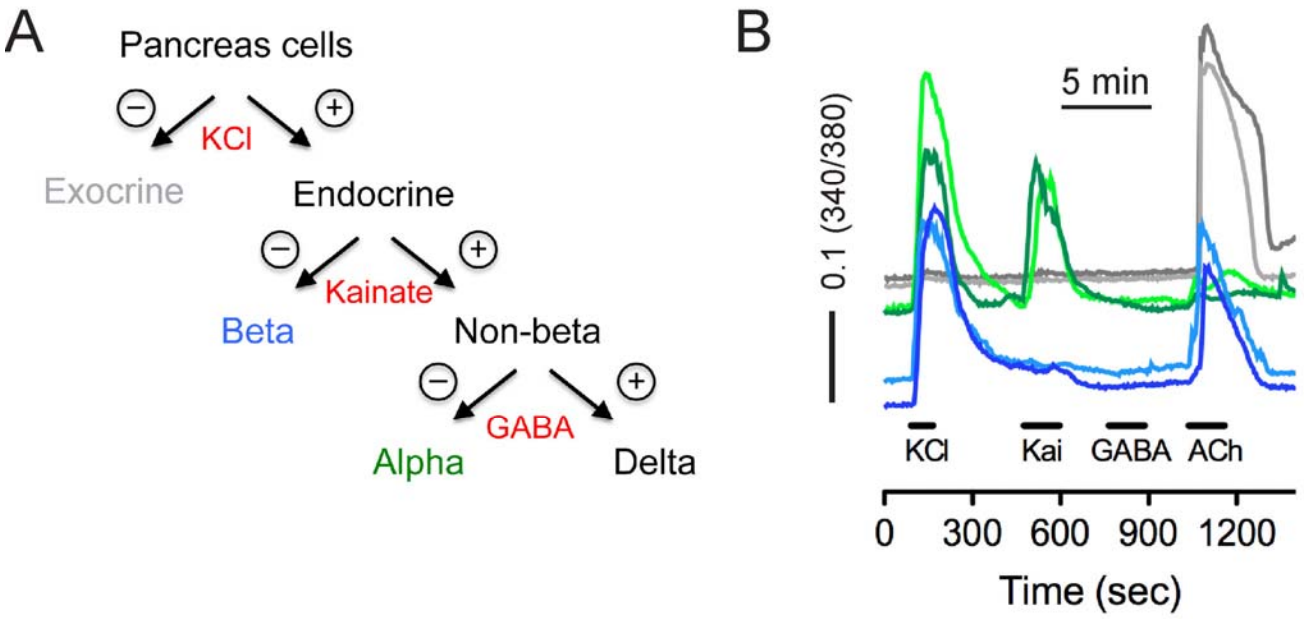
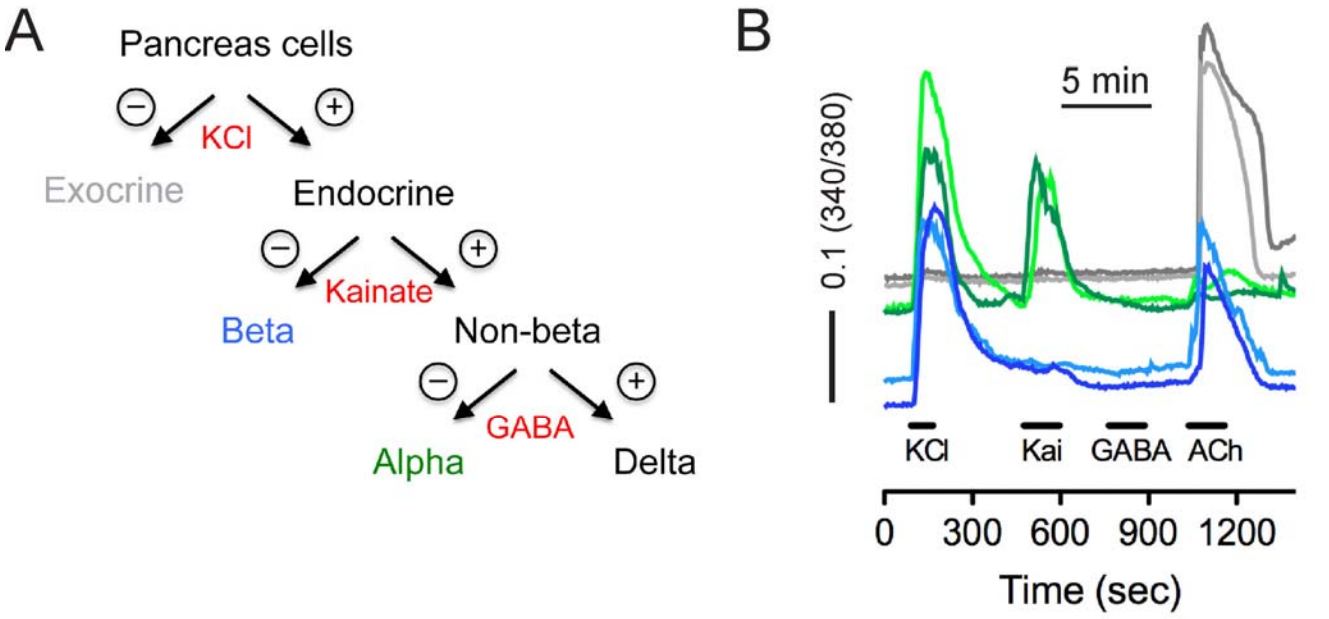
SUPPLEMENTARY DATA

Supplementary Figure 1. Scheme showing how endocrine cell types were identified after dispersion using imaging of [Ca2+]i. A: [Ca2+]i responses to KCl depolarization, kainate and GABA allow distinguishing beta, alpha, and delta cells in dispersed islet preparations. Stimuli are applied in random order at the end of the experiment. B: Traces of [Ca2+]i responses of 2 beta cells (blue), 2 alpha cells (green), and 2 exocrine cells (grey) showing responses to acetylcholine (10 μM) in beta cells and exocrine cells but not alpha cells. Alpha cells responded to kainate (100 μM).



SUPPLEMENTARY DATA

Supplementary Figure 2. Characterization of somatostatin biosensor cells. A: Schematic of the biosensor cell approach. Responses in the somatostatin biosensor cells were recorded by loading cells with Fura-2 and imaging cytoplasmic [Ca2+]i. B: Dose-response relationship of somatostatin biosensors cells expressing the somatostatin receptor 3 coupled to the promiscuous G protein Gα15 (mean ± SEM from 9 biosensor cells). Somatostatin-28 was used as agonist. C: Somatostatin-28 (100 nM) reliably elicits [Ca2+]i responses in somatostatin biosensor cells (mean ± SEM from 11 biosensor cells). Shaded portion of the trace shows prolonged application of somatostatin-28. D: [Ca2+]i responses to somatostatin-28 (1 μM) are completely blocked by the somatostatin receptor antagonist cyclosomatostatin (10 μM). Cyclosomatostatin was present throughout the shaded portion of the trace (mean ± SEM from 11 biosensor cells).



SUPPLEMENTARY DATA

Supplementary Figure 3. Blocking M3 receptors reduces insulin responses to changes in glucose concentration. Perifusion assay showing that the M3 receptor antagonist J-104129 (50 nM) reduced insulin responses to multiple increases in glucose concentration to 11 mM (11G).