

Supplemental Table S5. Downregulated Differentially Expressed Genes and Enriched Functional Annotations of RL-PTCs before Adjustment for the Thyroiditis Status according to the Clinicopathological Prognostic Factors

Annotation	q value	Genes
Age		
Regulation of immune response	7.82×10^{-14}	<i>IGHV4-39, ICAM4, SLA2, CD1C, CD1B, CD3D, KLRK1, IGLV1-40, IGLV1-47, IGKC, IGLV3-21, CD19, TRBC1, IGKV3-15, SLAMF7, SLAMF6, IGLC2, IGHV3-33, IGKV1-5, SH2D1A, CRTAM, CD8B, IGKV4-1, SIGLEC7, HCST, IGKV3-20</i>
Antigen binding	7.40×10^{-12}	<i>IGHM, LAG3, IGHV3-33, IGKV1-5, IGHV4-39, IGHG3, IGHG2, IGLV1-40, IGLV1-47, IGKC, IGLV3-21, IGHD, IGKV4-1, IGKV3-15, TRDC, IGLC2, IGHA1, IGKV3-20, SLAMF1</i>
Immune response	1.07×10^{-10}	<i>IL21, ADAMDEC1, CXCL9, CCL4L2, CXCR5, IGHV4-39, CTSW, CXCL14, IGLV1-40, IGLV1-47, IGKC, IGLV3-21, CCL5, TRBC1, IGKV3-15, TNFSF11, CCL19, CCL18, IGHA1, TRGC2, CD70, IGHV3-33, IGKV1-5, GZMH, CXCL11, AIM2, CD8B, ITGAD, CD7, IGHD, IGKV4-1, LTB, IGKV3-20</i>
Extracellular region	1.44×10^{-10}	<i>PRSSI, ORM1, ADAMDEC1, CXCL9, SCT, CCL4L2, CXCL17, ICAM4, IGHV4-39, CTSW, ORM2, CXCL14, HAPLN1, IGHG3, IGHG2, PLAU, IGKV1-12, IL12B, TNFSF11, IGLC2, INSL3, IGHV3-33, C4ORF48, DKK1, PRAP1, C1QL2, F5, SFRP1, CD8B, PLA2G10, MZB1, IGKV4-1, DSC3, LYPD1, ITIH1, KLK6, IL22RA2, IGLV1-40, IGLV1-47, IGKC, IGLV3-21, CCL5, NPY, PENK, PPY, SPP1, IGKV3-15, IGFBP6, CCL19, IGHA1, BCHE, PLA2G2D, IGKV1-5, IGFL2, GDF6, KLK10, CD2, GZMK, POMC, CXCL11, SST, APOC2, PNOC, SIGLEC6, IGKV3-20</i>
Plasma membrane	1.44×10^{-10}	<i>CLEC10A, CPNE7, SIRPG, IHH, ICAM4, PKD2L1, AQP5, GPR62, CLDN2, SLA2, RPH3A, GPR174, PLAU, TRBC1, IGKV1-12, TNFSF11, CASR, IGHV3-33, KRT5, DKK1, EDAR, SFRP1, ASTL, CD8B, CLDN9, LY6D, IGKV4-1, DSC3, ADCYAP1R1, GYPE, CHRNA6, LYPD1, SLC5A1, CD1C, SLC6A20, RASGRP1, CD1B, IL22RA2, CD79A, NKAIN1, OR211P, KLRK1, IGLV1-40, NKAIN3, IGLV1-47, GALR2, ADGRG5, CD19, PENK, IGKV3-15, SLAMF7, SLAMF6, KCNN4, XCRI, SYTI, PCDH20, CRTAM, SLC4A10, ESRI, FXYD3, ALPP, FXYD2, PNOC, IGKV3-20, PT-PR1, IGHM, SLC44A4, TREH, RASGRF1, IGHV4-39, MSLN, CD3D, GRM3, PST-PIP1, ANXA8, IGLC2, SLC18A3, AMN, KCND2, FCRL3, FCRL4, RHOH, F5, CLDN10, GAP43, ITGAD, CDHR1, IGHD, DSG3, LTB, CDH15, HCST, CAMK1G, CATSPER1, PTGER1, CAMK2A, CLECLI, CXCR5, ATP1A4, KCNA4, ADCY2, ADCY8, IGKC, IGLV3-21, CXCR3, LY6G6C, CACNG4, TRAT1, CD70, IGKV1-5, SNX20, CD2, KRT19, CYP2W1, P2RX5, CD7, PDCD1, SIGLEC7</i>
Extracellular space	5.80×10^{-10}	<i>IL21, IGHM, ORM1, CXCL9, SCT, CCL4L2, CXCL17, IHH, ICAM4, CTSW, ELFN2, MSLN, ORM2, CXCL14, IGHG3, SMR3B, IGHG2, PLAU, IL12B, TNFSF11, IGLC2, LGALS7, AMN, MIA, CARTPT, DKK1, SERPINB5, F5, SFRP1, IFNE, LTB, CST6, KLK6, IL22RA2, IGKC, CCL5, NPY, SPOCK3, PPY, SPP1, IGFBP6, CCL19, IGHA1, CCL18, CPA5, ZG16B, CD70, GDF6, MSMP, KLK11, KLK12, POMC, CXCL11, SST, APOC2, SCGB3A1, IGKV3-20</i>
Blood microparticle	1.28×10^{-9}	<i>BCHE, IGHM, PRSSI, ORM1, IGKV1-5, ITIH1, ORM2, IGHG3, IGHG2, IGLV1-47, IGKC, IGLV3-21, IGHD, IGKV4-1, IGKV3-15, TRDC, IGLC2, IGHA1, IGKV3-20</i>
Complement activation, classical pathway	1.34×10^{-9}	<i>IGHM, IGHV3-33, IGKV1-5, IGHV4-39, IGHG3, IGHG2, IGLV1-40, IGLV1-47, IGKC, IGLV3-21, IGHD, IGKV4-1, IGKV3-15, TRDC, IGLC2, IGHA1, IGKV3-20</i>
Serine-type endopeptidase activity	1.14×10^{-8}	<i>PRSSI, IGHV3-33, TMPRSS4, IGKV1-5, IGHV4-39, KLK10, KLK11, F5, KLK12, KLK6, GZMH, IGHG3, GZMK, IGHG2, IGLV1-40, IGLV1-47, IGKC, PLAU, IGLV3-21, IGKV4-1, IGKV3-15, IGLC2, IGKV3-20</i>
External side of plasma membrane	3.93×10^{-8}	<i>IGHM, CXCL9, LAG3, DNAI2, CXCR5, IGHG3, CD2, CD79A, KLRK1, IGHG2, IGKC, CD8B, CD19, CXCR3, IGHD, TRDC, PDCD1, IGLC2, IGHA1, SLAMF1</i>

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Supplemental Table S5. Continued

Annotation	q value	Genes
Size		
Complement activation	3.65×10^{-38}	<i>FCN1, IGHV2-5, CFH, CIS, CIR, IGHV3-23, IGHV4-59, IGHV3-48, C2, IGLV2-8, IGLV3-25, IGHG1, C6, IGHG2, IGLV3-27, IGLV1-47, C7, IGLV6-57, IGKC, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGKV2-40, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV2-23, IGKV4-1, CFB, IGKV2-30</i>
Complement activation, classical pathway	7.98×10^{-38}	<i>IGHV2-5, CIS, CIR, IGHV3-23, IGHV4-59, IGHV3-48, C2, IGLV2-8, IGLV3-25, IGHG1, C6, IGHG2, IGLV3-27, IGLV1-47, C7, IGLV6-57, IGKC, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHA1, IGKV2-40, CR1, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLL5, IGLV2-23, IGHD, IGKV4-1, IGKV2-30</i>
Extracellular region	5.72×10^{-34}	<i>FCN1, SERPINA3, ADAMDEC1, HHIP, IGHV3-23, CHRDL1, JCHAIN, IGLV2-8, IL4I1, IGHG1, IGHG2, PLAU, IGKV1-12, IGLC3, FDCSP, COL10A1, IGLC1, SVEP1, IGHV3-7, PROK1, CHGB, SERPINB2, IGHV3-33, ADIPOQ, OMD, IGKV1D-39, DCN, MMP12, BCAN, SFRP2, MZB1, IGKV4-1, CRH, CFB, IGKV2-30, COL17A1, CCL13, PTGFR, IGHV2-5, CFH, SFTPA2, CIS, PCOLCE2, GRP, CIR, NXP4, CD5L, IGHV4-59, NDNF, IGHV3-48, FBLN1, NTN1, C2, IGLV3-25, C6, IGLV3-27, IGLV1-47, IGKC, C7, IGLV6-57, WIF1, IGLV3-21, NPY, IGLV1-44, PENK, PPY, IGKV3-15, APOD, CCL19, IGHA1, IGKV2-40, BCHE, CCL22, LUM, IGHV3-11, IGKV5-2, IGKV1-5, PLA2G2A, FNI, WNT7A, IGF1, S100B, GDF6, IGSF10, MFAP4, CXCL10, CXCL11, GDNF, IGLV2-23, PNOG, SAA1, CRLF1, FGF10, CBLN1</i>
Receptor-mediated endocytosis	4.19×10^{-21}	<i>IGHV2-5, IGHV3-23, CD5L, IGHV4-59, IGHV3-48, JCHAIN, IGLV2-8, IGLV3-25, IGLV3-27, IGLV1-47, IGLV6-57, IGKC, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHA1, IGKV2-40, SCARA5, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV2-23, CD207, SAA1, IGKV4-1, IGKV2-30</i>
Fc-gamma receptor signaling pathway involved in phagocytosis	5.83×10^{-21}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGHV3-48, IGLV2-8, IGLV3-25, IGHG1, IGHG2, IGLV3-27, IGLV1-47, IGLV6-57, IGKC, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGKV2-40, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV2-23, IGKV4-1, IGKV2-30</i>
Regulation of immune response	1.09×10^{-20}	<i>COL17A1, IGHV2-5, IGHV3-23, IGHV4-59, IGHV3-48, CD1C, CD1B, IGLV2-8, IGLV3-25, IGLV3-27, IGLV1-47, IGLV6-57, IGKC, IGLV3-21, CD19, IGLV1-44, IGLC3, IGKV3-15, SLAMF7, IGLC1, IGHV3-7, IGKV2-40, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV2-23, IGKV4-1, IGKV2-30</i>
Immune response	2.97×10^{-19}	<i>CCL13, ADAMDEC1, IGHV2-5, CIR, IGHV3-23, IGHV4-59, IGHV3-48, CD1E, JCHAIN, IGLV2-8, IGLV3-25, IGLV3-27, IGLV1-47, C7, IGLV6-57, IGKC, IGLV3-21, IGLV1-44, IGKV3-15, CCR8, IGLC1, CCR7, CCL19, IGHV3-7, IGHA1, CCR4, IGKV2-40, CCL22, IGHV3-33, TNFRSF9, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, CXCL10, CXCL11, IGLV2-23, IGHD, IGKV4-1, IGKV2-30</i>
Blood microparticle	2.62×10^{-18}	<i>SERPINA3, CFH, CIS, CIR, IGHV3-23, CD5L, JCHAIN, IGLV3-25, IGHG1, IGHG2, IGLV1-47, IGKC, IGLV3-21, IGLC3, IGKV3-15, IGLC1, IGHA1, IGKV2-40, BCHE, IGKV1-5, FNI, IGLL5, IGHD, IGKV4-1, CFB, IGKV2-30</i>
Fc-epsilon receptor signaling pathway	3.62×10^{-16}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGHV3-48, IGLV2-8, IGLV3-25, IGLV3-27, IGLV1-47, IGLV6-57, IGKC, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, FCER1A, IGLC1, IGHV3-7, IGKV2-40, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV2-23, IGKV4-1, IGKV2-30</i>
Proteolysis	4.75×10^{-15}	<i>FCN1, ADAMDEC1, IGHV2-5, CIS, CIR, IGHV3-23, IGHV4-59, IGHV3-48, C2, IGLV2-8, IGLV3-25, IGHG1, RELN, IGHG2, IGLV3-27, IGLV1-47, IGLV6-57, IGKC, CAPN6, PLAU, IGLV3-21, UBD, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGKV2-40, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, MMP12, IGLV2-23, IGKV4-1, CFB, IGKV2-30</i>

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Supplemental Table S5. Continued

Annotation	<i>q</i> value	Genes
Extrathyroidal extension		
Antigen binding	2.41 × 10 ⁻²²	<i>IGHM, IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGLL5, IGHG4, IGHG2, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGHA1, IGKV3-20</i>
Complement activation, classical pathway	2.91 × 10 ⁻²²	<i>IGHM, IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGLL5, IGHG4, IGHG2, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGHA1, IGKV3-20</i>
Complement activation	3.75 × 10 ⁻¹⁸	<i>IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGHG4, IGHG2, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGKV3-20</i>
Fc-gamma receptor signaling pathway involved in phagocytosis	9.61 × 10 ⁻¹⁶	<i>IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGHG4, IGHG2, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGKV3-20</i>
Serine-type endopeptidase activity	1.09 × 10 ⁻¹²	<i>IGHV3-30, IGHV3-11, IGHV4-59, KLK4, IGHV3-48, IGHV4-39, IGLV2-8, IGHG4, IGHG2, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGKV3-20</i>
Receptor-mediated endocytosis	5.94 × 10 ⁻¹²	<i>IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGHA1, IGKV3-20</i>
Fc-epsilon receptor signaling pathway	4.96 × 10 ⁻¹¹	<i>IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGKV3-20</i>
Regulation of immune response	4.96 × 10 ⁻¹¹	<i>IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, IGHV4-39, IGLV2-8, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGKV3-20</i>
Extracellular region	6.15 × 10 ⁻¹⁰	<i>CALCB, NXPH4, IGHV4-59, KLK4, IGHV3-48, DEFB1, IGHV4-39, IGLV2-8, SCUBE2, IGHG4, IGHG2, IGKV1-16, IGLV1-47, IGLV6-57, IGKC, OBP2B, LIPI, PPY, IGLC1, EPPIN, IGHA1, CHGB, IGHV3-30, IGHV3-11, GDF6, IGKV2D-28, IGLV2-23, COL9A3, CRLF1, IGKV3-20</i>
Immune response	1.86 × 10 ⁻⁸	<i>IGHV3-30, IGHV3-11, IGHV4-59, IGHV3-48, DEFB1, IGHV4-39, IGLV2-8, IGKV2D-28, IGKV1-16, IGLV6-57, IGLV1-47, IGKC, IGLV2-23, IGLC1, IGHA1, IGKV3-20</i>
Lymph node metastasis		
Extracellular region	2.10 × 10 ⁻⁴	<i>LAMC3, NXPH4, KLK4, DEFB1, MTRNR2L8, LIPF, ENHO, SCUBE2, LIPI, NPY, PPY, CHGB, KIRREL3, BTBD17, LGI2, GDF1, KLK15, GDF6, BCAN, EFNA2, PNOC, TLL2, COL9A3, COL6A6, DAND5</i>
Juxtaparanode region of axon	4.63 × 10 ⁻²	<i>CNTNAP2, DLG2, KCNA1</i>
Voltage-gated potassium channel complex	4.63 × 10 ⁻²	<i>CNTNAP2, DLG2, KCNA1, KCNN1, HCN2</i>
MACIS score		
Antigen binding	1.32 × 10 ⁻⁴⁹	<i>IGHM, IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, JCHAIN, IGLV2-11, IGLV2-8, IGHG3, IGLV3-25, IGHG2, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, TRDC, IGHV3-7, IGHA1, IGHA2, SLAMF1, LAG3, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, HLA-G, IGKV1D-12, IGLL5, IGLV1-51, IGHD, IGKV4-1, IGKV3-20, IGKV2-30, IGLV3-19</i>
Complement activation, classical pathway	1.38 × 10 ⁻⁴⁷	<i>IGHM, IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, C2, IGLV2-11, IGLV2-8, IGHG3, IGLV3-25, IGHG2, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, TRDC, IGHV3-7, IGHA1, IGHA2, CR2, IGHV3-30, CR1, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, IGKV1D-12, IGLL5, IGLV1-51, IGHD, IGKV4-1, IGKV3-20, IGKV2-30, IGLV3-19</i>

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Supplemental Table S5. Continued

Annotation	q value	Genes
Immune response	1.29×10^{-41}	<i>IL21, ADAMDECI, CXCL9, IGHV3-23, IGKV3D-11, FASLG, IGHV4-39, CTSW, CXCL13, CXCL14, JCHAIN, IGLV2-8, IGKV1-16, IGKV1-17, IGLC1, IGHV3-7, CCR5, CCR2, HLA-DPA1, CR2, IGHV3-30, IGHV3-33, TNFRSF18, IGKV1D-39, LAX1, CD8B, IGHD, IGKV4-1, LTB, IGKV2-30, IGLV3-19, HLA-DQB1, IGHV2-5, IGHV4-59, IL2RG, CD1A, IGLV2-11, IGLV3-25, IGKC, IGLV6-57, IGLV2-14, IGLV3-21, CCL5, IGLV1-44, IGKV3-15, CCL19, IGHA1, GBP2, CCL18, IGHA2, HLA-DQA1, TRGC2, IL32, IGHV3-53, TNFSF14, IGHV3-11, GZMA, IGKV5-2, IGKV1-5, IGLV7-43, IGKV1D-12, CXCL10, CXCL11, IGLV1-51, CD27, IGKV3-20</i>
Regulation of immune response	8.28×10^{-41}	<i>IGHV2-5, KLRB1, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, ITGAL, CD3D, CD1A, IGLV2-11, IGLV2-8, IGLV3-25, KLRK1, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, CD19, IGLV1-44, IGLC3, IGKV3-15, SLAMF7, IGLC1, SLAMF6, IGHV3-7, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, SH2D1A, CRTAM, IGKV1D-39, IGLV7-43, HLA-G, IGKV1D-12, NCR1, IGLV1-51, CD8B, IGKV4-1, HCST, CARD11, IGKV3-20, IGKV2-30, IGLV3-19</i>
Complement activation	9.75×10^{-41}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, C2, IGLV2-11, IGLV2-8, IGHG3, IGLV3-25, IGHG2, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, IGKV1D-12, IGLV1-51, CFHRI, IGKV4-1, IGKV3-20, CFB, IGKV2-30, IGLV3-19</i>
Fc-gamma receptor signaling pathway involved in phagocytosis	9.11×10^{-31}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, IGLV2-11, IGLV2-8, IGHG3, IGLV3-25, IGHG2, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, IGKV1D-12, IGLV1-51, IGKV4-1, IGKV3-20, IGKV2-30, IGLV3-19, MYO1G</i>
Serine-type endopeptidase activity	5.22×10^{-27}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, C2, IGLV2-11, IGLV2-8, IGHG3, IGLV3-25, IGHG2, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, PLAU, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, GZMA, IGKV1-5, IGKV1D-39, IGLV7-43, KLK11, KLK12, IGKV1D-12, GZMK, IGLV1-51, IGKV4-1, IGKV3-20, CFB, IGKV2-30, IGLV3-19</i>
Receptor-mediated endocytosis	7.29×10^{-26}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, JCHAIN, IGLV2-11, IGLV2-8, IGLV3-25, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHA1, IGHA2, AMN, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, IGKV1D-12, IGLV1-51, IGKV4-1, IGKV3-20, IGKV2-30, IGLV3-19</i>
Fc-epsilon receptor signaling pathway	2.04×10^{-25}	<i>IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, PSMA8, IGLV2-11, IGLV2-8, IGLV3-25, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, IGLV3-21, IGLV1-44, IGLC3, IGKV3-15, IGLC1, IGHV3-7, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, PSMB9, IGKV1D-12, IGLV1-51, IGKV4-1, CARD11, IGKV3-20, IGKV2-30, IGLV3-19</i>
Proteolysis	3.26×10^{-20}	<i>ADAMDECI, IGHV2-5, IGHV3-23, IGHV4-59, IGKV3D-11, IGHV4-39, C2, IGLV2-11, IGLV2-8, IGHG3, IGLV3-25, IGHG2, IGKV1-16, IGLV6-57, IGKC, IGKV1-17, IGLV2-14, PLAU, IGLV3-21, ADAMTS18, UBD, IGLV1-44, IGLC3, CLCA2, IGKV3-15, IGLC1, IGHV3-7, IGHV3-30, IGHV3-53, IGHV3-33, IGHV3-11, IGKV5-2, IGKV1-5, IGKV1D-39, IGLV7-43, KLK11, KLK12, IGKV1D-12, GZMK, CAPN12, IGLV1-51, ASTL, MMP16, IGKV4-1, IGKV3-20, CFB, IGKV2-30, IGLV3-19</i>

RL-PTC, *RAS*-like papillary thyroid carcinoma; MACIS, metastasis-age-completeness of resection-invasion-size.