Didier Picard, May 2017

Current list of HBD fusion proteins

Protein X [a]	HBD [b]	regulated as [c]	Refs.
Transcription factors			
APETALA3	GR	transcription factor in Arabidopsis	1
ATF6α	ER [e]	transcription factor	2
Athb-1	GR	Arabidopsis transcription factor in tobacco	3
Bob1/OBF1	ER [e]	coactivator	4
CCAT (from calcium channel cav1.2)	ER [e]	transcription factor	5
C/EBP	ER, GR	transcription factor	6
C/EBPβ (=NF-M)	ER	transcription factor, differentiation factor	7
CLOCK	GR	transcription factor	8
CONSTANS	GR	putative transcription factor in arabidposis	9
E1A	GR	transcription factor	10
E1A	ER	oncoprotein	11
E2F-1, -2, -3	ER	transcription factor	12
E2A	ER [e]	transcription factor	13
E7 (of HPV16)	ER	oncoprotein	g
EBNA2	ER [e]	oncoprotein	14
EBNA3C	ER [e]	oncoprotein	15
Erm (Ets family)	ER	transcription factor	16
c-Fos, v-Fos, FosB-L, FosB-S	ER, GR	oncoprotein, transcription factor	17,18
FOXO3a	ER	transcription factor	19
Gal4	ER, GR, MR, PR	transcription factor in yeast, tissue culture cells and zebra fish	20, 21, i
Gal4-KRAB	PR [e]	transcriptional repressor	22
Gal4-p65 [d]	PR [e]	transcription factor	23
Gal4-VP16	ER, GR, PR [e]	transcription factor in yeast, in tissue culture cells, transgenic mice, Xenopus, Drosophila and plants	22,24-30
GATA-1, -2, -3	ER	transcription factor, promoter of proliferation	31
Gcn4	ER, MR	transcription factor	32
Gli	ER	transcription factor	33

Hoxa9	ER	transcription factor	34
Hoxb8	ER	transcription factor	34
IRF-1	ER	transcription factor	35
c-Jun	ER	transcription factor	36
JunD	ER	transcription factor	37
v-Jun (DBD [f])	ER	as DNA binding factor	38
Klf1	ER [e]	transcription factor	39
LexA-p65 [d]	PR [e]	transcription factor in fish	40
LexA-VP16	ER	transcription factor in yeast and plants	i, 41,42
MT-MC1	ER [e]	transcription factor	43
v-Myb	ER	transcription factor	44
c-Myc	ER, GR	oncoprotein	45
MyoD	ER, TR, GR	transcription factor in tissue culture and frog embryos	46,47
Notch (ic)	ER	transcription factor	48
p53	ER	regulator of proliferation	49,50
Pax3-FKHR	ER [e]	transcription factor	51
Pax5	ER	transcription factor	52
PU.1	ER	transcription factor	53
R (of maize)	GR	transcription factor in Arabidopsis	54
v-Rel, c-Rel	ER	oncoprotein, transcription factor	55,56
RUNX1	ER [e]	transcription factor	57
Snail	ER [e]	transcription factor	58
Stat1, Stat5A, Stat5B	ER	transcription factor	59
Stat6	ER [e]	transcription factor	59,60
TLS-CHOP	ER	oncoprotein	61
Twist	ER [e]	transcription factor	58
Xbra	GR	transcription factor in frog embryos	62
Zinc finger TFs	ER [e], PR	artifical transcription factors	63,64
Zta	ER [e]	activator of EBV replication	65
Kinases			
Abl	ER, GR	oncoprotein, tyrosine kinase	66
Akt (=PKB)	ER [e]	serine / threonine kinase	67
erbB1	ER	tyrosine kinase	g
MEK1	ER [e]	oncoprotein, dual kinase	68
MEKK3	ER	activation of SAPK pathway	69
Raf-1	ER, AR	oncoprotein, serine / threonine kinase	70,71
A-Raf, B-Raf	ER	oncoproteins	72
Ste11	ER, MR, PR	serine / threonine kinase in yeast	73 and i

Src	ER	tyrosine kinase	g; see also ref. 74
Split Cas9	ER *e*, GR	Synthetic activator	75
Recombinases & nucleases			
Cre *j*	ER *e*, PR *e*, GR *e*, AR *e*	recombinase in tissue culture cells, transgenic mice and yeast	76-84
Flp	ER, GR, AR	recombinase in tissue culture cells and yeast	85,86
piggyBac transposase	ER *e*	in tissue culture cells	87
I-PpoI	ER *e*	homing endonuclease	88
Split Cas9	ER *e*, GR	Endonuclease	75
Cas9	ER *e*	Excision of intein from Cas9	89
Cas9	ER *e*	Endonuclease	90
Miscellaneous			
BLNK	ER *e*	adaptor protein	91
β-catenin	ER *e*	signaling molecule	92
Cdc13	ER	cyclin (in S. pombe)	93
Fas	ER, RAR	apoptosis	94
β-galactosidase	ER, PR	α-complementation in yeast	95
$G_{\alpha q}$	ER *e*	G protein	96
Intein fusion	ER *e*	protein splicing	97,98
p16-INK4A	ER	CDK inhibitor	99
Psf2	ER	DNA replication (in S. pombe)	93
Ras	ER	in yeast	100
Ras G12V	ER *e*	oncogene transformation	101
Rep (of AAV)	ER, PR *e*	replication, integration	h, 102
Rev (of HIV)	GR	transactivation (RNA-binding protein)	103
Rex (of HTLV-1)	ER	Rex functions, localization	104
SIRT1	ER *e*	Protein deacetylase	105
Telomerase	ER *e*	Telomerase function	106
Thymidylate synthase	ER *e*	Enzyme activity and growth in E. coli	107

Footnotes

a Proteins were alphabetically grouped into different classes.

b HBDs were from the following receptors: AR, ER, GR, MR, PR, RAR, and TR, androgen, estrogen, glucocorticoid, mineralocorticoid, progesterone, retinoic acid, and thyroid receptors, respectively.

c Unless indicated assays were done in vertebrate tissue culture cells.

d Contains activation domain of the NFκB component p65.

e Mutant HBDs that only (or also) respond to antihormones were used in some experiments.

f DBD, DNA binding domain.

g J. M. Bishop, personal communication.

h A. Salvetti, personal communication.

i Picard lab, unpublished results.

j High level expression, at least in some tissues or cells, can lead to significant constitutive activity (108,109).

Reviews:

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