Supplementary figure 1. Study design.



Supplementary figure 2. The VIMP values of all the variables included in our signature. (a) The VIMP values for DFS. (b) The VIMP values for OS.



Supplementary figure 3. K-M curves for differences in patient survival in high-, intermediate-, and low-risk groups from external cohort validation. (a) K-M curves for DFS. (b) K-M curves for OS.



Supplementary table 1 Patient demographics and clinicopathologic data of internal training cohort

|  |  |
| --- | --- |
| Variables | Patients(N=585) |
| Gender |  |
| Male | 406 (69.4%) |
| Female | 179 (30.6%) |
| Median follow-up months | 45.0 |
| Median age (mean ± SD) | 63 (62.38 ± 11.67) |
| T stage |  |
| T1+T2 | 184 (31.4%) |
| T3 | 125 (21.4%) |
| T4 | 276 (47.2%) |
| N stage |  |
| N0 | 261 (44.6%) |
| N1 | 84 (14.4%) |
| N2 | 97 (16.6%) |
| N3 | 143 (24.4%) |
| Pathological stage |  |
| I | 154 (26.3%) |
| II | 165 (28.2%) |
| III | 266 (45.5%) |
| Tumor CSA (mean ± SD) | 12.00 ± 24.52 cm2 |
| Pathological type |  |
| Adenocarcinoma | 557 (95.2%) |
| Mucinous Adenocarcinoma and Signet-ring cell carcinoma | 28 (4.8%) |
| Degree of differentiation |  |
| Moderate and well | 103 (17.6%) |
| Poor | 482 (82.4%) |
| Lymphatic infiltration |  |
| Present | 386 (66.0%) |
| Absent | 199 (34.0%) |
| Vascular infiltration |  |
| Present | 141 (24.1%) |
| Absent | 444 (75.9%) |
| Nerve infiltration |  |
| Present | 461 (78.8%) |
| Absent | 124 (21.2%) |
| Median Ki67 (Range)  | 55% (5%-95%) |
| NLR (mean ± SD) | 2.92 ± 2.85 |
| PLR (mean ± SD) | 158.12 ± 84.25 |
| CEA value (mean ± SD, ng/ml) | 8.83 ± 41.95 |
| CA125 value (mean ± SD, U/ml) | 17.47 ± 35.33 |
| CA19-9 value (mean ± SD, U/ml) | 66.69 ± 256.69 |
| Metastasis or recurrence |  |
| Yes | 203 (34.7%) |
| No | 382 (65.3%) |
| Survival status |  |
| Alive | 355 (60.7%) |
| Dead | 230 (39.3%) |

Supplementary table 2 Simulate Anneal Arithmetic to select variables to construct model for DFS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Coef** | **S.E.** | **Wald** | **Pr (> |Z|)** |
| T stage  | 0.6983 | 0.1222 | 5.71 | < 0.0001 |
| N stage | 0.3177 | 0.0676 | 4.70 | < 0.0001 |
| Vascular infiltration | 0.4099 | 0.1563 | 2.62 | 0.0087 |
| Nerve infiltration | -0.6632 | 0.3629 | -1.83 | 0.0676 |
| CEA | 0.004 | 0.0010 | 4.06 | < 0.0001 |
| CA19-9 | 0.0005 | 0.0002 | 3.12 | 0.0018 |
| C-index | 0.7502 |

Supplementary table 3 Simulate Anneal Arithmetic to select variables to construct model for OS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Coef** | **S.E.** | **Wald** | **Pr (> |Z|)** |
| T stage  | 0.5180 | 0.0896 | 5.78 | < 0.0001 |
| N stage | 0.3801 | 0.0737 | 5.16 | < 0.0001 |
| Lymphatic infiltration | -0.4742 | 0.2168 | -2.19 | 0.0287 |
| Vascular infiltration | 0.4114 | 0.1483 | 2.77 | 0.0055 |
| CEA | 0.0029 | 0.0009 | 3.05 | 0.0023 |
| CA19-9 | 0.0006 | 0.0002 | 3.42 | 0.0006 |
| C-index | 0.7341 |

Supplementary table 4 Univariate Cox regression analyses to validate our signatures (external validation cohort, NA, not available)

|  |  |  |
| --- | --- | --- |
| **Variables** |  **DFS, p-value** |  **OS, p-value** |
| T stage  | 0.000 | < 0.001 |
| N stage | 0.000 | < 0.001 |
| Lymphatic infiltration | NA | 0.000 |
| Vascular infiltration | 0.017 | 0.021 |
| Nerve infiltration | 0.018 | NA |
| CEA | 0.000 | 0.001 |
| CA19-9 | 0.248 | 0.278 |