**Table S1:** Software List

|  |  |  |
| --- | --- | --- |
| Software | Version | Purpose |
| Limma1 | 3.44.4 | Analysis of differentially expressed genes |
| Heatmap2 | 4.1.0 | Drawing of heat map |
| ggplot23 | 3.3.2 | Drawing of Venn diagram and scatter plot |
| ggpubr4 | 0.4.0 | Visualization of significance test |
| survival5 | 3.1-12 | Survival analysis and model analysis |
| Survminer6 | 0.4.6 | Survival analysis |
| glmnet7 | 4.0-2 | Model analysis |
| clusterProfiler8 | 4.0.2 | Gene enrichment analysis |
| GSEA9 | 3.0.3 | Enrichment analysis |
| Rms10 | 6.1.0 | Nomogram analysis |
| TIDE11 | http://tide.dfci.harvard.edu/login/ | Immunotherapy analysis |

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**Supplementary Table S2A： WGCNA.cyan (224 genes)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| STARD5 | HLA-B | FBXL6 | RSAD2 | HELZ2 | SP140L |
| DDX60L | IFIH1 | TRIM5 | AL589743.1 | CXCL10 | AP3S1 |
| USP18 | ZNF707 | FBXL8 | HIST1H2BE | IFI44L | EPSTI1 |
| FBXO6 | IFNK | C20orf141 | HARS2 | CCDC109B | CHP1 |
| EIF2AK2 | PARP10 | GSDMD | GPN2 | SDF4 | TTLL11 |
| STAT1 | TMEM229B | IFIT3 | CYP27B1 | SPACA5 | PMFBP1 |
| CASP4 | NMI | MX2 | PEX14 | IFI27L1 | ADH7 |
| NLRP1 | OASL | FAM111A | OAS1 | LGALS3BP | TAP1 |
| IFITM1 | HIST1H2AJ | MTHFSD | NT5DC2 | MVP | SLC6A4 |
| CTSC | CASP7 | RNF213 | CARD17 | PLSCR1 | TYRO3 |
| LRPAP1 | CD47 | GNLY | SERTAD3 | CASP1 | IL15 |
| SP110 | NAGS | HLA-G | LAMP3 | FJX1 | HERC5 |
| NTF4 | DNAJC8 | KLHDC7B | BATF2 | XRCC4 | B3GAT3 |
| TYMP | KYNU | CNTD2 | LCE5A | ABCC11 | SH2D2A |
| PML | GNPTG | ISG20 | APOL4 | BTN3A3 | PARP12 |
| IFIT5 | DAGLB | HSPB9 | MLKL | TNFRSF25 | IRF9 |
| HLA-F | CLN8 | IRF3 | CXCL11 | PAIP2B | IFI6 |
| DTX3L | NPY4R | GATA5 | NLRC5 | DHX58 | DNAH17 |
| TOR2A | GS1-114I9.3 | ZNFX1 | RAG1 | XAF1 | IFITM3 |
| SLC8A2 | SP100 | GPR39 | PSMB8 | SNRNP70 | PFDN1 |
| IL12RB2 | GIPR | ISG15 | ARFGAP1 | FETUB | TEX29 |
| ERP44 | STAT2 | TAP2 | KIAA2013 | WARS | EID2 |
| DDX58 | UBE2L6 | C19orf66 | HLA-A | TMEM50A | RPLP0 |
| ZBTB48 | PARP9 | MAD2L2 | NT5C3A | SCO2 | PSMB9 |
| LY6E | NIPSNAP3A | OAS3 | SLC25A28 | B2M | PSME1 |
| BTN3A2 | IFNGR2 | OAS2 | BTN3A1 | DDX60 | TDRD7 |
| TRIM22 | SAMD9L | SMCO2 | IFIT1 | MIIP | RPS6KA1 |
| USF1 | PSME2 | ADAR | BST2 | TRIM14 | FAM183B |
| DHRS2 | CARD16 | IFI27 | PHF11 | KIF12 | TNFSF10 |
| IFI44 | IFIT2 | CT62 | LMF2 | HERC6 | SAMD9 |
| LCAT | MOV10 | TRIM21 | PQLC2 | LIN37 | IFNB1 |
| PARP14 | IFNGR1 | WDR25 | HLA-E | PITPNM3 | TAPBP |
| AKIP1 | ODF3B | CMPK2 | SAR1A | SLC2A9 | APOL2 |
| LY6K | TLR3 | OGFR | IRF7 | AIM2 | ST8SIA6 |
| LYPD1 | TM2D2 | STOML1 | EPHA8 | TRIM34 | IFI35 |
| OTOF | GBP1 | GBP3 | TFAP2B | HLA-C | APOL1 |
| LRRC47 | MAN1B1 | NABP1 | CCM2 | RTP4 | MX1 |
| ZNF787 | TRIM69 |  |  |  |  |

**Supplementary Table S2B： WGCNA.pink(827 genes)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CTSA | RP11-644F5.10 | CTD-2574D22.6 | GIMAP8 | GALNT9 | FCN1 |
| IL32 | PROK2 | CCL2 | CCL7 | IMPA2 | NR1H3 |
| MAP9 | FZD8 | ABI3 | FAM124A | LGALSL | GPR150 |
| FOXP1 | APOBEC3F | CTSO | TDRD6 | CACNA2D4 | ADRBK2 |
| PHF1 | TOM1L2 | GPR141 | FAR2 | PFKFB2 | RGS9 |
| FCGR2B | TRIL | CMTM7 | RNASE2 | ST8SIA1 | RCN1 |
| IL27RA | APOC2 | CD99L2 | HOOK1 | CCL1 | BBS12 |
| EPB41L2 | FES | RPS10 | FCGR1B | PODXL | LILRB4 |
| EPHA3 | RAP1A | CHST13 | RSPO2 | HOXC4 | ADAMDEC1 |
| ATP6AP2 | RANBP3L | SAMSN1 | SOX15 | PRDM16 | AP1M1 |
| NLGN3 | TMSB4X | KPNA7 | FCGR3A | MS4A14 | LIX1L |
| KCNJ5 | LZTS1 | ADPRH | RP11-248J23.6 | KCND1 | CD274 |
| CRYBB1 | INSM2 | CD300A | PNMAL2 | HCK | CCR8 |
| PRKACB | MNDA | TNFAIP8L2 | BAIAP2 | CTSL | RNF130 |
| SLC18A2 | CD68 | TYROBP | ITGAM | RNF19A | CD101 |
| CXCR1 | CTSD | PPP5D1 | MMP7 | EMID1 | ELOVL2 |
| ABCA1 | GPR84 | CD63 | CDS1 | LACC1 | MARCO |
| CREM | GSAP | CCL13 | WBP1L | PAG1 | ARHGAP28 |
| POU6F1 | NUB1 | ELMO1 | GRAMD1B | C3AR1 | PHACTR1 |
| MMP8 | MSR1 | S100A11 | LCP2 | ATP8B4 | EMR1 |
| SPI1 | CERS3 | NDUFAF3 | ORAI2 | HFE | CST1 |
| CLEC5A | SPATA45 | LAPTM5 | PRDM8 | TPD52L1 | CLEC4D |
| RBM43 | FCGR1A | VSIG4 | KCNMB1 | PPDPF | LGMN |
| FCGRT | ST3GAL5 | CYP27A1 | APOC1 | PDE1B | NEK6 |
| ANXA3 | FIGN | CLEC4G | TM6SF1 | MATK | DOCK11 |
| RP11-248J23.7 | ARL6IP5 | VSTM1 | AZIN2 | CCRL2 | HDX |
| ASGR1 | IER5L | IL7R | KCTD12 | NOD1 | SMPD1 |
| LSAMP | CCDC71L | ADORA3 | SLFN11 | DOK1 | IL2RA |
| CALHM2 | SPP1 | BST1 | MBOAT4 | CD14 | MEGF10 |
| SLC43A2 | CAMK1 | RASGEF1B | SNX2 | ATP6V0D2 | LRRC29 |
| IL18BP | PTGER2 | ARG2 | TPK1 | TMX4 | SIRPB2 |
| STRA6 | FGR | TMSB15B | OPRL1 | RBPJ | LILRA2 |
| LY86 | UGT1A10 | LRRC25 | MRPS10 | NLRP3 | TLR8 |
| FPR3 | NLRC4 | TLR4 | COMT | 2-Mar | TMEM255A |
| ADAM8 | C5orf58 | FFAR3 | ERAP1 | AIF1 | USP51 |
| PLEKHO2 | LILRA1 | TNFSF11 | AC073657.1 | PHTF1 | ZDHHC14 |
| TFEC | CCDC62 | CD4 | S100A4 | NPC2 | TRIM8 |
| MS4A4E | ZNF22 | SHKBP1 | RP4-576H24.4 | C1R | SNX10 |
| VCAM1 | CD80 | USH1G | GATA6 | RASA4B | TTC38 |
| C10orf128 | HRH4 | TMEM176B | RAB20 | OXER1 | C3orf36 |
| CASS4 | PERP | MTMR10 | CX3CL1 | RP11-123K3.4 | PEA15 |
| PHC2 | FRMD4A | FPR1 | TBXAS1 | ZC3H12B | GOLM1 |
| RELB | MS4A4A | CCL3 | SIGLEC7 | FCAR | CCL4 |
| F2RL3 | DAAM1 | ING1 | KRT3 | LRFN5 | NDFIP2 |
| COTL1 | GUSB | ZNF331 | RIPK2 | FMNL1 | PLEKHA4 |
| CD200 | CCL3L3 | RASSF4 | LILRA6 | KCNMA1 | ACP2 |
| CISH | SERPINA1 | GBGT1 | FTL | XRRA1 | BMF |
| TNFSF12-TNFSF13 | DCP1B | SIGLEC10 | CXorf21 | LHFPL2 | HIVEP3 |
| TRIM46 | LST1 | WBSCR17 | SULT1C2 | RASGRP3 | MATN1 |
| TNFSF12 | IL3RA | TRPV2 | CHI3L1 | DPEP2 | DAPK1 |
| ZNF821 | TGM2 | SLCO2B1 | DGKZ | IGSF6 | TNFSF13B |
| GRINA | YPEL4 | FAM65C | SLC10A6 | ITGB2 | PTGIR |
| P2RX4 | B4GAT1 | ZNF358 | GHDC | CASP5 | C2 |
| FBP1 | IL18 | APOE | TRIM61 | KCNK17 | ALOX12 |
| NRROS | NMT2 | ZBTB46 | NFIB | CYP1B1 | AP1M2 |
| CTBS | PTPRJ | SEMA7A | FCGR2A | SLC8A1 | TMEM176A |
| CXCL9 | SIGLEC12 | CXCL5 | LPL | LCP1 | KLHL1 |
| NFKBIE | TLN1 | ARHGAP20 | EMR3 | CCR1 | C19orf38 |
| TMEM133 | NINJ2 | NPAS3 | DOCK4 | EBPL | TUSC1 |
| RGL1 | LAD1 | LRRC4C | GSTP1 | SLC40A1 | LY96 |
| SERPINF1 | GPR137 | C22orf46 | TNFRSF1B | C1orf54 | OR5B21 |
| IGIP | TMEM106A | SCMH1 | RNASE3 | SIRPD | GJB5 |
| HS3ST2 | CTSS | FCER1G | FAM19A1 | GAS6 | CABP4 |
| XXbac-BPG181M17.5 | FAM49A | ASL | NR1H2 | TSPYL5 | ZNF618 |
| HDAC7 | FAS | ETS1 | SCARF1 | CTSZ | CD86 |
| FYN | FAM103A1 | HOMER2 | CTLA4 | C5AR2 | C5AR1 |
| TK2 | WDR81 | HEXB | MAP3K3 | GNG2 | IRAK3 |
| CCL4L1 | ASPHD2 | CREBL2 | STXBP6 | PIK3R6 | DIO3 |
| TSPAN33 | ZNF438 | ALOX5 | PNMAL1 | VENTX | NHLRC3 |
| IL11RA | ARRB1 | MPP1 | PRAME | FAM155A | CCL17 |
| SDC3 | TNFSF14 | C1S | CD81 | NTRK1 | DRAM1 |
| CATSPER1 | GABRR2 | ITIH4 | HS3ST3B1 | RPS18 | DOK2 |
| LPAR1 | THEMIS2 | LILRB3 | SLC16A10 | IL27 | NTAN1 |
| SLC52A3 | EPHB2 | PLEKHO1 | TMEM140 | C1QA | CXCR4 |
| OCSTAMP | SMOC2 | LYSMD2 | NKX1-1 | TPST2 | CUEDC2 |
| PCYOX1L | CLCN6 | HELB | SDSL | TBC1D1 | CCL18 |
| LILRA5 | ABCD1 | PDK3 | SAMHD1 | ARL4C | PKD2L2 |
| NDN | C9orf91 | S1PR2 | AQP9 | PDE10A | HRH2 |
| PILRA | PAPSS2 | TCTN1 | ARID5A | SHISA2 | OSM |
| APOBEC3C | CYBB | ICAM1 | IL17RA | SIRPB1 | MS4A6A |
| EXOC3L1 | NINJ1 | CALM3 | CD163 | MAN2B1 | SLC11A1 |
| LAIR1 | HAPLN3 | TPBGL | NFKB2 | CLEC4E | G0S2 |
| NFAM1 | C3orf67 | ARL4D | TAB1 | MAP3K9 | TMEM8B |
| CD300E | CEACAM3 | UNC93B1 | RENBP | RTN1 | CTSB |
| RELT | CD209 | OLFM1 | LRRC37A3 | TLR1 | RP11-613M10.8 |
| OR6K3 | DNAJC18 | SLAMF8 | WIPF1 | MCOLN1 | DMXL2 |
| ENTHD1 | ENPP2 | TSPAN4 | CKLF | DUSP4 | CLCN7 |
| PIGK | SPPL2A | NDNL2 | FGF2 | SLC2A6 | F8 |
| CD33 | BEST1 | PCDHB5 | LILRB2 | CLEC4A | CAT |
| PPP3R2 | PIK3AP1 | HSD17B14 | REEP6 | ALOX5AP | MMP12 |
| CAMK1G | FCN3 | PLA2G7 | DNASE2B | CSF1 | IFNA8 |
| TPP1 | SIGLEC9 | BCL2A1 | ZNF467 | ADAMTSL5 | OLR1 |
| GSC | ETV1 | RPL10A | MS4A6E | SLC27A4 | SLFN12 |
| CCL8 | SLCO2A1 | EVI2A | GDPD2 | YPEL1 | ENTPD1 |
| PLXNC1 | OSCAR | SLC38A10 | MAN1A1 | NUCB1 | MMP9 |
| TMEM170B | SIGLEC1 | TESK1 | ATG7 | LIPA | COL22A1 |
| FAM26F | UHRF2 | IQGAP2 | JAZF1 | CXCL16 | RGS10 |
| EMILIN2 | MCEMP1 | 1-Mar | NEURL3 | CHIT1 | TCN2 |
| LILRB1 | CACNA2D2 | SH2B3 | OTOA | ARMCX2 | PPP2R2B |
| CSF3R | CSF1R | ABCA2 | RGAG4 | CD70 | OTOP3 |
| CGGBP1 | GLRB | MAP3K12 | MAFB | KBTBD11 | SH3BGRL |
| CD300LB | MARCKSL1 | CD84 | TICAM2 | MRC1 | PPM1F |
| DCSTAMP | SMARCD3 | KLHL22 | POU4F2 | RNASE6 | GPBAR1 |
| TMEM115 | FGL2 | HNMT | ARHGAP18 | EVL | GPR34 |
| GOLGA8H | SRGN | PKN1 | SLC46A3 | DPYSL2 | IFNAR1 |
| TIPARP | FAM162A | FBXO43 | LONRF3 | C10orf10 | MICB |
| TMEM236 | TMEM110 | DNAJC5B | EID3 | CKMT1B | IFI30 |
| TLR2 | GDPD5 | BCL2L10 | CD300LF | CD83 | AOAH |
| HAMP | CTSH | LGR5 | ANKRD10 | TWF2 | SUCNR1 |
| CD163L1 | RAMP1 | PHYHIPL | P2RX7 | FAM105A | C19orf12 |
| SIRPA | PTGER4 | NFE2L3 | PLEK | GPRC5A | GNB4 |
| SLC15A3 | APOBR | CD97 | GLRX | SLC39A8 | ID2 |
| RGS1 | KLF5 | FMO1 | HAVCR2 | SLC1A3 | C1QB |
| CD1B | ITGAX | SLC6A12 | CPVL | HAAO | NAIP |
| PDE4B | HDAC9 | SMG9 | FAM228B | IL18R1 | LRRTM2 |
| WDR62 | SLC41A2 | GAA | KLHL29 | CYSLTR2 | METTL7B |
| CECR6 | AF165138.7 | NCAM2 | C7orf31 | FCGR3B | CCL24 |
| ACKR4 | TMEM72 | EN2 | PNRC1 | ZNF25 | ACP5 |
| CFH | PDCD1LG2 | NPDC1 | PRAM1 | VASH1 | GFRA2 |
| UTS2 | C1orf162 | TNFSF15 | ERMN | ACE | NRGN |
| RGS19 | C5orf15 | C1QC | WSCD2 | SSPO | CADM4 |
| FERMT3 | S100A10 | RNF19B | CCDC50 | ARRB2 | LITAF |
| UNC5A | IL10 | CCR5 | TXNDC15 | SH3GL3 | ZNF804A |
| PSAP | JADE2 | RP5-966M1.6 | FBXO31 | SLC7A7 | HK3 |
| TMEM150B | RAB8B | FAM20A | MILR1 | KCTD17 | DENND5B |
| STAB1 | TFPI | CMKLR1 | MICALL2 | CLEC7A | AKAP2 |
| SIGLEC15 | PADI4 | CCDC149 | IL4I1 | CYP4V2 | SH3KBP1 |
| SEMA5B | SOD2 | EMR2 | CEACAM4 | CLEC6A | MAN2B2 |
| EBF3 | ZNF165 | RASGRP4 | SLC2A11 | GPR183 | TREM2 |
| ATP6V1B2 | CTC-512J12.6 | EID2B | NAGPA | STARD9 | FPR2 |
| FAM83C | HSD11B1 | FOLR2 | CMTM2 | LRFN3 | IFFO1 |
| IFT27 | SLC29A3 | NCF2 | KMO | MAS1 | ZNF853 |
| MS4A7 | MGAT1 | AC069368.3 | ZMYND15 | ZFYVE21 | SGTB |
| HTRA4 | C8orf4 | MICAL1 | LXN | RBMS3 | LGI2 |
| PLD3 | FOXP3 | ESRP1 | MSANTD3-TMEFF1 | TNFRSF8 | TNFRSF9 |
| SERPING1 | MYO1F | GPR97 | GLIPR2 | CD300C | FAM83G |
| LILRB5 | SIDT2 | ITGA4 | NLRP12 | RNASE1 | CYTH4 |
| SMCO4 | SARDH | FOXF1 | SDS | BATF3 |  |

**Supplementary Table S3A: 124 intersection genes were acquired by overlap analysis.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| EIF2AK2 | MMP7 | CCM2 | CLEC7A | PLD3 | TREM2 |
| STAT1 | APOC1 | APOL1 | TYROBP | FCGR3A | SDS |
| CTSC | FTL | CXCL10 | IL7R | RELB | DRAM1 |
| TYMP | CHI3L1 | IFI44L | TRPV2 | COTL1 | CXCR4 |
| HLA-F | FCGR2A | FJX1 | APOE | CXCL9 | MMP12 |
| LY6E | PRAME | PAIP2B | CXCL5 | NFKBIE | OLR1 |
| IFI44 | AQP9 | WARS | FCER1G | SDC3 | MMP9 |
| LY6K | RENBP | MIIP | ETS1 | PILRA | OTOP3 |
| LYPD1 | WIPF1 | AIM2 | C1S | SLC15A3 | ACP5 |
| HLA-B | GDPD2 | HLA-C | PLEKHO1 | RSAD2 | ITGB2 |
| OASL | IL4I1 | EPSTI1 | ICAM1 | LAMP3 | LCP1 |
| UBE2L6 | SPP1 | ADH7 | ARL4D | CXCL11 | CTSZ |
| IFIT2 | UGT1A10 | TAP1 | OLFM1 | NLRC5 | SHISA2 |
| TLR3 | SERPINA1 | HERC5 | SLAMF8 | HLA-A | SLC2A6 |
| FBXL6 | IL18 | B3GAT3 | PLA2G7 | IFIT1 | CD83 |
| IFIT3 | THEMIS2 | SH2D2A | BCL2A1 | BST2 | GPRC5A |
| GNLY | ABCD1 | PARP12 | PKN1 | IFI27 | CTSL |
| HLA-G | NINJ1 | IFI6 | GAA | IFI35 | LHFPL2 |
| KLHDC7B | MARCKSL1 | DNAH17 | ADAMDEC1 | FPR3 | ALOX12 |
| ISG15 | ITGAX | PSMB9 | CST1 | ADAM8 | LY96 |
| MAD2L2 | FOXP3 | IL32 | SNX10 |  |  |

**Table S4A:** Analysis of the expression of RENBP and the clinical pathological parameters.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| characteristics | Level | Low Expression | High Expression | P |
| Gender | Male | 14 | 14 | 1.000 |
|  | Female | 1 | 0 |  |
| Age | ≤60 | 6 | 3 | 0.427 |
|  | ＞60 | 9 | 11 |  |
| T Staging | T1, T2 | 4 | 5 | 0.700 |
|  | T3, T4 | 11 | 9 |  |
| N Staging | N0 | 10 | 10 | 1.000 |
|  | N1, N2, N3 | 5 | 4 |  |
| Clinical Staging | Ⅰ, Ⅱ | 4 | 4 | 1.000 |
|  | Ⅲ, Ⅳ | 11 | 10 |  |
| Degree of Differentiation | Moderately and Poorly Differentiated | 12 | 11 | 1.000 |
|  | Well Differentiated | 3 | 3 |  |
| Smoking History | No | 2 | 0 | 0.483 |
|  | Yes | 13 | 14 |  |
| Drinking History | No | 11 | 10 | 1.000 |
|  | Yes | 4 | 4 |  |

**Table S4B:** Analysis of the expression of OLR1 and the clinical pathological parameters.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| characteristics | Level | Low Expression | High Expression | P |
| Gender | Male | 15 | 13 | 0.483 |
|  | Female | 0 | 1 |  |
| Age | ≤60 | 5 | 4 | 1.000 |
|  | ＞60 | 10 | 10 |  |
| T Staging | T1, T2 | 2 | 7 | 0.050 |
|  | T3, T4 | 13 | 7 |  |
| N Staging | N0 | 8 | 12 | 0.109 |
|  | N1, N2, N3 | 7 | 2 |  |
| Clinical Staging | Ⅰ, Ⅱ | 2 | 6 | 0.109 |
|  | Ⅲ, Ⅳ | 13 | 8 |  |
| Degree of Differentiation | Moderately and Poorly Differentiated | 13 | 10 | 0.390 |
|  | Well Differentiated | 2 | 4 |  |
| Smoking History | No | 1 | 1 | 1.000 |
|  | Yes | 14 | 13 |  |
| Drinking History | No | 10 | 11 | 0.682 |
|  | Yes | 5 | 3 |  |

Taken the median of the difference between the RT-qPCR results of cancer and adjacent cancer as the critical value, laryngeal cancer patients were divided into the OLR1 low expression group (15 cases), OLR1 high expression group (14 cases), RENBP low expression group (15 cases) and the RENBP high expression group (14 cases). We analyzed the relationship between the expression levels of OLR1 and RENBP genes and clinical pathological parameters of patients by using Fisher's exact probability method. The analysis results showed that there were no statistically significant differences (P<0.05) in age, gender, N stage, clinical stage, degree of differentiation, smoking and drinking among laryngeal cancer patients with different levels of OLR1 and RENBP expression. But there is a difference between the expression of OLR1 and T staging.

Raw Data: The raw data of this study can be found in **Figshare**. DOI. 10.6084/m9.figshare.26799013