### Supplementary Table 1. Baseline demographic and clinical characteristics of patients.

| Parameters                          | N   | Range   | Minimum | Maximum | Mean  |
|-------------------------------------|-----|---------|---------|---------|-------|
| Age (year)                          | 220 | 69.00   | 14.00   | 83.00   | 55.710|
| Total protein (g/dL)                | 220 | 35.50   | 48.10   | 83.60   | 66.689|
| Albumin (g/dL)                      | 220 | 48.30   | 4.10    | 52.40   | 39.883|
| Globulin (g/dL)                     | 219 | 26.40   | 15.30   | 41.70   | 26.646|
| A/G ratio                           | 220 | 1.40    | 0.90    | 2.30    | 1.539 |
| Total bilirubin (µmol/L)            | 220 | 28.10   | 0.90    | 29.00   | 4.163 |
| Direct bilirubin (µmol/L)           | 220 | 149.10  | 3.20    | 152.30  | 19.925|
| ALT (U/L)                           | 220 | 104.30  | 9.90    | 114.20  | 22.488|
| AST (U/L)                           | 220 | 13.50   | 1.16    | 14.66   | 4.677 |
| Urea (mmol/L)                       | 220 | 131.80  | 23.60   | 155.40  | 79.018|
| Creatinine (µmol/L)                 | 220 | 27.60   | 121.10  | 148.70  | 141.606|
| Glucose (mmol/L)                    | 220 | 14.70   | 95.40   | 110.10  | 103.829|
| Total bilirubin (µmol/L)            | 220 | 0.88    | 1.69    | 2.57    | 2.254 |
| HDL (mmol/L)                        | 220 | 13.20   | 2.40    | 15.60   | 6.228 |
| Lymphocyte count (10³/mL)           | 220 | 149.00  | 16.00   | 165.00  | 117.370|
| Platelet count (10³/mL)             | 220 | 149.00  | 16.00   | 165.00  | 117.370|
| Neutrophil count (10³/mL)           | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| Lymphocyte count (10³/mL)           | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| Monocyte count (10³/mL)             | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| Neutrophil percentage (%)           | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| Lymphocyte percentage (%)           | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| Monocyte percentage (%)             | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| Thrombocytocrit (%)                 | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| MPV (fl)                            | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| PDW (%)                             | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| PT (second)                         | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| INR                                 | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| APTT (second)                       | 220 | 12.60   | 0.90    | 13.50   | 3.961 |
| TT (second)                         | 220 | 12.60   | 0.90    | 13.50   | 3.961 |

Abbreviations: A/G, albumin to globulin ration; ALT, Alanine aminotransferase; AST, Aspartate aminotransferase; HDL, high-density lipoprotein; LDL, low-density lipoprotein; HDL/CHO, high-density lipoprotein to cholesterol ration; WBC, white blood cell; RBC, red blood cell; MPV, mean platelet volume; PDW, platelet distribution width; PT, prothrombin time; INR, international normalized ratio; APTT, activated partial thromboplastin time; TT, thrombin time.
### Supplementary Table 2. Relationships between clinical characteristics and IVE.

| Parameters                              | non-IVE group | IVE group | P-value |
|-----------------------------------------|---------------|-----------|---------|
| Age                                     |               |           |         |
| ≤60                                     | 55            | 77        | 0.697   |
| >60                                     | 39            | 49        |         |
| Gender                                  |               |           |         |
| Male                                    | 47            | 79        | 0.060   |
| Female                                  | 47            | 47        |         |
| Location                                |               |           |         |
| Left colon                              | 18            | 23        | 0.241   |
| Right colon                             | 23            | 20        |         |
| Rectum                                  | 53            | 83        |         |
| Invasion depth                          |               |           |         |
| T1-2                                    | 14            | 9         | 0.063   |
| T3-4                                    | 80            | 117       |         |
| Lymph node metastasis                   |               |           |         |
| pN1                                     | 65            | 55        | <0.001  |
| pN2                                     | 29            | 71        |         |
| Histologic type                         |               |           |         |
| Mucinous/mix                            | 14            | 15        | <0.001  |
| Poor                                    | 6             | 43        |         |
| Well /Moderate                          | 74            | 68        |         |
| Tumor Morphology                        |               |           |         |
| Ulcerative                              | 44            | 57        | 0.472   |
| Infiltrating                            | 3             | 8         |         |
| Protruded                               | 46            | 53        |         |
| Diameter                                |               |           |         |
| <5cm                                    | 45            | 73        | 0.070   |
| ≥5cm                                    | 48            | 47        |         |
| Obstruction symptoms                    |               |           |         |
| No                                      | 93            | 113       | 0.008   |
| Yes                                     | 1             | 12        |         |
| CEA (ng/ml)                             |               |           |         |
| <5                                      | 64            | 83        | 0.095   |
| ≥5                                      | 28            | 37        |         |
| CA199 (kU/L)                            |               |           |         |
| <35                                     | 77            | 96        | 0.491   |
| ≥35                                     | 15            | 24        |         |
| CA242 (kU/L)                            |               |           |         |
| <20                                     | 73            | 95        | 0.806   |
| ≥20                                     | 16            | 19        |         |
| Adjuvant chemotherapy                   |               |           |         |
| FOLFOX4/6                               | 58            | 78        | 0.737   |
| XELOX                                   | 7             | 10        |         |
| Other                                   | 2             | 6         |         |
| No chemotherapy                         | 27            | 32        |         |
## Supplementary Table 3. Difference of blood routine and chemistry between groups.

| Parameters | non-IVE group | IVE group | P-value |
|------------|---------------|-----------|---------|
| Total protein (g/dL) | 66.38±6.12 | 66.92±6.51 | 0.539 |
| Albumin (g/dL) | 39.92±4.39 | 39.86±5.34 | 0.929 |
| Globulin (g/dL) | 26.47±4.26 | 26.78±4.45 | 0.600 |
| A/G ration | 1.54±0.27 | 1.53±0.29 | 0.783 |
| Total bilirubin (µmol/L) | 10.98±7.40 | 10.76±6.01 | 0.812 |
| Direct bilirubin (µmol/L) | 4.11±3.31 | 4.20±2.47 | 0.822 |
| ALT (U/L) | 21.2±15.82 | 19.1±17.07 | 0.396 |
| AST (U/L) | 22.51±9.51 | 22.47±13.66 | 0.980 |
| Urea (mmol/L) | 4.58±1.62 | 4.75±1.81 | 0.474 |
| Creatinine (µmol/L) | 74.7±19.2 | 82.24±20.34 | 0.006 |
| Glucose (mmol/L) | 5.17±1.08 | 5.34±1.34 | 0.330 |
| Triglyceride (mmol/L) | 1.29±1.08 | 1.32±1.17 | 0.828 |
| Cholesterol (mmol/L) | 4.53±1.02 | 4.54±0.99 | 0.940 |
| HDL (mmol/L) | 1.24±0.26 | 1.29±0.32 | 0.249 |
| LDL (mmol/L) | 2.77±0.96 | 2.97±2.12 | 0.424 |
| HDL/CHO | 0.28±0.07 | 0.31±0.20 | 0.309 |
| Potassium (mmol/L) | 3.94±0.43 | 4.02±0.38 | 0.156 |
| Sodium (mmol/L) | 141.58±3.48 | 141.63±2.73 | 0.909 |
| Chloride (mmol/L) | 104.29±2.82 | 103.49±3.10 | 0.050 |
| Calcium (mmol/L) | 2.25±0.13 | 2.25±0.12 | 0.968 |
| WBC count (10³/mL) | 6.01±2.05 | 6.39±1.81 | 0.213 |
| RBC count (10⁶/mL) | 225.67±94.72 | 233.67±95.28 | 0.537 |
| Hemoglobin (g/L) | 116.12±23.26 | 118.31±24.56 | 0.504 |
| Platelet count (10⁹/mL) | 225.67±94.72 | 233.67±95.28 | 0.537 |
| Neutrophil count (10³/mL) | 3.68±1.82 | 4.17±2.04 | 0.066 |
| Lymphocyte count (10³/mL) | 1.66±0.59 | 1.51±0.65 | 0.093 |
| Monocyte count (10³/mL) | 0.48±0.18 | 0.49±0.20 | 0.665 |
| Neutrophil percentage (%) | 59.26±10.38 | 63.38±10.17 | 0.002 |
| Lymphocyte percentage (%) | 28.77±9.62 | 24.80±9.19 | 0.002 |
| Monocyte percentage (%) | 8.23±2.81 | 7.95±2.82 | 0.480 |
| Thrombocytocrit (%) | 0.20±0.08 | 0.20±0.08 | 0.590 |
| MPV (fl) | 8.95±1.69 | 8.73±1.33 | 0.268 |
| PDW (%) | 16.77±1.43 | 16.82±0.75 | 0.727 |
| PT (second) | 12.71±0.88 | 12.74±1.40 | 0.839 |
| INR | 0.98±0.08 | 0.99±0.12 | 0.520 |
| APTT (second) | 34.58±4.56 | 34.22±5.02 | 0.583 |
| TT (second) | 17.19±1.41 | 18.1±5.61 | 0.116 |
| Fibrinogen (g/L) | 3.74±1.06 | 3.60±0.80 | 0.289 |

Abbreviations: A/G, albumin to globulin ratio; ALT, Alanine aminotransferase; AST, Aspartate aminotransferase; HDL, high-density lipoprotein; LDL, low-density lipoprotein; HDL/CHO, high-density lipoprotein to cholesterol ratio; WBC, white blood cell; RBC, red blood cell; MPV, mean platelet volume; PDW, platelet distribution width; PT, prothrombin time; INR, international normalized ratio; APTT, activated partial thromboplastin time; TT, thrombin time.
### Supplementary Table 4. Six patients for microarray analysis.

| Patients | IVE | Age | Gender | TNM stage | LY% | NE% | Location | Lymph node metastasis | Histologic type |
|----------|-----|-----|--------|-----------|-----|-----|----------|-----------------------|-----------------|
| NO.1     | YES | 61  | Male   | T4aN1bM0  | 27.5| 33.0| Rectum   | 2/13                  | Moderate        |
| NO.2     | YES | 60  | Male   | T4aN1bM0  | 24.0| 66.7| Sigmoid  | 3/11                  | Moderate        |
| NO.3     | YES | 62  | Male   | T4aN2bM0  | 16.8| 77.9| Rectum   | 7/12                  | Moderate        |
| NO.4     | NO  | 52  | Female | T4aN1bM0  | 32.0| 57.0| Rectum   | 3/18                  | Moderate        |
| NO.5     | NO  | 43  | Male   | T4aN2aM0  | 37.2| 57.3| Rectum   | 6/11                  | Moderate        |
| NO.6     | NO  | 63  | Male   | T4aN1aM0  | 41.0| 42.7| Rectum   | 2/14                  | Moderate        |

### Supplementary Table 5. Top ten up/down regulated genes in IVE group.

| Genes         | log2 (Fold change) | P-value |
|---------------|--------------------|---------|
| CALB1         | 9.250              | 0.001   |
| REG1A         | 5.930              | 0.011   |
| DSG3          | 5.928              | 0.001   |
| KLK8          | 5.866              | 0.022   |
| ABHD12B       | 5.697              | 0.034   |
| XLOC_004031   | 5.419              | 0.026   |
| KLF12         | 3.993              | 0.024   |
| MAGEA6        | 3.355              | 0.031   |
| KRT16P2       | 3.105              | 0.011   |
| PLA2G4D       | 3.104              | 0.010   |
| XLOC_011804   | -2.677             | 0.042   |
| RIIAD1        | -2.731             | 0.007   |
| ASPN          | -2.748             | 0.014   |
| XLOC_I2_015529| -2.801             | 0.020   |
| DRD2          | -2.935             | 0.010   |
| ZBTB16        | -2.943             | 0.024   |
| XLOC_012248   | -2.945             | 0.008   |
| XLOC_I2_010573| -3.307             | 0.023   |
| PTF1A         | -3.526             | 0.044   |
| DKK1          | -4.461             | 0.023   |