

Supplementary Table S1. Association between cytokine overexpression and survival.

| PDAC | AG | | | UG | | | |
|---------------|-----|-----|-------------|-----|-----|--------------|-----------------|
| | NOC | NOE | MS | NOC | NOE | MS | p* |
| IL-1 α | 6 | 1 | N/A | 143 | 81 | 19.58 | 0.0925 |
| IL-1 β | 11 | 4 | 34.79 | 138 | 78 | 19.48 | 0.250 |
| IL-6 | 12 | 5 | 49.34 | 137 | 77 | 19.65 | 0.603 |
| IL-18 | 14 | 9 | 15.11 | 135 | 73 | 19.81 | 0.796 |
| IL-33 | 10 | 6 | 43.76 | 139 | 76 | 19.65 | 0.530 |
| IL-36 β | 10 | 4 | 19.81 | 139 | 78 | 19.58 | 0.460 |
| TNF α | 14 | 9 | 22.70 | 135 | 73 | 19.65 | 0.836 |
| IL-1RA | 6 | 2 | 20.17 | 143 | 80 | 19.65 | 0.946 |
| IL-10 | 14 | 8 | 16.98 | 135 | 74 | 19.81 | 0.483 |
| CXCL1 | 8 | 4 | 12.91 | 141 | 78 | 19.81 | 0.794 |
| CXCL5 | 11 | 8 | 12.94 | 138 | 74 | 19.65 | 0.425 |
| CXCL8 | 12 | 9 | 10.12 | 137 | 73 | 19.94 | 0.248 |
| CXCL9 | 10 | 10 | 8.77 | 139 | 72 | 20.17 | 6.145e-4 |
| CXCL10 | 13 | 12 | 9.82 | 136 | 70 | 20.17 | 9.738e-4 |
| CXCL11 | 14 | 12 | 8.77 | 135 | 70 | 20.60 | 4.401e-4 |
| CCL21 | 9 | 4 | 17.90 | 140 | 78 | 19.65 | 0.999 |
| CCL2 | 9 | 4 | 24.05 | 140 | 78 | 19.58 | 0.611 |
| CCL5 | 9 | 6 | 16.98 | 140 | 76 | 19.94 | 0.0774 |

| CCC | AG | | | UG | | | |
|---------------|-----|-----|-------------|-----|-----|--------------|---------------|
| | NOC | NOE | MS | NOC | NOE | MS | p* |
| IL-1 α | 4 | 0 | N/A | 29 | 15 | 24.34 | 0.209 |
| IL-1 β | 1 | 0 | N/A | 32 | 15 | 24.34 | 0.624 |
| IL-6 | 3 | 1 | 12.65 | 30 | 14 | 24.34 | 0.612 |
| IL-18 | 1 | 1 | 63.70 | 32 | 14 | 24.34 | 0.595 |
| IL-33 | 3 | 2 | 11.14 | 30 | 13 | 30.35 | 0.0985 |
| IL-36 β | 5 | 1 | N/A | 28 | 14 | 24.34 | 0.315 |
| TNF α | 4 | 1 | 23.03 | 29 | 14 | 24.34 | 0.495 |
| IL-1RA | 2 | 1 | 24.34 | 31 | 14 | 30.35 | 0.824 |
| IL-10 | 5 | 1 | N/A | 28 | 14 | 23.03 | 0.446 |
| CXCL1 | 2 | 1 | 0.85 | 31 | 14 | 24.34 | 0.910 |
| CXCL5 | 3 | 2 | 8.90 | 30 | 13 | 30.35 | 0.0215 |
| CXCL8 | 3 | 0 | N/A | 30 | 15 | 24.34 | 0.432 |
| CXCL9 | 2 | 0 | N/A | 31 | 15 | 24.34 | 0.222 |
| CXCL10 | 3 | 0 | N/A | 30 | 15 | 24.34 | 0.183 |
| CXCL11 | 4 | 0 | N/A | 29 | 15 | 24.34 | 0.162 |
| CCL21 | 3 | 0 | N/A | 30 | 15 | 23.03 | 0.233 |
| CCL2 | 5 | 1 | 12.65 | 28 | 14 | 24.34 | 0.719 |
| CCL5 | 3 | 1 | N/A | 30 | 14 | 24.34 | 0.663 |

PDAC, pancreatic ductal adenocarcinoma; CCC, cholangiocarcinoma; AG, altered group (putative copy-number alterations; mRNA expression z-score of 1.5 relative to diploid samples); UG, unaltered group; NOC, number of cases (total); NOE, number of Events; MS, median survival (months); p, logrank test p-value

dataset: The Cancer Genome Atlas; tool: cBioPortal

Supplementary Table S2. Association between cytokine expression and tumor immune cell infiltration.

| PDAC | II | algorithm | COR | Rho | p |
|--------|-------------|-----------|-----------------|--------|-----------------|
| CXCL1 | neutrophil | TIMER | positive | 0.39 | 1.31e-07 |
| CXCL5 | neutrophil | TIMER | positive | 0.331 | 9.53e-06 |
| CXCL8 | N/A | | | | |
| CXCL9 | T cell CD8+ | TIMER | positive | 0.609 | 9.11e-19 |
| | T cell CD4+ | TIMER | positive | 0.271 | 3.39e-04 |
| CXCL10 | T cell CD8+ | TIMER | positive | 0.461 | 2.14e-10 |
| | T cell CD4+ | TIMER | NS | 0.007 | 9.27e-01 |
| CXCL11 | T cell CD8+ | TIMER | positive | 0.330 | 1.06e-05 |
| | T cell CD4+ | TIMER | NS | 0.026 | 7.39e-01 |
| CCL21 | T cell CD8+ | TIMER | positive | 0.536 | 3.99e-14 |
| | T cell CD4+ | TIMER | positive | 0.340 | 5.29e-06 |
| CCL2 | monocyte | XCELL | positive | 0.411 | 2.27e-08 |
| | NK cell | XCELL | NS | -0.093 | 2.28e-01 |
| | eosinophil | XCELL | NS | -0.031 | 6.92e-01 |
| CCL5 | monocyte | XCELL | positive | 0.531 | 7.48e-14 |
| | NK cell | XCELL | NS | -0.02 | 7.96e-01 |
| | eosinophil | XCELL | NS | -0.089 | 2.48e-01 |

| CCC | II | algorithm | COR | Rho | p |
|--------|-------------|-----------|-----------------|--------|-----------------|
| CXCL1 | neutrophil | TIMER | NS | 0.105 | 5.49e-01 |
| CXCL5 | neutrophil | TIMER | NS | 0.319 | 6.17e-02 |
| CXCL8 | N/A | | | | |
| CXCL9 | T cell CD8+ | TIMER | positive | 0.448 | 6.96e-03 |
| | T cell CD4+ | TIMER | positive | 0.469 | 4.46e-03 |
| CXCL10 | T cell CD8+ | TIMER | positive | 0.431 | 9.74e-03 |
| | T cell CD4+ | TIMER | NS | -0.185 | 2.88e-01 |
| CXCL11 | T cell CD8+ | TIMER | positive | 0.509 | 1.77e-03 |
| | T cell CD4+ | TIMER | NS | 0.256 | 1.38e-01 |
| CCL21 | T cell CD8+ | TIMER | NS | 0.221 | 2.01e-01 |
| | T cell CD4+ | TIMER | NS | -0.043 | 8.08e-1 |
| CCL2 | monocyte | XCELL | NS | 0.08 | 6.49e-01 |
| | NK cell | XCELL | NS | -0.154 | 3.78e-01 |
| | eosinophil | XCELL | NS | 0.156 | 3.71e-01 |
| CCL5 | monocyte | XCELL | NS | 0.092 | 5.97e-01 |
| | NK cell | XCELL | NS | 0.172 | 3.23e-01 |
| | eosinophil | XCELL | NS | -0.144 | 4.09e-01 |

PDAC, pancreatic ductal adenocarcinoma; CCC, cholangiocarcinoma; II, immune infiltrate; COR, correlation of gene expression and immune cells infiltration; N/A, gene expression not available in the tool; NS, not significant, p, logrank test p-value

dataset: The Cancer Genome Atlas; tool: TIMER