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Supplementary information

Beyond sex determination: the Y chromosome in male cancers

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Supplementary Table 1 | Functional and clinical relevance of human Y chromosome genes.

Yp (short arm)

Gene	Genomic location	Gene name	Function	Potential role in cancer (Red) and disease	Ref.
AKAP17A	Xp22.33 / Yp11.32	A-Kinase Anchoring Protein 17A	pre-mRNA splicing	Tic disorder, KS, Turner syndrome	1-3
AMELY	Yp11.2	Amelogenin Y-Linked	Biomineralization	HCC, dental disorders	4,5
ASMT	Xp22.3 / Yp11.3	Acetylserotonin O-Methyltransferase	Melatonin synthesis	Autism spectrum disorder	6
CD99	Xp22.32 / Yp11.3	CD99 Molecule	T-cell adhesion	Ewing sarcoma, lymphoma	1,7,8
CRLF2	Xp22.3 / Yp11.3	Cytokine Receptor Like Factor 2	Hematopoiesis	ALL, Down syndrome	9,10
CSF2RA	Xp22.32 / Yp11.3	CSF2 Receptor Alpha	Cytokine signaling	Lung disease	9,11
DHRSX	Xp22.33 / Yp11.2	Dehydrogenase/Reductase X-Linked	Oxidoreductase	Congenital glycosylation disorders	9,12,13
GTPBP6	Xp22.33 / Yp11.32	GTP Binding Protein 6	Nucleotide binding	Klinefelter syndrome	9,14
IL3RA	Xp22.3 / Yp13.3	Interleukin-3 Receptor Alpha	Immune signaling	Leukemia	15
P2RY8	Xp22.33 / Yp11.3	P2Y Receptor 8	GPCR signaling	Leukemia, lymphoma	16,17
PCDH11Y	Yp11.2	Protocadherin 11 Y-Linked	Cell adhesion	Autism	18,19
PLCXD1	Xp22.33 / Yp11.32	PLC X Domain Containing 1	Signal transduction	Myalgic encephalomyelitis	20
PPP2R3B	Xp22.3 / Yp11.3	PP2A Regulatory Subunit	Phosphatase regulation	Melanoma, scoliosis	21,22
PRKY	Yp11.2	Protein Kinase Y-Linked (pseudogene)	Signal transduction	Prostate cancer, DSD	23,24
RPS4Y1	Yp11.2	Ribosomal Protein S4 Y-Linked 1	Translation	Gastric cancer, TBI	25,26

SHOX	Xp22.33 / Yp11.32	SHOX Homeobox	Growth and development	Short stature, Turner syndrome	27
SLC25A6	Xp22.32 / Yp11.3	Mitochondrial ADP/ATP carrier	Mitochondrial transport	Alzheimer disease	28
SRY	Yp11.2	Sex Determining Region Y	Transcription factor	DSD, prostate & liver cancer	29-31
TBL1Y	Yp11.2	Transducin Beta Like 1 Y-Linked	Transcription activation	Sensorineural deafness	32
TGIF2LY	Yp11.2	TGFB Induced Factor Homeobox 2 Like Y	Transcription	Prostate cancer, infertility	33,34
TSPY1	Yp11.2	Testis Specific Protein Y-Linked 1	Cell proliferation	Testicular, prostate, liver cancer	35-37
ZBED1	Xp22.33 / Yp11	Zinc Finger BED-Type Containing 1	E3-type SUMO ligase	Gastric cancer	38,39
ZFY	Yp11.2	Zinc Finger Protein Y-Linked	Transcription	Prostate cancer, Turner syndrome	40-43

Yq (long arm)

Gene	Genomic location	Gene name	Function	Potential role in cancer and disease	Ref.
BPY2	Yq11.223	Basic Charge Y-Linked 2	Cell cycle regulation	Azoospermia	44
CDY1	Yq11.23	Chromodomain Y-Linked 1	Chromatin remodeling	Spermatogenic failure	44,45
DAZ	Yq11.223	Deleted in Azoospermia	Spermatogenesis	Azoospermia	44,46,47
DDX3Y	Yq11.221	DEAD-Box Helicase 3 Y	RNA helicase	Tumor suppression, infertility	48-50
EIF1AY	Yq11.223	Translation Initiation Factor 1A Y	Translation	ASD, infertility	9,51
HSFY	Yq11.222	Heat Shock Factor Y-Linked	Transcription	Azoospermia	52
IL9R	Xq28 / Yq12	Interleukin-9 Receptor	Immune signaling	CTCL, AML, asthma	53-55

KDM5D	Yq11.223	Lysine Demethylase 5D	Histone demethylase	Prostate, bladder cancer	56-59
KDM6C (UTY)	Yq11.221	Lysine Demethylase 6C	Histone demethylase	ccRCC, bladder cancer	58,60
NLGN4Y	Yq11.221	Neuroligin 4 Y	Cell adhesion	Autism	61,62
PRY	Yq11.223	PTPN13-Like Y	Protein interactions	Infertility	1,63,64
RBMY	Yq11.223	RNA Binding Motif Y	Transcription, tumor suppression	HCC, prostate cancer	65-68
RPS4Y2	Yq11.223	Ribosomal Protein S4 Y-Linked 2	Translation	Prostate cancer	69,70
SPRY3	Xq28 / Yq12	Sprouty RTK Signaling Antagonist 3	RTK signaling	Lung cancer	71
TMSB4Y	Yq11.221	Thymosin Beta 4 Y	Actin regulation	Tumor suppressor	72,73
TTTY15 (lncRNA)	Yq11.221	Testis Transcript Y-Linked 15	Deubiquitinase-related	Prostate, lung, gastric cancer	74-78
USP9Y	Yq11.221	Ubiquitin Specific Peptidase 9 Y	Deubiquitinase	Infertility, lung cancer suppression	50
VAMP7	Xq28 / Yq12	Vesicle Associated Membrane Protein 7	Vesicle fusion	HCC progression	79
VCY	Yq11.221	Variable Charge Y-Linked	Spermatogenesis	Infertility	80

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