

Supplementary Table 1 Target

PD target	Rh target
ZSCAN30	CAT
ZSCAN12	SI
ZNRD1	TYR
ZNF814	HMOX1
ZNF788	RAD51
ZNF750	AKT1
ZNF732	TNF
ZNF718	PTGS2
ZNF71	PRKAA2
ZNF674-AS1	XDH
ZNF616	CASP9
ZNF585B	BCL2
ZNF567	PCNA
ZNF562	GABPA
ZNF546	GORASP1
ZNF530	ANG
ZNF529-AS1	ZNF396
ZNF397	IL6
ZNF346	OVOL2
ZNF333	MAPK14
ZNF230	RBMS3
ZNF208	KEAP1
ZMIZ2	TP53
ZMAT1	ZNF467
ZFP41	C3
ZFP1	ARG1
ZDHHC24	SOD2
ZDHHC18	PARP1
ZDHHC1	GPR19
ZC3HAV1	HIF1A
ZC3H12D	PLXNA4
ZBTB7A	FOXO6
ZBTB10	CCND1
YTHDC2	LDHA
YME1L1	INS
YIPF4	PRKCH
YIPF2	ZFPM2
YBX1	PTPRR
XIST	PPARG
WTIP	CHRNE
WNT6	EDN1
WFDC11	HSPB8

WDR91	PI4KB
WDR88	MAPK8
WDR76	RGL1
WDR27	HEXA
WDHD1	ATP6V0D2
WARS2	LIN9
VSTM4	MAFF
VPS53	DMXL2
VPS35	HSPA1B
VPS18	ZRANB3
VN1R4	ACHE
VN1R2	HSPA6
VMO1	MAPK13
VMA21	CHRM4
VIPR2	CYP1B1
VCPIP1	MFF
VAV3	UBL4A
UTP11	GPT
USP9X	PIK3CA
USH1G	UHRF1
UPF3A	PTPRD
UNC13C	C1QBP
UHRF1	MT-ND5
UGT2B15	MTOR
UBR2	ABO
UBE2B	AHR
TYRO3P	AKR1C3
TXNRD1	ALDH2
TXNDC2	AR
TXLNGY	AURKB
TUB	CBR1
TTY4C	MBL2
TTC9B	TYR
TTC39C	IL10
TTC22	INS1
TTC12	MMP2
TSPYL6	NFE2L2
TSPY26P	NQO1
TSPAN1	TIMP1
TSEN54	IL23R
TSC22D1	MARK1
TRPV2	
TRPC6	
TRIM34	

TRIM36
TRIB3
TRHDE-AS1
TRAF4
TRAF3IP3
TRABD2B
TPTE
TPBG
TOR1AIP2
TOR1AIP1
TOP3B
TNXB
TNRC6A
TNMD
TNIP3
TNFRSF11A
TNFRSF10C
TMPRSS13
TMPO
TMEM79
TMEM40
TMEM259
TMEM255A
TMEM245
TMEM221
TMEM218
TMEM213
TMEM116
TMEFF2
TMED6
TMCO6
TMBIM4
TLR3
TLL2
TIFA
THPO
THOC6
THEMIS
THAP2
TH
TFE3
TFAP2A
TEX43
TEX41

TEX29
TESMIN
TEAD4
TDRD6
TDH
TCTE3
TCHP
TCF3
TCERG1L
TCEB3
TBX6
TBX5-AS1
TBX2-AS1
TBX1
TBL3
TBL1Y
TBC1D29
TBC1D19
TAZ
TAT
TASP1
TAF8
TAF13
TACR1
TACC2
TAC1
SYNGR3
SVOPL
SVEP1
SV2C
SUSD2
SUSD1
SURF2
SUFU
STYK1
STX8
STRN
STMN1
STC2
STATH
ST8SIA4
SSTR1
SSSCA1
SSMEM1

SRGAP3
SPZ1
SPTBN1
SPRED2
SPPL3
SPINT1
SPIB
SPEF2
SPATA22
SPACA6
SP3P
SOX6
SOX4
SOX2
SOCS3
SNX29P1
SNX24
SNX20
SNTN
SNORA68
SNHG4
SMURF1
SMR3A
SMPD1
SMIM10L2B
SMCHD1
SMAD4
SLIT1
SLCO4A1
SLC9A7
SLC9A3R2
SLC9A2
SLC8A1
SLC7A8
SLC6A3
SLC6A2
SLC5A3
SLC4A9
SLC39A2
SLC35F5
SLC35D3
SLC2A13
SLC28A1
SLC27A2

SLC25A53
SLC25A41
SLC25A29
SLC25A28
SLC23A1
SLC19A1
SLC18A2
SLC12A8
SLC10A4
SLC10A2
SLAMF1
SKP2
SIRT4
SIAH3
SHOX2
SHOX
SHKBP1
SHANK3
SHANK2
SH3D21
SH3BGRL2
SGSH
SGPP2
SGF29
SGCZ
SFT2D1
SEZ6L
SETD7
SERPINB13
SERPINA2
SERINC2
SEL1L2
SEC23IP
SEC22C
SEC16B
SEC14L2
SDC1
SCUBE1
SCN4A
SCML4
SCG2
SCFD2
SCEL
SCARNA13

SCAND2P
SBNO2
SAXO2
SAMD5
SAA2
S100A10
RYS2
RUNX2
RUBCN
RTFDC1
RTBDN
RSPO2
RSAD2
RRS1-AS1
RRAD
RPL36A
RPA4
ROBO2
RNF17
RNF151
RNF144A-AS1
RNF144A
RITA1
RIPK4
RIMBP2
RIF1
RHOH
RHOF
RHEB
RHD
RGS6
RGS5
RGS4
RGP4-AS1
RGMB-AS1
RGCC
RET
RERG
REPS2
RELN
REG3A
REEP1
RECK
RDH12

RBPM52
RBM48
RBM3
RBBP6
RASGRP4
RARRES1
RARB
RAP2A
RANBP17
RALYL
RAG2
RAD52
RAD51B
RABGEF1
RAB7A
RAB3C
RAB27B
RAB21
PYM1
PXDNL
PTPRN
PTPRC
PTPN21
PTPN1
PSMD6
PSMB2
PRPSAP1
PRPF4B
PRPF18
PROSER2-AS1
PRKD3
PRKCA
PRKACA
PRIM2B
PRELID2
PRAMEF10
PPP4R2
PPP1R3A
PPP1R1C
PPOX
PPME1
PP13439
POU5F2
POPDC2

POLR3B
POC1A
PNLIPRP3
PMEL
PLK4
PLEKHH2
PLEKHA3
PLCXD2
PLCXD1
PLCH2
PLBD2
PLA2G1B
PKN3
PITHD1
PIP5K1A
PIK3R6
PIK3R5
PIH2
PIGK
PIEZO2
PIDD1
PID1
PHKG2
PHF21A
PHF19
PHC2
PGR
PGM2L1
PGGT1B
PEX11G
PDLIM7
PDLIM1
PDE7A
PCSK1
PCNT
PCK1
PCDHGC4
PCDHB9
PCDHB1
PCDH8
PCBP2
PCAT19
PCA3
PBX1

PAX3
PAX2
PARM1
PARD3B
PAPPA
PAPOLB
PADI1
P4HA1
P2RY10
P2RX7
P2RX1
OXR1
OTUD4
OTUD1
OSGIN1
OSBPL10
ORMDL3
OR7E19P
OR7C1
OR5AK4P
OR51E2
OR2L2
OR10D1P
OPALIN
OLFM3
OK/SW-CL.58
OIT3
OGT
OFCC1
OCIAD1
NUP93
NUF2
NRTN
NRP1
NREP
NR5A2
NR4A2
NR0B1
NPSA
NPRL2
NPPC
NPNT
NPIPA5
NPHS1

NPHP3
NPHP1
NPC1L1
NPAS3
NOTUM
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NOC4L
NMT2
NLRP2
NLRP13
NLRC4
NKX2-1
NHSL1
NHLRC2
NHEG1
NFIB
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NDST4
NCLN
NCF4
NCF1C
NCAPG
NBR2
NBEAP1
NAV3
NAP1L4
NAA30
MYOZ2
MYO10
MYNN
MYCN
MUC7
MUC4
MTSS1L
MTSS1
MTPAP
MTMR7
MTHFSD
MTHFR
MTHFD2L
MTBP
MRPL23
MRGPRX3
MOGAT2

MMP28
MMP12
MMP10
MKL1
MIR6836
MIR663AHG
MIR612
MIR452
MIR4435-2HG
MIP
MICB
MIA
MGC12916
MGAT4D
MFI2-AS1
METAP1D
MELTF
MDGA2
MATN3
MASP2
MAPRE3
MAPK8IP1
MAMDC4
MAGOHB
MAGI2-AS2
MAGI1
MAGEA8
MAF
MACROD1
MACC1
LYVE1
LY96
LY6K
LXN
LSMEM1
LRRK1
LRRFIP2
LRRC55
LRRC34
LRP1
LRIT1
LPO
LPAR5
LOXL1

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LOC100130111

LOC100129917

LMOD3

LMO7

LMAN1

LIPF

LINGO3

LINC01549

LINC01428

LINC01426

LINC01360

LINC01352

LINC01330

LINC01233

LINC01153

LINC01139

LINC01133

LINC01101

LINC01023

LINC01020

LINC01013

LINC01004

LINC00997

LINC00965

LINC00911

LINC00884

LINC00689

LINC00675

LINC00661

LINC00628

LINC00467

LINC00458

LINC00348

LINC00324

LINC00052

LINC00032

LHX4-AS1

LHFPL3-AS2

LHFPL3-AS1

LGI2

LGALS8

LEKR1

LAMB4

KRTAP4-4

KRTAP19-1

KRT38
KNL1
KNG1
KMT2B
KLK4
KLHL13
KLHL1
KLF13
KIZ
KIF27
KIAA1683
KIAA1257
KDM8
KDM5D
KCTD11
KCNS2
KCNQ3
KCNK3
KCNJ6
KCNJ3
KCNJ1
KCNIP2-AS1
KCNG3
KCNE5
KCNE4
KCNB1
KCNA5
KCNA2
KAT6A
KANSL1-AS1
KANK4
JMJD6
JMJD1C
JCHAIN
ITPR2
ITPK1
ITGA8
ISM1
ISLR
IQCH
INPP5D
INMT
INHBE
IMMP1L

IL7R
IL3RA
IL2RA
IL1RL1
IL1RAP
IL12A
IKZF1
IGLC1
IGKC
IGFBP5
IGF2BP3
IGF2BP2-AS1
IFT80
IFNA8
IFNA2
ICOS
IBA57-AS1
HTR1F
HSPB1
HSPA1L
HSD17B1
HS3ST3B1
HRC
HR
HPS1
HPGD
HOXD4
HOXD11
HOXD10
HOPX
HNRNPC
HNMT
HMGN3-AS1
HMGA2
HM13
HKDC1
HIST1H4G
HIST1H4A
HIST1H1T
HIPK1-AS1
HILS1
HILPDA
HHLA2
HERC2P7

HEMGN
HELLS
HCG8
HCG27
HCFC1
HBM
HBA2
HAS1
HAR1A
HAO2
HABP4
GVINP1
GTSE1
GTF2IRD2
GSTZ1
GSDMB
GS1-600G8.3
GRP
GRIN1
GRIA4
GRIA3
GPX3
GPRC5A
GPR68
GPR6
GPR39
GPR26
GPR20
GPR1-AS
GPR161
GPR157
GPD1
GPCPD1
GP2
GOLGA6L6
GNG2
GLYAT
GJB3
GJB2
GIT2
GIP
GHSR
GHRLOS
GHRHR

GGNBP2
GFRA1
GFI1B
GEMIN7
GBE1
GATS
GAS1
GABRA4
FZD9
FZD7
FYB
FUS
FST
FRMD8
FRG1KP
FOXP4-AS1
FOXK2
FOXE1
FOXD2
FOXA2
FOSL2
FNIP1
FLVCR2
FLJ41170
FLJ37035
FLJ30901
FLJ25758
FLCN
FKBP4
FKBP15
FHAD1
FGFR2
FGF13
FGD5-AS1
FGD3
FGD2
FGB
FEM1A
FCRL4
FCN2
FBXO3
FBXO22
FBF1
FAS-AS1

FANCC
FANCB
FAM47E
FAM46C
FAM24A
FAM234B
FAM20A
FAM208B
FAM167B
FAM160B2
FAM133DP
FABP4
FAAP20
EXOC3L4
EXD3
ESR2
ESR1
ERVFH21-1
ERICH5
ERGIC3
EREG
EQTN
EPPIN
EPHA7
EPB41
ENPP3
ENO1-AS1
ENDOU
EN1
EME1
EMC1
EMB
ELAVL4
EIF4EBP1
EIF2S2
EIF1B-AS1
EHBP1L1
EFHC2
EEPD1
EDNRB-AS1
ECE1
EBP
EBF3
DYNLRB1

DYDC2
DTYMK
DTX3
DSG1
DSE
DRD2
DR1
DPT
DPH6
DOK6
DOK4
DOK1
DOCK5
DOC2A
DNLZ
DNASE1
DNALI1
DNAJB8-AS1
DLK1
DLGAP3
DLEU7
DKFZP761C1711
DIRAS2
DIO1
DIAPH2-AS1
DGUOK
DEPDC1B
DEPDC1-AS1
DEFB125
DEFB1
DEFA5
DDX3Y
DDX28
DDX17
DDX10
DDR1-AS1
DDC-AS1
DDC
DDB2
DCLK1
DCC
DCAF8
DCAF13
DBIL5P2

DAPL1
CYSLTR1
CYP4A11
CYP2C9
CYP27C1
CYP1B1-AS1
CYB5A
CXXC1P1
CXCR4
CXADR
CUX2
CTXN3
CTSS
CTHRC1
CST1
CSF3R
CSAG2
CRHR1
CREBBP
CREB3L1
CRB3
CPVL
CPLX2
CPA3
CPA1
COX10
CORO2A
COLEC11
COL9A1
COL8A2
COL5A1
COL1A1
COG2
COA1
CNTN6
CNST
CMTM6
CLSTN2
CLRN1
CLIC6
CLEC7A
CLEC2B
CLDN23
CLDN15

CLCA1
CKAP2
CIRBP-AS1
CIRBP
CHRNA3
CHRM3
CHRM2
CHORDC1
CHD5
CGREF1
CFAP97
CFAP46
CFAP161
CETP
CES5A
CERS4
CEP89
CEP152
CENPJ
CELSR1
CELA3B
CEACAM6
CEACAM21
CDK12
CDH8
CDH6
CDH26
CD80
CD300A
CCNA2
CCDC96
CCDC7
CCDC38
CCDC185
CCDC169
CCDC168
CCDC138
CBLN1
CATSPERG
CASP1
CASC18
CARS2
CARD8
CANT1

CAMK1G
CADPS2
CADPS
CACUL1
CACNG8
CACNB3
CACNA1E
CACNA1C
CA8
CA6
C9orf72
C9orf135
C8orf34
C7orf77
C5orf17
C3orf35
C2orf80
C2CD4A
C20orf197
C1orf234
C1orf228
C18orf61
C18orf12
C17orf78
C16orf70
C12orf80
C12orf54
C10orf53
C10orf126
C10orf107
BTRC
BTN2A2
BTBD17
BSPRY
BSN-AS2
BRDT
BRD7
BPIFC
BMPR1A
BMP3
BMP2K
BLZF1
BFSP1
BEST3

BEND4
BCL6
BCL11A
BCAS4
B4GALT6
AXIN1
AVL9
AUTS2
ATP9B
ATP6V0E2-AS1
ATP5S
ATP4B
ATP2A3
ATP11A-AS1
ATG9B
ASMTL-AS1
ASF1B
ASCL2
ASB4
ASB2
ASB10
ARSD
ARL17B
ARL11
ARL10
ARIH2OS
ARHGEF7-AS2
ARHGAP29
ARHGAP28
ARHGAP24
ARG1
AQP12B
APOC3
APLNR
APCDD1L-AS1
APAF1
AP4E1
ANXA2
ANKRD40
ANKRD29
ANKRD26P3
ANKRD24
ANKLE1
ANK1

ANGPT2
AMER3
AMBRA1
ALOX12
ALG5
ALDH1A1
AKR1C3
AKR1C1
AKAP12
AK7
AHSA2
AGTR1
AFF3
AFDN
ADAMTSL1
ADAMTS9-AS2
ADAMTS19
ADAMTS18
ADAM3A
ADA
ACTRT3
ACSS1
ACSF3
ACER1
ACAP2
ACAD10
ABI3BP
ABHD11
ABHD1
ABCC3
SNCA
PARK7
ATP13A2
MAOB
PRKN
PINK1
DRD1
IGF1R
LRRK2
GAK
GBA
MAPT
BST1
HLA-DRA

PARK16
DNM1L
PPARGC1A
CP
CYP2D6
GDNF
GFAP
TMEM230
GSTM1
HFE
HMOX1
HSPA9
IL6
MAOA
NOS1
ABCB1
BDNF
SOD1
SOD2
TNF
GSTP1
DDIT4
CYP2E1
MAP3K5
NGF
NQO1
AIF1
GSTA4
IGF2
TRPM2
HLA-DRB5
IGF2R
INS
ENO2
FBP1
FCER2
GPX1
HGF
HSPA1A
INSR
MIR181C
MAG
MTA1
BAG5

TCL1B
ADARB2
COL19A1
SLC2A14
EDN1
CNTNAP2
GSK3B
HBG1
HSPA4
HSPA8
IL1B
DRAXIN
KCNJ4
MAP2
PITX3
NCAPG2
SLC30A10
NECTIN2
RPL6
RPL23A
RPS8
TALDO1
TFAM
RPL14
OPTN
SPR
TWNK
ATG7
GRK5
HTR1A
PENK
GDF5
ADH7
DLG4
ABL1
PPP1R9B
GRK6
HSF1
HSPD1
LEP
ND3
PTN
ARPC3
ADCY5

CCN2
GRK2
GRK3
DBN1
DLG1
GCH1
STK39
APOE
FASLG
RRN3
GJC2
HCN3
RIT2
FEZ1
SLC41A1
LAMP3
MCCC1
CCDC62
GPNMB
DGKQ
STH
VPS13C
TMEM175
HLA-DRB1
CTSB
SIPA1L2
SREBF1
NUCKS1
HIP1R
MAPT-AS1
BCKDK
RAI1
FAM47E-STBD1
LHFPL2
TCEANC2
DLG2
INPP5F
MMRN1
KANSL1
ITPKB
LMNA
NSF
PAM
BIN3

RREB1
SH3GL2
TPM1
NAT2
ZSCAN16-AS1
CCNT2-AS1
MAPT-IT1
BORCS7-ASMT
FRY
TNK2
DSCAS
TMC3-AS1
CDK5
MPHOSPH6
LINC02224
LINC02210-
CRHR1
LINC02471
LINC02451
AHS1
LRRK2-DT
LOC107987479
CIT
CHM
NLRP3
RAB39B
AGAP1
BORCS7
KLHDC1
CNTN1
COL5A2
COL13A1
COMT
SLCO6A1
ADORA2A
CRK
CRP
MAPK14
CSF2
LINC02210
PM20D1
CTSD
CNKSR3
CBL2

CYP17A1
TMEM229B
BRINP1
DBH
SPPL2C
ACE
SPTSSB
PARK10
ASXL1
DRD3
EEF1A2
EIF4G1
AKT1
ALDH2
SIRT2
TBC1D9
SYT11
MCF2L
FMR1
SYNM
SIRT1
TARDBP
SF3B1
SMUG1
MTOR
FYN
GABPA
FBXO7
RNF19A
GAPDH
GIGYF2
POLDIP2
FGF20
GBAP1
GCC
HPGDS
GLP1R
HTRA2
GPR37
REM1
GRN
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CTNNA3
GRM5

GSTT1
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IP6K2
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TET2
CNNM2

WBP1L
PLPPR1
PREP
PIP4P2
MAPK1
SLC50A1
PRNP
PDSS2
PTEN
PTGS2
BCHE
BCL2
ATXN2
SCN2A
CCL2
DNAJC1
CASC16
SNCA-AS1
SNCB
SNCG
THY1
TLR4
TP53
TPO
UCHL1
VDR
VEGFA
WNT3
YWHAE
ZNF165
ZP3
MANF
MUL1
AIMP2
CCDC82
RABEP2
KCNIP4
CAB39L
BAP1
CASP3
PLA2G6
GPR65
LINGO1
SLC45A3

GBF1
SQSTM1
RAB29
NDUFAF2
TPTE2
GRAP2
MAP4K4
SNCAIP
ZNF646
TBC1D5
CTIF
PLEKHM1
ADH1C
ATXN8OS
DNAJC6
GBA1
PSAP
PTPA
TBP

Supplementary Table 2 Common elements in "HR" and "PD"

22 common elements in "HR" and "PD":

HMOX1
AKT1
TNF
PTGS2
BCL2
GABPA
IL6
MAPK14
TP53
ARG1
SOD2
INS
EDN1
ACHE
PIK3CA
UHRF1
MTOR
AKR1C3
ALDH2
IL10
NFE2L2

NQO1
