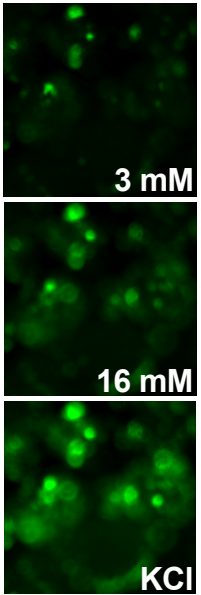
SUPPLEMENTARY MATERIALS

Figure S1. Simultaneous measurement of insulin secretion and real-time calcium imaging in response to glucose and KCl. Islets from a single donor were briefly digested and incubated overnight with lentivirus expressing the genetically encoded calcium indicator protein Gcamp6s under the control of the rat insulin promoter. 90 islets were perfused with KRBH containing 3 mM or 16 mM glucose or 30 mM KCl. A representative fluorescent image for each condition is shown on the left.

Figure S2. Measurement of DNA and insulin content in human islets cultured for 5 weeks. Human islets from three donors were lysed a day after receipt (Day 1) or after 42 days in a transwell or hydrogel environment and total DNA content (left) or insulin content (right) were measured.

Supplementary Movie 1. Real-time visualization of calcium flux in EndoC-ßH1 transduced with a Gcamp6s reporter under the control of the rat insulin promoter exposed to low glucose, high glucose, and KCl.

Figure S1


3 mM
16 mM
KCl

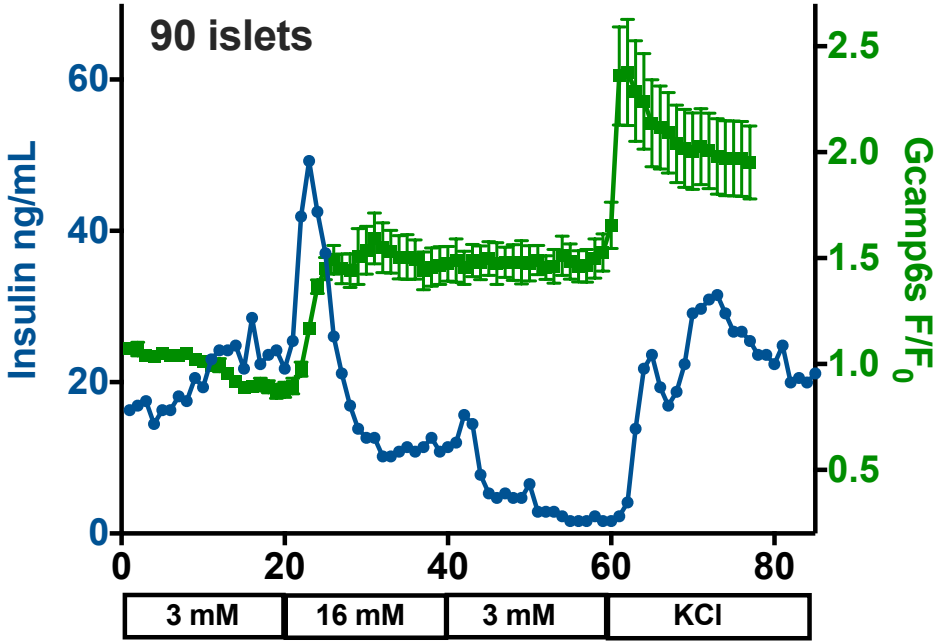
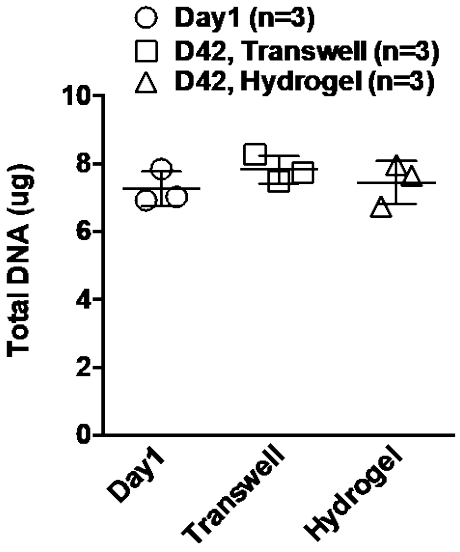
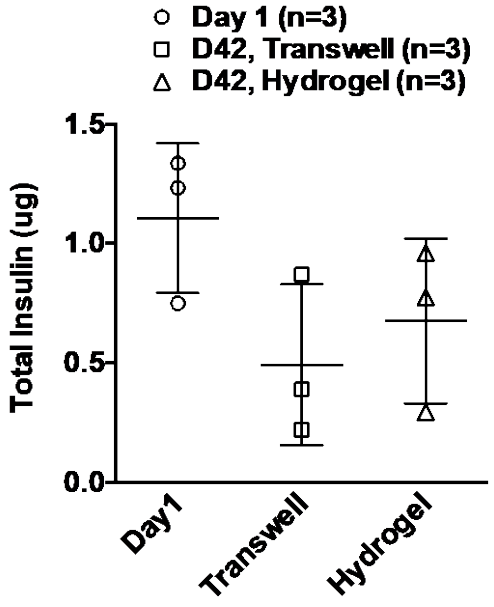

90 islets
Insulin ng/mL
Gcamp6s F/F0
60
40
20
0
2.5
2.0
1.5
1.0
0.5
0
20
40
60
80
3 mM
16 mM
3 mM
KCl

Figure S2


Day1 (n=3)
D42, Transwell (n=3)
D42, Hydrogel (n=3)
Total DNA (ug)
10
8
6
4
2
0
Day1
Transwell
Hydrogel


Day 1 (n=3)
D42, Transwell (n=3)
D42, Hydrogel (n=3)
Total Insulin (ug)
1.5
1.0
0.5
0.0
Day1
Transwell
Hydrogel