Alpha cells secrete acetylcholine as a non-neuronal paracrine signal priming human beta cell function

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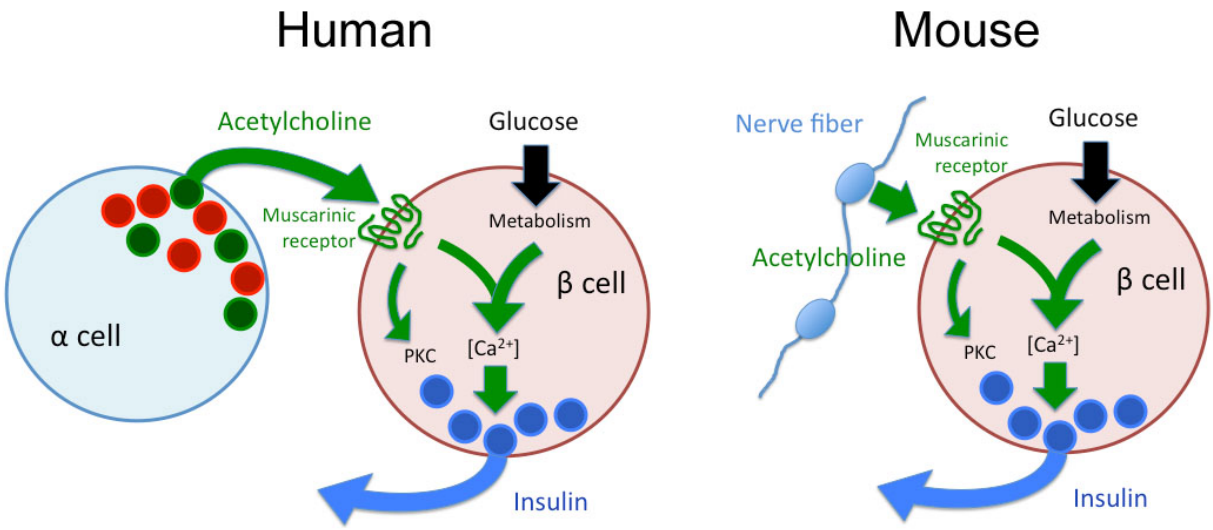
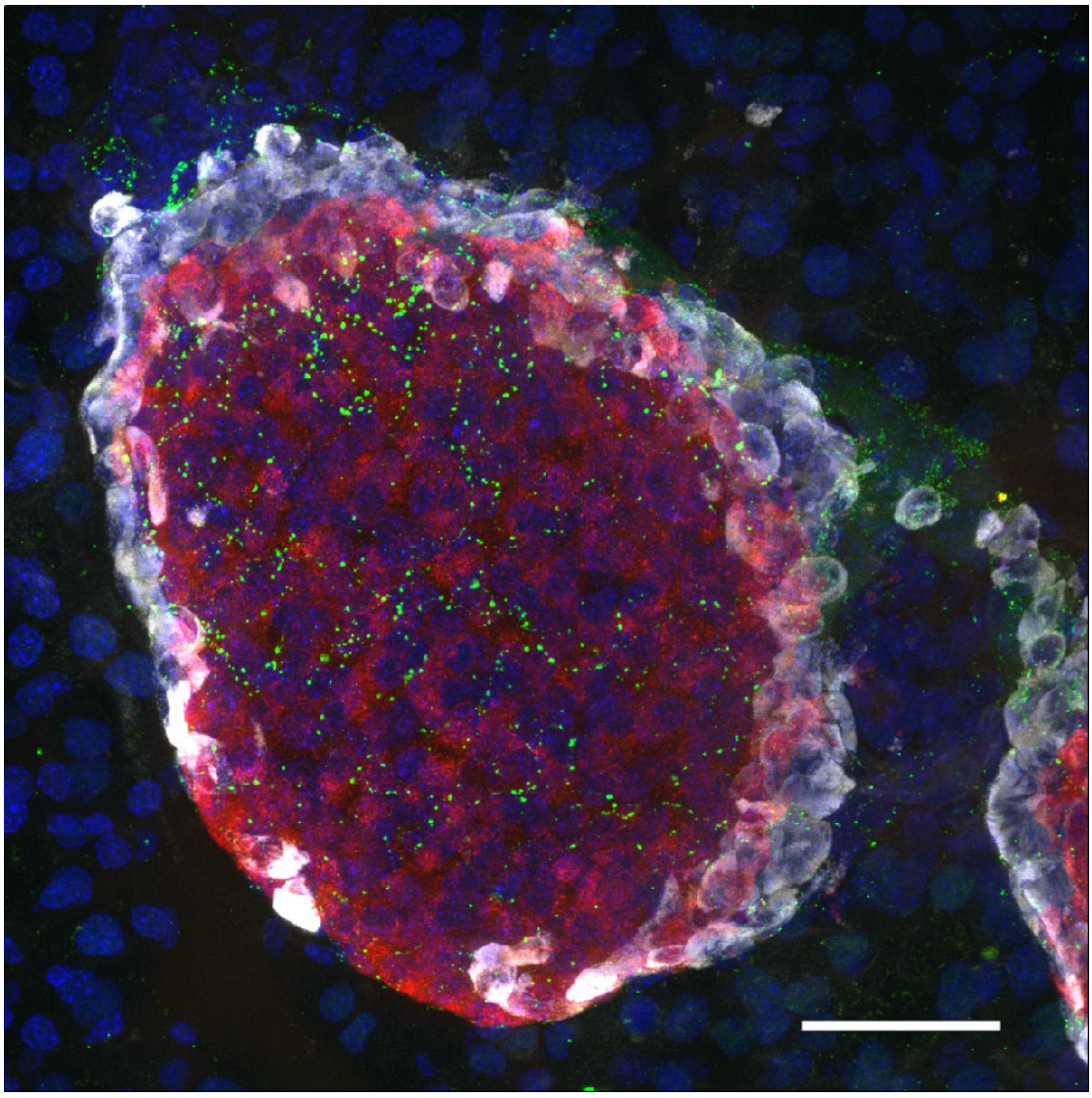
Supplementary Information

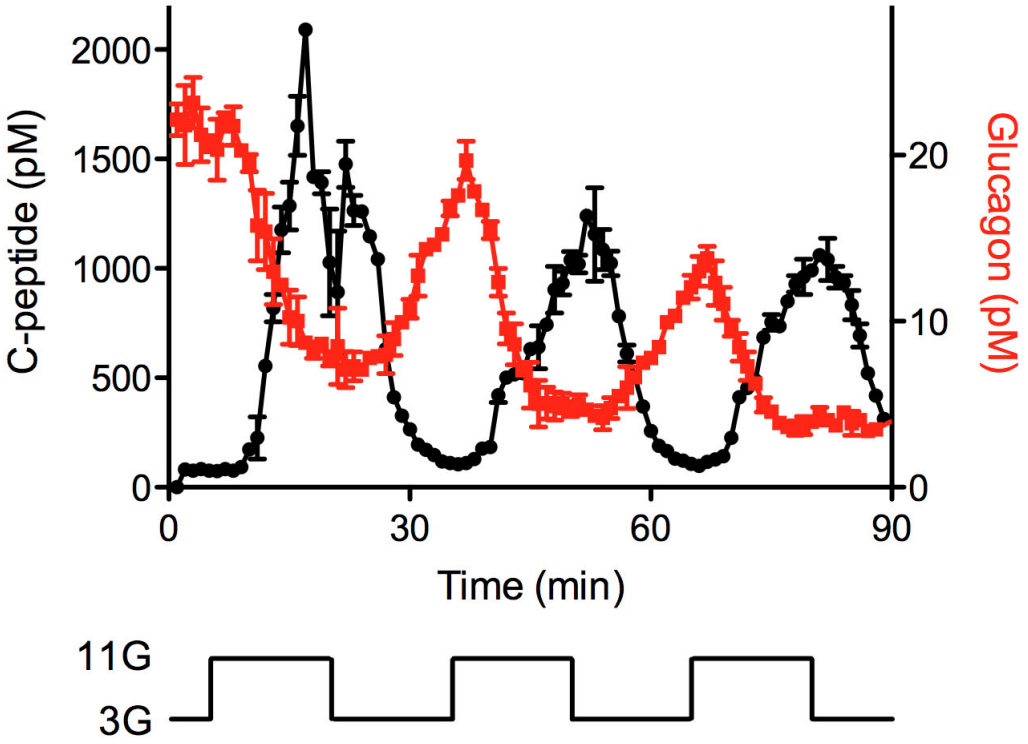


Supplementary Figure 1 Graphical representation of the results.

In human alpha cells, acetylcholine is stored in vesicles for exocytotic release (green). Glucagon is stored in different granules (red). Alpha cell-derived acetylcholine amplifies beta cell secretion in response to increases in glucose. By contrast, in mouse islets, parasympathetic fibers provide cholinergic input to beta cells.



Supplementary Figure 2 Cholinergic fibers innervate beta cells in the mouse islet. Z-stack of confocal images of a mouse pancreatic section showing an islet immunostained for vesicular acetylcholine transporter (vAChT, green), glucagon (white), and insulin (red). Scale bar, 50 μm.



Supplementary Figure 3 Stimulation protocol used to alternately stimulate alpha and beta cells.

In perifusion assays of dynamic secretory responses, the glucose concentration was made to fluctuate between 3 mM (3G) and 11 mM (11G). This stimulation pattern resulted in alternate activation of beta cells (increases in C-peptide secretion; black symbols) and alpha cells (increases in glucagon secretion; red symbols). This stimulation protocol was used for the experiments shown in Fig. 4c, d (n = 4 islet preparations).