SUPPLEMENTAL DATA （online appendix）

Supplemental data include three figures and can be found with this article online.

FIGURE S1 The specificity determination of the newly generated antibody against BRSK2. A**.** Reaction of BRSK2 antibody with the HA-BRSK2 protein from 293T cells. Lane 1: anti-serum from the unimmunized rabbit (1:2000); Lane 2: anti-serum after immunization (1:2000); Lane 3: anti-purified antibody against BRSK2 (1:200); Lane 4: anti-HA antibody (Sigma) (1:2000). B. The antibody was specific for the BRSK2 protein. The upper was short exposure time, and the middle was longer exposure time. Lane 2: the BRSK2 antibody was blocked by His-BRSK2 recombinant protein before used; Lane 1: unblocked antibody was used. C. BRSK2 was showing expressed in human pancreatic islets tissue and ducts. Immunostaining of human pancreatic islets using antibody against BRSK2, followed by DAB/H_2O_2 staining. Scale bar, 25 μm. D. The expression and activity of BRSK2 was dose-dependently increased by decreased glucose concentrations (30, 25, 20, 15, 5, 0 mM), and with no glucose treatment for 0, 1, 2, 3, 5, 7 h separately. Loading of each lane was controlled by immunolabeling of β-actin. E. CDC25C F (CDC25C fragment, aa143-253) was phosphorylated on Ser216 by BRSK2 and used as substrate for BRSK2 activity detection.

FIGURE S2 A. Expression of PCTAIRE1 in MIN6 cells compared with its highly identical kinases PCTAIRE2 and PCTAIRE3. PCTAIRE1 was ubiquitously expressed in transformed cell lines including MIN6 cells, while no PCTAIRE2 and PCTAIRE3 expression detected in MIN6. B. Co-immunoprecipitation of BRSK2 and PCTAIRE1 using HA-BRSK2 and Myc-PCTAIRE1 transfected into MIN6 cells. Cell lysates were immunoprecipitated with Myc antibody and immunoblotted with HA or Myc antibody. Myc-PCTAIRE1 could be immunoprecipitated HA-BRSK2 expressed in MIN6 cells using Myc antibody, showing their in vitro interaction.

FIGURE S3 A. Serum Glucagon showed no significant difference between the BRSK2-RNAi mice and control mice. B. Increased isolated islet size and islet area in BRSK2-RNAi mice. Saline and nonsilence were displayed as negative control. *** $P<0.001$, n=3 mice/ condition. Scale bar, 50 μm. C. Islet β cell size of BRSK2-RNAi mice was showed increase using E-cadherin/insulin co-immunostaing and analysized by Image J software. Scale bar, 10 μm. * $P<0.05$, ** $P<0.01$, NS means $P>0.05$. n=6 mice/ condition.

Figure S1

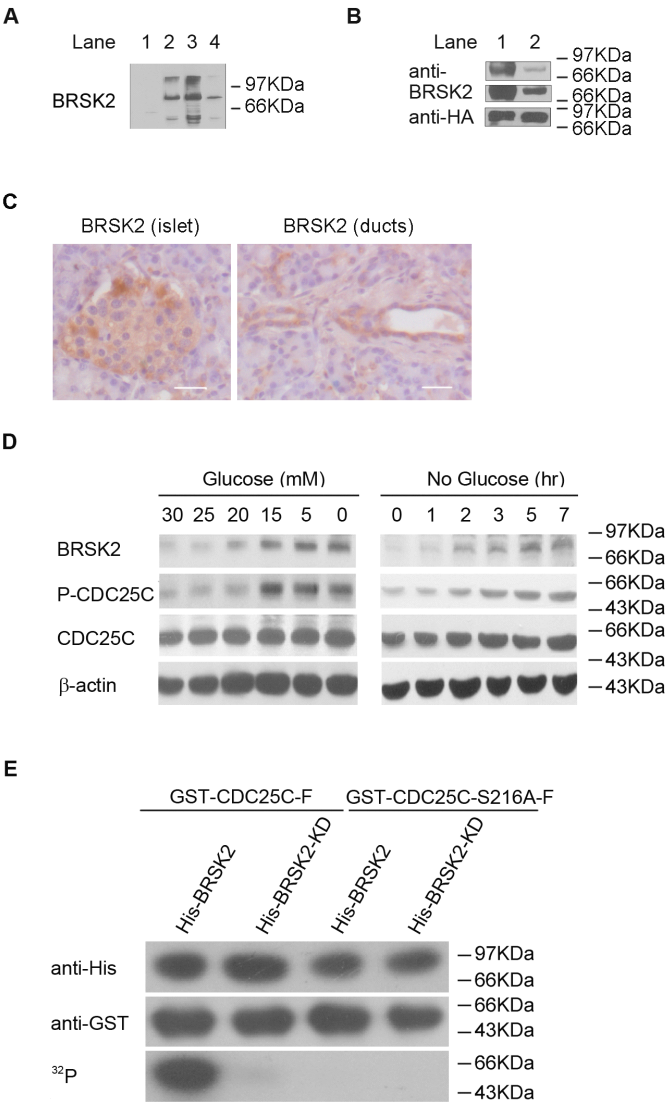

A
Lane 1 2 3 4
BRSK2
97KDa
66KDa
B
Lane 1 2
anti-BRSK2
anti-HA
97KDa
66KDa
66KDa
97KDa
66KDa
C
BRSK2 (islet)
BRSK2 (ducts)
D
Glucose (mM)
30 25 20 15 5 0
No Glucose (hr)
0 1 2 3 5 7
BRSK2
P-CDC25C
CDC25C
β-actin
97KDa
66KDa
66KDa
43KDa
66KDa
43KDa
43KDa
E
GST-CDC25C-F
GST-CDC25C-S216A-F
His-BRSK2
His-BRSK2-KD
His-BRSK2
His-BRSK2-KD
anti-His
anti-GST
32P
97KDa
66KDa
66KDa
43KDa
66KDa
43KDa

Figure S2

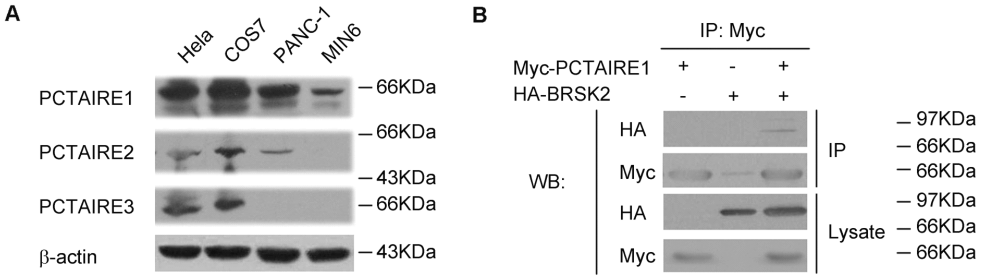
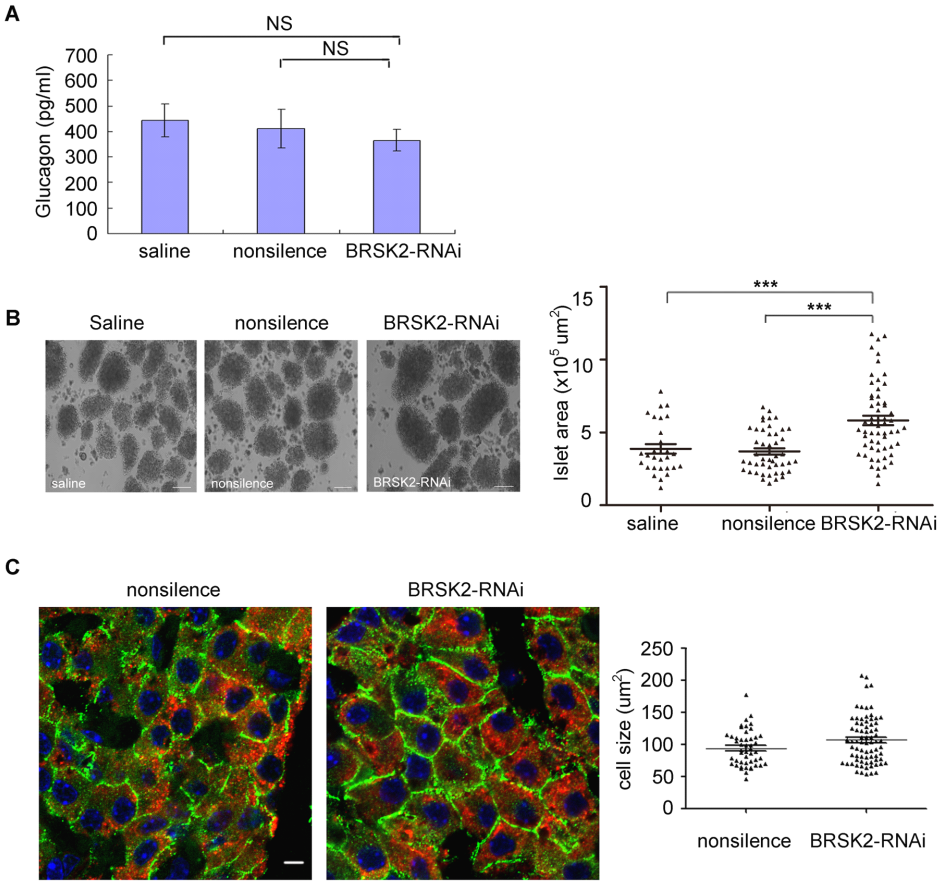

A
Hela
COS7
PANC-1
MIN6
PCTAIRE1
PCTAIRE2
PCTAIRE3
β-actin
66KDa
66KDa
43KDa
66KDa
43KDa
B
IP: Myc
Myc-PCTAIRE1 + - +
HA-BRSK2 - + +
WB:
HA
Myc
HA
Myc
IP
Lysate
97KDa
66KDa
66KDa
97KDa
66KDa
66KDa

Figure S3


A
NS
NS
Glucagon (pg/ml)
700
600
500
400
300
200
100
0
saline
nonsilence
BRSK2-RNAi
B
Saline
nonsilence
BRSK2-RNAi
saline
nonsilence
BRSK2-RNAi
***
***
Islet area (x10^5 um^2)
15
10
5
0
saline
nonsilence
BRSK2-RNAi
C
nonsilence
BRSK2-RNAi
cell size (um^2)
250
200
150
100
50
0
nonsilence
BRSK2-RNAi