

**Supplementary Table S1. The primer sequences of genes**

Gene name	Forward (5' to 3')	Reverse (5' to 3')
circ-PRKCI	ACGATGACATTGTG	ATGATATCCCCGCGGTAGTAG
	AGGAAGATTG	
miR-545-3p	TCGGCAGGTCAGCA	GTCGTATCCAGTGCAGGGTCCGAGGTATTC
	AACATTTA	GCACTGGATACGACGCACAC
CCND1	ATCAAGTGTGACCC	ATCAAGTGTGACCCGGACTG
	GGACTG	
GADPH	CCAGGTGGTCTCCT	GCTGTAGCCAAATCGTTGT
	CTGA	
U6	CTCGCTTCGGCAGC	AACGCTTCACGAATTTGCGT
	ACA	

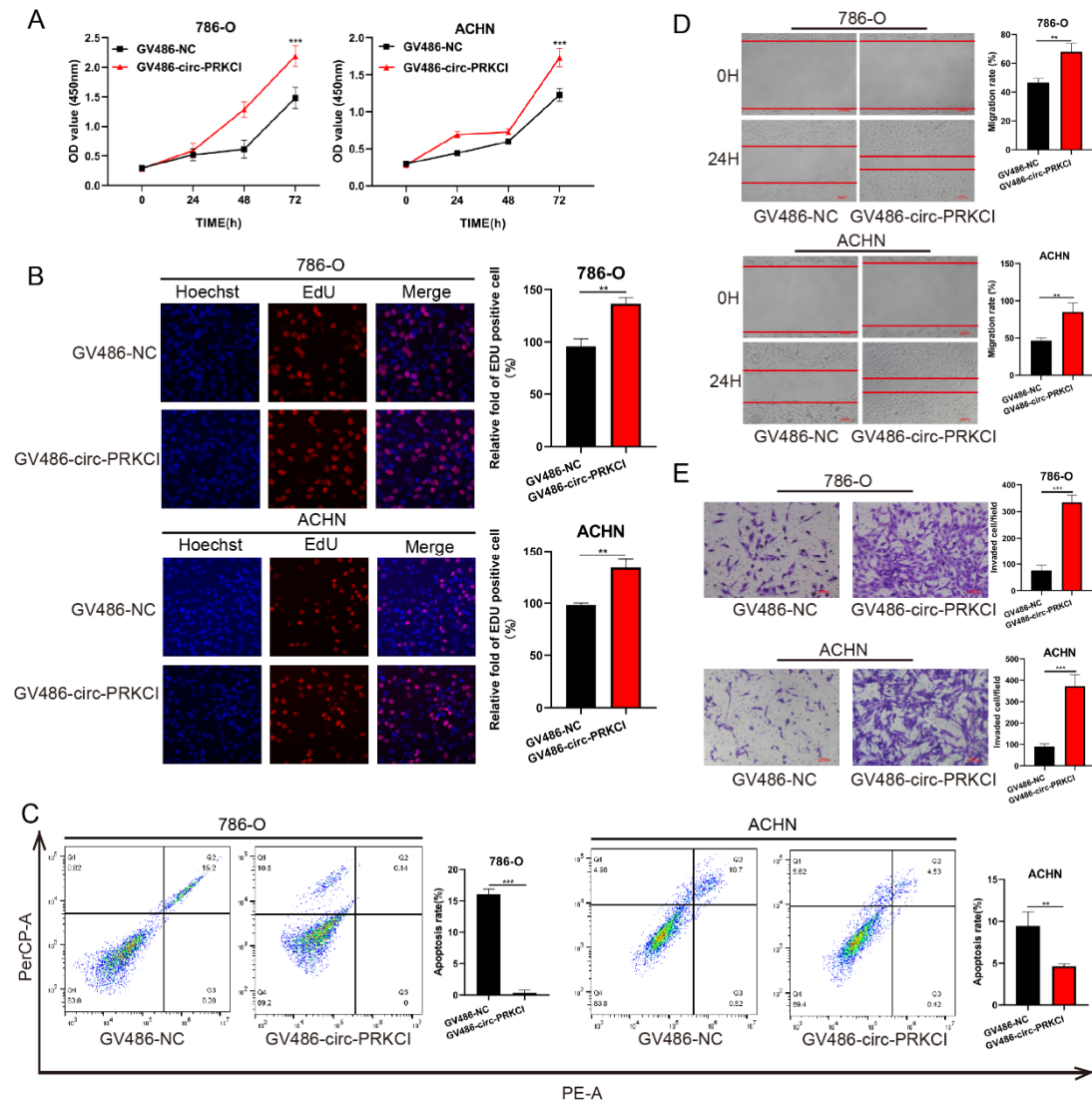
**Supplementary Table S2. Information of antibodies**

<b>Antibody name</b>	<b>Dilution</b>	<b>Brand</b>	<b>Catalog number</b>
GM130	1:1000	CST, Shanghai, China	#74220
CD54	1:1000	CST, Shanghai, China	#74220
Annexin	1:1000	CST, Shanghai, China	#74220
CD63	1:1000	CST, Shanghai, China	#74220
BCL-2	1:5000	Proteintech, Shanghai, China	12789-1-AP
Cleaved-caspase3	1:500	Proteintech, Shanghai, China	19677-1-AP
Cleaved-caspase9	1:500	Proteintech, Shanghai, China	10380-1-AP
Beta Actin	1:10000	Proteintech, Shanghai, China	20536-1-AP
E-cadherin	1:5000	Proteintech, Shanghai, China	20874-1-AP
N-cadherin	1:2000	Proteintech, Shanghai, China	22018-1-AP
Vimentin	1:5000	Proteintech, Shanghai, China	10366-1-AP
GADPH	1:20000	Proteintech, Shanghai, China	10494-1-AP
CCND1	1:5000	Proteintech, Shanghai, China	60186-1-Ig
Alpha Tubulin	1:10000	Proteintech, Shanghai, China	11224-1-AP

**Supplementary Table S3. Thirteen intersective genes between four databases**

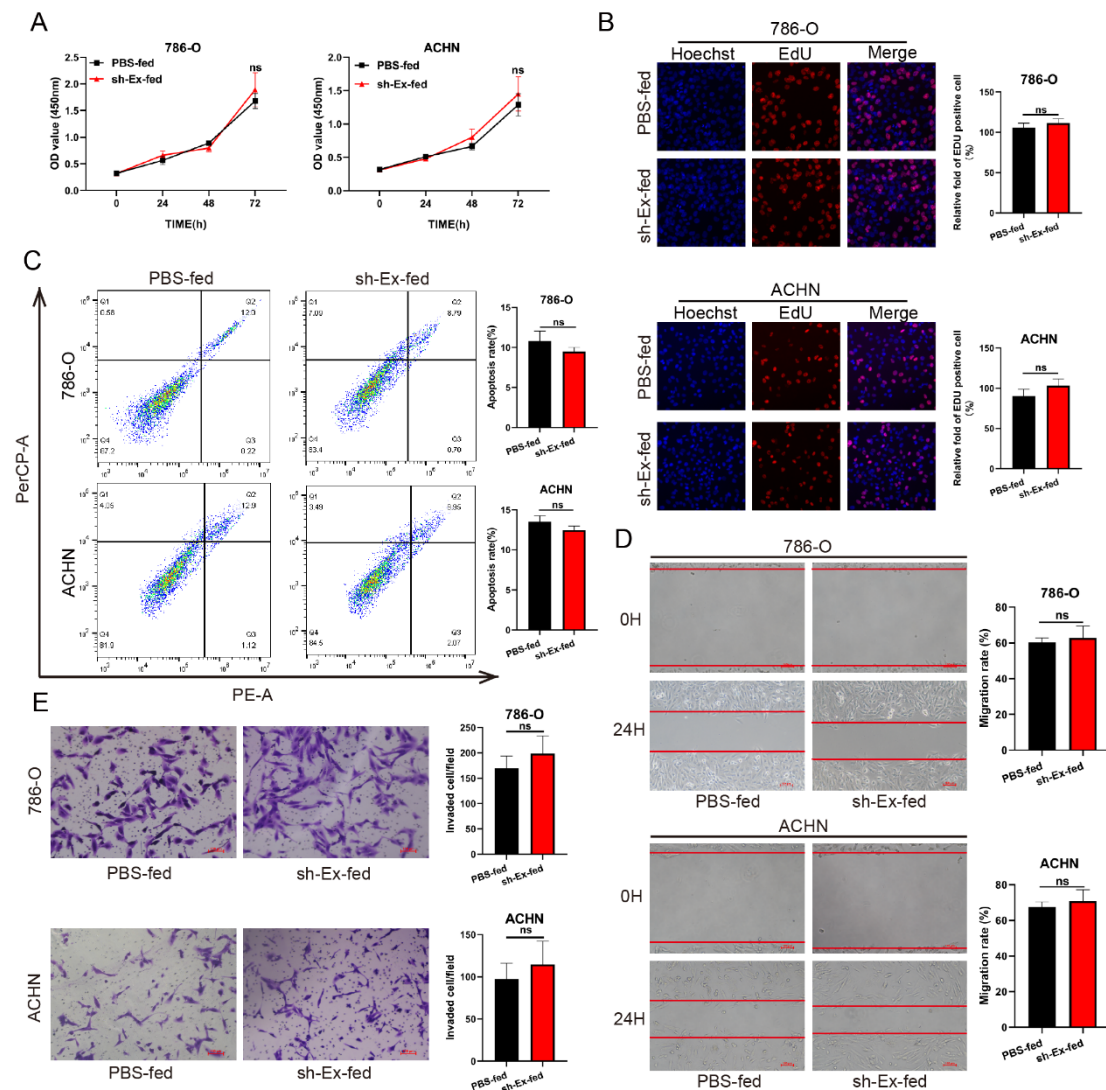
<b>Gene</b>
ARIH1
ZCCHC3
RBPJ
PLAG1
PEX5L
AGO4
FAM13A
TUBB
SLC16A9
DISC1
<b>CCND1</b>
SCARF1
TPM3

## Supplementary Figure S1



*Figure S1. Overexpression of circ-PRKCI enhanced RCC proliferation, migration, invasion, and apoptosis inhibition. (A and B) CCK-8 and EdU assays showed the cell proliferation ability was enhanced after upregulating circ-PRKCI. (C) Flow cytometry analysis indicated cell apoptosis was inhibited after transfected with GV486-circ-PRKCI. (D and E) Cell scratch and Transwell assays showed the increased migration and invasion ability of transfected RCC cells. (\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ )*

## Supplementary Figure S2



*Figure S2. Little effect of sh-Ex on RCC proliferation, apoptosis, migration and invasion. (A and B) Cell proliferation of 786-O and ACHN treated with PBS or sh-Ex was detected by CCK8 and EdU assay. (C) Cell apoptosis was detected by flow cytometry analysis. (D) Cell scratch assay for migration ability of 786-O and ACHN treated with PBS or sh-Ex. (E) Transwell assay for invasion ability of 786-O and ACHN treated with PBS or sh-Ex. (ns: no significance)*