

## SUPPLEMENTARY MATERIAL

**Supplementary Table 1. Top 10 KEGG pathway analysis up-regulated in TubA/GV pair, compared to MII/GV pair.**

Ubiquitin mediated proteolysis	21	Ube3b, Ddb1, Ube2g2, Ube4b, Skp2, Cdc34, Ube3c, Herc1, Cdc26, Birc3, Plas4, Slah1b, Slah1a, Trim32, Uba3, Ddb2, Mdm2, Itch, Rchy1, Ube2s, Cull1
Cell cycle	20	Trp53, Cdc7, E2f4, E2f5, Dbf4, Skp2, Ywhab, Pkmyt1, Chek1, Rb1, Pttg1, Cdc26, Ccnb1 (cyclin B1), Rad21, Eps300, Ccnd3, Mdm2, Ccna2, Cull1, Stag1
Insulin signaling pathway	20	Map2k1, Prkab2, Mknk2, PrkabB1, Raf1, Pde3b, Rhoq, Foxo1, Socs4, Ppp1cb, Akt1, Prkar2b, Ppp1r3d, Nras, Prkar2a, Sorbs1, Rheb, Prkaca, Shc1, Crk
Prostate cancer	15	Trp53, Fgfr2, Map2k1, Pdgfa, Raf1, Nfkb1a, Lef1, Foxo1, Nfkb1, Rb1, Pten, Akt1, Nras, Ep300, Mdm2
Pathways in cancer	34	Fgfr2, Pdgfa, Fgf9, Foxo1, Nfkb1a, Nfkb1, Cdh1, Gli3, Pten, Akt1, Rac1, Rala, Trp53, Dvl2, Ctbp2, Map2k1, Ralbp1, Runx1t1, Skp2, Raf1, Lef1, Rb1, Cttna1, Birc3, Dapk2, Nras, Ccde6, Rassf5, Ep300, Hif1a, Itga6, Pias4, Mdm2, Crk
p53 signaling pathway	12	Ccnb1, Trp53, Ccnd3, Siah1b, Siah1a, Shisa5, Ddb2, Mdm2, Chek1, Rrm2b, Rchy1, Pten
Renal cell carcinoma	12	Akt1, Nras, Ep300, Hif1a, Map2k1, Pdgfa, Pak4, Rac1, Rap1a, Raf1, Flcn, Crk
Tight junction	18	Ppp2r1a, Gnai3, Gnai2, Cldn4, Gnai1, Mpp5, Cask, Cttna1, Pten, Tjap1, Llg12, Csnk2a2, Akt1, Nras, Csnk2a1, Ash11, Pard6g, Mllt4
Progesterone-mediated oocyte maturation	13	Gnai3, Gnai2, Map2k1, Gnai1, Raf1, Pkmyt1, Pde3b, Cdc26, Ccnb1, Akt1, Rps6ka6, Prkaca, Ccna2
MAPK signaling pathway	28	Trp53, Fgfr2, Map2k1, Pdgfa, Fgf9, Taok3, Ptprr, Mknk2, Ppmla, Raf1, Nfkb1, Tab2, Daxx, Atf2, Akt1, Nras, Rps6ka6, Dusp1, Dusp14, Pla2g12a, Rac1, Rap1a, Prkaca, Crk, Dusp7, Rasa1, Rasa2, Ppp5c

**Supplementary Table 2. Top 10 KEGG pathway analysis down-regulated in TubA/GV pair compared to MII/GV pair.**

Ribosome	58	Rpl18, Rpl36a, Rpl19, Rpl14, Gm6251, Rpl2211, Rps3, Rpl391, Fau, Rpl10, Rpl12, Rps27a, Rpl36al, Rpl35a, Rps4x, Rps18, Rps19, Rps17, Rps15, Rps13, Rps10, Ubb, Kpna2, Gm12191, Rpl27a, Rpl35, Rpl36, Rpl38, Rpl39, Rps25, Rps26, Mrpl13, Rpl30, Rpl7, Rps29, Rpl6, Rpl31, Rpl8, Rpl3, Gm15772, Rpl5, Rpl10a, Rpl7a, Rps20, Rpl4, Rps21, Rps23, Rps24, Rpsa, Rpl26, Rps9, Rpl27, Rpl24, Rpl23A, Rps6, Rps5, Rpl28, Rps7, Rpl29, Rpl18a, Rpl23, Rpl13a, Rpl21
Parkinson's disease	53	Atp5d, Atp5e, Uqcrcl, Cyc1, Uchl1, Uqcrfs1, Uqcrq, Cox5b, Ndufs7, Ndufs6, Ndufs5, Ndufs8, Atp5o, Ndufs3, Atp5h, Ndufs2, Rps27a, Atp5j, Ndufb10, Cyct, Cysc, Ndufc2, Ube2j1, Gm5801, Cox4I1, Ndufc1, Uqcrh, Ubb, Uqcrb, Ndufb3, Ndufb4, Ndufb5, Ndufb7, Cox7b, Cox7c, Atp5g2, Cox7a2l, Atp5g1, Atp5g3, Ndufa2, Ndufa8, Ndufa9, Ndufa7, Atp5f1, Vdac2, Vdac3, Park7, Ndufv3, Sdhd, Ndufv1, Sdhd, Ndufv2, Cox6a2, Atp5a1
Oxidative phosphorylation	52	Atp5d, Atp5e, Uqcrcl, Cyc1, Uqcrfs1, Uqcrq, Cox5b, Ndufs7, Ndufs6, Ndufs5, Ndufs8, Atp5O, Atp6v0d1, Ndufs3, Cox17, Atp5h, Ndufs2, Atp5k, Atp5j, Ndufb10, Ndufc2, Cox4i1, Ndufc1, Ndufa11, Uqcrh, Uqcrb, Ndufb3, Ndufb4, Ndufb5, Ndufb7, Cox7b, Cox7c, Atp5g2, Cox7a2l, Atp5g1, Atp5g3, Atp6v0c, Atp5j2, Ndufa2, Ndufa8, Ndufa9, Ndufa7, Atp5f1, Lhpp, Ndufv3, Sdhd, Ndufv1, Atp6v1e1, Sdhd, Ndufv2, Cox6a2, Atp5a1
Huntington's disease	58	Atp5d, Atp5e, Clta, Uqcrcl, Cltb, Cyc1, Uqcrfs1, Uqcrq, Cox5b, Ndufs7, Ndufs6, Ndufs5, Ndufs8, Atp5o, Ndufs3, Atp5h, Ndufs2, Atp5j, Ndufb10, Cyct, Cysc, Ndufc2, Cox4i1, Ndufc1, Dctn2, Uqcrh, Uqcrb, Ndufb3, Ndufb4, Ndufb5, Polr2e, Ndufb7, Polr2l, Polr2k, Cox7b, Polr2i, Cox7c, Atp5g2, Cox7a2l, Atp5g1, Atp5g3, Ndufa2, Creb3, Ndufa8, Ndufa9, Ndufa7, Atp5f1, Sod1, Vdac2, Vdac3, Ndufv3, Sdhd, Ndufv1, Bax, Ndufv2, Sdhd, Cox6a2, Atp5a1
Alzheimer's disease	54	Atp5d, Atp5e, Uqcrcl, Cyc1, Uqcrfs1, Uqcrd, Cox5b, Ndufs7, NdufS6, Ndufs5, Ndufs8, Atp5o, Ndufs3, Atp5h, Ndufs2, Atp5j, Ndufb10, Cyct, Cysc, Ndufc2, Cox4i1, Ndufc1, Cdk5, Psen1, Uqcrh, Bace2, Uqcrb, NdufB3, Hsd17b10, Ndufb4, Ndufb5, Ndufb7, Aph1c, Cox7b, Cox7c, Atp5g2, Cox7a2l, Atp5g1, Atp5g3, Ppp3cc, Ndufa2, Ndufa8, Ndufa9, Ndufa7, Atp5f1, Bad, Ndufv3, Sdhd, Ndufv1, Sdhd, Ndufv2, Cox6a2, Calm3, Atp5a1, Calm2
Proteasome ubiquitin mediated proteolysis	19	Psmb5, Psmf1, Psmb4, Psmd14, Psmb7, Psmc5, Psmd13, Psmb6, Psma6, Psmc4, Psmb1, Psme2, Psmc3, Psmc2, Psmc1, Psma3, Psmd4, Psmd6, Psmd8
Pyrimidine metabolism	27	Polr2e, Polr2l, Polr2k, Polr2i, Dtymk, Upp1, Znrd1, Tk2, Tyms, Nt5m, Nt5c3, Uck2, Entpd1, Nudt2, Polr3h, Polr3k, Polr1e, Polr1d, Polr1c, Polr3a, Polr3c, Nme6, Pold4, Umps, Nme3, Nnm1, Pold2

RNA polymerase		12	Polr3h, Polr2e, Polr3k, Polr1e, Polr2l, Polr1d, Polr2k, Polr2i, Znr1, Polr3a, Polr1c, Polr3c
Pentose phosphate pathway		10	Aldoa, Pgm2, Pgl3, G6pdx, Fbp1, Pfkfb3, Dera, Tkt, Fbp2, Gpi1
DNA replication		11	Rpa2, Pold4, Rfc3, Rfc4, Ssbp1, Rfc2, Pold2, Rnaseh2a, Fen1, Rnaseh2c, Mcm5

**Supplementary Table 3. List of primers used in this study.**

Genes	Forward	Reverse
<i>Cdc14b</i>	GTGAAGAAGAGCCGCAG	GCTGTAGAGAATGGCAAAAC
<i>Arp3</i>	CGCCATGGTATAGTTGAAGA	AGTGGAGGTTTCAGTCAAAG
<i>Aurora c</i>	CGTACAGCCACGATAATACA	CCTGTGAATCACCTTCTTCT
<i>Cops3</i>	TGTGGAAAGAAAACAGCCC	GTCAGTTGGTTGGTATTCATC
<i>Cops5</i>	AAACCCTGGACTAAGGATCA	TCACCATTTTCAGTAGAGCC
<i>Tkt</i>	ATGGCATAACAGGCAAATA	TTGTAAATTCAGCAAAGGC
<i>Obox1</i>	GGCACTATCAGTTGGTGTTA	ATATTCTGGAGGTTTCATCCG
<i>Gapdh</i>	AGGTCGGTGTGAACGGATTTG	TGTAGACCATGTAGTTGAGGTCA