

## Supplementary Materials

Supplementary Table S1. 20 types of post-translational modification gene sets.

Acetylation	Succinylation	Ubiquitination
HAT1	EP300	UBA1
AADAT	PAG1	UBA2
KYAT3	KAT2A	UBA3
GOT2	CPT1A	UBA5
KAT5	SIRT5	UBA6
KAT6A	SIRT7	UBA7
KAT6B	Malonylation	AKTIP
KAT7	EP300	BIRC6
KAT8	PAG1	UBE2A
ELP3	KAT2A	UBE2B
GTF3C4	SIRT5	UBE2C
KAT14	Crotonylation	UBE2D1
EP300	EP300	UBE2D2
PAG1	PAG1	UBE2D3
EIF6	KAT8	UBE2D4
KAT2B	KAT2A	UBE2E1
SRC	SIRT1	UBE2E2
FGR	SIRT2	UBE2E3
NCOA3	SIRT3	UBE2E4P
ACAT1	B-hydroxybutyrylation	UBE2F
BRD4	EP300	UBE2G1
BRD3	PAG1	UBE2G2
PBRM1	SIRT3	UBE2H
HDAC1	HDAC1	UBE2I
HDAC2	HDAC2	UBE2J1
HDAC3	Lactylation	UBE2J2
HDAC4	EP300	UBE2K
HDAC5	PAG1	UBE2L1
HDAC6	HDAC1	UBE2L2
HDAC7	HDAC3	UBE2L3
HDAC8	Myristoylation	UBE2L4
HDAC9	NMT1	UBE2L5
HDAC10	NMT2	UBE2L6
HDAC11	SIRT6	UBE2M
SIRT1	ARF6	UBE2N
SIRT2	ARF1	UBE2NL
SIRT3	Sumoylation	UBE2O
SIRT4	SAE1	UBE2QL1
SIRT5	UBA2	UBE2Q1
SIRT6	UBE2I	UBE2Q2
SIRT7	PIAS1	CDC34

Palmitoylation	PIAS2	UBE2R2
ZDHHC1	PIAS3	UBE2S
ZDHHC2	PIAS4	UBE2T
ZDHHC3	CBX4	UBE2U
ZDHHC4	RANBP2	UBE2V1
ZDHHC5	ZNF451	UBE2V2
ZDHHC6	SENP1	UBE2W
ZDHHC7	SENP2	UBE2Z
ZDHHC8	SENP3	AFF4
ZDHHC9	SENP4	AMFR
ZDHHC11	SENP5	ANAPC11
ZDHHC12	SENP6	ANKIB1
ZDHHC13	SENP7	AREL1
ZDHHC14	Neddylation	ARIH1
ZDHHC15	NAE1	ARIH2
ZDHHC16	UBA3	BARD1
ZDHHC17	UBE2M	BFAR
ZDHHC18	UBE2F	BIRC2
ZDHHC19	RBX1	BIRC3
ZDHHC20	RBX2	BIRC7
ZDHHC21	CUL1	BIRC8
ZDHHC22	CUL2	BMI1
ZDHHC23	CUL3	BRAP
LYPLA2P1	CUL4A	BRCA1
PPT1	CUL4B	CBL
ABHD17A	CUL5	CBLB
ABHD17B	CUL7	CBLC
ABHD17C	DCUN1D1	CBLL1
ISGylation	DCUN1D2	CCDC36
UBE1L	DCUN1D3	CCNB1IP1
UBE2L6	DCUN1D4	CGRRF1
HERC5	DCUN1D5	CHFR
HERC6	NEDD8	CNOT4
TRIM25	SENP8	CUL9
TRIM21	CSN5	CYHR1
TRIM38	CSN6	DCST1
USP18	FAT10ylation	DTX1
ATG8ylation	UBA6	DTX2
ATG7	USE1	DTX3
ATG3	RNF4	DTX3L
ATG12	HDAC6	DTX4
ATG5	UFMylation	DZIP3
ATG16L1	UBA5	E4F1
MAP1LC3A	UFC1	FANCL

MAP1LC3B	UFL1	G2E3
MAP1LC3C	UFSP1	HACE1
GABARAP	UFSP2	HECTD1
GABARAPL1	Glycosylation	HECTD2
GABARAPL2	ALG1	HECTD3
GABARAPL3	ALG2	HECTD4
Methylation	ALG3	HECW1
SETD1A	ALG4	HECW2
SETD1B	ALG5	HERC1
EHMT1	ALG6	HERC2
EHMT2	ALG8	HERC3
SUV39H1	ALG9	HERC4
SUV39H2	ALG12	HERC5
SETDB1	DPM1	HERC6
SETDB2	DPM2	HLTF
KMT2A	DPM3	HUWE1
KMT2B	DPAGT1	IRF2BP1
KMT2C	MGAT1	IRF2BP2
KMT2D	MGAT2	IRF2BPL
SETD2	MGAT3	ITCH
PRDM9	MGAT4	KCMF1
DOT1L	MGAT5	KMT2C
NSD1	OSTC	KMT2D
NSD2	STT3A	LNX1
NSD3	STT3B	LNX2
SETMAR	GALNT1	LONRF1
SMYD2	GALNT2	LONRF2
SMYD3	GALNT3	LONRF3
SMYD4	GALNT4	LRSAM1
SMYD5	GALNT5	LTN1
PRMT1	GALNT6	MAEA
PRMT2	GALNT7	MAP3K1
PRMT3	GALNT8	1-Mar
PRMT4	GALNT9	10-Mar
PRMT5	GALNT10	11-Mar
PRMT6	GALNT11	2-Mar
PRMT7	GALNT12	3-Mar
PRMT8	GALNT13	4-Mar
PRMT9	GALNT14	5-Mar
KDM1A	GALNT15	6-Mar
KDM1B	GALNT16	7-Mar
KDM2A	GALNT17	8-Mar
KDM2B	GALNT18	9-Mar
KDM3A	GALNT19	MDM2

KDM3B	GALNT20	MDM4
KDM4A	GALNTL1	MECOM
KDM4B	GALNTL2	MEX3A
KDM4C	B3GNT1	MEX3B
KDM4D	B3GNT2	MEX3C
KDM5A	B3GNT3	MEX3D
KDM5B	B3GNT4	MGRN1
KDM5C	B3GNT5	MIB1
KDM5D	B3GNT6	MIB2
KDM6A	B3GNT7	MID1
KDM6B	B3GNT8	MID2
KDM7A	B3GNT9	MKRN1
KDM7B	B4GALT1	MKRN2
Biotinylation	B4GALT2	MKRN3
BPL1	B4GALT3	MKRN4P
BPL2	B4GALT4	MNAT1
S-nitrosylation	B4GALT5	MSL2
ADH5	B4GALT6	MUL1
TXN	B4GALT7	MYCBP2
GSTP1		MYLIP
CASP3		NEDD4
TXNRD1		NEDD4L
PDIA3		NEURL1
GAPDH		NEURL1B
Phosphorylation		NEURL3
AKT1		NFX1
AKT2		NFXL1
AKT3		NHLRC1
MAPK1		NOSIP
MAPK3		NSMCE1
PRKACA		PARK2
PRKACB		PCGF1
PRKACG		PCGF2
CAMK2A		PCGF3
CAMK2B		PCGF5
CAMK2D		PCGF6
CAMK2G		PDZRN3
SRC		PDZRN4
JAK1		PELI1
JAK2		PELI2
JAK3		PELI3
TYK2		PEX10
EGFR		PEX12
PDGFRB		PEX2

ABL1	PHF7
MEK1	PHRF1
MEK2	PJA1
PPP1CA	PJA2
PPP1CB	PLAG1
PPP1CC	PLAGL1
PPP2CA	PML
PPP2CB	PPIL2
PTPN1	PRPF19
PTPN11	RAD18
PTPRC	RAG1
DUSP1	RAPSN
DUSP2	RBBP6
DUSP3	RBCK1
Deubiquitination	RBX1
USP7	RC3H1
USP20	RC3H2
CYLD	RCHY1
USP15	RFFL
USP13	RFPL1
USP4	RFPL2
OTUB1	RFPL3
USP17L2	RFPL4A
USP33	RFPL4AL1
USP9X	RFPL4B
USP10	RFWD2
USP2	RFWD3
USP16	RING1
USP3	RLF
USP37	RLIM
USP19	RMND5A
USP8	RMND5B
USP12	RNF10
USP14	RNF103
USP1	RNF11
USP44	RNF111
VCPIP1	RNF112
USP11	RNF113A
USP22	RNF113B
USP28	RNF114
USP36	RNF115
BAP1	RNF121
WDR48	RNF122
USP21	RNF123

USP46	RNF125
OTUD7B	RNF126
USP25	RNF128
BRCC3	RNF13
USP48	RNF130
USP5	RNF133
OTUD5	RNF135
USP24	RNF138
USP17L24	RNF139
USP17L25	RNF14
USP17L29	RNF141
USP17L30	RNF144A
USP17L26	RNF144B
USP17L27	RNF145
USP17L28	RNF146
USP47	RNF148
ABRAXAS2	RNF149
USP30	RNF150
UHL3	RNF151
USP17L5	RNF152
USP26	RNF157
TNFAIP3	RNF165
YOD1	RNF166
USP49	RNF167
OTUB2	RNF168
UHL5	RNF169
UBC	RNF17
ATXN3	RNF170
USP17L6P	RNF175
USP42	RNF180
USP17L1	RNF181
USP17L3	RNF182
USP35	RNF183
BABAM1	RNF185
EIF3F	RNF186
USP51	RNF187
PSMD14	RNF19A
ZRANB1	RNF19B
UHL1	RNF2
USP29	RNF20
USP34	RNF207
JOSD1	RNF208
BABAM2	RNF212
OTUD3	RNF212B

USP27X	RNF213
USP6	RNF214
USP38	RNF215
USP18	RNF216
USP17L22	RNF217
USP17L13	RNF219
USP17L18	RNF220
USP17L11	RNF222
USP17L17	RNF223
USP17L20	RNF224
USP17L10	RNF225
USP17L12	RNF24
USP17L19	RNF25
USP17L21	RNF26
ATXN7L3	RNF31
USP31	RNF32
JOSD2	RNF34
WDR20	RNF38
OTUD7A	RNF39
OTUD6B	RNF4
USP32	RNF40
OTUD1	RNF41
USP9Y	RNF43
TP53	RNF44
STAMBPL1	RNF5
USP40	RNF6
TRAF6	RNF7
TRAF2	RNF8
USP45	RNFT1
RIPK1	RNFT2
ENY2	RSPRY1
OTUD6A	SCAF11
USP17L15	SH3RF1
MDM2	SH3RF2
OTULIN	SH3RF3
USP17L4	SHPRH
USP17L8	SIAH1
STAMBP	SIAH2
ATXN3L	SIAH3
IKBKG	SMURF1
OTUD4	SMURF2
RPS27A	STUB1
ADRM1	SYVN1
MINDY1	TMEM129

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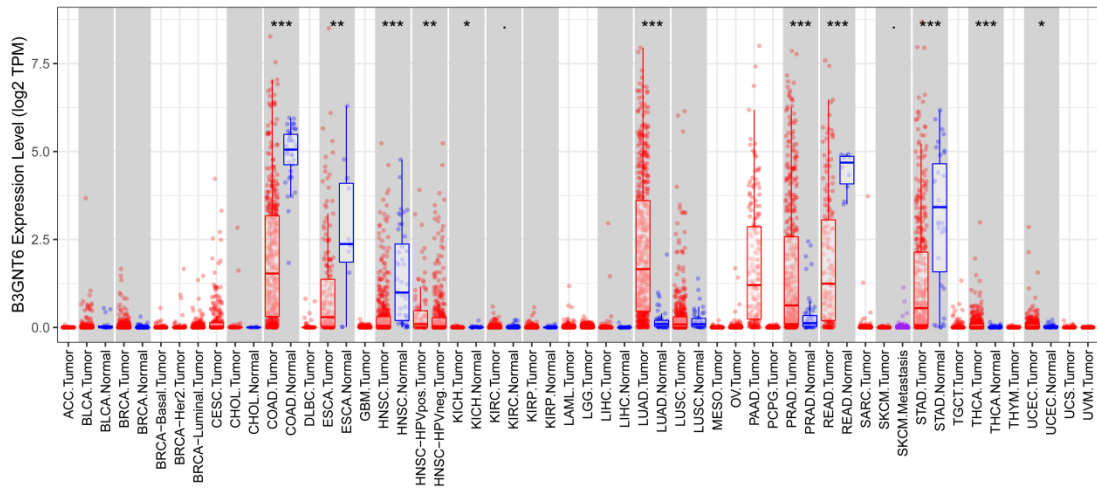
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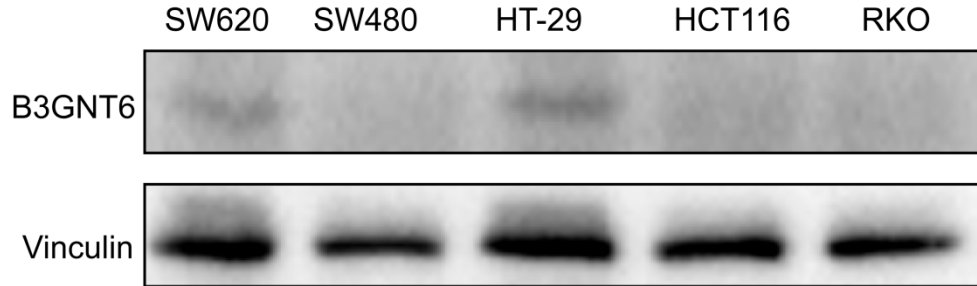
Supplementary Table S2. The antibodies and agents used in the study.

Antibody/Agent	Assay	Catalog	Origin	Dilution/Concentration	Incubation period
B3GNT6	WB	2129	Protein tech	1/1000	overnight, 4 °C
	IF	1-1- AP		1/500	overnight, 4 °C
MUC1	WB	TB53 64	Abmart	1:1000	overnight, 4 °C
E-Cadherin	WB	2087	Protein	1:20000	overnight, 4 °C

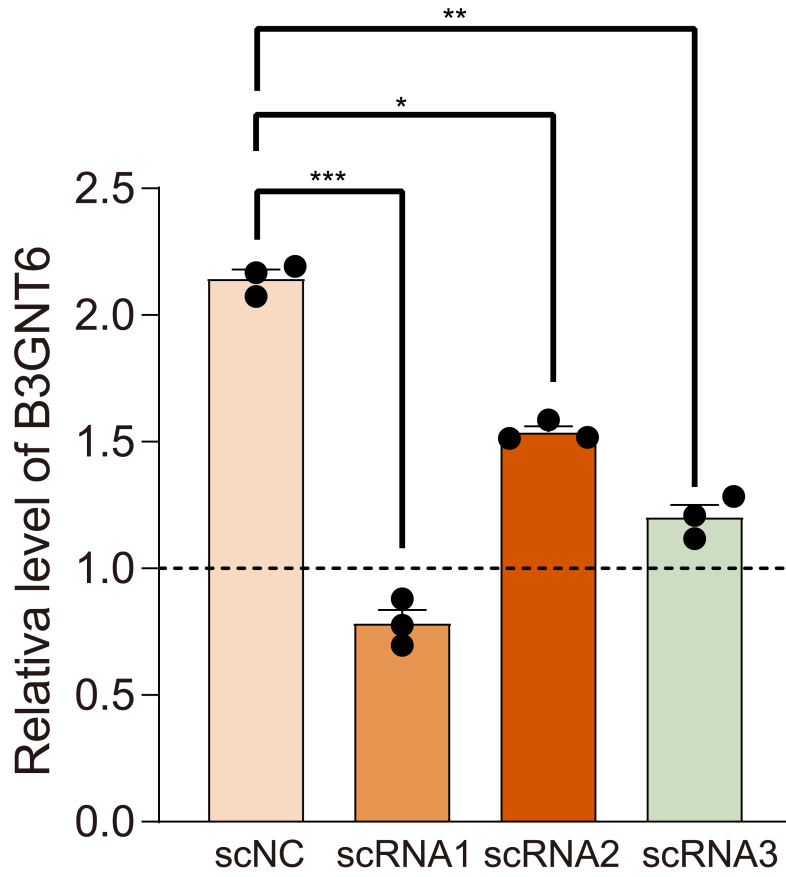
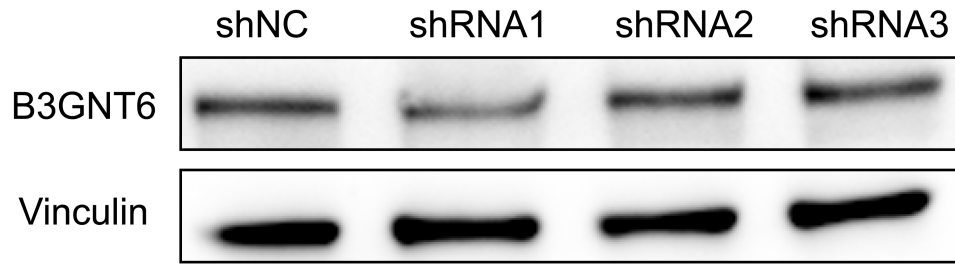
N-Cadherin	WB	4-1- AP TA40 39	Abmart	1:1000	overnight, 4 °C
ZO-1	WB	2177 3-1- AP	Protein tech	1:10000	overnight, 4 °C
Vinculin	WB	2652 0-1- AP	Protein tech	1/40000	overnight, 4 °C



Supplementary Figure S1 The expression of B3GNT6 in pan-cancer.



Supplementary Figure S2 B3GNT6 expression in a variety of colorectal cancer cell lines.



Supplementary Figure S3 B3GNT6 knockdown screening.