| Data Source | Total | CD8T memory | CD8T naïve | CD4T memory | B memory | NK | Neutrophil | Eosinophil | Normal vascular and lymphatic endothelial cell | Normal lung and colon epithelial cell | Normal endometrial tissue | Thyroid carcinoma | Prostate adenocarcinoma | Pancreatic adenocarcinoma | Normal ovarian tissue | Lung squamous cell carcinoma | Kidney renal papillary cell carcinoma | Normal head and neck tissue | Head and neck squamous cell carcinoma | Normal esophagus | Colon adenocarcinoma | Normal cervix | Normal breast | Normal bladder |
|-------------|-------|-------------|------------|-------------|----------|----|------------|------------|-----------------------------------------------|----------------------------------|------------------------|---------------------|---------------------|-----------------------|-------------------------|----------------------------|---------------------------------|--------------------------|---------------------------------|---------------------|------------------|------------------|
| TCGA        | 528   | 61 (11.9)   | 386 (73.1) | 452 (85.6)  | 48 (9.1)  | 11 (2.1) | 15 (2.8)  | 2 (0.4)    | 27 (5.1)                                      | 74 (14.0)                        | 82 (15.6)              | 58 (11.2)          | 65 (12.8)          | 35 (13.3)             | 4 (66.7)                | 275                       | 62 (12.1)                      | 202 (73.5)              | 198 (72.0)                      | 54 (19.6)          | 6 (2.2)           | 15 (5.5)        |
| TCGA        | 377   | 59 (13.5)   | 255 (67.6) | 187 (49.6)  | 17 (4.5)  | 161 (42.7) | 2 (0.5)    | 2 (0.5)    | 175 (45.9)                                    | 87 (24.6)                        | 86 (23.1)              | 5 (1.4)            | 24 (6.4)           | 66 (14.3)             | 52 (66.7)               | 6            | 62 (8.9)                     | 6 (72.2)                     | 9 (100.0)               | 0 (0)                          | 0 (0)              | 0 (0)            | 0 (0)            |
| TCGA        | 65    | 67 (12.4)   | 5 (83.3)   | 9 (100.0)   | 0 (0)     | 0 (0)     | 0 (0)     | 0 (0)    | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 20                      | --                                         | --                            | --                               | --                              | --                  | --               | --               |
| TCGA        | 319   | 61 (11.8)   | 205 (64.3) | 266 (83.4)  | 49 (15.4) | 1 (0.3)  | 3 (0.9)   | 0 (0)    | 155 (48.9)                                    | 31 (9.8)                         | 73 (23.0)              | 58 (18.3)          | 2 (0.6)            | 0 (0)                | 0 (0)                  | 74                       | 67 (10.8)                      | 46 (62.2)                   | 60 (81.1)                        | 6 (8.1)                        | 1 (1.4)          | 7 (9.5)          |
| TCGA        | 55    | 67 (12.8)   | 5 (83.3)   | 9 (100.0)   | 0 (0)     | 0 (0)     | 0 (0)     | 0 (0)    | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 68                       | 52 (14.3)                      | 39 (59.1)                   | 58 (87.9)                        | 4 (6.1)                        | 2 (3.0)           | 2 (3.0)          | 0 (0)          |
| GSE167998   | 35    | 65 (13.3)   | 214 (46.7) | 353 (77.1)  | 50 (10.9) | 6 (1.3)  | 49 (10.7) | 0 (0)    | 248 (54.7)                                    | 112 (24.7)                       | 73 (16.1)              | 20 (4.4)           | 5 (1.1)            | 4 (14.3)              | 34 (12.1)              | 9 (66.7)                | 71 (8.9)                     | 6 (66.7)                     | 5 (100.0)                        | 0 (0)                         | 0 (0)          | 0 (0)            |
| SeSAMe      | 6     | 27 (7.3)    | 5 (83.3)   | 3 (50.0)    | 1 (16.7)  | 0 (0)    | 0 (0)     | 2 (33.3) | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 275                      | --                                         | --                            | --                               | --                              | --                  | --               | --               |
| GSE167998   | 4     | 41 (14.5)   | 3 (75.0)   | 4 (100.0)   | 0 (0)     | 0 (0)    | 0 (0)     | 0 (0)    | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 4 (66.7)                 | 34 (13.5)                     | 10 (25.0)                   | 4 (66.7)                        | 2 (33.3)                       | 0 (0)          | 0 (0)            | 0 (0)          |
| TCGA        | 275   | 62 (12.1)   | 202 (73.5) | 198 (72.0)  | 54 (19.6) | 6 (2.2)  | 15 (5.5) | 2 (0.7)  | 168 (66.9)                                    | 18 (7.2)                         | 51 (20.3)              | 14 (5.6)           | 24 (8.7)           | 6 (2.2)               | 4 (66.7)                | 50                       | 62 (10.6)                      | 38 (76.0)                   | 43 (86.0)                        | 6 (12.0)                       | 0 (0)           | 1 (2.0)         |
| GSE122126   | 9     | 71 (72.2)   | 5 (83.3)   | 9 (100.0)   | 0 (0)     | 0 (0)    | 0 (0)     | 0 (0)    | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 9 (100.0)                | --                                         | --                            | --                               | --                              | --                  | --               | --               |
| GSE122126, E-MTAB-8952 | 319 | 61 (11.8)   | 205 (64.3) | 266 (83.4)  | 49 (15.4) | 1 (0.3)  | 3 (0.9)   | 0 (0)    | 155 (48.9)                                    | 31 (9.8)                         | 73 (23.0)              | 58 (18.3)          | 2 (0.6)            | 0 (0)                | 0 (0)                  | 9 (130)                | 67 (12.4)                     | 6 (66.7)                     | 5 (100.0)                        | 0 (0)                         | 0 (0)          | 0 (0)            | 0 (0)          |
| GSE53051    | 66    | 52 (14.3)   | 39 (59.1)  | 58 (87.9)   | 4 (6.1)   | 2 (3.0)  | 2 (3.0)  | 0 (0)    | 21 (31.8)                                    | 25 (37.9)                        | 14 (21.2)              | 6 (9.1)            | 0 (0)              | 0 (0)                | 0 (0)                  | 9 (100.0)               | 67 (12.4)                     | 6 (66.7)                     | 5 (100.0)                        | 0 (0)                         | 0 (0)          | 0 (0)            | 0 (0)          |
| GSE193297   | 74    | 67 (10.8)   | 46 (62.2)  | 60 (81.1)   | 6 (8.1)   | 1 (1.4)  | 7 (9.5)  | 0 (0)    | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 74                       | --                                         | --                            | --                               | --                              | --                  | --               | --               |
| GSE193297   | 6    | 43 (10.6)   | 2 (100.0)  | 2 (100.0)   | 0 (0)     | 0 (0)    | 0 (0)     | 0 (0)    | --                                             | --                               | --                     | --                  | --                  | --                  | --                    | 6 (100.0)                | 43 (10.6)                     | 2 (100.0)                   | 2 (100.0)                        | 0 (0)                         | 0 (0)          | 0 (0)            | 0 (0)          |
| Data Source | Tissue Type | N  | Mean Age (SD) | Male N (%) | White N (%) | Black N (%) | Asian N (%) | Unreported Race N (%) | Other Race N (%) |
|-------------|-------------|----|---------------|------------|-------------|-------------|--------------|----------------------|------------------|
| GSE133556   | High grade serous ovarian cancer | 99 | 43 (16.5) | 0 (0) | 97 (98.0) | 1 (1.0) | 1 (1.0) | 0 (0) | 0 (0) |
| GSE182379   | Immune cell artificial mixtures | 12 | -- | -- | -- | -- | -- | -- | -- |
| TCGA         | Pancreatic adenocarcinoma | 184 | 65 (11.0) | 102 (55.4) | 162 (88.0) | 7 (3.8) | 11 (6.0) | 4 (2.2) | 0 (0) |
| TCGA         | Stomach adenocarcinoma | 395 | 65 (18.7) | 259 (65.6) | 253 (64.1) | 13 (3.3) | 89 (22.5) | 39 (9.9) | 1 (0.3) |
| E-MTAB-5463 | Normal human intestinal epithelium | 6 | 10 (5.7) | 1 (10.0) | 6 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| GSE12234    | Human umbilical vein endothelial cells | 6 | 0 (0) | 6 (100) | 4 (66.7) | 2 (33.3) | 0 (0) | 0 (0) | 0 (0) |
| GSE148766   | Drug sensitive and resistant metastatic colorectal carcinoma | 36 | 50 (13.5) | NA | NA | NA | NA | NA | NA |
| GSE100503   | Breast in ductal carcinoma in situ core biopsy | 13 | 56 (11.3) | 13 (100) | 13 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| GSE66313    | Breast in ductal carcinoma in situ surgical excision | 13 | 56 (11.3) | 13 (100) | 13 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| GSE141441   | Triple-negative breast cancer recurrence | 166 | 59 (15.4) | 0 (0) | NA | NA | NA | NA | NA |

*Horvath methylation age inferred using watermelon

# Inferred sex and ethnicity, based on methylation using SeSAMe
| Tumor Type                                         | Cell Type  | Hazard ratio (95%CI) |
|---------------------------------------------------|------------|----------------------|
| Head and neck squamous cell carcinoma             | Stromal    | 1.51 (1.02, 2.22)    |
|                                                   | Endothelial| 1.57 (1.07, 2.29)    |
| Bladder carcinoma                                 | Dendritic cell | 0.45 (0.28, 0.73) |
| Kidney papillary carcinoma                        | Endothelial| 3.48 (1.27, 9.55)    |
|                                                   | Stromal    | 3.44 (1.46, 8.13)    |
| Lung adenocarcinoma                               | CD8mem     | 0.50 (0.32, 0.79)    |
|                                                   | Endothelial| 1.83 (1.13, 2.95)    |
|                                                   | Epithelial | 0.50 (0.31, 0.80)    |
| Lung squamous cell carcinoma                      | Epithelial | 1.80 (1.16, 2.78)    |
| Thyroid carcinoma                                 | Bmem       | 7.13 (1.17, 43.53)   |

Supplementary Table 3