plasma membrane	<i>STXBP1</i>	STXB1	Syntaxin-binding protein 1
plasma membrane	<i>TFRC</i>	TFR1	Transferrin receptor protein 1
plasma membrane	<i>TGFB1</i>	TGFB1	Transforming growth factor beta-1
plasma membrane	<i>THBS1</i>	TSP1	Thrombospondin-1
plasma membrane	<i>TJP2</i>	ZO2	Tight junction protein ZO-2
plasma membrane	<i>TNC</i>	TENA	Tenascin
plasma membrane	<i>VAMP5</i>	VAMP5	Vesicle-associated membrane protein 5
plasma membrane	<i>VASN</i>	VASN	Vasorin
plasma membrane	<i>WNT5A</i>	WNT5A	Protein Wnt-5a
uncharacterized	<i>A6NL28</i>	TPM3L	Putative tropomyosin alpha-3 chain-like protein
uncharacterized	<i>ADAM5P</i>	ADAM5	Putative disintegrin and metalloproteinase domain-containing protein 5
uncharacterized	<i>AKAP2</i>	AKAP2	A-kinase anchor protein 2
uncharacterized	<i>C16orf55</i>	CP055	Uncharacterized protein C16orf55
uncharacterized	<i>CYR61</i>	CYR61	Protein CYR61
uncharacterized	<i>FAM176B</i>	F176B	Protein FAM176B
uncharacterized	<i>HBA1</i>	HBA	Hemoglobin subunit alpha
uncharacterized	<i>HIST1H4A</i>	H4	Histone H4
uncharacterized	<i>HPCA</i>	HPCA	Neuron-specific calcium-binding protein hippocalcin
uncharacterized	<i>LSM12</i>	LSM12	Protein LSM12 homolog
uncharacterized	<i>PHLDB1</i>	PHLB1	Pleckstrin homology-like domain family B member 1
uncharacterized	<i>PRKCDBP</i>	PRDBP	Protein kinase C delta-binding protein
cytoplasm	<i>ADAMTS1</i>	ATS1	A disintegrin and metalloproteinase with thrombospondin motifs 1
cytoplasm	<i>ATP5D</i>	ATPD	ATP synthase subunit delta, mitochondrial
cytoplasm	<i>ATP5I</i>	ATP5I	ATP synthase subunit e, mitochondrial
cytoplasm	<i>CCDC50</i>	CCD50	Coiled-coil domain-containing protein 50
cytoplasm	<i>CHCHD3</i>	CHCH3	Coiled-coil-helix-coiled-coil-helix domain-containing protein 3, mitochondrial
cytoplasm	<i>CLEC3B</i>	TETN	Tetranectin
cytoplasm	<i>CLTB</i>	CLCB	Clathrin light chain B
cytoplasm	<i>CLTC</i>	CLH1	Clathrin heavy chain 1
cytoplasm	<i>COX5A</i>	COX5A	Cytochrome c oxidase subunit 5A, mitochondrial
cytoplasm	<i>DDX3X</i>	DDX3X	ATP-dependent RNA helicase DDX3X

cytoplasm	<i>DPYSL2</i>	DPYL2	Dihydropyrimidinase-related protein 2
cytoplasm	<i>DTD1</i>	DTD1	D-tyrosyl-tRNA(Tyr) deacylase 1
cytoplasm	<i>EEF1D</i>	EF1D	Elongation factor 1-delta
cytoplasm	<i>EEF2</i>	EF2	Elongation factor 2
cytoplasm	<i>EIF2S1</i>	IF2A	Eukaryotic translation initiation factor 2 subunit 1
cytoplasm	<i>EIF4H</i>	IF4H	Eukaryotic translation initiation factor 4H
cytoplasm	<i>ENSA</i>	ENSA	Alpha-endosulfine
cytoplasm	<i>EPN2</i>	EPN2	Epsin-2
cytoplasm	<i>FH</i>	FUMH	Fumarate hydratase, mitochondrial
cytoplasm	<i>GAS6</i>	GAS6	Growth arrest-specific protein 6
cytoplasm	<i>GLIPR2</i>	GAPR1	Golgi-associated plant pathogenesis-related protein 1
cytoplasm	<i>HNRNPA2B1</i>	ROA2	Heterogeneous nuclear ribonucleoproteins A2/B1
cytoplasm	<i>HNRNPD</i>	HNRPD	Heterogeneous nuclear ribonucleoprotein D0
cytoplasm	<i>HTRA1</i>	HTRA1	Serine protease HTRA1
cytoplasm	<i>KANK2</i>	KANK2	KN motif and ankyrin repeat domain-containing protein 2
cytoplasm	<i>KPNB1</i>	IMB1	Importin subunit beta-1
cytoplasm	<i>LMO7</i>	LMO7	LIM domain only protein 7
cytoplasm	<i>MIF</i>	MIF	Macrophage migration inhibitory factor
cytoplasm	<i>MT1E</i>	MT1E	Metallothionein-1E
cytoplasm	<i>MT2A</i>	MT2	Metallothionein-2
cytoplasm	<i>NACA</i>	NACA	Nascent polypeptide-associated complex subunit alpha
cytoplasm	<i>NDUFA2</i>	NDUA2	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2
cytoplasm	<i>NPM1</i>	NPM	Nucleophosmin
cytoplasm	<i>PCBP1</i>	PCBP1	Poly(rC)-binding protein 1
cytoplasm	<i>PCMT1</i>	PIMT	Protein-L-isoaspartate(D-aspartate) O-methyltransferase
cytoplasm	<i>PGAM1</i>	PGAM1	Phosphoglycerate mutase 1
cytoplasm	<i>PPIA</i>	PPIA	Peptidyl-prolyl cis-trans isomerase A
cytoplasm	<i>PPIB</i>	PPIB	Peptidyl-prolyl cis-trans isomerase B
cytoplasm	<i>PRDX1</i>	PRDX1	Peroxiredoxin-1
cytoplasm	<i>PTRF</i>	PTRF	Polymerase I and transcript release factor
cytoplasm	<i>RAB21</i>	RAB21	Ras-related protein Rab-21
cytoplasm	<i>RPL11</i>	RL11	60S ribosomal protein L11
cytoplasm	<i>RPL12</i>	RL12	60S ribosomal protein L12
cytoplasm	<i>RPL13</i>	RL13	60S ribosomal protein L13
cytoplasm	<i>RPL22</i>	RL22	60S ribosomal protein L22
cytoplasm	<i>RPL23A</i>	RL23A	60S ribosomal protein L23a
cytoplasm	<i>RPL29</i>	RL29	60S ribosomal protein L29

cytoplasm	<i>RPL30</i>	RL30	60S ribosomal protein L30
cytoplasm	<i>RPL35A</i>	RL35A	60S ribosomal protein L35a
cytoplasm	<i>RPL5</i>	RL5	60S ribosomal protein L5
cytoplasm	<i>RPL6</i>	RL6	60S ribosomal protein L6
cytoplasm	<i>RPLP1</i>	RLA1	60S acidic ribosomal protein P1
cytoplasm	<i>RPS18</i>	RS18	40S ribosomal protein S18
cytoplasm	<i>RPS19</i>	RS19	40S ribosomal protein S19
cytoplasm	<i>RPS2</i>	RS2	40S ribosomal protein S2
cytoplasm	<i>RPS21</i>	RS21	40S ribosomal protein S21
cytoplasm	<i>RPS25</i>	RS25	40S ribosomal protein S25
cytoplasm	<i>RPS28</i>	RS28	40S ribosomal protein S28
cytoplasm	<i>RPS29</i>	RS29	40S ribosomal protein S29
cytoplasm	<i>RPS3A</i>	RS3A	40S ribosomal protein S3a
cytoplasm	<i>RPS6</i>	RS6	40S ribosomal protein S6
cytoplasm	<i>SCAMP3</i>	SCAM3	Secretory carrier-associated membrane protein 3
cytoplasm	<i>SEPT8</i>	SEPT8	Septin-8
cytoplasm	<i>SH3BGRL3</i>	SH3L3	SH3 domain-binding glutamic acid-rich-like protein 3
cytoplasm	<i>SRP14</i>	SRP14	Signal recognition particle 14 kDa protein
cytoplasm	<i>SRP9</i>	SRP09	Signal recognition particle 9 kDa protein
cytoplasm	<i>STX7</i>	STX7	Syntaxin-7
cytoplasm	<i>THSD4</i>	THSD4	Thrombospondin type-1 domain-containing protein 4
cytoplasm	<i>TPI1</i>	TPIS	Triosephosphate isomerase
cytoplasm	<i>TUFM</i>	EFTU	Elongation factor Tu, mitochondrial
cytoplasm	<i>UQCRC1</i>	QCR1	Cytochrome b-c1 complex subunit 1, mitochondrial
cytoplasm	<i>VAT1</i>	VAT1	Synaptic vesicle membrane protein VAT-1 homolog
cytoplasm	<i>VCP</i>	TERA	Transitional endoplasmic reticulum ATPase
cytoplasm	<i>YBX1</i>	YBOX1	Nuclease-sensitive element-binding protein 1
cytoplasm	<i>YWHAQ</i>	1433T	14-3-3 protein theta
cytoplasm	<i>YWHAZ</i>	1433Z	14-3-3 protein zeta/delta
cytoplasm	<i>ZC3H15</i>	ZC3HF	Zinc finger CCCH domain-containing protein 15

Table S2: Categorization of proteins reproducibly identified from GEF-H1-silencing MSC-3A6 cells.

Cellular Component	Gene Name	Entry Name	Common Protein Name
focal adhesion	<i>ACTB</i>	ACTB	Actin, cytoplasmic 1
focal adhesion	<i>ACTN1</i>	ACTN1	Alpha-actinin-1
focal adhesion	<i>CFL1</i>	COF1	Cofilin-1
focal adhesion	<i>CSRP1</i>	CSRP1	Cysteine and glycine-rich protein 1
focal adhesion	<i>CTTN</i>	SRC8	Src substrate cortactin
focal adhesion	<i>ENAH</i>	ENAH	Protein enabled homolog
focal adhesion	<i>EPHA2</i>	EPHA2	Ephrin type-A receptor 2
focal adhesion	<i>EZR</i>	EZRI	Ezrin
focal adhesion	<i>FHL2</i>	FHL2	Four and a half LIM domains protein 2
focal adhesion	<i>FLNA</i>	FLNA	Filamin-A
focal adhesion	<i>HRAS</i>	RASH	GTPase HRas
focal adhesion	<i>HSPB1</i>	HSPB1	Heat shock protein beta-1
focal adhesion	<i>ILK</i>	ILK	Integrin-linked protein kinase
focal adhesion	<i>ITGA2</i>	ITA2	Integrin alpha-2
focal adhesion	<i>ITGA3</i>	ITA3	Integrin alpha-3
focal adhesion	<i>ITGA5</i>	ITA5	Integrin alpha-5
focal adhesion	<i>ITGA6</i>	ITA6	Integrin alpha-6
focal adhesion	<i>ITGAV</i>	ITAV	Integrin alpha-V
focal adhesion	<i>ITGB1</i>	ITB1	Integrin beta-1
focal adhesion	<i>ITGB5</i>	ITB5	Integrin beta-5
focal adhesion	<i>LASP1</i>	LASP1	LIM and SH3 domain protein 1
focal adhesion	<i>LIMD1</i>	LIMD1	LIM domain-containing protein 1
focal adhesion	<i>LIMS2</i>	LIMS2	LIM and senescent cell antigen-like-containing domain protein 2
focal adhesion	<i>LRP1</i>	LRP1	Prolow-density lipoprotein receptor-related protein 1
focal adhesion	<i>MARCKS</i>	MARCS	Myristoylated alanine-rich C-kinase substrate
focal adhesion	<i>MSN</i>	MOES	Moesin
focal adhesion	<i>NEXN</i>	NEXN	Nexilin
focal adhesion	<i>PALLD</i>	PALLD	Palladin
focal adhesion	<i>PDLIM2</i>	PDLI2	PDZ and LIM domain protein 2
focal adhesion	<i>PFN1</i>	PROF1	Profilin-1
focal adhesion	<i>PLEC</i>	PLEC	Plectin
focal adhesion	<i>PRNP</i>	PRIO	Major prion protein
focal adhesion	<i>PXN</i>	PAXI	Paxillin
focal adhesion	<i>TENC1</i>	TENC1	Tensin-like C1 domain-containing phosphatase

focal adhesion	<i>TLN1</i>	TLN1	Talin-1
focal adhesion	<i>TNS1</i>	TENS1	Tensin-1
focal adhesion	<i>VASP</i>	VASP	Vasodilator-stimulated phosphoprotein
focal adhesion	<i>VCL</i>	VINC	Vinculin
focal adhesion	<i>VIM</i>	VIME	Vimentin
focal adhesion	<i>ZYX</i>	ZYX	Zyxin
cytoskeleton	<i>ACTN4</i>	ACTN4	Alpha-actinin-4
cytoskeleton	<i>ADD1</i>	ADDA	Alpha-adducin
cytoskeleton	<i>AGRN</i>	AGRIN	Agrin
cytoskeleton	<i>AKAP12</i>	AKA12	A-kinase anchor protein 12
cytoskeleton	<i>ALDOA</i>	ALDOA	Fructose-bisphosphate aldolase A
cytoskeleton	<i>BASP1</i>	BASP1	Brain acid soluble protein 1
cytoskeleton	<i>CALD1</i>	CALD1	Caldesmon
cytoskeleton	<i>CALM1</i>	CALM	Calmodulin
cytoskeleton	<i>CEP170</i>	CE170	Centrosomal protein of 170 kDa
cytoskeleton	<i>CFL2</i>	COF2	Cofilin-2
cytoskeleton	<i>CNN2</i>	CNN2	Calponin-2
cytoskeleton	<i>CNN3</i>	CNN3	Calponin-3
cytoskeleton	<i>CORO1C</i>	COR1C	Coronin-1C
cytoskeleton	<i>CSRP2</i>	CSRP2	Cysteine and glycine-rich protein 2
cytoskeleton	<i>DBN1</i>	DREB	Drebrin
cytoskeleton	<i>DBNL</i>	DBNL	Drebrin-like protein
cytoskeleton	<i>DSTN</i>	DEST	Destrin
cytoskeleton	<i>FKBP4</i>	FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4
cytoskeleton	<i>FLNB</i>	FLNB	Filamin-B
cytoskeleton	<i>FLNC</i>	FLNC	Filamin-C
cytoskeleton	<i>FLOT1</i>	FLOT1	Flotillin-1
cytoskeleton	<i>GAPDH</i>	G3P	Glyceraldehyde-3-phosphate dehydrogenase
cytoskeleton	<i>INA</i>	AINX	Alpha-internexin
cytoskeleton	<i>LIMA1</i>	LIMA1	LIM domain and actin-binding protein 1
cytoskeleton	<i>LMNA</i>	LMNA	Prelamin-A/C
cytoskeleton	<i>MYH9</i>	MYH9	Myosin-9
cytoskeleton	<i>MYL12A</i>	ML12A	Myosin regulatory light chain 12A
cytoskeleton	<i>MYL6</i>	MYL6	Myosin light polypeptide 6
cytoskeleton	<i>MYO1C</i>	MYO1C	Unconventional myosin-Ic
cytoplasm	<i>PDIA3</i>	PDIA3	Protein disulfide-isomerase A3
cytoskeleton	<i>PPP1R18</i>	PPR18	Phostensin

cytoplasm	<i>PRKCSH</i>	GLU2B	Glucosidase 2 subunit beta
cytoplasm	<i>RRBP1</i>	RRBP1	Ribosome-binding protein 1
cytoskeleton	<i>SEPT2</i>	SEPT2	Septin-2
cytoskeleton	<i>SEPT7</i>	SEPT7	Septin-7
cytoskeleton	<i>SEPT9</i>	SEPT9	Septin-9
cytoplasm	<i>SERPINH1</i>	SERPH	Serpin H1
cytoskeleton	<i>SPTAN1</i>	SPTN1	Spectrin alpha chain, non-erythrocytic 1
cytoskeleton	<i>SPTBN1</i>	SPTB2	Spectrin beta chain, non-erythrocytic 1
cytoskeleton	<i>STMN1</i>	STMN1	Stathmin
cytoskeleton	<i>STOM</i>	STOM	Erythrocyte band 7 integral membrane protein
cytoskeleton	<i>TAGLN2</i>	TAGL2	Transgelin-2
cytoskeleton	<i>TPM2</i>	TPM2	Tropomyosin beta chain
cytoskeleton	<i>TPM3</i>	TPM3	Tropomyosin alpha-3 chain
cytoskeleton	<i>TPM4</i>	TPM4	Tropomyosin alpha-4 chain
cytoskeleton	<i>TRIOBP</i>	TARA	TRIO and F-actin-binding protein
cytoskeleton	<i>TUBA1A</i>	TBA1A	Tubulin alpha-1A chain
cytoskeleton	<i>TUBB2A</i>	TBB2A	Tubulin beta-2A chain
cytoskeleton	<i>UTRN</i>	UTRO	Utrophin
extracellular matrix	<i>ADAMTSL1</i>	ATL1	ADAMTS-like protein 1
extracellular matrix	<i>AHSG</i>	FETUA	Alpha-2-HS-glycoprotein
extracellular matrix	<i>COL1A1</i>	CO1A1	Collagen alpha-1(I) chain
extracellular matrix	<i>COL1A2</i>	CO1A2	Collagen alpha-2(I) chain
extracellular matrix	<i>COL6A3</i>	CO6A3	Collagen alpha-3(VI) chain
extracellular matrix	<i>EMILIN1</i>	EMIL1	EMILIN-1
extracellular matrix	<i>FBLN1</i>	FBLN1	Fibulin-1
extracellular matrix	<i>FBLN2</i>	FBLN2	Fibulin-2
extracellular matrix	<i>FN1</i>	FINC	Fibronectin
extracellular matrix	<i>HAPLN3</i>	HPLN3	Hyaluronan and proteoglycan link protein 3
extracellular matrix	<i>LOX</i>	LYOX	Protein-lysine 6-oxidase
extracellular matrix	<i>LOXL1</i>	LOXL1	Lysyl oxidase homolog 1
extracellular matrix	<i>LTBP2</i>	LTBP2	Latent-transforming growth factor beta-binding protein 2
extracellular matrix	<i>LTBP4</i>	LTBP4	Latent-transforming growth factor beta-binding protein 4
extracellular matrix	<i>MGP</i>	MGP	Matrix Gla protein
extracellular matrix	<i>PCOLCE</i>	PCOC1	Procollagen C-endopeptidase enhancer 1
extracellular matrix	<i>VCAN</i>	CSPG2	Versican core protein
extracellular matrix	<i>VTN</i>	VTNC	Vitronectin
plasma membrane	<i>ADAM9</i>	ADAM9	Disintegrin and metalloproteinase domain-containing protein 9

plasma membrane	<i>ALCAM</i>	CD166	CD166 antigen
plasma membrane	<i>ANXA1</i>	ANXA1	Annexin A1
plasma membrane	<i>ANXA2</i>	ANXA2	Annexin A2
plasma membrane	<i>AP2A1</i>	AP2A1	AP-2 complex subunit alpha-1
plasma membrane	<i>AP2M1</i>	AP2M1	AP-2 complex subunit mu
plasma membrane	<i>APOC3</i>	APOC3	Apolipoprotein C-III
plasma membrane	<i>APOE</i>	APOE	Apolipoprotein E
plasma membrane	<i>APP</i>	A4	Amyloid beta A4 protein
plasma membrane	<i>ATP1A1</i>	AT1A1	Sodium/potassium-transporting ATPase subunit alpha-1
plasma membrane	<i>ATP2B4</i>	AT2B4	Plasma membrane calcium-transporting ATPase 4
plasma membrane	<i>ATP5A1</i>	ATPA	ATP synthase subunit alpha, mitochondrial
plasma membrane	<i>BSG</i>	BASI	Basigin
plasma membrane	<i>CCDC80</i>	CCD80	Coiled-coil domain-containing protein 80
plasma membrane	<i>CD44</i>	CD44	CD44 antigen
plasma membrane	<i>CDH2</i>	CADH2	Cadherin-2
plasma membrane	<i>CLIC1</i>	CLIC1	Chloride intracellular channel protein 1
plasma membrane	<i>CLTA</i>	CLCA	Clathrin light chain A
plasma membrane	<i>CSDA</i>	DBPA	DNA-binding protein A
plasma membrane	<i>CTNNA1</i>	CTNA1	Catenin alpha-1
plasma membrane	<i>CTNNB1</i>	CTNB1	Catenin beta-1
plasma membrane	<i>DKK1</i>	DKK1	Dickkopf-related protein 1
plasma membrane	<i>EDIL3</i>	EDIL3	EGF-like repeat and discoidin I-like domain-containing protein 3
plasma membrane	<i>EEF1A1</i>	EF1A1	Elongation factor 1-alpha 1
plasma membrane	<i>EFEMP2</i>	FBLN4	EGF-containing fibulin-like extracellular matrix protein 2
plasma membrane	<i>ENO1</i>	ENOA	Alpha-enolase
plasma membrane	<i>EPB41L2</i>	E41L2	Band 4.1-like protein 2
plasma membrane	<i>EPHB2</i>	EPHB2	Ephrin type-B receptor 2
plasma membrane	<i>EPS8</i>	EPS8	Epidermal growth factor receptor kinase substrate 8
plasma membrane	<i>ESYT1</i>	ESYT1	Extended synaptotagmin-1
plasma membrane	<i>F2</i>	THRB	Prothrombin
plasma membrane	<i>F5</i>	FA5	Coagulation factor V
plasma membrane	<i>GNAI2</i>	GNAI2	Guanine nucleotide-binding protein G(i) subunit alpha-2
plasma membrane	<i>GNAI3</i>	GNAI3	Guanine nucleotide-binding protein G(k) subunit alpha
plasma membrane	<i>GNG12</i>	GBG12	Guanine nucleotide-binding protein G(l)/G(s)/G(o) subunit gamma-12
plasma membrane	<i>GSK3B</i>	GSK3B	Glycogen synthase kinase-3 beta
plasma membrane	<i>HNRNPM</i>	HNRPM	Heterogeneous nuclear ribonucleoprotein M
plasma membrane	<i>HSPA5</i>	GRP78	78 kDa glucose-regulated protein

plasma membrane	<i>HSPA8</i>	HSP7C	Heat shock cognate 71 kDa protein
plasma membrane	<i>HSPA9</i>	GRP75	Stress-70 protein, mitochondrial
plasma membrane	<i>HSPD1</i>	CH60	60 kDa heat shock protein, mitochondrial
plasma membrane	<i>HSPG2</i>	PGBM	Basement membrane-specific heparan sulfate proteoglycan core protein
plasma membrane	<i>ICAM1</i>	ICAM1	Intercellular adhesion molecule 1
plasma membrane	<i>IGF2</i>	IGF2	Insulin-like growth factor II
plasma membrane	<i>LGALS1</i>	LEG1	Galectin-1
plasma membrane	<i>LIN7C</i>	LIN7C	Protein lin-7 homolog C
plasma membrane	<i>MARCKSL1</i>	MRP	MARCKS-related protein
plasma membrane	<i>MCAM</i>	MUC18	Cell surface glycoprotein MUC18
plasma membrane	<i>MDH2</i>	MDHM	Malate dehydrogenase, mitochondrial
plasma membrane	<i>MYADM</i>	MYADM	Myeloid-associated differentiation marker
plasma membrane	<i>MYOF</i>	MYOF	Myoferlin
plasma membrane	<i>NRP1</i>	NRP1	Neuropilin-1
plasma membrane	<i>PACSN3</i>	PACN3	Protein kinase C and casein kinase substrate in neurons protein 3
plasma membrane	<i>PIP4K2A</i>	PI42A	Phosphatidylinositol 5-phosphate 4-kinase type-2 alpha
plasma membrane	<i>PKM</i>	KPYM	Pyruvate kinase isozymes M1/M2
plasma membrane	<i>PPFIBP1</i>	LIPB1	Liprin-beta-1
plasma membrane	<i>PTK7</i>	PTK7	Inactive tyrosine-protein kinase 7
plasma membrane	<i>RFTN1</i>	RFTN1	Raftlin
plasma membrane	<i>RPL7A</i>	RL7A	60S ribosomal protein L7a
plasma membrane	<i>SDPR</i>	SDPR	Serum deprivation-response protein
plasma membrane	<i>SERPINE1</i>	PAI1	Plasminogen activator inhibitor 1
plasma membrane	<i>SLC1A5</i>	AAAT	Neutral amino acid transporter B(0)
plasma membrane	<i>STXBP1</i>	STXB1	Syntaxin-binding protein 1
plasma membrane	<i>TGFB1</i>	TGFB1	Transforming growth factor beta-1
plasma membrane	<i>THBS1</i>	TSP1	Thrombospondin-1
plasma membrane	<i>TJP2</i>	ZO2	Tight junction protein ZO-2
plasma membrane	<i>TNC</i>	TENA	Tenascin
plasma membrane	<i>VASN</i>	VASN	Vasorin
plasma membrane	<i>WNT5A</i>	WNT5A	Protein Wnt-5a
uncharacterized	<i>A6NL28</i>	TPM3L	Putative tropomyosin alpha-3 chain-like protein
uncharacterized	<i>AKAP2</i>	AKAP2	A-kinase anchor protein 2
uncharacterized	<i>CYR61</i>	CYR61	Protein CYR61
uncharacterized	<i>FAM176B</i>	F176B	Protein FAM176B
uncharacterized	<i>HBA1</i>	HBA	Hemoglobin subunit alpha
uncharacterized	<i>HIST1H4A</i>	H4	Histone H4

uncharacterized	<i>HPCA</i>	HPCA	Neuron-specific calcium-binding protein hippocalcin
uncharacterized	<i>PRKCDBP</i>	PRDBP	Protein kinase C delta-binding protein
cytoplasm	<i>ADAMTS1</i>	ATS1	A disintegrin and metalloproteinase with thrombospondin motifs 1
cytoplasm	<i>CCDC50</i>	CCD50	Coiled-coil domain-containing protein 50
cytoplasm	<i>CHCHD3</i>	CHCH3	Coiled-coil-helix-coiled-coil-helix domain-containing protein 3, mitochondrial
cytoplasm	<i>CLTB</i>	CLCB	Clathrin light chain B
cytoplasm	<i>COX5A</i>	COX5A	Cytochrome c oxidase subunit 5A, mitochondrial
cytoplasm	<i>DPYSL2</i>	DPYL2	Dihydropyrimidinase-related protein 2
cytoplasm	<i>DTD1</i>	DTD1	D-tyrosyl-tRNA(Tyr) deacylase 1
cytoplasm	<i>EEF1B2</i>	EF1B	Elongation factor 1-beta
cytoplasm	<i>EEF1D</i>	EF1D	Elongation factor 1-delta
cytoplasm	<i>EEF2</i>	EF2	Elongation factor 2
cytoplasm	<i>EIF2S1</i>	IF2A	Eukaryotic translation initiation factor 2 subunit 1
cytoplasm	<i>EIF4H</i>	IF4H	Eukaryotic translation initiation factor 4H
cytoplasm	<i>ENSA</i>	ENSA	Alpha-endosulfine
cytoplasm	<i>EPN2</i>	EPN2	Epsin-2
cytoplasm	<i>FH</i>	FUMH	Fumarate hydratase, mitochondrial
cytoplasm	<i>GLIPR2</i>	GAPR1	Golgi-associated plant pathogenesis-related protein 1
cytoplasm	<i>HTRA1</i>	HTRA1	Serine protease HTRA1
cytoplasm	<i>KANK2</i>	KANK2	KN motif and ankyrin repeat domain-containing protein 2
cytoplasm	<i>LMO7</i>	LMO7	LIM domain only protein 7
cytoplasm	<i>LSM14A</i>	LS14A	Protein LSM14 homolog A
cytoplasm	<i>MIF</i>	MIF	Macrophage migration inhibitory factor
cytoplasm	<i>MT1E</i>	MT1E	Metallothionein-1E
cytoplasm	<i>NACA</i>	NACA	Nascent polypeptide-associated complex subunit alpha
cytoplasm	<i>NDUFA2</i>	NDUA2	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2
cytoplasm	<i>NPM1</i>	NPM	Nucleophosmin
cytoplasm	<i>PCBP1</i>	PCBP1	Poly(rC)-binding protein 1
cytoplasm	<i>PCMT1</i>	PIMT	Protein-L-isoaspartate(D-aspartate) O-methyltransferase
cytoplasm	<i>PGAM1</i>	PGAM1	Phosphoglycerate mutase 1
cytoplasm	<i>PLS3</i>	PLST	Plastin-3
cytoplasm	<i>PPIA</i>	PPIA	Peptidyl-prolyl cis-trans isomerase A
cytoplasm	<i>PPP1R12C</i>	PP12C	Protein phosphatase 1 regulatory subunit 12C
cytoplasm	<i>PTRF</i>	PTRF	Polymerase I and transcript release factor
cytoplasm	<i>RPL11</i>	RL11	60S ribosomal protein L11
cytoplasm	<i>RPL12</i>	RL12	60S ribosomal protein L12
cytoplasm	<i>RPL13</i>	RL13	60S ribosomal protein L13

cytoplasm	<i>RPL22</i>	RL22	60S ribosomal protein L22
cytoplasm	<i>RPL35A</i>	RL35A	60S ribosomal protein L35a
cytoplasm	<i>RPL37A</i>	RL37A	60S ribosomal protein L37a
cytoplasm	<i>RPL5</i>	RL5	60S ribosomal protein L5
cytoplasm	<i>RPL9</i>	RL9	60S ribosomal protein L9
cytoplasm	<i>RPLP1</i>	RLA1	60S acidic ribosomal protein P1
cytoplasm	<i>RPS18</i>	RS18	40S ribosomal protein S18
cytoplasm	<i>RPS19</i>	RS19	40S ribosomal protein S19
cytoplasm	<i>RPS2</i>	RS2	40S ribosomal protein S2
cytoplasm	<i>RPS21</i>	RS21	40S ribosomal protein S21
cytoplasm	<i>RPS25</i>	RS25	40S ribosomal protein S25
cytoplasm	<i>RPS29</i>	RS29	40S ribosomal protein S29
cytoplasm	<i>RPS3A</i>	RS3A	40S ribosomal protein S3a
cytoplasm	<i>RPS6</i>	RS6	40S ribosomal protein S6
cytoplasm	<i>RPS8</i>	RS8	40S ribosomal protein S8
cytoplasm	<i>SCAMP3</i>	SCAM3	Secretory carrier-associated membrane protein 3
cytoplasm	<i>SEC22B</i>	SC22B	Vesicle-trafficking protein SEC22b
cytoplasm	<i>SEPT8</i>	SEPT8	Septin-8
cytoplasm	<i>SH3BGRL3</i>	SH3L3	SH3 domain-binding glutamic acid-rich-like protein 3
cytoplasm	<i>SNRPE</i>	RUXE	Small nuclear ribonucleoprotein E
cytoplasm	<i>SRP14</i>	SRP14	Signal recognition particle 14 kDa protein
cytoplasm	<i>SRP9</i>	SRP09	Signal recognition particle 9 kDa protein
cytoplasm	<i>SSBP1</i>	SSBP	Single-stranded DNA-binding protein, mitochondrial
cytoplasm	<i>THSD4</i>	THSD4	Thrombospondin type-1 domain-containing protein 4
cytoplasm	<i>TPI1</i>	TPIS	Triosephosphate isomerase
cytoplasm	<i>VAT1</i>	VAT1	Synaptic vesicle membrane protein VAT-1 homolog
cytoplasm	<i>VCP</i>	TERA	Transitional endoplasmic reticulum ATPase
cytoplasm	<i>YBX1</i>	YBOX1	Nuclease-sensitive element-binding protein 1
cytoplasm	<i>YWHAQ</i>	1433T	14-3-3 protein theta
cytoplasm	<i>YWHAZ</i>	1433Z	14-3-3 protein zeta/delta
cytoplasm	<i>ZC3H15</i>	ZC3HF	Zinc finger CCCH domain-containing protein 15

Table S3: Proteins in the reproducible lists from both non-silencing and GEF-H1-silencing MSC-3A6 cells and their ratios indicating change in relative FA abundance in response to GEF-H1 expression.

Only present in GEF-H1-silencing FAs

Gene Name	Entry Name	Common Protein Name
<i>EEF1B2</i>	EF1B	Elongation factor 1-beta
<i>ENO1</i>	ENOA	Alpha-enolase
<i>F2</i>	THRB	Prothrombin
<i>LSM14A</i>	LS14A	Protein LSM14 homolog A
<i>MDH2</i>	MDHM	Malate dehydrogenase, mitochondrial
<i>PACSN3</i>	PACN3	Protein kinase C and casein kinase substrate in neurons protein 3
<i>PLS3</i>	PLST	Plastin-3
<i>PPP1R12C</i>	PP12C	Protein phosphatase 1 regulatory subunit 12C
<i>RPL37A</i>	RL37A	60S ribosomal protein L37a
<i>RPL9</i>	RL9	60S ribosomal protein L9
<i>RPS8</i>	RS8	40S ribosomal protein S8
<i>SEC22B</i>	SC22B	Vesicle-trafficking protein SEC22b
<i>SNRPE</i>	RUXE	Small nuclear ribonucleoprotein E
<i>SSBP1</i>	SSBP	Single-stranded DNA-binding protein, mitochondrial

FA recruitment inhibited by GEF-H1 expression (the Ratio of protein abundance < 0.5)

Gene Name	Entry Name	Common Protein Name	Ratio of Protein Abundance
<i>ADAMTSL1</i>	ATL1	ADAMTS-like protein 1	0.144844491
<i>AKAP12</i>	AKA12	A-kinase anchor protein 12	0.424364482
<i>AKAP2</i>	AKAP2	A-kinase anchor protein 2	0.195876861
<i>ALCAM</i>	CD166	CD166 antigen	0.203510266
<i>ALDOA</i>	ALDOA	Fructose-bisphosphate aldolase A	0.115771842
<i>ANXA1</i>	ANXA1	Annexin A1	0.126802293
<i>ATP1A1</i>	AT1A1	Sodium/potassium-transporting ATPase subunit alpha-1	0.256730516
<i>ATP5A1</i>	ATPA	ATP synthase subunit alpha, mitochondrial	0.072876591
<i>BSG</i>	BASI	Basigin	0.181119399
<i>CALD1</i>	CALD1	Caldesmon	0.37990232
<i>CALM1</i>	CALM	Calmodulin	0.296527863
<i>CD44</i>	CD44	CD44 antigen	0.325641531
<i>CDH2</i>	CADH2	Cadherin-2	0.496416112

<i>CEP170</i>	CE170	Centrosomal protein of 170 kDa	0.388971872
<i>CFL1</i>	COF1	Cofilin-1	0.179149181
<i>CFL2</i>	COF2	Cofilin-2	0.073638429
<i>CLIC1</i>	CLIC1	Chloride intracellular channel protein 1	0.49882972
<i>CNN2</i>	CNN2	Calponin-2	0.190277508
<i>COL1A1</i>	CO1A1	Collagen alpha-1(I) chain	0.259951104
<i>COL1A2</i>	CO1A2	Collagen alpha-2(I) chain	0.440716288
<i>COL6A3</i>	CO6A3	Collagen alpha-3(VI) chain	0.063489858
<i>CORO1C</i>	COR1C	Coronin-1C	0.37030344
<i>CSDA</i>	DBPA	DNA-binding protein A	0.056056181
<i>DPYSL2</i>	DPYL2	Dihydropyrimidinase-related protein 2	0.21311785
<i>DSTN</i>	DEST	Destrin	0.126342136
<i>DTD1</i>	DTD1	D-tyrosyl-tRNA(Tyr) deacylase 1	0.288355069
<i>EDIL3</i>	EDIL3	EGF-like repeat and discoidin I-like domain-containing protein 3	0.245640847
<i>EPS8</i>	EPS8	Epidermal growth factor receptor kinase substrate 8	0.045045711
<i>ESYT1</i>	ESYT1	Extended synaptotagmin-1	0.213128217
<i>F5</i>	FA5	Coagulation factor V	0.258574403
<i>FH</i>	FUMH	Fumarate hydratase, mitochondrial	0.206589759
<i>FHL2</i>	FHL2	Four and a half LIM domains protein 2	0.420729598
<i>FKBP4</i>	FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	0.346569252
<i>FN1</i>	FINC	Fibronectin	0.22304462
<i>GSK3B</i>	GSK3B	Glycogen synthase kinase-3 beta	0.427989077
<i>HIST1H4A</i>	H4	Histone H4	0.274960501
<i>HNRNPM</i>	HNRPM	Heterogeneous nuclear ribonucleoprotein M	0.417420614
<i>HSPA5</i>	GRP78	78 kDa glucose-regulated protein	0.095071193
<i>HSPB1</i>	HSPB1	Heat shock protein beta-1	0.121116184
<i>HSPD1</i>	CH60	60 kDa heat shock protein, mitochondrial	0.188968036
<i>HSPG2</i>	PGBM	Basement membrane-specific heparan sulfate proteoglycan core protein	0.476719138
<i>HTRA1</i>	HTRA1	Serine protease HTRA1	0.248609894
<i>ICAM1</i>	ICAM1	Intercellular adhesion molecule 1	0.329409173
<i>ILK</i>	ILK	Integrin-linked protein kinase	0.345276588
<i>ITGA5</i>	ITA5	Integrin alpha-5	0.272516581
<i>ITGAV</i>	ITAV	Integrin alpha-V	0.462728948
<i>LOXL1</i>	LOXL1	Lysyl oxidase homolog 1	0.187504402
<i>LTBP4</i>	LTBP4	Latent-transforming growth factor beta-binding protein 4	0.054551129
<i>MARCKSL1</i>	MRP	MARCKS-related protein	0.455690468
<i>MGP</i>	MGP	Matrix Gla protein	0.361021978

<i>MIF</i>	MIF	Macrophage migration inhibitory factor	0.169973714
<i>MYADM</i>	MYADM	Myeloid-associated differentiation marker	0.13253645
<i>MYL12A</i>	ML12A	Myosin regulatory light chain 12A	0.412838065
<i>PALLD</i>	PALLD	Palladin	0.285711118
<i>PCBP1</i>	PCBP1	Poly(rC)-binding protein 1	0.150489837
<i>PCMT1</i>	PIMT	Protein-L-isoaspartate(D-aspartate) O-methyltransferase	0.061639774
<i>PCOLCE</i>	PCOC1	Procollagen C-endopeptidase enhancer 1	0.103570967
<i>PFN1</i>	PROF1	Profilin-1	0.148795011
<i>PPIA</i>	PPIA	Peptidyl-prolyl cis-trans isomerase A	0.30787814
<i>PRNP</i>	PRIO	Major prion protein	0.256170397
<i>PTRF</i>	PTRF	Polymerase I and transcript release factor	0.428245106
<i>RFTN1</i>	RFTN1	Raftlin	0.49663636
<i>RPL12</i>	RL12	60S ribosomal protein L12	0.350506609
<i>RPL5</i>	RL5	60S ribosomal protein L5	0.034232035
<i>RPS19</i>	RS19	40S ribosomal protein S19	0.322745881
<i>RPS29</i>	RS29	40S ribosomal protein S29	0.166799214
<i>RPS6</i>	RS6	40S ribosomal protein S6	0.239480431
<i>SDPR</i>	SDPR	Serum deprivation-response protein	0.154228706
<i>SERPINE1</i>	PAI1	Plasminogen activator inhibitor 1	0.041410659
<i>SRP14</i>	SRP14	Signal recognition particle 14 kDa protein	0.35196284
<i>STMN1</i>	STMN1	Stathmin	0.220588803
<i>STXB1</i>	STXB1	Syntaxin-binding protein 1	0.308483423
<i>THSD4</i>	THSD4	Thrombospondin type-1 domain-containing protein 4	0.31959279
<i>TNC</i>	TENA	Tenascin	0.227897348
<i>TUBA1A</i>	TBA1A	Tubulin alpha-1A chain	0.118684196
<i>VIM</i>	VIME	Vimentin	0.470064322
<i>YBX1</i>	YBOX1	Nuclease-sensitive element-binding protein 1	0.219197834
<i>YWHAQ</i>	1433T	14-3-3 protein theta	0.445213335
<i>ZYX</i>	ZYX	Zyxin	0.342835546

GEF-H1-independent FA recruitment (the Ratio of protein abundance 0.5 ~ 2)

Gene Name	Entry Name	Common Protein Name	Ratio of Protein Abundance
<i>A6NL28</i>	TPM3L	Putative tropomyosin alpha-3 chain-like protein	0.722166326
<i>ACTB</i>	ACTB	Actin, cytoplasmic 1	0.576072634
<i>ACTN1</i>	ACTN1	Alpha-actinin-1	0.526324022
<i>ACTN4</i>	ACTN4	Alpha-actinin-4	0.526324022

<i>ADAM9</i>	ADAM9	Disintegrin and metalloproteinase domain-containing protein 9	1.336957951
<i>ADAMTS1</i>	ATS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	0.512533456
<i>ADD1</i>	ADDA	Alpha-adducin	0.587687211
<i>AGRN</i>	AGRIN	Agrin	1.091164547
<i>AHSG</i>	FETUA	Alpha-2-HS-glycoprotein	1.056170458
<i>ANXA2</i>	ANXA2	Annexin A2	0.885600181
<i>AP2M1</i>	AP2M1	AP-2 complex subunit mu	1.370762681
<i>APOC3</i>	APOC3	Apolipoprotein C-III	0.796138519
<i>APOE</i>	APOE	Apolipoprotein E	0.984948378
<i>APP</i>	A4	Amyloid beta A4 protein	1.912495812
<i>ATP2B4</i>	AT2B4	Plasma membrane calcium-transporting ATPase 4	0.956396362
<i>BASP1</i>	BASP1	Brain acid soluble protein 1	0.815250471
<i>CCDC50</i>	CCD50	Coiled-coil domain-containing protein 50	0.842445101
<i>CCDC80</i>	CCD80	Coiled-coil domain-containing protein 80	1.143852758
<i>CHCHD3</i>	CHCH3	Coiled-coil-helix-coiled-coil-helix domain-containing protein 3, mitochondrial	1.266128383
<i>CLTA</i>	CLCA	Clathrin light chain A	0.784745884
<i>CLTB</i>	CLCB	Clathrin light chain B	0.951238209
<i>CNN3</i>	CNN3	Calponin-3	1.492798216
<i>COX5A</i>	COX5A	Cytochrome c oxidase subunit 5A, mitochondrial	1.408597546
<i>CSRP1</i>	CSRP1	Cysteine and glycine-rich protein 1	0.767986275
<i>CTNNA1</i>	CTNA1	Catenin alpha-1	0.936604184
<i>CTNNB1</i>	CTNB1	Catenin beta-1	1.68855921
<i>CTTN</i>	SRC8	Src substrate cortactin	0.773244575
<i>CYR61</i>	CYR61	Protein CYR61	1.071575188
<i>DBNL</i>	DBNL	Drebrin-like protein	1.59207945
<i>DKK1</i>	DKK1	Dickkopf-related protein 1	0.575813819
<i>EEF1D</i>	EF1D	Elongation factor 1-delta	0.930452235
<i>EEF2</i>	EF2	Elongation factor 2	0.677891273
<i>EFEMP2</i>	FBLN4	EGF-containing fibulin-like extracellular matrix protein 2	0.796431952
<i>EIF2S1</i>	IF2A	Eukaryotic translation initiation factor 2 subunit 1	1.098853868
<i>EIF4H</i>	IF4H	Eukaryotic translation initiation factor 4H	1.524321019
<i>EMILIN1</i>	EMIL1	EMILIN-1	0.61244093
<i>ENAH</i>	ENAH	Protein enabled homolog	1.717313581
<i>ENSA</i>	ENSA	Alpha-endosulfine	1.153570575
<i>EPB41L2</i>	E41L2	Band 4.1-like protein 2	0.631966951
<i>EPHA2</i>	EPHA2	Ephrin type-A receptor 2	1.025730471

<i>EPHB2</i>	EPHB2	Ephrin type-B receptor 2	1.28029117
<i>EPN2</i>	EPN2	Epsin-2	1.000485092
<i>EZR</i>	EZRI	Ezrin	0.54860267
<i>FAM176B</i>	F176B	Protein FAM176B	0.646771609
<i>FLNA</i>	FLNA	Filamin-A	0.65329574
<i>FLNB</i>	FLNB	Filamin-B	0.65329574
<i>FLNC</i>	FLNC	Filamin-C	0.65329574
<i>FLOT1</i>	FLOT1	Flotillin-1	0.832435685
<i>GAPDH</i>	G3P	Glyceraldehyde-3-phosphate dehydrogenase	0.52217293
<i>GLIPR2</i>	GAPR1	Golgi-associated plant pathogenesis-related protein 1	1.947588144
<i>GNAI2</i>	GNAI2	Guanine nucleotide-binding protein G(i) subunit alpha-2	1.372783499
<i>GNAI3</i>	GNAI3	Guanine nucleotide-binding protein G(k) subunit alpha	1.981700137
<i>GNG12</i>	GBG12	Guanine nucleotide-binding protein G(l)/G(s)/G(o) subunit gamma-12	1.062826258
<i>HBA1</i>	HBA	Hemoglobin subunit alpha	0.947245579
<i>HPCA</i>	HPCA	Neuron-specific calcium-binding protein hippocalcin	0.796138519
<i>HRAS</i>	RASH	GTPase HRas	1.504393997
<i>HSPA9</i>	GRP75	Stress-70 protein, mitochondrial	0.802043021
<i>IGF2</i>	IGF2	Insulin-like growth factor II	0.719289329
<i>ITGA2</i>	ITA2	Integrin alpha-2	0.544310051
<i>ITGA3</i>	ITA3	Integrin alpha-3	1.082067691
<i>ITGA6</i>	ITA6	Integrin alpha-6	0.943480301
<i>ITGB1</i>	ITB1	Integrin beta-1	1.126282401
<i>ITGB5</i>	ITB5	Integrin beta-5	0.671486612
<i>KANK2</i>	KANK2	KN motif and ankyrin repeat domain-containing protein 2	0.961795091
<i>LASP1</i>	LASP1	LIM and SH3 domain protein 1	0.880805856
<i>LGALS1</i>	LEG1	Galectin-1	0.703832509
<i>LIMA1</i>	LIMA1	LIM domain and actin-binding protein 1	0.547410318
<i>LIMS2</i>	LIMS2	LIM and senescent cell antigen-like-containing domain protein 2	1.643661597
<i>LMNA</i>	LMNA	Prelamin-A/C	0.810699289
<i>LMO7</i>	LMO7	LIM domain only protein 7	1.776400882
<i>LOX</i>	LYOX	Protein-lysine 6-oxidase	0.848438064
<i>LTBP2</i>	LTBP2	Latent-transforming growth factor beta-binding protein 2	1.811514296
<i>MARCKS</i>	MARCS	Myristoylated alanine-rich C-kinase substrate	0.783673946
<i>MCAM</i>	MUC18	Cell surface glycoprotein MUC18	1.199014311
<i>MSN</i>	MOES	Moesin	1.042089986
<i>MT1E</i>	MT1E	Metallothionein-1E	0.852735925
<i>MYH9</i>	MYH9	Myosin-9	0.999037763

<i>MYO1C</i>	MYO1C	Unconventional myosin-1c	1.21605535
<i>MYOF</i>	MYOF	Myoferlin	1.534530491
<i>NACA</i>	NACA	Nascent polypeptide-associated complex subunit alpha	0.66145653
<i>NDUFA2</i>	NDUA2	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2	1.796433972
<i>NEXN</i>	NEXN	Nexilin	1.825348642
<i>NPM1</i>	NPM	Nucleophosmin	1.113585043
<i>NRP1</i>	NRP1	Neuropilin-1	0.773608308
<i>PDIA3</i>	PDIA3	Protein disulfide-isomerase A3	1.938120355
<i>PDLIM2</i>	PDLI2	PDZ and LIM domain protein 2	1.018690986
<i>PGAM1</i>	PGAM1	Phosphoglycerate mutase 1	1.408924164
<i>PIP4K2A</i>	PI42A	Phosphatidylinositol 5-phosphate 4-kinase type-2 alpha	0.690405156
<i>PKM</i>	KPYM	Pyruvate kinase isozymes M1/M2	0.986144954
<i>PPFIBP1</i>	LIPB1	Liprin-beta-1	1.779577733
<i>PPP1R18</i>	PPR18	Phostensin	1.060973072
<i>PRKCDBP</i>	PRDBP	Protein kinase C delta-binding protein	1.407836628
<i>PRKCSH</i>	GLU2B	Glucosidase 2 subunit beta	1.624910705
<i>PTK7</i>	PTK7	Inactive tyrosine-protein kinase 7	0.665117087
<i>PXN</i>	PAXI	Paxillin	1
<i>RPL22</i>	RL22	60S ribosomal protein L22	1.107695318
<i>RPL35A</i>	RL35A	60S ribosomal protein L35a	1.261150583
<i>RPLP1</i>	RLA1	60S acidic ribosomal protein P1	0.600853012
<i>RPS21</i>	RS21	40S ribosomal protein S21	1.02080179
<i>RPS25</i>	RS25	40S ribosomal protein S25	0.563827082
<i>RPS3A</i>	RS3A	40S ribosomal protein S3a	1.140860777
<i>RRBP1</i>	RRBP1	Ribosome-binding protein 1	0.939000564
<i>SEPT7</i>	SEPT7	Septin-7	1.686530689
<i>SERPINH1</i>	SERPH	Serpin H1	1.026586054
<i>SLC1A5</i>	AAAT	Neutral amino acid transporter B(0)	0.856510264
<i>SPTAN1</i>	SPTN1	Spectrin alpha chain, non-erythrocytic 1	0.911650135
<i>STOM</i>	STOM	Erythrocyte band 7 integral membrane protein	0.546356719
<i>TAGLN2</i>	TAGL2	Transgelin-2	0.746814773
<i>TENC1</i>	TENC1	Tensin-like C1 domain-containing phosphatase	1.611921733
<i>TGFB1</i>	TGFB1	Transforming growth factor beta-1	0.923798063
<i>THBS1</i>	TSP1	Thrombospondin-1	1.112175836
<i>TLN1</i>	TLN1	Talin-1	0.71994596
<i>TNS1</i>	TENS1	Tensin-1	1.084824308
<i>TPM3</i>	TPM3	Tropomyosin alpha-3 chain	0.921082916

<i>TPM4</i>	TPM4	Tropomyosin alpha-4 chain	1.146858749
<i>TRIOBP</i>	TARA	TRIO and F-actin-binding protein	1.005270576
<i>TUBB2A</i>	TBB2A	Tubulin beta-2A chain	1.45734949
<i>VASN</i>	VASN	Vasorin	0.837225788
<i>VASP</i>	VASP	Vasodilator-stimulated phosphoprotein	1.893070993
<i>VAT1</i>	VAT1	Synaptic vesicle membrane protein VAT-1 homolog	1.008840908
<i>VCAN</i>	CSPG2	Versican core protein	0.630305442
<i>VCL</i>	VINC	Vinculin	0.857245078
<i>VCP</i>	TERA	Transitional endoplasmic reticulum ATPase	1.878565552
<i>WNT5A</i>	WNT5A	Protein Wnt-5a	0.543821516
<i>YWHAZ</i>	1433Z	14-3-3 protein zeta/delta	0.960747932

GEF-H1-dependent FA recruitment (the Ratio of protein abundance > 2)

Gene Name	Entry Name	Common Protein Name	Ratio of Protein Abundance
<i>AP2A1</i>	AP2A1	AP-2 complex subunit alpha-1	4.619720557
<i>CSRP2</i>	CSRP2	Cysteine and glycine-rich protein 2	2.204501867
<i>DBN1</i>	DREB	Drebrin	3.970404849
<i>EEF1A1</i>	EF1A1	Elongation factor 1-alpha 1	3.459791412
<i>FBLN1</i>	FBLN1	Fibulin-1	7.432235289
<i>FBLN2</i>	FBLN2	Fibulin-2	2.053948691
<i>HAPLN3</i>	HPLN3	Hyaluronan and proteoglycan link protein 3	2.664250221
<i>HSPA8</i>	HSP7C	Heat shock cognate 71 kDa protein	7.946151851
<i>INA</i>	AINX	Alpha-internexin	2.982156035
<i>LIMD1</i>	LIMD1	LIM domain-containing protein 1	3.252673709
<i>LIN7C</i>	LIN7C	Protein lin-7 homolog C	2.685179485
<i>LRP1</i>	LRP1	Prolow-density lipoprotein receptor-related protein 1	2.913148472
<i>MYL6</i>	MYL6	Myosin light polypeptide 6	4.124270925
<i>PLEC</i>	PLEC	Plectin	2.693428906
<i>RPL11</i>	RL11	60S ribosomal protein L11	2.667937446
<i>RPL13</i>	RL13	60S ribosomal protein L13	2.682377789
<i>RPL7A</i>	RL7A	60S ribosomal protein L7a	5.800140454
<i>RPS18</i>	RS18	40S ribosomal protein S18	2.132765586
<i>RPS2</i>	RS2	40S ribosomal protein S2	2.121090266
<i>SCAMP3</i>	SCAM3	Secretory carrier-associated membrane protein 3	2.101951701
<i>SEPT2</i>	SEPT2	Septin-2	2.394787005
<i>SEPT8</i>	SEPT8	Septin-8	2.484090993

<i>SEPT9</i>	SEPT9	Septin-9	3.162943249
<i>SH3BGRL3</i>	SH3L3	SH3 domain-binding glutamic acid-rich-like protein 3	2.165327453
<i>SPTBN1</i>	SPTB2	Spectrin beta chain, non-erythrocytic 1	4.251727902
<i>SRP9</i>	SRP09	Signal recognition particle 9 kDa protein	2.111988128
<i>TJP2</i>	ZO2	Tight junction protein ZO-2	3.405246567
<i>TP11</i>	TPIS	Triosephosphate isomerase	2.998747322
<i>TPM2</i>	TPM2	Tropomyosin beta chain	8.706196131
<i>UTRN</i>	UTRO	Utrophin	4.040178085
<i>VTN</i>	VTNC	Vitronectin	2.962236304
<i>ZC3H15</i>	ZC3HF	Zinc finger CCCH domain-containing protein 15	2.752724594

Only present in non-silencing FAs

Gene Name	Entry Name	Common Protein Name
<i>ADAM5P</i>	ADAM5	Putative disintegrin and metalloproteinase domain-containing protein 5
<i>ADRM1</i>	ADRM1	Proteasomal ubiquitin receptor ADRM1
<i>APOH</i>	APOH	Beta-2-glycoprotein 1
<i>ARHGEF2</i>	ARHG2	Rho guanine nucleotide exchange factor 2
<i>ARPC5</i>	ARPC5	Actin-related protein 2/3 complex subunit 5
<i>ATP5D</i>	ATPD	ATP synthase subunit delta, mitochondrial
<i>ATP5I</i>	ATP5I	ATP synthase subunit e, mitochondrial
<i>ATP5O</i>	ATPO	ATP synthase subunit O, mitochondrial
<i>BCAM</i>	BCAM	Basal cell adhesion molecule
<i>C16orf55</i>	CP055	Uncharacterized protein C16orf55
<i>CD151</i>	CD151	CD151 antigen
<i>CD55</i>	DAF	Complement decay-accelerating factor
<i>CD59</i>	CD59	CD59 glycoprotein
<i>CD99</i>	CD99	CD99 antigen
<i>CDC42EP1</i>	BORG5	Cdc42 effector protein 1
<i>CDC42EP3</i>	BORG2	Cdc42 effector protein 3
<i>CKAP4</i>	CKAP4	Cytoskeleton-associated protein 4
<i>CLEC3B</i>	TETN	Tetranectin
<i>CLTC</i>	CLH1	Clathrin heavy chain 1
<i>CNP</i>	CN37	2',3'-cyclic-nucleotide 3'-phosphodiesterase
<i>CTGF</i>	CTGF	Connective tissue growth factor
<i>CTNND1</i>	CTND1	Catenin delta-1
<i>DDX3X</i>	DDX3X	ATP-dependent RNA helicase DDX3X

<i>EGFR</i>	EGFR	Epidermal growth factor receptor
<i>EHD1</i>	EHD1	EH domain-containing protein 1
<i>EHD4</i>	EHD4	EH domain-containing protein 4
<i>EPS15L1</i>	EP15R	Epidermal growth factor receptor substrate 15-like 1
<i>ERBB2IP</i>	LAP2	Protein LAP2
<i>FBLIM1</i>	FBL11	Filamin-binding LIM protein 1
<i>FERMT2</i>	FERM2	Fermitin family homolog 2
<i>GAS6</i>	GAS6	Growth arrest-specific protein 6
<i>GNAS</i>	GNAS1	Guanine nucleotide-binding protein G(s) subunit alpha isoforms XLas
<i>HAPLN1</i>	HPLN1	Hyaluronan and proteoglycan link protein 1
<i>HNRNPA1</i>	ROA1	Heterogeneous nuclear ribonucleoprotein A1
<i>HNRNPA2B1</i>	ROA2	Heterogeneous nuclear ribonucleoproteins A2/B1
<i>HNRNPD</i>	HNRPD	Heterogeneous nuclear ribonucleoprotein D0
<i>ITGA7</i>	ITA7	Integrin alpha-7
<i>KIRREL</i>	KIRR1	Kin of IRRE-like protein 1
<i>KPNB1</i>	IMB1	Importin subunit beta-1
<i>LPP</i>	LPP	Lipoma-preferred partner
<i>LSM12</i>	LSM12	Protein LSM12 homolog
<i>MACF1</i>	MACF1	Microtubule-actin cross-linking factor 1, isoforms 1/2/3/5
<i>MRC2</i>	MRC2	C-type mannose receptor 2
<i>MT2A</i>	MT2	Metallothionein-2
<i>MYH10</i>	MYH10	Myosin-10
<i>MYL9</i>	MYL9	Myosin regulatory light polypeptide 9
<i>NUMB</i>	NUMB	Protein numb homolog
<i>PDLIM4</i>	PDLI4	PDZ and LIM domain protein 4
<i>PFN2</i>	PROF2	Profilin-2
<i>PHLDB1</i>	PHLB1	Pleckstrin homology-like domain family B member 1
<i>PLP2</i>	PLP2	Proteolipid protein 2
<i>PLSCR3</i>	PLS3	Phospholipid scramblase 3
<i>PLXNB2</i>	PLXB2	Plexin-B2
<i>PPIB</i>	PPIB	Peptidyl-prolyl cis-trans isomerase B
<i>PPP1R12A</i>	MYPT1	Protein phosphatase 1 regulatory subunit 12A
<i>PRDX1</i>	PRDX1	Peroxiredoxin-1
<i>PRSS12</i>	NETR	Neurotrypsin
<i>PVR</i>	PVR	Poliovirus receptor
<i>RAB13</i>	RAB13	Ras-related protein Rab-13
<i>RAB21</i>	RAB21	Ras-related protein Rab-21

<i>RAC1</i>	RAC1	Ras-related C3 botulinum toxin substrate 1
<i>RAI14</i>	RAI14	Ankycorbin
<i>RPL23A</i>	RL23A	60S ribosomal protein L23a
<i>RPL29</i>	RL29	60S ribosomal protein L29
<i>RPL30</i>	RL30	60S ribosomal protein L30
<i>RPL6</i>	RL6	60S ribosomal protein L6
<i>RPS28</i>	RS28	40S ribosomal protein S28
<i>S100A11</i>	S10AB	Protein S100-A11
<i>SERBP1</i>	PAIRB	Plasminogen activator inhibitor 1 RNA-binding protein
<i>SLC39A14</i>	S39AE	Zinc transporter ZIP14
<i>SLC7A5</i>	LAT1	Large neutral amino acids transporter small subunit 1
<i>SNAP29</i>	SNP29	Synaptosomal-associated protein 29
<i>SNTB2</i>	SNTB2	Beta-2-syntrophin
<i>STEAP3</i>	STEA3	Metalloreductase STEAP3
<i>STX7</i>	STX7	Syntaxin-7
<i>TFRC</i>	TFR1	Transferrin receptor protein 1
<i>TGFB111</i>	TGF11	Transforming growth factor beta-1-induced transcript 1 protein
<i>TGFB2</i>	TGFB2	Transforming growth factor beta-2
<i>TLN2</i>	TLN2	Talin-2
<i>TMOD3</i>	TMOD3	Tropomodulin-3
<i>TRIP6</i>	TRIP6	Thyroid receptor-interacting protein 6
<i>TUFM</i>	EFTU	Elongation factor Tu, mitochondrial
<i>UACA</i>	UACA	Uveal autoantigen with coiled-coil domains and ankyrin repeats
<i>UQCRC1</i>	QCR1	Cytochrome b-c1 complex subunit 1, mitochondrial
<i>VAMP5</i>	VAMP5	Vesicle-associated membrane protein 5

Table S4: The list of shRNA, siRNA, primers and antibodies used in the experiments.**shRNA and siRNA**

Name	Vector	Target sequence
GEF-H1 shRNA	pLenti6/BLOCK-iT0222-DEST (Invitrogen)	GTGACTATCCACAACCGCTGT
NMIIB shRNA	pLKO.1 (the National RNAi Core Facility Platform, Taiwan)	GCCAAGCTCAAGAACAAGCAT
GEF-H1 siRNA (Dharmacon_Thermo Science)		CAACGGAACUGGCAUJACU

Primers

Name	Sequence
the forward PCR primer of GEF-H1 for GFP-C1-GEF-H1	5'- AATTCAAGCTTTAATGTCTCGGATCGAATCCCTCACGCGGGCG-3'
the reverse PCR primer of GEF-H1 for GFP-C1-GEF-H1	5'- AATTCGGTACCTTAGCTCTCGGAGGCTACAGCCTCCCCGTC-3'
the site-directed mutagenesis primer for pGFP-C1-GEF-H1 (shRNA resistance)	5'-CTGCAATGTGACTATCCATAATCGCTGTAAAGACA-3'
the forward PCR primer of GEF-H1 ₁₋₂₃₅ for GFP-C1-GEF-H1_DH(m)	5'- AATTCAAGCTTTAATGTCTCGGATCGAATCCCTCACGCGGGCG-3'
the reverse PCR primer of GEF-H1 ₁₋₂₃₅ for GFP-C1-GEF-H1_DH(m)	5'-AATTCATGAGGAGGGTATTTATCAGCTGGAGAAAGGGGCC-3'
the forward PCR primer of GEF-H1 ₄₂₉₋₉₈₅ for GFP-C1-GEF-H1_DH(m)	5'- AATTCATGAGGAGGGTATTTATCAGCTGGAGAAAGGGGCC-3'
the reverse PCR primer of GEF-H1 ₄₂₉₋₉₈₅ for GFP-C1-GEF-H1_DH(m)	5'- AATTCGGTACCTTAGCTCTCGGAGGCTACAGCCTCCCCGTC-3'
the site-directed mutagenesis primer for GFP-C1-GEF-H1_DH (m) (shRNA resistance)	5'-GTGACTATCCATAATCGCTGT-3'
the forward PCR primer for pLKO-AS3W-GEF-H1 and pLKO-AS3W-GEF-H1_DH (m)	5'- AATTCGCTAGCATGTCTCGGATCGAATCCCTCACGCGGGCG-3'
the reverse PCR primer for pLKO-AS3W-GEF-H1 and pLKO-AS3W-GEF-H1_DH (m)	5'- AATTCGAATCCCTTAGCTCTCGGAGGCTACAGCCTCCCCGTC-3'

Antibodies

Name	Host	Catalog number	Dilutions
paxillin	mouse	BD 610052	dilution for western: 1/5000 dilution for immunofluorescence: 1/1000

phospho-MLC (Thr18/Ser19)	rabbit	Cell signaling #3674	dilution for western: 1/1000
MLC	rabbit	Cell Signaling #3672	dilution for western: 1/1000
GAPDH	mouse	GeneTex GTX627408	dilution for western: 1/1000
GAPDH	rabbit	GeneTex GTX100118	dilution for IP: 1/100
GEF-H1	rabbit	GeneTex GTX125893	dilution for western: 1/1000 dilution for immunofluorescence: 1/50 dilution for IP: 1/100
integrin β 1	mouse	Millipore MAB2259Z	dilution for western: 1/1000
NMIIA	rabbit	Cell signaling #3403	dilution for western: 1/1000
NMIIB	rabbit	Cell signaling #3404	dilution for western: 1/1000 dilution for immunofluorescence: 1/100
GFP	rabbit	GeneTex GTX113617	dilution for western: 1/2500
Alexa Fluor 568-anti-mouse IgG		Invitrogen A11031	dilution for immunofluorescence: 1/300
Alexa Fluor 488-anti-rabbit IgG		Invitrogen A11034	dilution for immunofluorescence: 1/300
Alexa Fluor 647-anti-mouse IgG		Jackson ImmunoResearch 715-606-151/J1	dilution for immunofluorescence: 1/300
Alexa Fluor 488 phalloidin		Invitrogen A12379	dilution for immunofluorescence: 1/400
HRP-AffiniPure goat anti-mouse IgG		Jackson ImmunoResearch 115-035-174	dilution for immunofluorescence: 1/5000
HRP-AffiniPure goat anti-rabbit IgG		Jackson ImmunoResearch 211-032-171	dilution for immunofluorescence: 1/5000
GFP-Trap beads		ChromoTek gta-100	