

Table S1. List of proteins in the BAHD1 interactome

BAHD1 nuclear partners found in this work yeast two-hybrid screen			
Name	Description	Function	Reference ^(a)
Chromatin adapters			
HP1 α (CBX5)	chromobox homolog 5 (HP1 alpha)	Binds histone H3 methylated on lysine 9 and chromatin-associated proteins	(20-23)
HP1 β (CBX1)	chromobox homolog 1 (HP1 beta)	Binds histone H3 methylated on lysine 9 and chromatin-associated proteins	
HP1 γ (CBX3)	chromobox homolog 3 (HP1 gamma)	Binds histone H3 methylated on lysine 9 and chromatin-associated proteins	
MBD1	methyl-CpG binding domain protein 1	Binds methylated CpG dinucleotide and chromatin-associated proteins	(22, 24-26)
Chromatin modification enzymes			
CHD1	chromodomain helicase DNA binding protein 1	ATP-dependent chromatin remodeling activity	(27-28)
HDAC5	histone deacetylase 5	Histone deacetylase activity	(23, 29, 30)
SETDB1 (ESET;KMT1E)	SET domain, bifurcated 1	Histone-lysine N-methyltransferase activity	(31-34)
Transcription factors			
GTF3C2	general transcription factor IIIC, polypeptide 2, beta 110kDa	Required for RNA polymerase III-mediated transcription	
HEYL (Hey3)	hairy/enhancer-of-split related with YRPW motif-like	DNA-binding transcription factor with basic helix-loop-helix domain	(35)
KLF10 (TIEG1)	Kruppel-like factor 10	DNA-binding transcription factor with C2H2 zinc finger domain	(36)
NR2F1 (COUP-TFI)	nuclear receptor subfamily 2, group F, member 1	DNA-binding transcription factor with C4 type zinc finger domain (ligand-regulated)	(36)
PEG3	paternally expressed 3	DNA-binding transcription factor with C2H2 zinc finger domain	
REQ (DPF2)	D4, zinc and double PHD fingers family 2	DNA-binding transcription factor with zinc and PHD fingers domain	
VGL-3 (VGLL3)	vestigial like 3 (Drosophila)	Transcription cofactor	(37)
ZBTB11	zinc finger and BTB domain containing 11	DNA-binding transcription factor with C2H2 zinc finger domain	
ZIM2	Zinc finger, imprinted 2	DNA-binding transcription factor with C2H2 zinc finger domain	
ZNF121	zinc finger protein 121	DNA-binding transcription factor with C2H2 zinc finger domain	
ZNF211	zinc finger protein 211	DNA-binding transcription factor with C2H2 zinc finger domain	
ZNF331	zinc finger protein 331	DNA-binding transcription factor with C2H2 zinc finger domain	
ZNF335	zinc finger protein 335	DNA-binding transcription factor with C2H2 zinc finger domain	
ZNF354A	zinc finger protein 354A	DNA-binding transcription factor with C2H2 zinc finger domain	
ZNF554	zinc finger protein 554	DNA-binding transcription factor with C2H2 zinc finger domain	
RNA processing factors			
BCDIN3 (BIN3)	bicoid-interacting 3	Methylphosphate capping protein present in a snRNP complex	(38)
DDX21 (Gu helicase)	DEAD (Asp-Glu-Ala-Asp) box polypeptide 21	RNA helicase activity	(39)
DDX27	DEAD (Asp-Glu-Ala-Asp) box polypeptide 27	Putative RNA helicase activity	(35)
SFRS10	Arginine/serine-rich splicing factor 10	RNA splicing factor	
SR-A1 (SCAF1)	SR-related CTD-associated factor 1	RNA splicing factor	
Others			
FAF1	Fas (TNFRSF6) associated factor 1	Fas-binding protein implicated in apoptosis	
KPNB2 (TNPO1)	transportin 1	Importin	
RASSF1	Ras association (RalGDS/AF-6) domain family member 1	Negative regulator of cell proliferation	
WDR42A	WD repeat domain 42A	Unknown	

BAHD1 nuclear partners found in reference (11)^(a)

KHDRBS3 (T-STAR, SLM-2)	Sam68-like phosphotyrosine protein	RNA binding protein	(11,40)
DVL3	dishevelled, dsh homolog 3	Involved in Wnt signaling	(11)
MDF1	MyoD family inhibitor	Inhibits myogenic transcription factors	(11)

BAHD1 indirect partners from Ingenuity and HRPD databases

Name ^(a)	Description	Function	Reference ^(a)
Chromatin-associated factor			
ATF7IP (MCAF1)	Activating transcription factor 7 interacting protein	Transcription co-repressor	(26,33)
Chromatin modification enzyme			
DNMT3	DNA (cytosine-5-)-methyltransferase 3	DNA methyltransferase (cytosine-specific) activity	(32, 41-43)
EZH2	Enhancer of zeste homolog 2	Histone-lysine N-methyltransferase activity of the PRC2 complex	(44)
RING1b (RNF2)	Ring finger protein 2	Ubiquitin protein ligase of the PRC1 complex	(45,46)
Transcription factors			
AP2 α	Transcription factor AP-2 alpha	DNA-binding transcription factor with C2H2 zinc finger domain	(47,51)
EGR1 (ZNF225)	Early growth response 1	DNA-binding transcription factor with C2H2 zinc finger domain	(47)
HAND1 (Thing1)	heart and neural crest derivatives expressed 1	DNA-binding transcription factor with basic helix-loop-helix domain	(11,48)
MEF2	myocyte enhancer factor 2	DNA-binding transcription factor	(23,29,37,49,50)
NCOR1	nuclear receptor co-repressor 1	DNA-binding transcription factor	(27,30)
SP1	Sp1 transcription factor	DNA-binding transcription factor with C2H2 zinc finger domain	(26,36,47,51,52)
TEF-1 (TEAD1)	Transcriptional enhancer factor 1	DNA-binding transcription factor	(50,52)
ZNF512B	zinc finger protein 512B	DNA-binding transcription factor with C2H2 zinc finger domain	(35)

(a) References are in Supporting information and provide support for interactions in Fig. S5