**Table 1: Previously published gene expression signatures that were used to compare our prediction models with.**

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| --- | --- |
| **Gene expression signatures** | **Genes** |
| Follicular B helper T cells (Tfh) signature | CD200, CXCL13, FBLN7, ICOS, SGPP2, SH2D1A, TIGIT, PDCD1 |
| T helper cells (Th1) signature | CCND2, CD38, CTLA4, RAB27A, RAB33A, SH2D2A, STAT1, TNFRSF4, IL12RB2, SAMD9L, CXCL9, IFNG |
| Regulatory T cells (Treg) signature | FOXP3, C15orf53, IL5, CTLA4, IL32, GPR15, IL4 |
| STAT1 signature | CXCL10, CXCL11, GBP1, STAT1 |
| Immune1 signature | C1QA, XCL2, SPP1, TNFRSF17, LY9, IGLC2, HLA-F |
| Immune2 signature | STAT1, CXCL10, TAP1, XCL11, CXCL9, MX1, INDO, ISG15, LAMP3, IFIT3, MX2, IFI44L, HERC6, RTP4, CCL5, HERC5, RSAD2, CD2, DDX58, ADAMDEC1, HCP5, FLJ20035, NMI, TFEC, IRF1, TRIM22, SPOCK2, UBD, SP140, CCL8, PSCDBP, CD3G, CTSC, IFI6, PLA2G7, ECGF1, STAT4, LAG3, LYZ, PLAC8, CD48, GZMK, ETV7, FASLG, GPR18, FGL2, IFI30, P2RX5, PTPN7, LAPTM5, IRF8, PIM2, BIRC3, CD69, SH2D1A, IFITM1, IFIT5, GPR171, ITGB2, PSME1, BTN3A2, HCLS1, IGSF6, KLRK1, SECTM1, ARHGAP15, PIP3-E, EBI2, SNX10, FLJ11286, DHX58, BST2, MGC29506, APOC1, VAV1, CLEC4A, LILRA4, ZC3HAV1, CD40LG, DDAH2, CCRL2, GLRX, CECR1, TRGV9, RFX5, ACP5, EBI3, IL18, KLRC3, RAB8A, REC8, RASGRP1, EFNA1, TRAF3, DNAL4 |
| Interferon-γ signature | IL2RG, CXCR6, CD3D, ITGAL, TAGAP, CIITA, HLA-DRA, PTPRC, CXCL9, CCL5, NKG7, GZMA, PRF1, CCR5, CD3E, GZMK, IFNG, HLA-E, GZMB, PDCD1, SLAMF6, CXCL13, CXCL10, IDO1, LAG3, STAT1, CXCL11 |

**Table 2: Results from univariable cox regression analysis (with hazard ratios, 95% confidence interval and p-values of the best prediction model and other gene expression signatures across multiple solid tumor types.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Tumor**  **Type** | **Parameters** | **ECA** | **Tfh** | **Th1** | **Treg** | **STAT1** | **Immune1** | **Immune2** | **Interferon-γ** |
| **Bladder carcinoma**  **(N = 408)** | **Hazard Ratio**  (UCI – LCI) | 0.57 (0.42-0.78) | 0.88  (0.78-1.00) | 0.90 (0.80 –1.03) | 0.88  (0.77-0.99) | 0.91 (0.80-1.03) | 1.01 (0.89-1.14) | 0.89 (0.79-1.01) | 0.87 (0.77 – 0.99) |
| **P-value** | 5e-4 | 0.06 | 0.13 | 0.04 | 0.17 | 0.86 | 0.09 | 0.04 |
| **TNBC (TCGA; N =150)** | **Hazard Ratio**  (UCI – LCI) | 0.38 (0.11-0.79) | 0.83 (0.57-1.2) | 0.66 (0.46-0.95) | 0.79 (0.56-1.11) | 0.63 (0.45-0.89) | 0.89 (0.62-1.27) | 0.76 (0.53-1.07) | 0.72 (0.50-1.04) |
| **P-value** | 0.01 | 0.32 | 0.03 | 0.18 | 0.008 | 0.53 | 0.12 | 0.08 |
| **Cervical carcinoma**  **(N = 304)** | **Hazard Ratio**  (UCI – LCI) | 0.54 (0.32-0.92) | 0.66 (0.52-0.84) | 0.76 (0.62-0.94) | 0.94 (0.65-0.95) | 0.83 (0.68-1.01) | 0.9 (0.73-1.10) | 0.75 (0.60-0.91) | 0.72 (0.58-0.98) |
| **P-value** | 0.02 | 6e-4 | 0.01 | 0.01 | 0.07 | 0.31 | 5e-3 | 3e-3 |
| **Colon adenocarcinoma (N = 283)** | **Hazard Ratio**  (UCI – LCI) | 0.54 (0.33-0.87) | 0.84 (0.68-1.02) | 0.87 (0.77-1.05) | 0.72 (0.60-0.87) | 0.83 (0.67-1.02) | 1.03 (0.85-1.25) | 0.92 (0.76-1.12) | 0.89 (0.72-1.08) |
| **P-value** | 0.12 | 0.08 | 0.16 | 5e-3 | 0.08 | 0.71 | 0.44 | 0.25 |
| **GBM (N = 152)** | **Hazard Ratio**  (UCI – LCI) | 1.85 (1.16-2.94) | 1.11 (0.91-1.33) | 1.06 (0.90-1.26) | 1.16 (0.98-1.36) | 1.03 (0.87-1.23) | 1.18 (0.98-1.43) | 1.09 (0.93-1.28) | 1.14 (0.96-1.34) |
| **P-value** | 9e-3 | 0.29 | 0.46 | 0.08 | 0.71 | 0.08 | 0.29 | 0.12 |
| **Head and neck (N = 520)** | **Hazard Ratio**  (UCI – LCI) | 0.60 (0.43-0.83) | 0.77 (0.68-0.88) | 0.87 (0.77-0.98) | 0.78 (0.69-0.88) | 0.93 (0.82-1.04) | 0.97 (0.86-1.09) | 0.88 (0.78-0.99) | 0.83 (0.73-0.93) |
| **P-value** | 2e-3 | 8.71e-5 | 0.02 | 7.53e-05 | 0.21 | 0.56 | 0.04 | 2.6e-3 |
| **Clear cell renal carcinoma (N = 533)** | **Hazard Ratio**  (UCI – LCI) | 0.57 (0.43-0.75) | 1.20 (1.06-1.37) | 1.13 (0.99-1.29) | 1.27 (1.03-1.47) | 1.09 (0.96-1.24) | 1.16 (1.01-1.32) | 1.13 (0.99-1.29) | 1.14 (1.01-1.30) |
| **P-value** | 4.61e-5 | 5e-3 | 0.06 | 9.6e-4 | 0.19 | 0.03 | 0.06 | 0.04 |
| **Papillary cell renal carcinoma (N = 290)** | **Hazard Ratio**  (UCI – LCI) | 2.24 (1.41-3.57) | 1.19 (0.95-1.52) | 1.04 (0.82-1.32) | 1.22 (0.95-1.58) | 1.49 (1.27-1.76) | 1.04 (0.82-1.31) | 1.12 (0.89-1.41) | 1.25 (1.02-1.52) |
| **P-value** | 6e-4 | 0.13 | 0.74 | 0.13 | 1.12e-6 | 0.73 | 0.31 | 0.03 |
| **Low grade glioma (N = 515)** | **Hazard Ratio**  (UCI – LCI) | 1.16 (1.25-2.17) | 1.07 (0.92-1.24) | 1.35 (1.18-1.55) | 1.07 (0.93-1.22) | 1.50 (1.33-1.70) | 1.37 (1.16-1.60) | 1.38 (1.21-1.57) | 1.36 (1.20-1.56) |
| **P-value** | 4.4e-4 | 0.39 | 1.19e-5 | 0.36 | 7.15e-11 | 1.7e-4 | 2.39e-6 | 3.07e-6 |
| **Liver carcinoma (N = 371)** | **Hazard Ratio**  (UCI – LCI) | 0.56 (0.41-0.74) | 0.86 (0.74-0.99) | 0.84 (0.73-0.97) | 0.89 (0.78-1.02) | 0.89 (0.78-1.02) | 1.04 (0.91-1.19) | 0.85 (0.73-0.98) | 0.80 (0.68-0.93) |
| **P-value** | 1.1e-4 | 0.04 | 0.02 | 0.11 | 0.11 | 0.51 | 0.02 | 0.003 |
| **Lung adenocarcinoma (N = 515)** | **Hazard Ratio**  (UCI – LCI) | 0.74 (0.58-0.95) | 0.99 (0.88-1.12) | 0.96 (0.85-1.08) | 0.94 (0.84-1.06) | 1.06 (0.94-1.20) | 0.96 (0.85-1.07) | 0.97 (0.86-1.09) | 0.93 (0.82-1.05) |
| **P-value** | 0.02 | 0.89 | 0.51 | 0.34 | 0.35 | 0.42 | 0.57 | 0.25 |
| **Lung squamous cell carcinoma (N = 501)** | **Hazard Ratio**  (UCI – LCI) | 0.74 (0.56-0.97) | 0.92 (0.81-1.05) | 0.97 (0.85-1.1) | 1.01 (0.89-1.15) | 0.96 (0.84-1.09) | 1.02 (0.90-1.16) | 0.99 (0.88-1.13) | 0.96 (0.84-1.09) |
| **P-value** | 0.03 | 0.23 | 0.60 | 0.83 | 0.55 | 0.72 | 0.92 | 0.96 |
| **Melanoma (N = 102)** | **Hazard Ratio**  (UCI – LCI) | 0.45 (0.22-0.89) | 0.76 (0.77-1.05) | 0.77 (0.56-1.05) | 0.70 (0.51-0.97) | 0.80 (0.59-1.08) | 0.89 (0.65-1.23) | 0.70 (0.51-0.97) | 0.69 (0.49-0.96) |
| **P-value** | 0.02 | 0.09 | 0.09 | 0.03 | 0.16 | 0.49 | 0.03 | 0.03 |
| **Ovarian carcinoma (N = 303)** | **Hazard Ratio**  (UCI – LCI) | 0.51 (0.30-0.88) | 0.84 (0.73-0.97) | 0.90 (0.78-1.04) | 0.89 (0.78-1.04) | 0.86 (0.75-0.99) | 0.97 (0.83-1.11) | 0.92 (0.79-1.06) | 0.90 (0.78-1.04) |
| **P-value** | 0.01 | 0.02 | 0.14 | 0.13 | 0.03 | 0.63 | 0.24 | 0.16 |
| **Prostate adenocarcinoma (N = 497)** | **Hazard Ratio**  (UCI – LCI) | 1.59 (1.10-2.30) | 1.03 (0.86-1.23) | 0.86 (0.72-1.04) | 1.17 (0.99-1.39) | 1.05 (0.88-1.26) | 1.38 (1.14-1.66) | 1.16 (0.97-1.39) | 1.05 (0.88-1.25) |
| **P-value** | 0.01 | 0.74 | 0.12 | 0.07 | 0.56 | 6e-4 | 0.10 | 0.60 |
| **Stomach adenocarcinoma (N = 176)** | **Hazard Ratio**  (UCI – LCI) | 1.5 (1.12-2.03) | 0.93 (0.81-1.07) | 1.00 (0.88-1.15) | 0.94 (0.81-1.09) | 0.97 (0.85-1.12) | 1.08 (0.95-1.24) | 1.03 (0.90-1.18) | 0.98 (0.85-1.12) |
| **P-value** | 6.6e-3 | 0.31 | 0.96 | 0.39 | 0.72 | 0.25 | 0.67 | 0.74 |