

## Description of Additional Supplementary Files

**File Name:** Supplementary Movie 1

**Description:** Fast Ca<sup>2+</sup> recordings in B-NORM islets showing highly coordinated oscillations in response to 11 mM glucose (playback = 70 frames per second).

**File Name:** Supplementary Movie 2

**Description:** Fast Ca<sup>2+</sup> recordings in B-MAT islets showing more stochastic responses to 11 mM glucose (playback = 70 frames per second).

**File Name:** Supplementary Movie 3

**Description:** Ca<sup>2+</sup> activity in hM4Di<sup>-/-</sup> islets before and after application of J60. Application of J60 does not affect Ca<sup>2+</sup> oscillations in response to 11 mM glucose in hM4Di<sup>-/-</sup> islets (playback = 30 frames per second).

**File Name:** Supplementary Movie 4

**Description:** Ca<sup>2+</sup> activity in hM4Di<sup>+/-</sup> islets before and after application of J60. Application of J60 to hM4Di<sup>+/-</sup> islets silences Ca<sup>2+</sup> oscillations in response to 11 mM glucose but not the depolarizing stimulus KCl (added at the end) (playback = 30 frames per second).

**File Name:** Supplementary Movie 5

**Description:** Fast Ca<sup>2+</sup> recordings in hM4Di<sup>-/-</sup> islets showing highly coordinated oscillations in response to 11 mM glucose (playback = 70 frames per second).

**File Name:** Supplementary Movie 6

**Description:** Fast Ca<sup>2+</sup> recordings in hM4Di<sup>+/-</sup> islets showing more stochastic responses to 11 mM glucose (playback = 70 frames per second).