## supplementary file 1

| SUID | MCODE_Cluster | MCODE_Node_Status | MCODE_Score | name    |
|------|---------------|-------------------|-------------|---------|
| 81   | Cluster 3     | Clustered         | 8           | FGA     |
| 84   | Cluster 2     | Clustered         | 16          | F2      |
| 92   | Cluster 1     | Clustered         | 26          | CXCL8   |
| 93   | Cluster 1     | Clustered         | 26          | CXCR1   |
| 101  | Cluster 5     | Clustered         | 5           | COL3A1  |
| 102  | Cluster 5     | Clustered         | 5           | COL1A1  |
| 104  | Cluster 2     | Clustered         | 16          | UTS2R   |
| 105  | Cluster 2     | Clustered         | 16          | UTS2    |
| 123  | Cluster 3     | Clustered         | 8           | ALB     |
| 124  | Cluster 3     | Clustered         | 8           | APOA1   |
| 127  | Cluster 1     | Clustered         | 26          | CXCL6   |
| 133  | Cluster 1     | Clustered         | 26          | CXCL1   |
| 134  | Cluster 1     | Clustered         | 26          | CCL20   |
| 144  | Cluster 1     | Clustered         | 26          | CXCL11  |
| 146  | Cluster 2     | Clustered         | 16          | TRH     |
| 147  | Cluster 2     | Clustered         | 16          | OXT     |
| 149  | Cluster 3     | Clustered         | 8           | IL6     |
| 154  | Cluster 5     | Clustered         | 5           | COL6A3  |
| 163  | Cluster 1     | Clustered         | 26          | CXCL5   |
| 165  | Cluster 2     | Clustered         | 16          | F2RL2   |
| 183  | Cluster 3     | Clustered         | 8           | CP      |
| 191  | Cluster 1     | Clustered         | 26          | CXCL3   |
| 202  | Cluster 3     | Clustered         | 8           | AFP     |
| 204  | Cluster 3     | Clustered         | 7           | HP      |
| 223  | Cluster 1     | Clustered         | 26          | C3      |
| 225  | Cluster 1     | Clustered         | 26          | FPR2    |
| 264  | Cluster 3     | Clustered         | 7           | DEFA4   |
| 265  | Cluster 3     | Clustered         | 7           | LTF     |
| 276  | Cluster 3     | Clustered         | 7           | TCN1    |
| 287  | Cluster 1     | Clustered         | 26          | ADCY5   |
| 288  | Cluster 1     | Clustered         | 26          | DRD2    |
| 302  | Cluster 4     | Clustered         | 10          | DRD5    |
| 305  | Cluster 3     | Clustered         | 7           | OLFM4   |
| 307  | Cluster 1     | Clustered         | 26          | CX3CR1  |
| 333  | Cluster 1     | Clustered         | 26          | GNG8    |
| 334  | Cluster 1     | Clustered         | 26          | GNGT1   |
| 339  | Cluster 1     | Clustered         | 26          | GNAT3   |
| 349  | Cluster 1     | Clustered         | 26          | PTGER3  |
| 374  | Cluster 3     | Clustered         | 7           | SLPI    |
| 376  | Cluster 2     | Clustered         | 16          | HTR2C   |
| 378  | Cluster 1     | Clustered         | 26          | NMU     |
| 380  | Cluster 1     | Clustered         | 26          | GRM8    |
| ID  | Cluster | Method   | Count | Gene   |
|-----|---------|----------|-------|--------|
| 388 | Cluster 1 | Clustered | 26    | PPY    |
| 389 | Cluster 1 | Clustered | 26    | SSTR1  |
| 391 | Cluster 5 | Clustered | 5     | COL14A1|
| 396 | Cluster 3 | Clustered | 7     | PTX3   |
| 403 | Cluster 2 | Clustered | 16    | GCGR   |
| 404 | Cluster 4 | Clustered | 10    | IAPP   |
| 426 | Cluster 5 | Clustered | 5     | COL11A1|
| 430 | Cluster 1 | Clustered | 26    | CASR   |
| 437 | Cluster 1 | Clustered | 26    | OPRD1  |
| 442 | Cluster 1 | Clustered | 26    | HTR1D  |
| 443 | Cluster 1 | Clustered | 26    | HTR1B  |
| 468 | Cluster 2 | Clustered | 16    | EDN3   |
| 469 | Cluster 2 | Clustered | 16    | PROK1  |
| 493 | Cluster 5 | Clustered | 5     | COL4A6 |
| 503 | Cluster 1 | Clustered | 26    | HCAR2  |
| 509 | Cluster 4 | Clustered | 10    | VIPR2  |
| 544 | Cluster 4 | Clustered | 10    | MC3R   |
| 546 | Cluster 2 | Clustered | 16    | HTR2B  |
| 570 | Cluster 4 | Clustered | 10    | PTGER2 |
| 576 | Cluster 4 | Clustered | 10    | SCTR   |
| 578 | Cluster 1 | Seed      | 26    | SUCNR1 |
| 595 | Cluster 3 | Clustered | 8     | ENAM   |
| 612 | Cluster 4 | Seed      | 10    | PTGDR  |
| 647 | Cluster 2 | Seed      | 16    | OPN4   |
| 726 | Cluster 3 | Seed      | 8     | SCG2   |
Supplementary file 2. P-value of OS and DFS for the 22 hub-genes.

| Genes  | OS (P-value) | DFS (P-value) |
|--------|--------------|---------------|
| C3     | 0.02         | 0.041         |
| PTGER3 | 0.042        | 0.2           |
| GRM8   | 0.044        | 0.36          |
| HTR1B  | 0.33         | 0.41          |
| CX3CR1 | 0.036        | 0.021         |
| SUCNR1 | 0.046        | 0.075         |
| SSTR1  | 0.018        | 0.04          |
| OPRD1  | 0.89         | 0.86          |
| CXCL5  | 0.13         | 0.32          |
| CXCR1  | 0.68         | 0.29          |
| CXCL11 | 0.62         | 0.66          |
| FPR2   | 0.73         | 0.34          |
| CXCL1  | 0.7          | 0.66          |
| GNGT1  | 0.012        | 0.016         |
| CXCL8  | 0.005        | 0.032         |
| GNAT3  | 0.047        | 0.2           |
| CXCL6  | 0.28         | 0.67          |
| CXCL3  | 0.074        | 0.32          |
| PPY    | 0.013        | 0.083         |
| HCAR2  | 0.009        | 0.012         |
| DRD2   | 0.19         | 0.3           |
| HTR1D  | 0.38         | 0.005         |

OS= overall survival; DFS=disease-free survival.
**Supplementary file 3. characteristics of the patients for miRNAs.**

| Parameter          | Alive (51)      | Dead (28)   | P       |
|--------------------|-----------------|-------------|---------|
| Age (years)        | 45.96±15.21     | 48.95±15.81 | 0.37    |
| Gender             |                 |             |         |
| Female             | 31              | 18          | 0.759(χ²=0.094) |
| Male               | 20              | 11          |         |
| Stage              |                 |             | 0.03(χ²=10.749) |
| T1                 | 7(13.7%)        | 2(7.1%)     |         |
| T2                 | 32(62.8%)       | 10(35.7%)   |         |
| T3                 | 5(9.8%)         | 5(17.9%)    |         |
| T4                 | 7(13.7%)        | 11(39.3%)   |         |
| Lymph node         |                 |             | 0.514(χ²=1.33) |
| N0                 | 44(86.3%)       | 26(92.9%)   |         |
| N1                 | 7(13.7%)        | 2(7.1%)     |         |
| Metastasis         |                 |             | 0.099(χ²=4.617) |
| M0                 | 44(86.3%)       | 20(71.4%)   |         |
| M1                 | 7(13.7%)        | 8(28.6%)    |         |