SUPPLEMENTARY DATA

Supplementary Table 1. The following antibodies were used in this study.

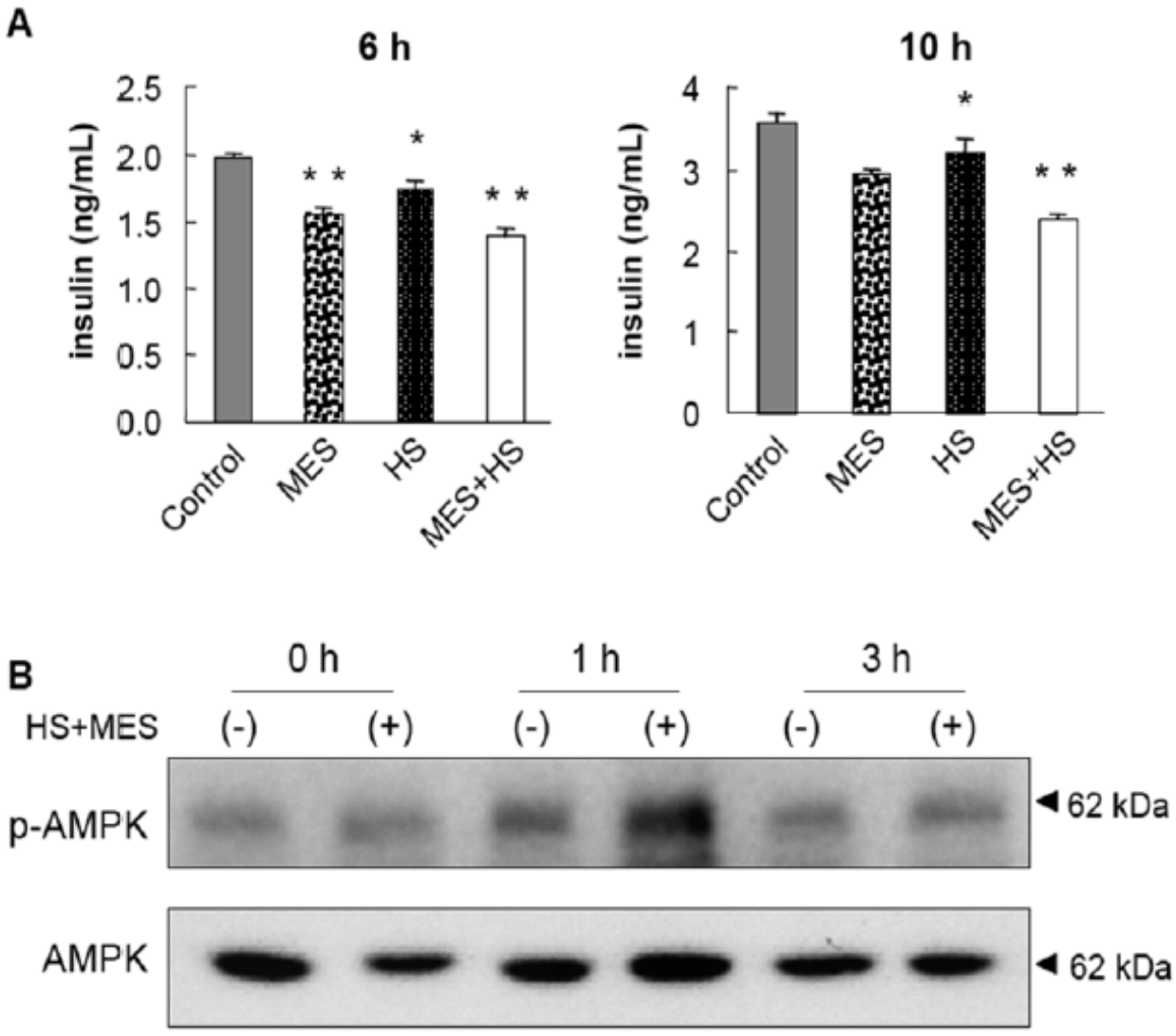
Stressgen Biotechnologies (Victoria, BC, Canada)
Anti-HSP72 antibody: SPA-810
Santa Cruz Biotechnology (Santa Cruz, CA)
Anti-insulin antibody: sc-9168
Anti-nuclear factor of activated T-cell (NFAT) c1antibody: sc-7294
Anti-glucose transporter (GLUT) 2 antibody: sc-9117
Anti-BiP (GRP78) antibody: sc-1050
Anti-C/EBP homologous protein (CHOP) (GADD153) antibody: sc-575
8-Hydroxy-2'-deoxyguanosine (8-OHdG) antibody: sc-66036
XBP-1antibody: sc-7160
Anti-actin antibody: sc-1615
Cell Signaling Technology Inc. (Beverly, MA)
Anti-forkhead box O1 (FOXO1) antibody: #9462
Anti-phospho-c-jun N-terminal kinase (JNK) antibody: #9251
Anti-JNK antibody: #9252
Anti-nuclear factor-kappa B (NF-kB) p65 antibody: #4764
Anti-cleaved-caspase-3 antibody: #9661
Anti-phospho-AMPKa: #2535
Anti-AMPKa: #2532
Chemicon International Inc. (Billerica, MA)
Anti-pancreatic and duodenal homeobox (PDX)-1 antibody: AB3243
a-tubulin antibody: #05-829
Upstate Biotechnology (Lake Placid, NY)
Anti-insulin receptor substrate (IRS)-2 antibody: 06-506
Biorbyt (Riverside, UK)
Anti-Annexin V antibody: orb18007

Supplementary Table 2. Primer sequences for quantitative real time RT-PCR.

insulin-2 FW; 5′-GCTCTCTACCTGGTGTGTGG-3′,
insulin-2 RV; 5′-GTTTTATTCATTGCAGAGGG-3′,
Hsp72 FW; 5′-TGGTGCTGACGAAGATGAAG-3′,
Hsp72 RV; 5′-AGGTCGAAGATGAGCACGTT-3′,
PDX-1 FW; 5′-GAAATCCACCAAAGCTCACG-3′,
PDX-1 RV; 5′-TTCAACATCACTGCCAGCTC-3′,
BiP FW; 5′-ATCGGACGCACTTGGAATGAC-3′,
BiP RV; 5′-TTCCCAAATACGCCTCAGCAG-3′,
CHOP FW; 5′-CATACACCACCACACCTGAAAG-3′,
CHOP RV; 5′-CCGTTTCCTAGTTCTTCCTTGC-3′,
b-actin-FW; 5′-CGTAAAGACCTCTATGCCAA-3′,
b-actin-RV: 5′-AGCCATGCCAATGTTGTCTC-3′.
To assess the specificity of the amplified PCR products, a melting curve analysis was performed after the last cycle.

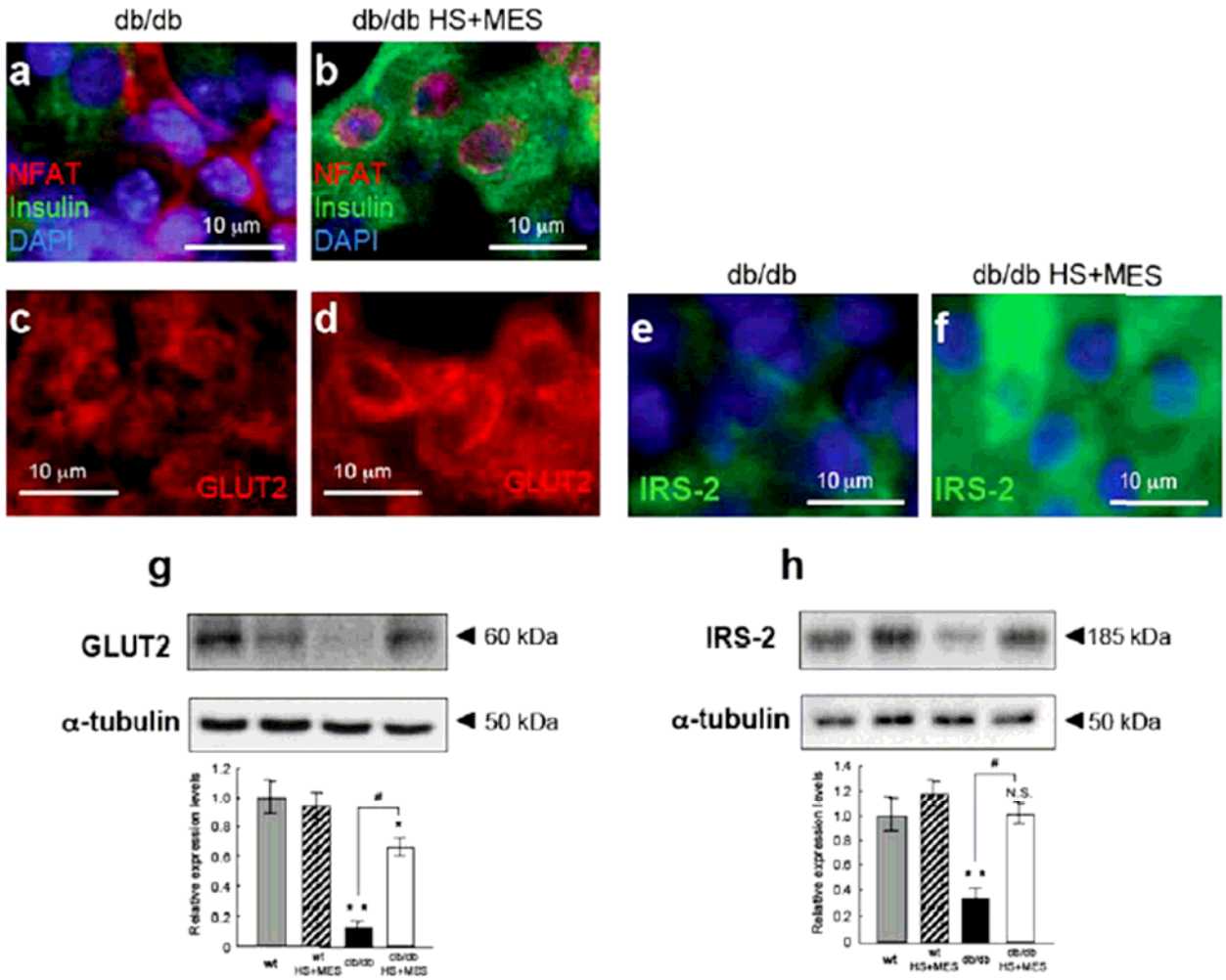
SUPPLEMENTARY DATA

Supplementary Figure 1. Insulin secretion capacity in MIN6 cells.
A: MIN 6 cells were incubated with 400mM palmitate for 24hr, then sham, MES, HS or HS+MES treatment were performed for 10min. After 6 and 10 hrs of these treatments, insulin concentrations in culture medium were measured by ELISA.
B: MIN 6 cells were incubated with 400mM palmitate for 24hr, then sham or HS+MES treatment were performed for 10min. After 0, 1 and 3 hrs of these treatments, cell lysates were isolated, and AMPK and phospho-AMPK levels were determined by Western blot.
**p*<0.05, ***p*<0.01 vs. sham-treated control.



SUPPLEMENTARY DATA

Supplementary Figure 2. Molecular markers of pancreatic β-cell integrity and function.
Immunohistochemical analysis of molecular markers associated with pancreatic β-cell integrity and function (a and b; NFAT/insulin, c and d; GLUT2, e and f; IRS-2).
GLUT2 and IRS-2 protein were determined by Western blotting, and the expression levels were corrected using internal control, α-tubulin.
**p*<0.05, ***p*<0.01, N.S. vs. sham-treated wt control. # *p*<0.05 vs. indicated group.



SUPPLEMENTARY DATA

Supplementary Figure 3. Molecular markers of apoptotic signal, inflammation and oxidative stress in pancreatic β-cells.
Immunohistochemical analysis of molecular markers associated with apoptosis (A: a and b; Cleaved caspase-3, c and d; Annexin-V), inflammation (B: a and b; NF-κB) and oxidative stress (B: c and d; 8-OHdG) in sham-treated db/db and HS+MES treated db/db islets.
Cleaved caspase-3 protein were determined by Western blotting, and the expression levels were corrected using internal control, α-tubulin.
**p<0.01, N.S. vs. sham-treated wt control. # p<0.05 vs. indicated group.