Figure S1. mRNA expression of CTCF and PIK3CA in RCC cell lines examined by RT-qPCR. (A) mRNA expression of CTCF in RCC cell lines. (B) mRNA expression of PIK3CA in RCC cell lines. RCC, renal cell carcinoma; CTCF, CCCTC-binding factor; PIK3CA, phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha.
Table SI. Basic information of 20 pairs of sunitinib-responsive and -non-responsive RCC tissues.

| Patient ID | Age, years | Sex   | Pathological diagnosis | Fuhrman grade | TNM stage | Treatment | Months of treatment | Optimal response |
|------------|------------|-------|------------------------|---------------|-----------|-----------|---------------------|------------------|
| N1         | 57         | Male  | ccRCC                  | II            | T2aN0M1   | Sunitinib | 6                   | PD               |
| N2         | 62         | Male  | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 8                   | PD               |
| N3         | 55         | Male  | ccRCC                  | III           | T2bN0M1   | Sunitinib | 7                   | PD               |
| N4         | 59         | Female| ccRCC                  | II            | T3aN0M1   | Sunitinib | 5                   | PD               |
| N5         | 70         | Male  | ccRCC                  | III           | T2bN0M1   | Sunitinib | 6                   | PD               |
| N6         | 51         | Male  | ccRCC                  | III-IV        | T2aN1M1   | Sunitinib | 7                   | PD               |
| N7         | 69         | Male  | ccRCC                  | III           | T1bN0M1   | Sunitinib | 5                   | PD               |
| N8         | 70         | Female| ccRCC                  | II            | T2bN0M1   | Sunitinib | 7                   | PD               |
| N9         | 65         | Male  | ccRCC                  | III           | T1bN0M1   | Sunitinib | 5                   | PD               |
| N10        | 67         | Female| ccRCC                  | III           | T1bN0M1   | Sunitinib | 8                   | PD               |
| N11        | 51         | Male  | ccRCC                  | II-III        | T3bN1M1   | Sunitinib | 9                   | PD               |
| N12        | 57         | Female| ccRCC                  | II            | T3aN0M1   | Sunitinib | 4                   | PD               |
| N13        | 60         | Male  | ccRCC                  | II-III        | T2bN0M1   | Sunitinib | 6                   | PD               |
| N14        | 47         | Male  | ccRCC                  | II            | T1bN0M1   | Sunitinib | 7                   | PD               |
| N15        | 51         | Male  | ccRCC                  | III-IV        | T2bN0M1   | Sunitinib | 8                   | PD               |
| N16        | 71         | Female| ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 9                   | PD               |
| N17        | 52         | Male  | ccRCC                  | III           | T2aN0M1   | Sunitinib | 5                   | PD               |
| N18        | 55         | Male  | ccRCC                  | II            | T3aN0M1   | Sunitinib | 6                   | PD               |
| N19        | 49         | Male  | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 8                   | PD               |
| N20        | 67         | Female| ccRCC                  | III           | T2bN0M1   | Sunitinib | 5                   | PD               |
| R1         | 41         | Male  | ccRCC                  | III           | T2aN0M1   | Sunitinib | 20                  | PR               |
| R2         | 57         | Male  | ccRCC                  | II            | T1bN0M1   | Sunitinib | 27                  | PR               |
| R3         | 67         | Female| ccRCC                  | III           | T2bN0M1   | Sunitinib | 22                  | PR               |
| R4         | 47         | Male  | ccRCC                  | III           | T2aN0M1   | Sunitinib | 29                  | PR               |
| R5         | 70         | Female| ccRCC                  | III-IV        | T1bN0M1   | Sunitinib | 20                  | PR               |
| R6         | 59         | Female| ccRCC                  | II            | T2aN0M1   | Sunitinib | 17                  | PR               |
| R7         | 79         | Male  | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 19                  | PR               |
| R8         | 55         | Male  | ccRCC                  | II-III        | T2bN0M1   | Sunitinib | 22                  | PR               |
| R9         | 68         | Male  | ccRCC                  | III-IV        | T2aN1M1   | Sunitinib | 23                  | PR               |
| R10        | 60         | Male  | ccRCC                  | III           | T2bN0M1   | Sunitinib | 27                  | PR               |
| R11        | 59         | Male  | ccRCC                  | III           | T1aN0M1   | Sunitinib | 21                  | PR               |
| R12        | 53         | Female| ccRCC                  | III-IV        | T2bN0M1   | Sunitinib | 22                  | PR               |
| R13        | 42         | Male  | ccRCC                  | II            | T1bN0M1   | Sunitinib | 25                  | PR               |
| R14        | 62         | Female| ccRCC                  | II-III        | T2aN0M1   | Sunitinib | 18                  | PR               |
| R15        | 69         | Female| ccRCC                  | II            | T3bN0M1   | Sunitinib | 20                  | PR               |
| R16        | 71         | Male  | ccRCC                  | III           | T3aN0M1   | Sunitinib | 21                  | PR               |
| R17        | 77         | Female| ccRCC                  | III           | T2aN0M1   | Sunitinib | 19                  | PR               |
| R18        | 72         | Male  | ccRCC                  | II-III        | T3aN0M1   | Sunitinib | 22                  | PR               |
| R19        | 64         | Male  | ccRCC                  | III-IV        | T2aN1M1   | Sunitinib | 24                  | PR               |
| R20        | 53         | Male  | ccRCC                  | II            | T1bN0M1   | Sunitinib | 19                  | PR               |

N, sunitinib-non-responsive; R, sunitinib-responsive; RCC, renal cell carcinoma; ccRCC, clear cell renal cell carcinoma; PD, progressive disease; PR, partial response.
Table SII. Basic information of patients with RCC with a low or high QPCT expression.

| Variable            | Low QPCT expression (n=58) | High QPCT expression (n=70) | All patients (n=128) |
|---------------------|----------------------------|----------------------------|---------------------|
|                     | Control (n=24) | Sunitinib (n=34) | Control (n=32) | Sunitinib (n=38) | Control (n=56) | Sunitinib (n=72) |
| Sex                 |               |                          |               |                          |               |                          |
| Male                | 20            | 29                       | 26            | 30                       | 46            | 59                       |
| Female              | 4             | 5                        | 6             | 8                        | 10            | 13                       |
| Age, years          |               |                          |               |                          |               |                          |
| <60                 | 15            | 20                       | 21            | 22                       | 36            | 42                       |
| ≥60                 | 9             | 14                       | 11            | 16                       | 20            | 30                       |
| Tumor size          |               |                          |               |                          |               |                          |
| ≤4 cm               | 4             | 6                        | 6             | 8                        | 10            | 14                       |
| >4 cm               | 20            | 28                       | 26            | 30                       | 46            | 58                       |
| Fuhrman grade       |               |                          |               |                          |               |                          |
| I-II                | 10            | 13                       | 14            | 16                       | 24            | 29                       |
| III-IV              | 14            | 21                       | 18            | 22                       | 32            | 43                       |
| TNM stage           |               |                          |               |                          |               |                          |
| I/II                | 0             | 0                        | 0             | 0                        | 0             | 0                        |
| III/IV              | 24            | 34                       | 32            | 38                       | 56            | 72                       |
| Tumor thrombus      |               |                          |               |                          |               |                          |
| No                  | 18            | 27                       | 25            | 30                       | 43            | 57                       |
| Yes                 | 6             | 7                        | 7             | 8                        | 13            | 15                       |
| Metastasis          |               |                          |               |                          |               |                          |
| No                  | 4             | 8                        | 6             | 9                        | 10            | 17                       |
| Yes                 | 20            | 26                       | 26            | 29                       | 46            | 55                       |

P-values: Low QPCT expression vs. High QPCT expression.
Table SIII. Basic information of 32 sunitinib-non-responsive patients and 34 sunitinib-responsive patients with RCC at Jinling Hospital (Nanjing, China).

| Patient ID | Age, years | Sex | Pathological diagnosis | Fuhrman grade | TNM stage | Treatment | Months of treatment | Optimal response |
|------------|------------|-----|------------------------|---------------|-----------|-----------|---------------------|------------------|
| N1         | 57         | Male | ccRCC                  | II            | T2aN0M1   | Sunitinib | 6                   | PD               |
| N2         | 62         | Male | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 8                   | PD               |
| N3         | 55         | Male | ccRCC                  | III           | T2bN0M1   | Sunitinib | 7                   | PD               |
| N4         | 59         | Female | ccRCC                | II            | T3aN0M1   | Sunitinib | 5                   | PD               |
| N5         | 70         | Male | ccRCC                  | III           | T1bN0M1   | Sunitinib | 6                   | PD               |
| N6         | 51         | Male | ccRCC                  | III-IV        | T2aN1M1   | Sunitinib | 7                   | PD               |
| N7         | 69         | Male | ccRCC                  | III           | T1bN0M1   | Sunitinib | 5                   | PD               |
| N8         | 70         | Female | ccRCC               | II            | T2bN0M1   | Sunitinib | 7                   | PD               |
| N9         | 65         | Male | ccRCC                  | III           | T1bN0M1   | Sunitinib | 5                   | PD               |
| N10        | 67         | Female | ccRCC              | III           | T1bN0M1   | Sunitinib | 8                   | PD               |
| N11        | 51         | Male | ccRCC                  | II-III        | T3bN1M1   | Sunitinib | 9                   | PD               |
| N12        | 57         | Female | ccRCC             | II            | T3aN0M1   | Sunitinib | 4                   | PD               |
| N13        | 60         | Male | ccRCC                  | III-IV        | T2bN0M1   | Sunitinib | 6                   | PD               |
| N14        | 47         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib | 7                   | PD               |
| N15        | 51         | Male | ccRCC                  | III-IV        | T2bN0M1   | Sunitinib | 8                   | PD               |
| N16        | 71         | Female | ccRCC             | II-III        | T1bN0M1   | Sunitinib | 9                   | PD               |
| N17        | 52         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib | 5                   | PD               |
| N18        | 55         | Male | ccRCC                  | II            | T3aN0M1   | Sunitinib | 6                   | PD               |
| N19        | 49         | Male | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 8                   | PD               |
| N20        | 67         | Female | ccRCC            | III           | T2bN0M1   | Sunitinib | 5                   | PD               |
| N21        | 42         | Male | ccRCC                  | III-IV        | T3aN0M1   | Sunitinib | 4                   | PD               |
| N22        | 52         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib | 6                   | PD               |
| N23        | 56         | Female | ccRCC             | II            | T1bN0M1   | Sunitinib | 5                   | PD               |
| N24        | 70         | Male | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 4                   | PD               |
| N25        | 67         | Male | ccRCC                  | III           | T3aN0M1   | Sunitinib | 7                   | PD               |
| N26        | 63         | Male | ccRCC                  | III-IV        | T3aN0M1   | Sunitinib | 4                   | PD               |
| N27        | 49         | Male | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 6                   | PD               |
| N28        | 45         | Female | ccRCC            | II-III        | T2aN0M1   | Sunitinib | 8                   | PD               |
| N29        | 68         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib | 4                   | PD               |
| N30        | 75         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib | 6                   | PD               |
| N31        | 48         | Female | ccRCC           | III-IV        | T2bN0M1   | Sunitinib | 5                   | PD               |
| N32        | 69         | Male | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 4                   | PD               |
| R1         | 41         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib | 20                  | PR               |
| R2         | 57         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib | 27                  | PR               |
| R3         | 67         | Female | ccRCC             | III           | T2bN0M1   | Sunitinib | 22                  | PR               |
| R4         | 47         | Male | ccRCC                  | II-III        | T3aN0M1   | Sunitinib | 29                  | PR               |
| R5         | 70         | Female | ccRCC             | III-IV        | T1bN0M1   | Sunitinib | 20                  | PR               |
| R6         | 59         | Female | ccRCC            | II            | T2aN0M1   | Sunitinib | 17                  | PR               |
| R7         | 79         | Male | ccRCC                  | II-III        | T1bN0M1   | Sunitinib | 19                  | PR               |
| R8         | 55         | Male | ccRCC                  | II-III        | T2bN0M1   | Sunitinib | 22                  | PR               |
| R9         | 68         | Male | ccRCC                  | III-IV        | T2aN1M1   | Sunitinib | 23                  | PR               |
| R10        | 60         | Male | ccRCC                  | III           | T2bN0M1   | Sunitinib | 27                  | PR               |
| R11        | 59         | Male | ccRCC                  | III           | T1aN0M1   | Sunitinib | 21                  | PR               |
| R12        | 53         | Female | ccRCC           | III-IV        | T2bN0M1   | Sunitinib | 22                  | PR               |
| R13        | 42         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib | 25                  | PR               |
| R14        | 62         | Female | ccRCC          | II-III        | T2aN0M1   | Sunitinib | 18                  | PR               |
| R15        | 69         | Male | ccRCC                  | II            | T3bN0M1   | Sunitinib | 20                  | PR               |
| R16        | 71         | Male | ccRCC                  | III           | T3aN0M1   | Sunitinib | 21                  | PR               |
| R17        | 77         | Female | ccRCC          | III           | T2aN0M1   | Sunitinib | 19                  | PR               |
| R18        | 72         | Male | ccRCC                  | II-III        | T3aN0M1   | Sunitinib | 22                  | PR               |
| R19        | 64         | Male | ccRCC                  | III-IV        | T2aN1M1   | Sunitinib | 24                  | PR               |
| R20        | 53         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib | 19                  | PR               |
| R21        | 43         | Female | ccRCC             | II            | T1bN0M1   | Sunitinib | 16                  | PR               |
| R22        | 55         | Male | ccRCC                  | III-IV        | T2aN0M1   | Sunitinib | 19                  | PR               |
| Patient ID | Age, years | Sex | Pathological diagnosis | Fuhrman grade | TNM stage | Treatment | Months of treatment | Optimal response |
|------------|------------|-----|------------------------|---------------|-----------|-----------|---------------------|------------------|
| R23        | 58         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib  | 22                  | PR               |
| R24        | 67         | Male | ccRCC                  | III           | T2bN0M1   | Sunitinib  | 20                  | PR               |
| R25        | 63         | Female | ccRCC                  | III-IV       | T2aN0M1   | Sunitinib  | 18                  | PR               |
| R26        | 69         | Female | ccRCC                  | III           | T1bN0M1   | Sunitinib  | 19                  | PR               |
| R27        | 77         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib  | 21                  | PR               |
| R28        | 46         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib  | 23                  | PR               |
| R29        | 57         | Female | ccRCC                  | II-III       | T3aN0M1   | Sunitinib  | 20                  | PR               |
| R30        | 75         | Male | ccRCC                  | II            | T1bN0M1   | Sunitinib  | 18                  | PR               |
| R31        | 58         | Male | ccRCC                  | III-IV       | T3bN0M1   | Sunitinib  | 19                  | PR               |
| R32        | 79         | Male | ccRCC                  | III           | T2aN0M1   | Sunitinib  | 21                  | PR               |
| R33        | 53         | Male | ccRCC                  | II-III       | T3aN0M1   | Sunitinib  | 17                  | PR               |
| R34        | 52         | Female | ccRCC                  | III           | T1bN0M1   | Sunitinib  | 26                  | PR               |

N, sunitinib-non-responsive; R, sunitinib-responsive; RCC, renal cell carcinoma; ccRCC, clear cell renal cell carcinoma; PD, progressive disease; PR, partial response.
| Name       | Name       | Name       | Name       | Name       |
|------------|------------|------------|------------|------------|
| MAN1B1     | NOSIP      | NAP1L3     | SPRR4      | GPRR5      | PIN4       |
| RUVBL2     | SULT1C2    | MED1       | TSC22D3    | ATIC       | BC044592.1 |
| TBXAS1     | ILF2       | ERF        | SSBP3      | RAB5B      | RUVBL1     |
| NME2       | CDCA3      | ADAMTS4L   | SF3B4      | ANXA9      | C2orf27A   |
| C11orf1    | GAPDH      | UBE2O      | GASTA3     | NLN        | ZNF876P    |
| MLF2       | HNRNPA0    | CCT7       | TPH1       | YPEL2      | KDM1A      |
| NAT9       | ARF6       | STK16      | EAF2       | SRRT       | PKX        |
| CCT3       | CAS3       | CSNK1G1    | GNMT       | CPTA1      | UBE2D3     |
| PSAT1      | DCTN3      | CTBP1      | C1QTNF5    | HTRA4      | SPP1       |
| NPM1       | TK1        | CXCL16     | GPT2       | ITPKB      | IGKC       |
| PRRC2B     | AHSA1      | SHMT1      | KRTAP1-3   | NCKIPSD    | PRB3       |
| PDCD2L     | CKMT1A     | NFYC       | PIK3CA     | BCAT1      | DNAJ4      |
| PRDX3      | RUndC3A    | SDSL       | TKFC       | ADSSSL1    | Lin28a     |
| THAP4      | SULT1B1    | RPL30      | ANXA2      | TNIP2      | KIAA0895   |
| NABP2      | MPST       | RPS6KA1    | RBMS1      | KBTBD6     | DCAF8      |
| ANXA3      | NFKBIB     | PLCD1      | VGLL2      | HBE1       | KIZ        |
| PSMA3      | HEMK1      | TAF6       | GBGT1      | ZNF69      | KBTBD7     |
| PRMT2      | GFM2       | GTF2H2     | MAGEA9     | GAMT       | DLG3       |
| SSBP2      | DCTPPI     | LIMCH1     | PNP        | NDFS3      | ALOXE3     |
| COL4A3BP   | BDH2       | SOHLH2     | CPNE3      | PGP        | SYNJ2BP    |
| CAP2       | CENPM      | DNALI1     | BEGAiN     | HDAC6      | CRYBB3     |
| LSM6       | FTI        | ACOX1      | ABHDI1A    | UBL7       | EZR        |
| FAM53C     | PRKAR1A    | HSPE1      | JMD6       | HRAS       | KLHDC9     |
| ZCCHC7     | PAPSS1     | GSTM5      | ALG13      | LOC105372481 | RRM1       |
| ASS1       | PYCR2      | FAM49B     | GAB1       | MED4       | PRB1       |
| TRMT12     | ASNS       | FAM131B    | KRTAP4-4   | CBL        | C5AR2      |
| CKB        | FAM131C    | PSTP1P1    | ADSS       | PYCRL      | GTF2I      |
| RPL10A     | HP         | STIP1      | TTC27      | ZNF207     | PPPR62     |
| NSDHL      | RAB34      | SPPR1B     | CBLN4      | SAMHD1     | SULCG2     |
| DOK1       | EWSR1      | MAPK10     | SPPR1A     | NANS       | IRF2BP2    |
| SULT1A1    | ISG20      | ABCA8      | NRPB2      | LOR        | ZNF154     |
| ABI1       | SULT1A3    | YEATS4     | DTNB1P1    | KJ902480.1 | KRTAP2-3   |
| METTL1     | ANXA11     | CLEC10A    | F2         | DUSP26     | KRTAP6-2   |
| ZCCHC10    | NDUS51     | ADGRE1     | DLG4       | TLE4       | SH3GL2     |
| NUP62CL    | PDE9A      | GALNT3     | DCDC2      | DNA2       | NAF1       |
| MIF        | PRAM1      | EEF1G      | ATP6V0D1   | MGAT4EP    | ENO1       |
| HNRNPD     | EAF1       | HTATIP2    | CBY1       | MUM1L1     | WIF1P      |
| HNRNPC     | MAPK8      | VWAS5B2    | NUP2L2     | RAP1GDS1   | METTL16    |
| OLA1       | GAD1       | SSBP1      | RTCA       | NABP       | PCCA       |
| ECHDC1     | SSBP4      | ZNF3       | C1orf74    | PABPC4     | AKAP8      |
| MORN1      | TSSK3      | RPSUD2     | HSCB       | BC079397.1 | ACSL6      |
| ALDOC      | WDR54      | PGPEP1     | IRF2BP1    | RALY       | PILRA      |
| DHODH      | PTK2       | IRS1       | KCNNAB1    | HSP90B1    | SMARCE1    |
| ARG1       | DNAJ6B     | FBXO2      | ADD1       | AIP        | UBE2Q1     |
| DDC        | EPB41L2    | ADAT3      | ACSL4      | ALKBH3     | MBNL3      |
| WBP2NL     | IGHG1      | KHDRBS3    | NAMPT      | VWA5A      | AVEN       |
| SARS       | ALDH4A1    | MCCC2      | TFAP2D     | NME4       | EIP4G3     |
| ADSL       | PAPSS2     | CDK6       | SUV420H1   | SMARCC1    | ACO1       |
| CDC37L1    | RUNDC3B    | IN080E     | BRAT1      | DAZ2       | ME3        |
| GLUL       | MT1X       | PRR35      | TFAP2A     | VGLL3      | SHQ1       |
| C11orf16   | GSTA1      | FAAH2      | TFAP2E     | DDX6       | GMPR       |
| AAR2       | GLML       | HRNRNPAB   | FAM109B    | GAS8-AS1   | KJ902540   |
| C11orf45   | ROBO3      | DAB1       | ACOT7      | SLCR25A30  | PAK4       |
| CA3        | SHCBP1     | J901215    | DTX2       | KLC3       | IST1       |
| KCNAB2     | BC047522.1 | ALDH16A1   | PKM        |            |            |