**Supplementary Tables**

**Table S1. GO analysis of PTPN family based on the DAVID tool.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Category** | **Term** | **Annotation** | **Count** | **FDR** |
| BP | GO:0035335 | peptidyl-tyrosine dephosphorylation | 18 | <0.001 |
| BP | GO:0006470 | protein dephosphorylation | 13 | <0.001 |
| BP | GO:0050860 | negative regulation of T cell receptor signaling pathway | 3 | 0.009 |
| BP | GO:0060338 | regulation of type I interferon-mediated signaling pathway | 3 | 0.015 |
| BP | GO:0043407 | negative regulation of MAP kinase activity | 3 | 0.024 |
| CC | GO:0005737 | cytoplasm | 15 | <0.001 |
| CC | GO:0009898 | cytoplasmic side of plasma membrane | 4 | <0.001 |
| CC | GO:0005856 | cytoskeleton | 6 | <0.001 |
| CC | GO:0005634 | nucleus | 10 | 0.332 |
| CC | GO:0019898 | extrinsic component of membrane | 2 | 0.517 |
| MF | GO:0004725 | protein tyrosine phosphatase activity | 18 | <0.001 |
| MF | GO:0004726 | non-membrane spanning protein tyrosine phosphatase activity | 7 | <0.001 |
| MF | GO:0030971 | receptor tyrosine kinase binding | 4 | <0.001 |
| MF | GO:0001784 | phosphotyrosine binding | 3 | <0.001 |
| MF | GO:0005515 | protein binding | 17 | 0.002 |

**Table S2. GO analysis of PTPN7 in BrCa based on the Linked Omics tool.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Category** | **Term** | **Annotation** | **Count** | **FDR** |
| BP | GO:0071806 | protein transmembrane transport | 59 | 0.010 |
| BP | GO:0032633 | interleukin-4 production | 34 | 0.016 |
| BP | GO:0001773 | myeloid dendritic cell activation | 27 | 0.024 |
| BP | GO:0050690 | regulation of defense response to virus by virus | 29 | 0.027 |
| BP | GO:0045730 | respiratory burst | 27 | 0.038 |
| CC | GO:0001772 | immunological synapse | 32 | 0.012 |
| CC | GO:0042629 | mast cell granule | 21 | 0.013 |
| CC | GO:0042611 | MHC protein complex | 19 | 0.016 |
| CC | GO:0071782 | endoplasmic reticulum tubular network | 18 | 0.018 |
| CC | GO:0001891 | phagocytic cup | 21 | 0.024 |
| MF | GO:0016502 | nucleotide receptor activity | 22 | 0.009 |
| MF | GO:0003823 | antigen binding | 52 | 0.009 |
| MF | GO:0015026 | coreceptor activity | 39 | 0.012 |
| MF | GO:0042287 | MHC protein binding | 24 | 0.019 |
| MF | GO:0038187 | pattern recognition receptor activity | 20 | 0.020 |

**Table S3. Correlation analysis between PTPN7 and PD-L1 in pan-cancer.**

|  |  |  |
| --- | --- | --- |
| **Cancer type** | **R value** | **P value** |
| ACC | 0.413  | <0.001  |
| BLCA | 0.643  | <0.001  |
| BRCA | 0.712  | <0.001  |
| CESC | 0.441  | <0.001  |
| CHOL | 0.639  | <0.001  |
| COAD | 0.613  | <0.001  |
| DLBC | 0.499  | <0.001  |
| ESCA | 0.396  | <0.001  |
| GBM | 0.412  | <0.001  |
| HNSC | 0.572  | <0.001  |
| KICH | 0.155  | 0.214  |
| KIRC | 0.410  | <0.001  |
| KIRP | 0.277  | <0.001  |
| LGG | 0.403  | <0.001  |
| LIHC | 0.530  | <0.001  |
| LUAD | 0.623  | <0.001  |
| LUSC | 0.430  | <0.001  |
| MESO | 0.478  | <0.001  |
| OV | 0.618  | <0.001  |
| PAAD | 0.532  | <0.001  |
| PCPG | 0.295  | <0.001  |
| PRAD | 0.680  | <0.001  |
| READ | 0.574  | <0.001  |
| SARC | 0.415  | <0.001  |
| SKCM | 0.741  | <0.001  |
| STAD | 0.552  | <0.001  |
| TGCT | 0.791  | <0.001  |
| THCA | 0.578  | <0.001  |
| THYM | 0.064  | 0.487  |
| UCEC | 0.458  | <0.001  |
| UCS | 0.588  | <0.001  |
| UVM | 0.516  | <0.001  |

**Table S4. Correlation analysis between PTPN7 and CTLA-4 in pan-cancer.**

|  |  |  |
| --- | --- | --- |
| Cancer type | R value | P value |
| ACC | 0.157  | 0.166  |
| BLCA | 0.896  | <0.001  |
| BRCA | 0.841  | <0.001  |
| CESC | 0.800  | <0.001  |
| CHOL | 0.748  | <0.001  |
| COAD | 0.637  | <0.001  |
| DLBC | 0.288  | 0.047  |
| ESCA | 0.738  | <0.001  |
| GBM | 0.468  | <0.001  |
| HNSC | 0.716  | <0.001  |
| KICH | 0.739  | <0.001  |
| KIRC | 0.784  | <0.001  |
| KIRP | 0.647  | <0.001  |
| LGG | 0.369  | <0.001  |
| LIHC | 0.864  | <0.001  |
| LUAD | 0.812  | <0.001  |
| LUSC | 0.782  | <0.001  |
| MESO | 0.670  | <0.001  |
| OV | 0.724  | <0.001  |
| PAAD | 0.816  | <0.001  |
| PCPG | 0.686  | <0.001  |
| PRAD | 0.756  | <0.001  |
| READ | 0.502  | <0.001  |
| SARC | 0.738  | <0.001  |
| SKCM | 0.593  | <0.001  |
| STAD | 0.674  | <0.001  |
| TGCT | 0.899  | <0.001  |
| THCA | 0.909  | <0.001  |
| THYM | -0.318 | <0.001  |
| UCEC | 0.736  | <0.001  |
| UCS | 0.563  | <0.001  |
| UVM | 0.729  | <0.001  |