

**Supplementary Table 1 The clinicopathological features of 20 human gastric cancer**

| <b>Clinical features</b> | <b><i>n</i></b> |
|--------------------------|-----------------|
| Age (yr)                 |                 |
| < 60                     | 8               |
| ≥ 60                     | 12              |
| Gender                   |                 |
| Male                     | 11              |
| Female                   | 9               |
| Tumor size (cm)          |                 |
| < 5                      | 7               |
| ≥ 5                      | 13              |
| Differentiation grade    |                 |
| Well                     | 10              |
| Moderate + Poor          | 10              |
| TNM stage                |                 |
| I + II                   | 12              |
| III                      | 8               |
| Depth of invasion        |                 |
| T1 + T2                  | 13              |
| T3 + T4                  | 7               |
| Lymph node metastasis    |                 |
| No                       | 14              |
| Yes                      | 6               |
| Distant metastasis       |                 |
| No                       | 16              |
| Yes                      | 4               |
| CEA, μg/ml               |                 |
| < 4.5                    | 9               |
| ≥ 4.5                    | 11              |
| CA19-9, kU/L             |                 |

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< 40

5

≥ 40

15

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**Supplementary Table 2 Bioinformatics analysis**

| <b>TargetScan</b> | <b>miRDB</b> | <b>DIANA</b> | <b>Common targets</b> |
|-------------------|--------------|--------------|-----------------------|
| DST               | CDC73        | PITX2        | COLEC12               |
| IGSF6             | ZEB2         | DPF3         | CNPY2                 |
| ITGA1             | NUFIP2       | SUV420H1     | YTHDF3                |
| CNPY2             | PCLO         | ROCK2        | SLC25A33              |
| C9orf170          | LRRTM2       | PCLO         | NPY2R                 |
| GNGT1             | NBEAL1       | AC027307.3   | CDKN1B                |
| CEP19             | PANK3        | GNPNAT1      | C20orf202             |
| GNPDA2            | ABHD5        | SBNO1        | THOC2                 |
| TNFSF13B          | CREB1        | SMG1         |                       |
| TMEM30C           | SLC12A6      | TNRC6B       |                       |
| RP11-321M21.3     | CNPY2        | RUNX1T1      |                       |
| CTA-299D3.8       | PRKAA2       | CREB1        |                       |
| DNAJC2            | TBC1D23      | COLEC12      |                       |
| PAGE4             | RGS7BP       | GCC2         |                       |
| COLEC12           | TPK1         | LUZP2        |                       |
| INIP              | MED12L       | MAPRE2       |                       |
| TEX37             | ROCK2        | PHKB         |                       |
| CDKN1B            | ROR1         | LGI2         |                       |
| ZNF138            | NEGR1        | IGSF6        |                       |
| ARMC1             | UBE2G1       | STX7         |                       |
| TTN               | DLST         | ZBTB44       |                       |
| SST               | RALA         | DGKH         |                       |
| C20orf202         | NABP1        | PTEN         |                       |
| SLN               | PDK1         | TMEM194A     |                       |
| NUPL2             | PHACTR2      | SLC12A2      |                       |
| SLC25A33          | DNAJB14      | PAXBP1       |                       |
| PTS               | STAU1        | CNPY2        |                       |
| CRYBB1            | EIF2AK1      | TGFA         |                       |

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|            |          |          |
|------------|----------|----------|
| SH3D19     | ITGA1    | TEAD1    |
| BMX        | FBXO22   | CEP350   |
| MRP63      | UBE2J1   | GOLGB1   |
| AL138847.1 | IGF1     | ITGA8    |
| STAU1      | TOB1     | FANCI    |
| FAM210B    | CDKN1B   | BCLAF1   |
| RTP4       | GUCY1A2  | SYT14    |
| GPR137C    | COLEC12  | DDI2     |
| CDC14A     | FAM20B   | CCSER2   |
| SLMO2      | C9orf170 | SPAG16   |
| ERI1       | ELOC     | BLM      |
| CCL7       | POU2F1   | LPGAT1   |
| PEX5L      | ARHGAP28 | NUFIP1   |
| NPY2R      | DIP2B    | OTUD6B   |
| C2orf66    | PAIP2    | RC3H2    |
| ZNF486     | PTEN     | EPAS1    |
| CTXN2      | SLC36A4  | BDP1     |
| HTR5A-AS1  | CCDC6    | YTHDF3   |
| ATRX       | ZNF138   | ATG12    |
| TPK1       | SEMA3E   | SLC25A33 |
| SH2D3A     | TNRC6B   | WDR44    |
| SDHAF2     | SCAF11   | AHCYL2   |
| MAP1LC3B   | GPR158   | FAM63B   |
| HIST1H2BF  | PCDH17   | TENM1    |
| NUDT9      | SLC25A33 | GMEB1    |
| C14orf1    | ZNHIT6   | SEPW1    |
| CCNT2      | SCAI     | ZDHHC15  |
| HMGN4      | ZFHX3    | HIRA     |
| C1orf112   | MRPL30   | SH3GLB1  |
| AC020907.1 | ZCCHC14  | TBC1D23  |
| CPA6       | HIRA     | CPNE4    |

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|           |           |               |
|-----------|-----------|---------------|
| THOC2     | APC       | NAA25         |
| IFT20     | SEMA3C    | NARG2         |
| MARC1     | TRMT10B   | ANGPT2        |
| IL1B      | PMEL      | INTS8         |
| CALCB     | ZBTB41    | CREBBP        |
| APOBEC3A  | RNF6      | PTPN3         |
| SCAF4     | SLITRK6   | MAP3K19       |
| GOLM1     | PDK4      | SLC7A11       |
| FGF5      | ETNK1     | C6orf62       |
| CCDC112   | LSS       | TMEM30C       |
| ERGIC2    | WDR44     | SP3           |
| C8orf44   | PIH1D2    | HS6ST2        |
| UQCR11    | PYROXD1   | NPY2R         |
| GTPBP4    | MEOX2     | PCGF5         |
| B3GNT5    | SESTD1    | XPO4          |
| DNAJB14   | GPRASP2   | USP10         |
| C3orf38   | KIAA1324L | WASL          |
| GLT8D2    | VGLL3     | RP11-690P14.4 |
| PSMD10    | ARMC1     | SESN3         |
| CNOT8     | PPP1R3A   | COL15A1       |
| SLC24A5   | SYT4      | TTF2          |
| OR2L13    | GPR176    | GNAI1         |
| AGPAT1    | SYNRG     | ADGB          |
| LINC00998 | UFSP2     | TRIM2         |
| YTHDF3    | TENM1     | XPO1          |
| ADA       | MFAP4     | GBP1          |
| ICOS      | RUNX1T1   | AKT3          |
| COCH      | RANBP3L   | TMEM150C      |
| MRPL16    | PPM1B     | TMEM178B      |
| ITGB8     | GOSR1     | MMP16         |
| ZNHIT6    | KANSL1L   | CDKN1B        |

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|------------|----------|--------------|
| CLDN14     | STIM2    | SENP1        |
| RAB28      | CCKBR    | MCTP1        |
| IL33       | MAP3K2   | MEF2C        |
| GREM1      | ARID4A   | USP38        |
| RGS7BP     | PHLDA1   | ZNF107       |
| AC008267.1 | NOD1     | AKAP13       |
| APC        | ROBO1    | EIF2S3L      |
| GNPNAT1    | BRD8     | PEX5L        |
| DNAJC19    | EGR1     | GUCY1A2      |
| GJB6       | SNRK     | HSPE1        |
| NDC1       | MTDH     | SOS1         |
| HLA-B      | PCSK5    | NUDT11       |
|            | NHS      | RANBP3L      |
|            | NR3C1    | MAP1B        |
|            | RYR3     | CTNNA3       |
|            | GPR180   | ZNF24        |
|            | FANCD2   | CCDC113      |
|            | RBM7     | UBR3         |
|            | ZNF827   | PUM2         |
|            | STK38L   | LRRTM2       |
|            | TCP11L1  | DNAJB4       |
|            | XPNPEP3  | PPP2R5E      |
|            | RFK      | NDC1         |
|            | SYT14    | NRCAM        |
|            | MYO5C    | TMED7-TICAM2 |
|            | CHURC1   | GJB6         |
|            | CCDC80   | ZNF675       |
|            | TNFSF13B | ANKRD36C     |
|            | RB1      | PPM1B        |
|            | PRDM11   | NET1         |
|            | DTNA     | ESCO1        |

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|         |              |
|---------|--------------|
| HDX     | MBTD1        |
| POU4F1  | SUZ12        |
| COL12A1 | CAPS2        |
| SLC5A3  | C4orf33      |
| CEP19   | ARPP19       |
| IARS2   | FUNDC2       |
| FAM171B | TEX30        |
| RIF1    | PRNP         |
| MEI4    | RELN         |
| ZDHHC21 | GPHN         |
| CCN3    | XPO7         |
| SH3GLB1 | TSFM         |
| UBL3    | MAF          |
| ARF6    | PCNX         |
| MYSM1   | SERF1A       |
| PSMD10  | MTHFR        |
| KMT5B   | TADA2A       |
| LPGAT1  | SH3BGRL2     |
| FXR1    | ZFX          |
| CCDC186 | TRIM33       |
| MPP6    | ETNK1        |
| HMGN4   | CMC1         |
| FCHO2   | UBE2W        |
| MNT     | HSPA4L       |
| PTPN21  | FOXK2        |
| BTNL9   | SMCO3        |
| DOCK1   | MTR          |
| PDXDC1  | RP1-102H19.8 |
| MTHFD2  | SPATS2L      |
| ELK3    | TMEM215      |
| TMEM99  | GCLM         |

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|----------------|-----------|
| ECM2           | AGPAT4    |
| FGF7           | C4orf46   |
| CREBBP         | RBM26     |
| EPAS1          | CELF2     |
| HS3ST1         | C20orf202 |
| TXLNB          | ATL3      |
| ATP11C         | DBX2      |
| FAM98A         | PAPD5     |
| RTP4           | WDR64     |
| NCOA7          | PMS1      |
| SASS6          | GNAQ      |
| SEC62          | CLMN      |
| CEP152         | ABI2      |
| TOMM20         | DDX17     |
| C5orf24        | SLC36A4   |
| USP1           | DHFR      |
| DEUP1          | PDE1C     |
| CACYBP         | ETV1      |
| GFPT1          | TBC1D9    |
| CALHM5         | FAM9C     |
| ARMCX5-GPRASP2 | BIRC6     |
| TUSC3          | PCNP      |
| HS3ST5         | RAB8B     |
| DACH1          | LPIN2     |
| NPHP3          | LSAMP     |
| EOGT           | CDC40     |
| CENPL          | DOK6      |
| ANTXR2         | PPP1R9A   |
| SOS2           | MFSD6     |
| NAPG           | DENND4C   |
| CHMP1B         | PLCE1     |

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|         |          |
|---------|----------|
| UBXN2B  | OPHN1    |
| BRWD1   | EYA1     |
| ASXL3   | SLC17A8  |
| FAM104A | BCL11A   |
| CCDC112 | MCC      |
| TRIM72  | ZNF850   |
| SLC35F3 | TOMM20   |
| HOXB7   | PRLR     |
| FBXL20  | UTRN     |
| CCDC184 | TMEM99   |
| ZNF430  | KANSL1L  |
| ZBTB18  | STAG2    |
| TMEM47  | MRPL16   |
| KDELC2  | TAOK1    |
| NAA16   | TRAPPC10 |
| UBR5    | CCDC6    |
| ATRN    | HMGA2    |
| RUNX2   | AZI2     |
| NPY2R   | IL22RA2  |
| NTRK3   | RBMY1B   |
| PAG1    | MAML2    |
| KLHL5   | RBMY1E   |
| EPS8    | PIEZO2   |
| AKAP5   | LRIT3    |
| TUBGCP5 | EPHA7    |
| FAM126A | SUB1     |
| KCTD16  | MS4A1    |
| BMT2    | TNIK     |
| CWF19L2 | KIAA1598 |
| ZC3H14  | KCNIP4   |
| AP4E1   | PRDM10   |

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|----------|------------|
| SLC6A3   | DNAJA2     |
| HMGA2    | PTGER2     |
| PSIP1    | PLA2G6     |
| PRPH2    | UBN2       |
| B9D1     | TNFSF10    |
| HOOK1    | LIMCH1     |
| RCN2     | GABPB1     |
| CHCHD4   | CACYBP     |
| SERTAD2  | GTDC1      |
| SH3GL3   | MGAT1      |
| PTPN3    | STXBP5L    |
| DNAJB9   | DLST       |
| ZNF704   | AC024257.1 |
| ERAP1    | CAMSAP2    |
| CANX     | GOT1       |
| SNAP91   | SGMS2      |
| IPCEF1   | IFT20      |
| P2RY1    | ATP11B     |
| AKT3     | C1orf27    |
| SYNJ2    | THOC2      |
| CDC40    | NDUFC2     |
| APOBEC3A | TTC39B     |
| CSNK1E   | CDC37L1    |
| SBNO1    | SLC5A12    |
| PRDM10   | F8         |
| GNA12    | MXD1       |
| SOCS6    | C1S        |
| ACBD3    | FBLN7      |
| CSNK1G3  | UBE2G1     |
| SH3D19   | MAGI1      |
| SLC39A10 | FAXC       |

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|       |     |
|-------|-----|
| MAP1B | NRK |
|-------|-----|

MCCC2

MARS2

YPEL5

EP300

DOP1B

AR

NKRF

KLHL11

RAB8B

LCORL

OSBPL11

GATC

OPRK1

YWHAE

SLITRK3

TPTEP2-CSNK1E

ACTR2

ZCCHC10

NEMP1

NOX3

RBM45

HSPA5

C8orf44

YTHDF3

ZNF426

SH2D3A

SGMS2

RAB3IP

OSBPL1A

MYO5A

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DNAJB4

EPGN

RALGPS2

LRCH1

AAK1

PIK3AP1

NPAT

NSL1

PSD3

GALNT1

CAPRIN1

RNF141

SLC27A6

SP3

IL1B

TWNK

MRTFB

SS18

PDE12

SEMA6D

USP38

THOC2

ADA

TCEAL6

VCPIP1

ZNF107

SLC10A7

DHFR

GTPBP4

METTL4

GGH

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GPR137C  
GPR1  
SNX18  
CEP44  
MAGT1  
BCCIP  
MAP3K4  
NR2C2  
SMG1  
LRP8  
SELENOT  
ZNF35  
SUB1  
INO80C  
TLK2  
PLEKHH1  
WDR78  
PIAS1  
GALNT7  
SLC12A1  
RUNX1  
BCKDHB  
CDKL2  
LACTB  
FAM114A2  
SRSF4  
ZNRF3  
SSR1  
CAV1  
SPIRE2  
TSPAN13

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TMPRSS11D

PIGBOS1

SESN3

CAST

CACNB4

PRLR

EXTL2

CLDN14

GM2A

KRT6C

DBT

TEAD1

RNF217

PIAS2

PHF24

KRBA2

VANGL1

EMC4

NODAL

GBP1

GABRG2

TPR

OTUD6B

ARL11

SUV39H2

SGCZ

RGS7

CEP350

TSHR

COCH

DAZ2

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KMT2A  
CCDC117  
SMAD2  
PRKCA  
MSR1  
CDKL5  
SLN  
DCUN1D1  
RELT  
IPO5  
SDHAF2  
SCAF4  
TTPAL  
ADAMTS5  
WDR26  
INTS8  
YARS2  
LHX9  
PROSER2  
FUT9  
TMEM232  
CALCA  
SOS1  
TRIM33  
ZNF566  
FAR1  
RNF216  
COL4A4  
DCX  
ATP9B  
MINDY2

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NAA25  
C20orf202  
SOD2  
TULP4  
ZBTB20  
ZNF280B  
TNFAIP8L1  
ARMCX2  
SERPINE1  
DNAJC27

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