

Genes in different clusters in BEAM analysis	
Gene	Cluster
Sdc4	1
Adgrg2	2
Selenop	1
Ifrd1	2
Ccdc141	1
Tgfbr3	2
Dbi	2
Hivep1	2
Itgb6	2
Mpc2	1
Gtdc1	2
Galnt18	1
Nfkbiz	2
Ppm1l	1
Prickle2	2
Tnrc18	1
Hnf1b	1
Col4a2	2
BC005537	3
Limch1	1
Adgrl2	2
Kcnh8	2
P4ha1	1
Tln2	1
Parp14	2
Atp6v1e1	1
Pdlim5	2
Ypel2	2
Ankrd12	2
Arhgap6	1
Zbtb16	2
Chka	2
Large1	2
Gpc3	2
Sash1	2
Etv6	2
Tcf4	2
Ivns1abp	1
Dstn	2
Adamts9	2
Pdia3	3

Trpm7	1
Kcnc2	2
Hook3	3
Osbpl3	2
Tnfaip3	2
Peli2	1
Rims2	2
Ppp4r4	2
Stxbp6	2
Neat1	2
lpmk	1
Gsap	2
Adam10	2
Nckap5	2
Clic4	2
Atp13a3	2
Erbin	3
Pfkfb3	2
Abtb2	2
Ctsl	2
Eda	2
Phldb2	1
Ccdc148	2
Sh3d19	2
Sgms2	2
Zfp704	2
Dach1	2
Tle4	1
Aff1	3
Oxct1	1
Ankrd44	2
Smad7	3
Shroom4	1
B4galt5	2
Myo5b	2
Atp5a1	3
Fras1	1
Kansl1	1
Hnf1aos1	2
Rnf180	2
Ube2e2	2
Slc30a5	1
Shank2	1

Pclo	1
Pax8	2
Slc6a18	1
Arhgap26	2
2210408l21Rik	1
Prdx1	3
Mid1	2
Pkp4	1
Rnf128	3
Airn	2
Commd10	1
2610307P16Rik	2
Cgnl1	3
Cobl	2
Fam107b	1
Me3	1
Gcc2	3
Cox7c	3
Iqgap2	1
Gcnt2	2
Wdr72	1
Arid5b	2
Rdh10	2
Mpp6	2
Zfp36l1	2
Dock8	3
Gm4876	2
Abca1	2
Apbb2	1
Stat1	1
Fermt1	2
Pth1r	3
Ctsb	3
Prrg4	2
Ank3	1
Myo9a	2
Glis3	2
Cdk8	1
Wee1	2
Nrg1	2
Cobll1	1
Kif5b	3
Col4a1	2

Tbc1d1	2
Sptan1	1
Etnk1	3
Cd63	3
Pard3b	2
Resf1	2
Tmcc3	2
Itga6	2
Pde4b	2
Sema6a	2
Ldlrad4	2
Npnt	2
Eil2	1
Sema3c	2
Car2	1
Plau	2
Cdkal1	1
Ngf	2
Hivep2	2
Jun	2
Atp5b	3
Grip1	2
Mrpl33	2
C3	2
Trpm3	2
Setbp1	2
H3f3b	2
Map3k1	2
Veph1	2
Pik3c2a	2
Vmp1	2
Atp1b1	1
Slc12a2	3
5730522E02Rik	1
Gab2	3
Picalm	2
Rbpms	2
Prrg1	2
Trio	2
Nhs12	2
Pbx1	1
Hs2st1	3
Cxcl2	2

Mdm2	3
Dapk1	3
Exoc4	3
Rbbp6	3
Agps	2
Eif2s2	3
Ext1	1
Psap	3
Tpr	3
Mast4	2
Slc25a30	1
Ptpn22	2
Camkmt	3
Enah	2
Birc3	2
Gpx3	1
Bod1l	3
Cfap69	1
Csgalnact1	1
Foxo3	1
Vgll4	1
Crim1	2
H2-K1	2
Rnf213	3
Lin52	1
Sdc2	1
Cltrn	1
Mlt3	3
Arhgap29	3
Znrf1	2
Cdh1	3
Itga1	2
Lpp	2
Ldhd	2
Shroom3	3
Slc22a23	1
Hspa5	3
Wsb1	3
Slco3a1	2
Birc2	2
Fhod3	2
Gclm	3
Atp1a1	1

Eif1	3
Cftr	2
Adamts1	2
Pabpc1	3
Dock4	1
St8sia6	2
Wwox	2
Acsl4	2
Plod2	2
Arhgap10	1
Pitpnc1	1
Pcdh7	1
Slc43a2	1
Rassf6	2
Nedd4l	1
Camk2d	3
Nfkb1	2
Hmgcs1	1
Meis2	3
Frk	2
Jarid2	1
Malt1	2
Vcl	2
Fat1	3
Cxcl1	2
Suz12	3
Zbtb38	3
Grk5	2
Gm15261	2
Ror1	2
Gls	3
Nudt4	3
Kcnma1	3
Fgf1	1
Hsp90b1	3
Ly6a	3
Plcl1	1
Mfhas1	2
Srrm1	3
Hmgb1	3
Kap	1
Gse1	3
Smarca2	1

Ly6e	2
Chn2	1
Txnip	3
9530026P05Rik	2
Ncl	3
Rpl5	3
Cmip	1
Zeb1	2
Nr3c2	3
Son	3
Itpr2	1
Slf1	3
Jazf1	2
Glul	1
Zfp697	1
Ppargc1a	1
Ybx1	3
Egfr	2
Fam129a	2
Rock2	3
mt-Nd3	3
Acyp2	1
Hspa8	3
Gxylt2	2
3-Mar	1
Tgfbr1	3
Phactr2	2
Chd4	3
Fth1	3
Lgmn	1
Tet2	1
Rpl17	3
Fam13b	2
Mme	3
Abcc4	3
Schip1	3
Pakap.1	2
Bcl2	3
Gm32461	2
Nrp1	3
Wwc1	3
Nfib	3
Cd9	2

Sema5a	2
Il34	2
Rpl27a	3
1600010M07Rik	2
Rras2	3
Fam13a	1
Uap1	2
Gmds	2
Cdh2	3
Ankrd33b	2
Prom1	2
Mapk4	2
Plscr1	2
Magi1	3
Fau	3
St3gal3	2
Dysf	3
Agbl4	1
Arl15	2
Pvt1	3
Slc7a8	1
Spns2	3
Syne2	3
Rbbp8	2
Ppia	3
Nt5e	2
Akt3	2
Tsc22d1	3
Paqr5	3
Chst11	1
Carmil1	3
Gm13415	2
Rpl23	3
Atp2a2	1
Prkag2	1
Arhgap24	1
Mylk	2
Smad3	3
Ptbp3	2
Phip	3
Eml4	3
Krt20	2
Tanc1	3

Rps12	3
Baz1b	3
Raph1	2
Palld	2
Ankrd6	2
Glud1	1
Vcam1	2
Srrm2	3
Cdk6	2
Rps2	3
Lgr4	1
Rpl10a	3
Plac8	2
Rbms1	3
Ctsd	3
Arsb	1
Npm1	3
Ugt8a	1
Zeb2	2
Parp8	2
Ppp2r3a	1
Sh3rf1	2
Cpe	2
Mcc	2
Ptprj	2
Cep112	3
Itgb1	2
Rpl13	3
Ranbp17	3
Rpl6	3
Gm13684	2
Gm42031	3
Tenm3	2
Fndc3b	3
Kl	1
Ntn1	2
Arhgap22	2
Dleu2	2
Sat1	2
Egfrs	2
Pkhd1	2
Nt5c2	1
Esr1	2

Slc6a15	2
Kansl1l	2
Arhgap15	1
Msn	3
Asap1	2
Dnm3	3
Tfcp2l1	1
Dtnb	3
Rps20	3
Cadps2	2
Vav3	3
Mertk	1
Ptpn13	2
Ppp2r5e	1
Tbc1d4	3
Ccdc88a	3
Clstn2	3
Arhgef3	2
Hsp90ab1	3
Ccser1	3
Prkca	3
Itgav	2
Gclc	3
Hacl1	1
Rbm47	1
Nuak2	1
Cd2ap	2
Plch1	3
Slc6a6	1
1700025G04Rik	2
Met	3
Thsd7a	2
Tns3	2
Col4a4	1
Mir99ahg	1
Col18a1	2
Rps24	3
Pbx3	3
Bicc1	2
Mat2a	1
Gm16685	2
Ckap5	3
Chsy3	2

Slc16a10	1
Igfbp7	2
Erc2	1
mt-Nd4l	3
Rps8	3
Pank1	1
Rplp1	3
Nbea	3
Fhl1	1
Stard13	3
Gm12353	2
MacroD2	1
Actg1	3
Umod	3
Plcb4	3
Ftl1	3
Fxyd2	3
Kcnk5	1
Phyhipl	1
Peak1	3
Oxr1	3
Fkbp5	1
Scin	2
Wnk1	3
Hoxb6	3
Agmo	1
Tpt1	3
Sord	1
Hecw2	2
Lncpint	1
Pdgfd	2
Map3k7cl	1
Specc1	2
Gm20275	2
Cadm1	3
Rpl41	3
Dcdc2a	2
Hnf4g	1
Map3k5	1
Alcam	3
Tead1	3
Ptma	3
Actb	3

Cep85	2
Ezh2	3
1-Mar	2
Cyp4b1	1
Creb5	2
Atrx	3
Dst	3
Tmem178b	1
Gatm	1
Iqgap1	3
Kctd1	3
Gphn	1
Nfat5	2
Igsf11	1
Stk39	3
Gabrb3	1
Aoah	1
Plppr1	2
Gas2	1
Cttnbp2	2
Ncoa7	1
Anxa2	2
Nkain2	3
Maml3	3
Gm47283	3
Lrrfip1	3
Tnfaip8	1
Syn3	2
Pik3c2g	1
Map1b	2
Bcas3	1
Acot12	1
Eef1a1	3
Npas3	1
Phactr1	3
Slc16a12	1
Abcc2	1
Atxn1	1
Epb41	1
Rad51b	3
Tpm1	2
P3h2	1
Grid1	2

Sugct	1
Ptpm	3
Bmp6	2
Car12	1
Nsd2	3
Angpt1	1
Pawr	1
Samd4	2
Sorcs1	2
mt-Cytb	3
S100a6	3
Fmn1	3
Col4a3	1
Sycp3	2
Ppp1r16b	1
Pde1a	1
Plcb1	1
Gcnt1	1
Slc17a3	1
Etl4	2
Slc5a2	1
Gria3	1
Ptpn14	3
mt-Nd1	3
Rtn4	2
Anxa3	2
Cldn10	1
Immp2l	2
Sult1d1	1
mt-Nd5	3
Igf1r	1
Fam214a	1
Alpl	1
Slc1a1	1
mt-Nd2	3
Cpeb3	1
Tinag	1
Tns1	1
Slc2a2	2
Tacc2	1
Rora	2
Ncam1	3
Dock10	2

Cep128	3
Slc7a7	1
Nav2	3
Gm36388	2
Unc5c	1
Syt12	2
Lpin2	1
Slc8a1	3
Adamts6	1
Slc12a3	3
Pdzrn3	1
Slit2	3
Gpc4	1
Pcsk5	2
Gm14764	1
Maml2	3
Lactb2	1
Clu	3
Srgap1	3
Ugt2b38	1
Myh9	2
Cpeb4	1
Thrb	1
Plat	2
mt-Nd4	3
Itgb8	2
Adra1a	1
Slc16a9	1
Aspa	1
Maf	1
Slc22a30	1
Plxdc2	1
Enpp2	1
Nfia	1
Hgd	1
Stox2	3
Cubn	1
Pah	1
Ahnak	3
Atp11a	2
Slc18a1	1
Sorbs2	3
Fyb2	2

Gm45792	1
Aass	1
Fmnl2	3
Osbpl6	1
Slc25a21	1
Naaladl2	3
Slc22a28	1
Tshz2	3
Pdzd2	1
Actn1	2
Pola1	3
Sdk1	3
Msra	1
Rgl1	1
Cald1	3
Lars2	3
Rbms3	3
Trps1	1
Myof	2
mt-Atp6	3
Glis1	1
Pdzk1	1
Cdh13	3
Cp	2
Hsd3b2	1
Prkn	1
Ar	1
Slc16a14	1
Cryl1	1
mt-Co3	3
Ntm	3
Timp3	2
Runx1	3
Epb41l3	1
Il7	2
Mki67	3
Trabd2b	1
Spp1	2
Frmd4b	1
Gpc6	3
Psd3	2
Fgfr2	2
Rhobtb1	2

Kcnj16	2
Aldob	1
Atp6v0a4	1
Slc12a1	3
Folh1	1
Gm42397	1
mt-Co2	3
Gramd1b	1
Tanc2	1
Slc17a1	1
Gm37245	2
Gldc	1
Wdr17	2
Utrn	3
Galnt14	1
Cd44	2
Erb4	3
Gm20528	2
Esrrg	2
Camk1d	3
Pter	2
Lrp2	1
Them7	1
Slc5a12	1
Slc27a2	1
Snhg11	1
Hnf4a	1
Pck1	1
Mecom	3
Dpyd	2
Fut9	1
Ptprd	1
Bnc2	1
Fggy	2
Cyp2j13	1
Cyp2j5	1
Errfi1	1
Magi2	2
Kcnip4	2
Ugt2b37	2
Slc4a4	1
Auts2	1
Slc13a1	2

Itpr1	1
Slco1a6	1
Nox4	1
Acsn2	1
Acsn1	1
Gm19950	1
Akap12	2
Chpt1	1
Nr1h4	1
Osbpl8	2
Havcr1	2
Taco1	3
Acox1	1
Slc34a1	1
Pde4d	1
Fhit	2
Lrmda	2
Gm6999	1
Diaph3	3
Ghr	1
Dab2	1
Gm16311	1

Supplementary Table S1 Genes in different clusters in BEAM analysis of SnRNA

DEGs in GSE161758							
	p_val	avg_log2FC	pct.1	pct.2	p_val_adj	cluster	gene
Tmsb4x	6.64E-25	1.613161	0.496	0.234	5.76E-21	atrophy	Tmsb4x
Gm11808	1.27E-24	1.149863	0.501	0.255	1.10E-20	atrophy	Gm11808
Apoe	3.49E-21	1.246883	0.345	0.137	3.03E-17	atrophy	Apoe
Cyba	2.05E-19	0.85564	0.633	0.394	1.78E-15	atrophy	Cyba
Igfbp7	1.01E-15	0.752096	0.592	0.385	8.73E-12	atrophy	Igfbp7
Ugt2b38	4.94E-15	1.095967	0.474	0.284	4.28E-11	atrophy	Ugt2b38
Lpl	2.06E-14	1.217384	0.285	0.126	1.79E-10	atrophy	Lpl
Defb29	6.22E-14	0.854035	0.51	0.329	5.39E-10	atrophy	Defb29
Cd36	1.19E-13	1.193577	0.255	0.108	1.03E-09	atrophy	Cd36
Tmem176a	2.48E-13	0.946866	0.458	0.29	2.15E-09	atrophy	Tmem176a
Tmem27	1.09E-12	0.732455	0.652	0.487	9.49E-09	atrophy	Tmem27
B2m	1.12E-12	1.009092	0.288	0.136	9.67E-09	atrophy	B2m
Cd63	6.98E-12	0.769585	0.529	0.35	6.05E-08	atrophy	Cd63
Tmbim4	1.32E-11	0.782129	0.405	0.242	1.14E-07	atrophy	Tmbim4
Cyp4b1	2.42E-11	0.907409	0.573	0.427	2.10E-07	atrophy	Cyp4b1
Ccdc107	3.32E-11	0.858919	0.37	0.211	2.87E-07	atrophy	Ccdc107
Arl6ip1	5.59E-11	0.767555	0.386	0.225	4.85E-07	atrophy	Arl6ip1
Lamp2	9.03E-11	0.723691	0.381	0.216	7.82E-07	atrophy	Lamp2
Bsg	3.44E-10	0.77416	0.323	0.177	2.98E-06	atrophy	Bsg

Slc27a2	4.01E-10	0.66804	0.567	0.426	3.48E-06	atrop hy	Slc27a2
Ugt2b37	9.91E-10	1.008104	0.255	0.129	8.59E-06	atrop hy	Ugt2b37
Kap	1.96E-09	0.812604	0.871	0.923	1.70E-05	atrop hy	Kap
Cyp2j5	2.13E-09	0.608238	0.422	0.269	1.84E-05	atrop hy	Cyp2j5
Actb	1.57E-08	0.649644	0.597	0.442	0.000136	atrop hy	Actb
Cox6a1	3.37E-08	0.356539	0.811	0.755	0.000292	atrop hy	Cox6a1
Napsa	5.13E-08	0.739863	0.373	0.242	0.000444	atrop hy	Napsa
Tmem176b	5.44E-08	0.599625	0.466	0.332	0.000471	atrop hy	Tmem176b
Spcs1	1.70E-07	0.673267	0.266	0.152	0.001472	atrop hy	Spcs1
Lrpap1	2.48E-07	0.684109	0.263	0.15	0.00215	atrop hy	Lrpap1
Pdzk1ip1	3.35E-07	0.660344	0.559	0.435	0.002902	atrop hy	Pdzk1ip1
Atp1b1	5.24E-07	0.449329	0.559	0.425	0.004542	atrop hy	Atp1b1
Nat8	7.33E-07	0.619163	0.326	0.209	0.00635	atrop hy	Nat8
Acsn2	1.31E-06	0.490562	0.677	0.585	0.011348	atrop hy	Acsn2
Psap	3.54E-06	0.496817	0.378	0.252	0.030674	atrop hy	Psap
Sod3	4.76E-06	0.557646	0.266	0.162	0.041287	atrop hy	Sod3
Cyp2e1	6.75E-06	0.707032	0.512	0.416	0.058533	atrop hy	Cyp2e1
Ldhd	1.07E-05	0.501815	0.562	0.466	0.092847	atrop hy	Ldhd
Timp3	1.60E-05	0.333641	0.471	0.333	0.13873	atrop hy	Timp3
Ces1f	5.42E-05	0.491346	0.37	0.266	0.469706	atrop hy	Ces1f
Folr1	6.26E-05	0.548554	0.367	0.261	0.542113	atrop hy	Folr1
Guca2b	0.000121	0.327894	0.649	0.586	1	atrop hy	Guca2b

Slc22a18	0.000188	0.426571	0.279	0.19	1	atrophy	Slc22a18
Atp1a1	0.000268	0.347985	0.452	0.345	1	atrophy	Atp1a1
Rps9	0.000302	0.312915	0.723	0.665	1	atrophy	Rps9
Smpdl3a	0.000592	0.561986	0.279	0.198	1	atrophy	Smpdl3a
Lamp1	0.001271	0.324236	0.405	0.332	1	atrophy	Lamp1
Ggt1	0.001528	0.453347	0.381	0.311	1	atrophy	Ggt1
Galnt11	0.001849	0.391672	0.337	0.256	1	atrophy	Galnt11
Hpn	0.002194	0.367734	0.258	0.183	1	atrophy	Hpn
Rps5	0.004116	0.283968	0.682	0.665	1	atrophy	Rps5
Hbb-bs	0.004913	0.585488	0.427	0.359	1	atrophy	Hbb-bs
G0s2	0.005778	0.586021	0.255	0.194	1	atrophy	G0s2
Pck1	2.48E-29	1.280063	0.765	0.507	2.15E-25	repair	Pck1
Sat1	1.75E-13	0.681086	0.652	0.452	1.52E-09	repair	Sat1
Bola3	4.42E-12	0.717431	0.542	0.351	3.83E-08	repair	Bola3
Iscu	9.17E-12	0.647751	0.606	0.427	7.95E-08	repair	Iscu
Pcbd1	1.14E-11	0.492953	0.71	0.507	9.89E-08	repair	Pcbd1
Cda	6.05E-11	0.486054	0.717	0.578	5.25E-07	repair	Cda
Cryl1	2.02E-10	0.625193	0.463	0.274	1.75E-06	repair	Cryl1
Sdhc	3.35E-10	0.623974	0.528	0.332	2.90E-06	repair	Sdhc
Ftl1	5.16E-10	0.351737	0.994	0.997	4.47E-06	repair	Ftl1
Ak4	6.20E-10	0.926664	0.31	0.145	5.37E-06	repair	Ak4
Idh1	8.84E-10	0.602014	0.556	0.373	7.66E-06	repair	Idh1

Bnip3	2.49E-09	0.769194	0.305	0.148	2.16E-05	repaired	Bnip3
Fis1	2.61E-09	0.667793	0.436	0.255	2.26E-05	repaired	Fis1
Scp2	2.87E-09	0.342703	0.887	0.841	2.49E-05	repaired	Scp2
Cisd1	4.64E-09	0.48096	0.709	0.597	4.02E-05	repaired	Cisd1
Gstm1	8.96E-09	0.765366	0.545	0.395	7.77E-05	repaired	Gstm1
Akr1a1	9.22E-09	0.316896	0.944	0.901	7.99E-05	repaired	Akr1a1
Pxmp4	1.26E-08	0.805993	0.283	0.14	0.000109	repaired	Pxmp4
Gstt2	1.48E-08	0.598004	0.433	0.274	0.000128	repaired	Gstt2
Atp5e	4.66E-08	0.29115	0.911	0.855	0.000404	repaired	Atp5e
Dnajc19	7.34E-08	0.54587	0.536	0.373	0.000636	repaired	Dnajc19
Gsr	8.97E-08	0.652136	0.36	0.211	0.000777	repaired	Gsr
Fitm1	1.98E-07	0.701944	0.351	0.214	0.001718	repaired	Fitm1
RP24-64C6-3	2.39E-07	0.524485	0.591	0.447	0.002067	repaired	RP24-64C6-3
Atp6v1f	2.48E-07	0.502661	0.521	0.364	0.002152	repaired	Atp6v1f
Prdx1	2.73E-07	0.34061	0.93	0.904	0.002368	repaired	Prdx1
Uba52	2.94E-07	0.401713	0.769	0.693	0.002546	repaired	Uba52
Med28	5.32E-07	0.567645	0.381	0.241	0.004613	repaired	Med28
Serf2	7.38E-07	0.360822	0.804	0.699	0.006392	repaired	Serf2
Hibadh	9.21E-07	0.469641	0.549	0.414	0.007985	repaired	Hibadh
Lamtor2	1.12E-06	0.573747	0.4	0.258	0.009741	repaired	Lamtor2
Mif	1.39E-06	0.373231	0.732	0.622	0.012066	repaired	Mif
Slc25a5	1.79E-06	0.349314	0.747	0.677	0.015475	repaired	Slc25a5

Atp5c1	1.98E-06	0.356074	0.64	0.507	0.017185	repair	Atp5c1
Sult1d1	4.36E-06	0.402399	0.639	0.545	0.037802	repair	Sult1d1
Cox7b	5.08E-06	0.301881	0.757	0.644	0.044022	repair	Cox7b
D8Ert738e	5.77E-06	0.445008	0.454	0.318	0.050033	repair	D8Ert738e
Vps29	7.85E-06	0.556694	0.294	0.181	0.068071	repair	Vps29
Atp6v1e1	9.89E-06	0.343692	0.456	0.318	0.085676	repair	Atp6v1e1
Ascc1	1.03E-05	0.392587	0.475	0.345	0.08936	repair	Ascc1
S100a1	1.15E-05	0.395252	0.54	0.405	0.09955	repair	S100a1
Glul	1.32E-05	0.539473	0.35	0.23	0.114715	repair	Glul
Gabarapl2	2.03E-05	0.437307	0.337	0.216	0.175793	repair	Gabarapl2
Mtch2	2.15E-05	0.513397	0.293	0.181	0.186254	repair	Mtch2
Gnas	2.93E-05	0.369635	0.42	0.293	0.253742	repair	Gnas
Dhrs4	3.08E-05	0.4421	0.446	0.334	0.267283	repair	Dhrs4
Dbp	3.64E-05	0.476696	0.315	0.2	0.31538	repair	Dbp
Park7	3.67E-05	0.299064	0.761	0.671	0.317764	repair	Park7
Gng5	4.03E-05	0.333846	0.671	0.564	0.349131	repair	Gng5
Map1lc3b	4.22E-05	0.442801	0.375	0.252	0.366047	repair	Map1lc3b
Uqcrh	4.30E-05	0.26085	0.77	0.69	0.37235	repair	Uqcrh
RP23-306P12-2	4.62E-05	0.417384	0.46	0.342	0.400547	repair	RP23-306P12-2
Adhfe1	5.79E-05	0.443363	0.321	0.208	0.501996	repair	Adhfe1
D630029K05Rik	5.97E-05	0.578669	0.263	0.164	0.517788	repair	D630029K05Rik
Gatm	6.30E-05	0.377972	0.542	0.419	0.546	repair	Gatm

Cat	6.37E-05	0.367029	0.547	0.427	0.551925	repa r	Cat
Ndufab1	7.01E-05	0.303567	0.622	0.51	0.607631	repa r	Ndufab1
Cryz	7.96E-05	0.418585	0.498	0.381	0.690243	repa r	Cryz
Ech1	8.74E-05	0.419608	0.532	0.436	0.757109	repa r	Ech1
Qdpr	8.83E-05	0.395495	0.476	0.351	0.765097	repa r	Qdpr
Bri3	8.90E-05	0.380534	0.528	0.408	0.770991	repa r	Bri3
Lamtor5	9.24E-05	0.398495	0.444	0.323	0.801113	repa r	Lamtor5
Camk2n1	0.000104	0.497372	0.338	0.236	0.89859	repa r	Camk2n1
Suc1g1	0.000108	0.342491	0.525	0.408	0.932454	repa r	Suc1g1
Atp5f1	0.000138	0.354108	0.591	0.493	1	repa r	Atp5f1
Slc25a4	0.000184	0.294555	0.403	0.288	1	repa r	Slc25a4
Ndufb5	0.000188	0.319303	0.529	0.416	1	repa r	Ndufb5
Hebp1	0.000219	0.497011	0.276	0.181	1	repa r	Hebp1
Glud1	0.000223	0.436411	0.3	0.2	1	repa r	Glud1
Hspd1	0.000229	0.321768	0.383	0.268	1	repa r	Hspd1
Grhpr	0.000232	0.409451	0.473	0.364	1	repa r	Grhpr
Gclm	0.000239	0.410516	0.427	0.321	1	repa r	Gclm
Mrpl54	0.000302	0.518707	0.261	0.17	1	repa r	Mrpl54
Eno1	0.000366	0.361866	0.466	0.351	1	repa r	Eno1
Txn1	0.000374	0.264769	0.719	0.63	1	repa r	Txn1
Stard10	0.000376	0.271087	0.42	0.312	1	repa r	Stard10
Cmpk1	0.000399	0.347426	0.311	0.211	1	repa r	Cmpk1

Polr3e	0.0004 25	0.52960 4	0.2 56	0.1 73	1	repa r	Polr3e
Pdpf	0.0004 31	0.54371	0.2 84	0.1 89	1	repa r	Pdpf
Dnajc12	0.0004 37	0.34753 6	0.5 03	0.4 05	1	repa r	Dnajc12
Hsbp1	0.0004 57	0.34184 8	0.3 99	0.2 96	1	repa r	Hsbp1
Mrps14	0.0004 58	0.46568 1	0.2 72	0.1 78	1	repa r	Mrps14
Rnf181	0.0004 6	0.29349 8	0.4 7	0.3 64	1	repa r	Rnf181
Timm13	0.0005 38	0.26981 4	0.5 64	0.4 47	1	repa r	Timm13
Calm3	0.0005 38	0.38432	0.4 58	0.3 45	1	repa r	Calm3
Gcsh	0.0005 59	0.43615 2	0.3	0.2 11	1	repa r	Gcsh
Pdha1	0.0005 86	0.48105 3	0.3 15	0.2 25	1	repa r	Pdha1
Cotl1	0.0006 31	0.43584 1	0.2 63	0.1 78	1	repa r	Cotl1
Mpc2	0.0006 4	0.29824 3	0.6 87	0.6 16	1	repa r	Mpc2
Gng12	0.0007 27	0.35999	0.2 97	0.2	1	repa r	Gng12
Myeov2	0.0007 75	0.30730 5	0.5 4	0.4 44	1	repa r	Myeov2
S100a10	0.0008 02	0.27768 9	0.2 64	0.1 75	1	repa r	S100a10
Mrps21	0.0008 6	0.32837 6	0.5 9	0.5 01	1	repa r	Mrps21
Coq9	0.0009 02	0.37046 1	0.2 74	0.1 86	1	repa r	Coq9
Acads	0.0009 08	0.42103	0.3 22	0.2 3	1	repa r	Acads
Mrpl50	0.0009 19	0.41871 1	0.2 59	0.1 75	1	repa r	Mrpl50
Timm17a	0.0009 49	0.37890 8	0.2 77	0.1 84	1	repa r	Timm17a
Snx3	0.0010 27	0.28926 2	0.3 11	0.2 16	1	repa r	Snx3
Gipc2	0.0010 48	0.28533 7	0.2 83	0.1 95	1	repa r	Gipc2

Fkbp1a	0.001192	0.286895	0.32	0.225	1	repaired	Fkbp1a
Ndufs7	0.001363	0.290282	0.52	0.419	1	repaired	Ndufs7
Grpel1	0.001411	0.458431	0.267	0.189	1	repaired	Grpel1
Hdgf	0.00162	0.322237	0.283	0.195	1	repaired	Hdgf
Tpd52	0.00214	0.35281	0.252	0.17	1	repaired	Tpd52
Tomm5	0.002275	0.417959	0.293	0.214	1	repaired	Tomm5
Pter	0.002352	0.309025	0.433	0.345	1	repaired	Pter
S100a11	0.002379	0.266676	0.353	0.26	1	repaired	S100a11
Serp1	0.002585	0.332233	0.27	0.192	1	repaired	Serp1
Ddah1	0.002806	0.282444	0.367	0.277	1	repaired	Ddah1
Etfb	0.002953	0.284153	0.68	0.611	1	repaired	Etfb
Taldo1	0.003532	0.325016	0.314	0.236	1	repaired	Taldo1
Hadh	0.003533	0.269535	0.508	0.419	1	repaired	Hadh
Mrpl30	0.003837	0.316071	0.291	0.211	1	repaired	Mrpl30
Ndufs3	0.003989	0.252901	0.364	0.271	1	repaired	Ndufs3
Swi5	0.004011	0.289304	0.412	0.321	1	repaired	Swi5
Dynlrb1	0.004343	0.388003	0.294	0.219	1	repaired	Dynlrb1
Lypla1	0.004654	0.313095	0.419	0.345	1	repaired	Lypla1
Pbld2	0.004838	0.338243	0.257	0.184	1	repaired	Pbld2
Mcee	0.00562	0.347787	0.271	0.197	1	repaired	Mcee
1110008F13Rik	0.005825	0.389334	0.271	0.203	1	repaired	1110008F13Rik
Erich4	0.005977	0.36976	0.311	0.236	1	repaired	Erich4

Dnaja1	0.0077 13	0.29389 5	0.3 27	0.2 52	1	repa r	Dnaja1
Ankrd13c	0.0078 56	0.25511 3	0.3 15	0.2 41	1	repa r	Ankrd13c
1810058l24 Rik	0.0084 34	0.25259 9	0.4 07	0.3 21	1	repa r	1810058l24 Rik
Ndufa10	0.0084 87	0.32435 3	0.3 54	0.2 82	1	repa r	Ndufa10
Aldh9a1	0.0094 53	0.26221 1	0.2 8	0.2 11	1	repa r	Aldh9a1

Supplementary Table S2 The differentially expressed genes analysis results between repaired and atrophy PT cells of GSE161758.

PCR primers for qRT-PCR	
Genes	PCR primers
Cd74 F	5'-AGTGCACGAGAACGGTAAC -3'
Cd74 R	5'-CGTTGGGGAACACACACCA -3'
mouse actin- F	5'-AACAGTCCGCCTAGAAGCAC -3'
mouse actin -R	5'-CGTTGACATCCGTAAAGACC -3'
App F	5'-AGGACTGACCACTCGACCAG -3'
App R	5'-CGGGGGTCTAGTTCTGCAT -3'

Supplementary Table S3 The primer sequences used in PCR of this research

Cell type	Macro	LOH-DL	LOH-AL	PT	CD-IC	DCT	Endo	CD-PC	Pod	Act-Fib1	Act-Fib2	URO	T cell
Marker genes													
	Ctss	Slc12a1	Slc12a1	SLC27A2	Slc26a4	Slc12a3	Emcn	Tmem45b	Nphs1	Pdgfrb	Pdgfrb	Upk1b	Cd247
	Itgam	Umod	Umod	Lrp2	Atp6v1g3		Ednrb	Aqp2	Nphs2	Dcn	Dcn		Cd3e
	C1qc	Epha7		Miox	Kit		Ehd3	Hsd11b2	Podxl	Cfh	Cfh		Cd8a
	C1qb	Bst1		Slc4a4	Slc4a1		Igfbp3	Fxyd4		Tnc	Tnc		Trbc2
	C1QA				Aqp6		Plat	Aqp3		Spon1	Spon1		Thy1
	Lyz2						Tek	TRPV5		Bmpr1b	Bmpr1b		
										Vcan			

Supplementary Table S4 The cell markers used in the cell type identification.