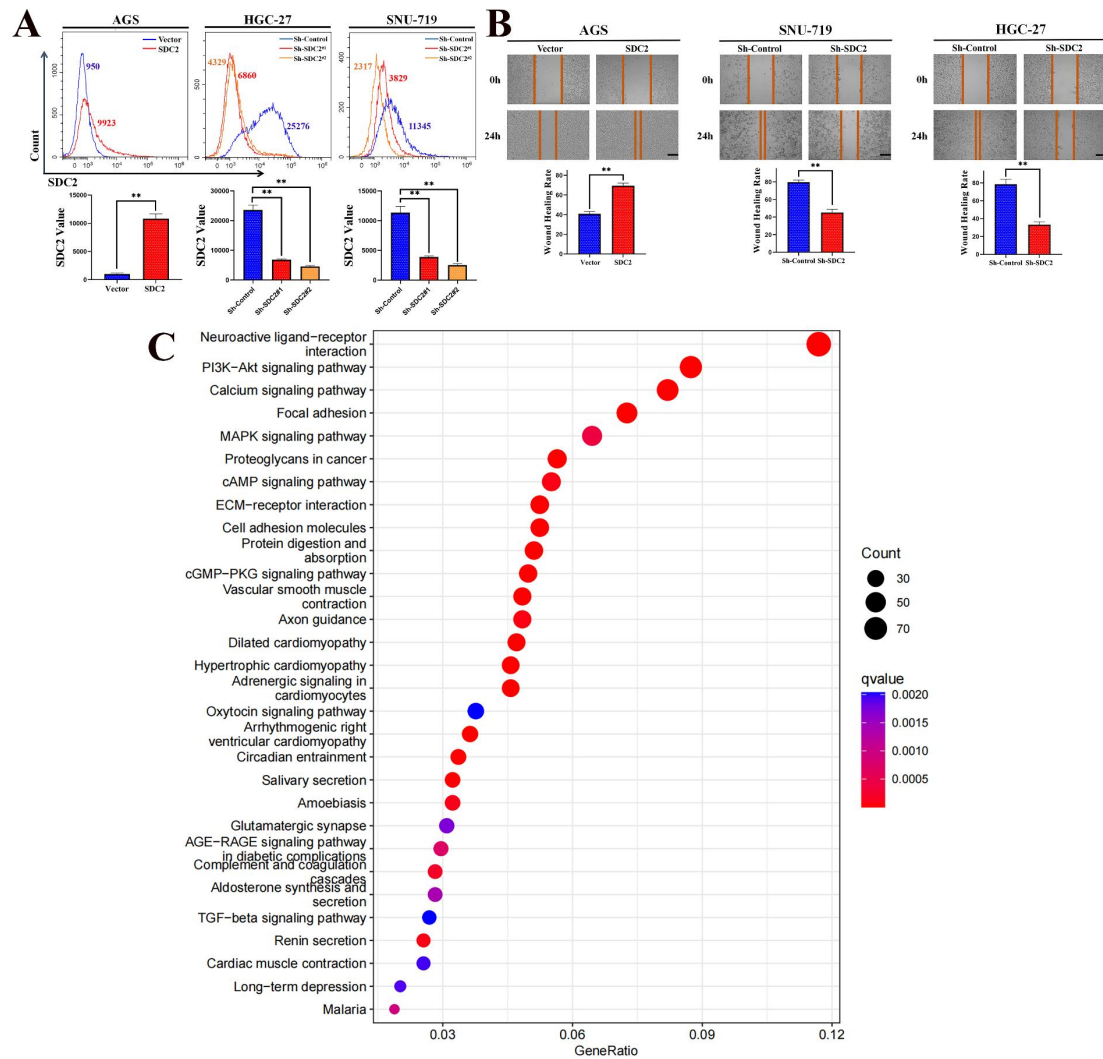


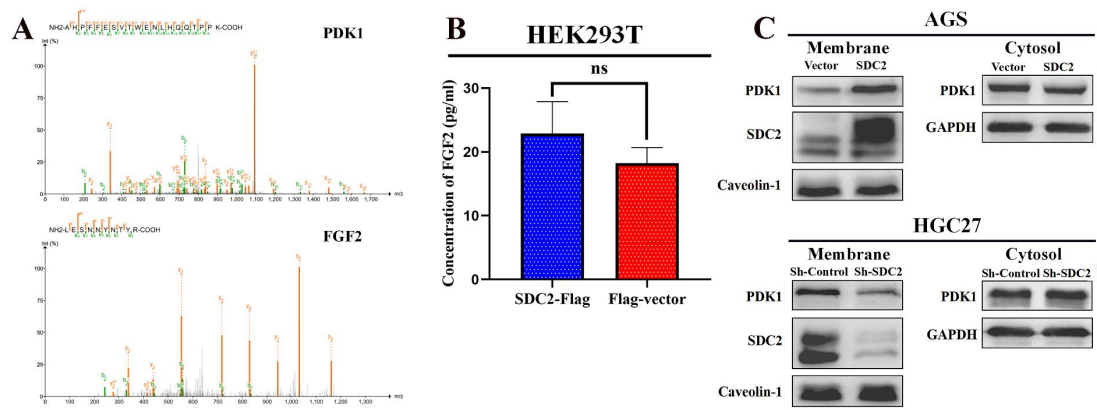
**Figure S1.**

**A.** SDC2 mRNA levels in the GC tissues of patients in the SDC2-WT group (N = 42) and the SDC2-MT group (N = 8) (SYSUCC Cohort). **B.** Overall survival and recurrence-free survival of GC patients in the SDC2-WT group (N = 42) and the SDC2-MT group (N = 8) (SYSUCC Cohort). **C.** Overall survival of GC patients with high SDC2 expression (N = 192) and low SDC2 expression (N = 192) (GEPIA2 Cohort). **D.** SDC2 mRNA levels in GC tissues with different N stages (GES13911 Cohort).



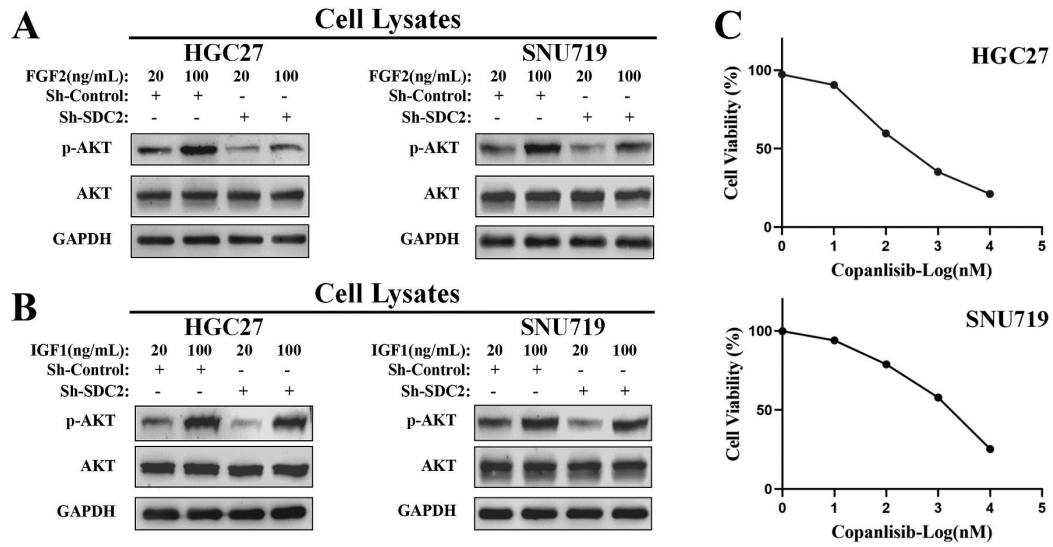
**Figure S2.**

**A.** Protein levels of SDC2 in three lines of GC cells after stable transfection with different SDC2 plasmids was measured using flow cytometry. **B.** Cell migration of AGS, SNU719, HGC27 cells that were transfected with different plasmids (Wound healing assay, scale bar: 200  $\mu$ m). **C.** Association of SDC2 with enrichment of signaling pathways (KEGG enrichment using the TCGA database).



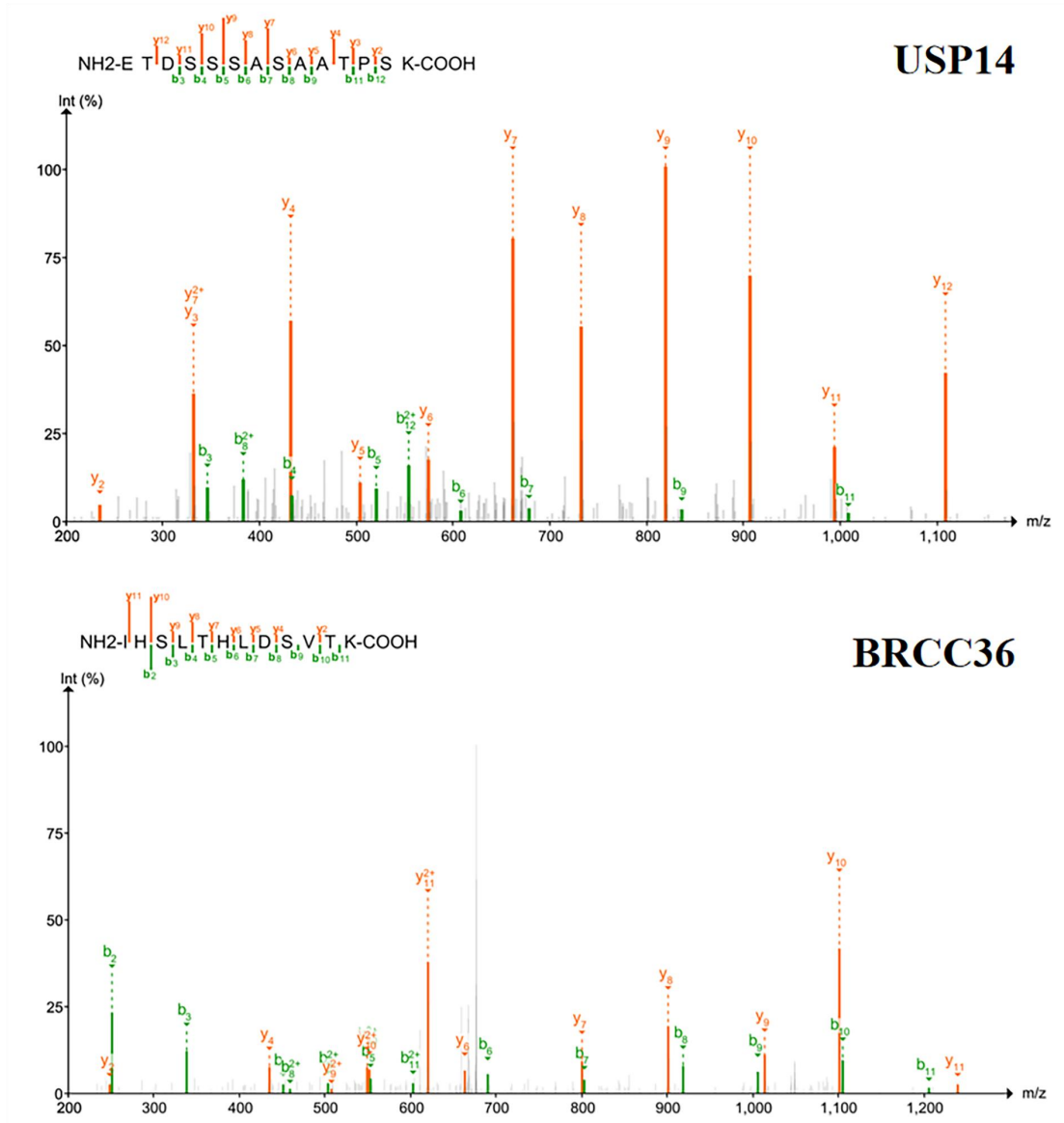
**Figure S3.**

**A.** Peptide mapping of PKD1 and FGF2 (LC/MS). **B.** Concentration of FGF2 in culture medium of 293T cells transfected with SDC2-Flag or Flag-vector plasmids. **C.** Effect of SDC2 on membrane translocation of PDK1 in AGS and HGC27 cells (Western blotting).



**Figure S4.**

**A & B.** FGF2-induced and IGF1-induced phosphorylation of AKT in GC cells with or without SDC2 knockdown (Western blotting). **C.** Effect of different Copanlisib concentration on the viability of two GC cell lines (treatment for 48 h).



**Figure S5.**

Peptide mapping of USP14 and BRCC36 (LC/MS).

**Table S1. Information for plasmids used in this study**

<b>shRNAs</b>	<b>Sequences</b>
Sh-SDC2 <sup>#1</sup>	5'- GACATGTACCTTGACAACAGC -3'
Sh-SDC2 <sup>#2</sup>	5'- GCTTCAGGAGTGTATCCTATT -3'
Sh-PDK1	5'- CAACATAGAGCAGTACATTCA -3'
Sh-USP14	5'- CCCAAGATTCAGCAGTCAGAT -3'

<b>Overexpression plasmids</b>	<b>NM number</b>
Lenti-CMV-H_SDC2-3×Flag-PGK-Puro	NM_002998
PGMLV-CMV-H_PDPK1-HA-PGK-Blasticidin	NM_002613
PGMLV-CMV-H_USP14-PGK-Puro	NM_005151
Lenti-CMV-H_USP14-myc-PGK-Blasticidin	NM_005151

**Table S2. Information for WB antibodies used in this study**

	<b>Identifiers</b>	<b>Source</b>
<i><b>SDC2</b></i>	# 365624	Santa Cruz, USA
<i><b>PDK1</b></i>	# 13037	Cell Signaling Technology, USA
<i><b>p-PDK1</b></i>	# 3438	Cell Signaling Technology, USA
<i><b>AKT</b></i>	# 4691	Cell Signaling Technology, USA
<i><b>p-AKT</b></i>	# 4060	Cell Signaling Technology, USA
<i><b>GAPDH</b></i>	# 5174	Cell Signaling Technology, USA
<i><b>Caveolin-1</b></i>	# 3267	Cell Signaling Technology, USA
<i><b>N-cadherin</b></i>	# 13116	Cell Signaling Technology, USA
<i><b>Vimentin</b></i>	# 46173	Cell Signaling Technology, USA
<i><b>FGF2</b></i>	# 98658	Cell Signaling Technology, USA
<i><b>USP14</b></i>	# 11931	Cell Signaling Technology, USA
<i><b>HA</b></i>	# 3724	Cell Signaling Technology, USA
<i><b>Flag</b></i>	# 66008-4-Ig	Proteintech, China

**Table S3. Correlation between SDC2-mutation and clinicopathological characteristics of GC patient samples (using Cohort 1-SYSUCC Cohort)**

<b>Characteristics</b>	<b>SDC2-WT, No. of cases</b>	<b>SDC2-MT, No. of cases</b>	<b><i>P</i> value</b>
<b>Age(y)</b>			
<60	24	5	0.778
≥60	18	3	
<b>Gender</b>			
Male	39	7	0.609
Female	3	1	
<b>Tumor Location</b>			
Proximal	10	4	0.051
Middle	25	1	
Distal	7	3	
<b>Tumor Size</b>			
<5 cm	22	5	0.599
≥5 cm	20	3	
<b>TNM stage</b>			
I	5	0	0.400
II	10	4	
III	26	4	
IV	1	0	



**Table S4. Correlation between SDC2 mRNA level and clinicopathological characteristics of GC patient samples (using Cohort 1-SYSUCC Cohort)**

Characteristics	SDC2 mRNA level		<i>P</i> value
	Low expression, No. of cases	High expression, No. of cases	
<b>Age(y)</b>			
<60	12	17	0.152
≥60	13	8	
<b>Gender</b>			
Male	24	22	0.297
Female	1	3	
<b>Tumor Location</b>			
Proximal	9	5	0.415
Middle	11	15	
Distal	5	5	
<b>Tumor Size</b>			
<5 cm	15	12	0.395
≥5 cm	10	13	
<b>TNM stage</b>			
I	3	2	0.686
II	6	8	
III	15	15	
IV	1	0	

**Table S5. Correlation between SDC2 IHC expression level and clinicopathological characteristics of GC patient samples (using Cohort 2-FUSCC Cohort)**

Characteristics	SDC2 IHC expression level		<i>P</i> value
	Low expression, No. of cases	High expression, No. of cases	
<b>Age(y)</b>			
<60	22	27	0.334
≥60	32	27	
<b>Gender</b>			
Male	39	34	0.304
Female	15	20	
<b>Tumor Location</b>			
Proximal	23	28	0.335
Distal	31	26	
<b>Tumor Size</b>			
<5 cm	40	31	0.068
≥5 cm	14	23	
<b>TNM stage</b>			
I	10	6	0.556
II	13	14	
III	31	34	