

Supplementary Figure with Legend.

Supplementary Figure 1

A.

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1  agtgcctcc  ccgtccgcg  gcgcggctg  cgaagttgag  cgaaaagttt  gaggcggag
61  ggagcgaggc  cggggagtc  gctccagcg  ggcgctccag  tccctcagac  gtgggctgag
121  cttgggacga  gctgcgttc  gccccaggcc  actgtaggga  acggcggttg  cgcctcccca
181  gcaaaccgga  ccgactgggt  agggcgcccc  accctgcctt  cgcgcgcgtc  gtgggtcctg
241  tgcggcccg  cctcgcggg  ccccgggaac  tgggccactt  gtcgcttggt  cgagagcagg
301  cggcagctgg  tggcccgtt  cgggcttggc  tttggcgcg  cccgggagcg  gctcccacga
361  gcgcgcgcg  cgtcgcaac  gagcggggcc  ctgagaagcg  cgcgcgcgcg  ctcccaccgc
421  tctggagctc  cgggcagggg  acacggcaac  ctggatggct  ggggcaggga  tcctctccca
481  gaacttcgtg  ccagcaatg  tccctcaag  ttctgggatt  ttacgcagc  tgaactcccc
541  tccccctggc  agccccgag  ggtccagcg  ccgcaggga  tgacgcggt  gtcctgcag
601  ccacgcctc  gggcgggga  ggcgagccc  acagcggcc  ctgcgacgc  cgcctgggca
661  gcaaccataa  ggaagctga  gcaaggagc  ccgccacgg  cagcgcccc  acagcgccag
721  ggacccctg  gcagcggg  ccgcggctc  aggttatgga  tccagcggc  ggcccccg
781  gctgctccc  gcgccttc  cgcgtgctg  tctgctgaa  cccgcgcgc  ggcaaggga
841  agcccttga  gctcttcg  agtcacgtg  agccctttt  gactgaggt  gaaatctct
901  taccgtgat  gctcactg  cggcggaac  acgcgcgga  gctggtgcg  tcggaggagc
961  tgggcgcgt  ggaagctc  gtaatcatg  ctggagacg  gctgatgc  gaggtgtga
1021  acgggtcat  ggagcggc  gactgggga  ccgccatca  gaagccctg  ttagcctcc
1081  cagcaggtc  tggcaacgc  ctggcagct  ccttgaacca  ttatgctgc  tatgagcag
1141  tcaccaatga  aagacctct  accaactgc  cgctattgt  gtgcgcgcg  ctgctgtcac
1201  ccatgaacct  gctgtctct  cacacggct  cggggctgc  cctcttct  gtgctcagc

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B.

Primer No.	Primer Sequence	Mapping position	Sizes of DNA products basepair (bp)
1	SK1-Forward 5' TTTACGCAGCTGGACTCCCCT	521 – 541	164 bp
2	SK1-Reverse 5' CTGCCTTCAGCTCCTTATCGG	664 – 684	
3	SK1-Forward 5' GGCTGAGGCTGAAATCTCCTT	881 – 902	289 bp
4	SK1-Reverse 5' GCAGTTGGTCAGGAGGTCTTC	1149 – 1169	
5	SK1-Forward 5' CGCTCAAGTTCTGGGATTTTT	503 – 523	185 bp
6	SK1-Reverse 5' CTCCTGCCTTCAGCTCCTTAT	667 – 687	
7	SK1-Forward 5' ATCTCCTTCACGCTGATGCT	894 – 913	103 bp
8	SK1-Reverse 5' CTCCAGACATGACCACCAGA	977 – 996	
9	SK1-Forward 5' TTTGGCTGAGGCTGAAATCT	878 – 897	306 bp
10	SK1-Reverse 5' CACAGCAATAGCGTGCAATT	1164 – 1183	
11	SK1-Forward 5' ATAAGGAGCTGAAGGCAGGAG	667 – 687	100 bp
12	SK1-Reverse 5' GCTGGATCCATAACCTCGAC	747 – 766	

Supplementary Figure 1. SphK1a and SphK1b PCR primer design. A) the SphK1 sequence showing the location of the SphK1 primers. B. SphK1 primer sequences (Forward and reverse). Each primer sequence is numbered, and colour coded which refers to the mapping positioning in Fig. 1A. The expected size of the PCR product is shown.

Supplementary Tables

Supplementary Table 1. SphK1 isoform expression profiles of cancer and non-cancer cell lines.

Cancer type	Reference/source	(SphK1a: primers F3-R4)	(SphK1b: primers F1-R2)
Breast Cancer (epithelial)			
MCF-7 luminal A (ER+/PR+/HER2-)	ATCC® HTB-22™	Y	Y
MCF-7-SphK1a		Y	Y
MCF-7-SphK1b		Y	Y
T-47D luminal A (ER+/PR+/HER2-)	ATCC® HTB-133™	Y	N
Cervical cancer			
HeLa	ATCC® CCL-2™	Y	N
Bone cancer (Epithelial)			
U-2OS (osteosarcoma)	ATCC® HTB-96™	Y	N
Prostate cancer (Epithelial)			
DU 145 (androgen independent)	ATCC® HTB-81™	Y	N
LNCaP (androgen dependent)	ATCC® CRL-1740™	Y	N
PC-3 (androgen independent)	ATCC® CRL-1435™	Y	N
VCaP (androgen independent)	ATCC® CRL-2876™	Y	N
Colon cancer (Epithelial)			
HCT 116	ATCC® CCL-247™	Y	N
HT29	ATCC® HTB-38™	Y	N
Brain cancer (Epithelial)			
U-87MG	ATCC® HTB-14™	Y	N
Mesothelioma (Epithelioid)			
NCL-H28 (*p113)	ATCC® CRL-5820™	Y	N
NCL-H28 (*p114)		Y	Y
NCL-H226 (*p74)	ATCC® CRL-5826™	Y	Y
NCL-H226 (*p75)		Y	Y
NCL-H2052 (*p51)	ATCC® CRL-5915™	Y	Y
NCL-H2052 (*p89)		Y	N
NCL-H2452 (*p36)	ATCC® CRL-5946™	Y	Y
NCL-H2452 (*p37)		Y	N
MM05 (*p25)	[38]*	Y	N
MM05 (*p32)		Y	N
VAMC23 (*p57)	[39]**	Y	Y
Mesothelioma (Biphasic)			
MSTO-211h (*p56)	ATCC® CRL-2081™	Y	N
SPC111 (*p14)	[40]**	Y	N
SPC111 (*p16)		Y	N
M38K P5 (*p5)	[41]	Y	N
M38K P5 (*p6)		Y	N
Mesothelioma (Benign)			
REN (*p14)	[42]	Y	Y
REN (*p15)		Y	Y
MeT-5A (1A)	ATCC® CRL-9444™	Y	N
MeT-5A (1B)		Y	N
LP9 (*p3)	[43]	Y	Y
LP9(*p14)		Y	N

Non-tumorigenic			
Human embryonic kidney (HEK293)	ATCC® CRL-1573™	Y	N

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Note: RNA from the mesothelioma cell lines were kindly provided by Dr Glen Reid and Patrick Winata (ADRI).

Note *p = passage number

Supplementary Table 2. Tumour characteristics and SphK1 isoform expression in human cancer tissues.

Type	Nature	Age/Sex	subtype	SphK1a	SphK1b
*Liver					
A1T	Cancer	62/Male	HCC	Y	N
A1P	Adjacent			Y	N
A2T	Cancer	63/M	HCC	Y	N
A2P	Adjacent			Y	N
A3T	Cancer	62/F	HCC	Y	N
A3P	Adjacent			Y	N
A4T	Cancer	66/M	HCC	Y	N
A4P	Adjacent			Y	N
A5T	Cancer	36/M	HCC	Y	N
A5P	Adjacent			Y	N
A6T	Cancer	66/M	HCC	Y	N
A6P	Adjacent			Y	N
**Prostate					
9T	Cancer	57/M	pT3a stage	Y	Y
10P	Adjacent			Y	Y
14T,15T	Cancer	75/M	pT2c stage	Y	Y
16P	Adjacent			Y	Y
17T,18T	Cancer	72/M	pT2c stage	Y	Y
19P	Adjacent			Y	N
21T,22T	Cancer	70/M	pT3b stage	Y	N
23P,24P	Adjacent			Y	Y
25T	Cancer	75/M	pT2a stage	Y	Y
26P	Adjacent			Y	Y
27T	Cancer	69/M	pT3b stage	Y	N
28P	Adjacent			Y	N
29T	Cancer	64/M	pT3b stage	Y	Y
30P	Adjacent			Y	N
*Breast					
1T	Tumour	34/F	30% IDC(Grade:3); 70% DCIS (High Grade)/(ER+, PR-, HER2-)	Y	Y
1P	Adjacent			Y	Y
2T	Tumour	42/F	IDC(Grade:3)/(ER-, PR-, HER2+)	Y	Y
2P	Adjacent			Y	Y
3T	Tumour	47/F	IDC(Grade:3)/(ER+, PR+, HER2+)	Y	Y
3P	Adjacent			Y	Y

4T	Tumour	66/F	8% IDC(Grade2); 92% DCIS (Medium Grade)/(ER-, PR-, HER2+)	Y	N
4P	Adjacent	66/F		N	N
5T	Tumour	32/F	IDC (Grade 2)/(ER-, PR+, HER2+)	Y	Y
5P	Adjacent			N	N
6T	Tumour	60/F	IDC (Grade 2)	Y	N
6P	Adjacent			N	N
7T	Tumour	61/F	IDC (Grade 2)/(ER-, PR+, HER2+)	N	N
7P	Adjacent			Y	Y
8T	Tumour	62/F	10% IDC (Grade 1); 90% DCIS (Low Grade)/(ER+, PR+, HER2+)	Y	Y
8P	Adjacent			Y	N
9T	Tumour	47/F	ILC	Y	N
9P	Adjacent			N	N
10T	Tumour	60/F	IDC (Grade 2)/(ER+, PR+, HER2+)	Y	N
10P	Adjacent			Y	Y
11T	Tumour	76/F	IDC (Grade 2)/(ER+, PR+, HER2+)	Y	N
11P	Adjacent			N	N
12T	Tumour	53/F	90% IDC (Grade 2); 10% DCIS/(ER+, PR+, HER2+)	Y	Y
12P	Adjacent			Y	N
13T	Tumour	54/F	IDC (Grade 3)/ER-, PR-, HER2-)	Y	Y
13P	Adjacent			Y	Y
14T	Tumour	43/F	IDC (Grade 3)/ER+, PR+, HER2+)	Y	Y
14P	Adjacent			Y	Y
15T	Tumour	50/F	IDC (Grade 3)/ER+, PR+, HER2+)	Y	Y
15P	Adjacent			Y	Y

Note: HCC – hepatocellular carcinoma.

* Kindly provided by Prof Xiaofeng Zhu

** Kindly provided by Dr Meijun Long, Dr Hongjie Chen and Dr Qiuxia Li.