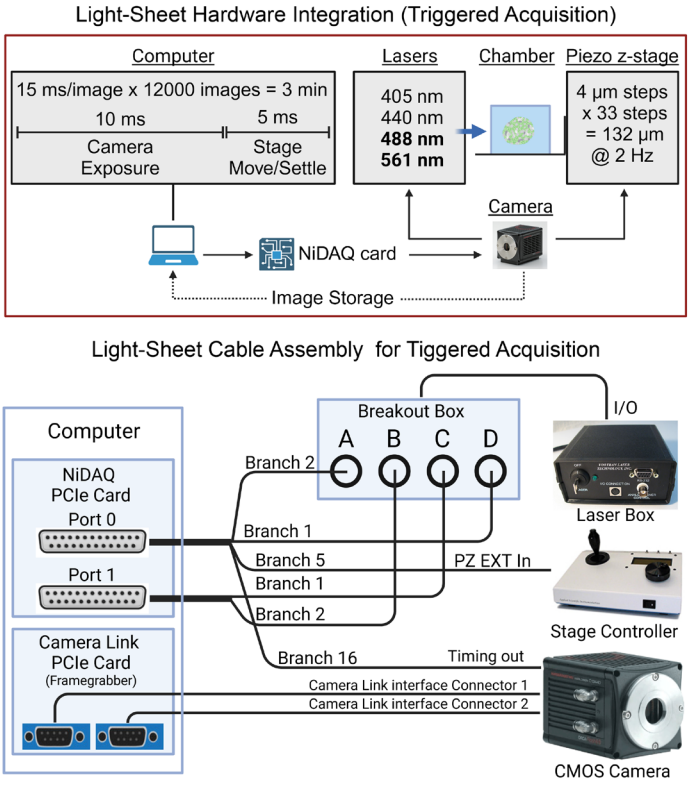
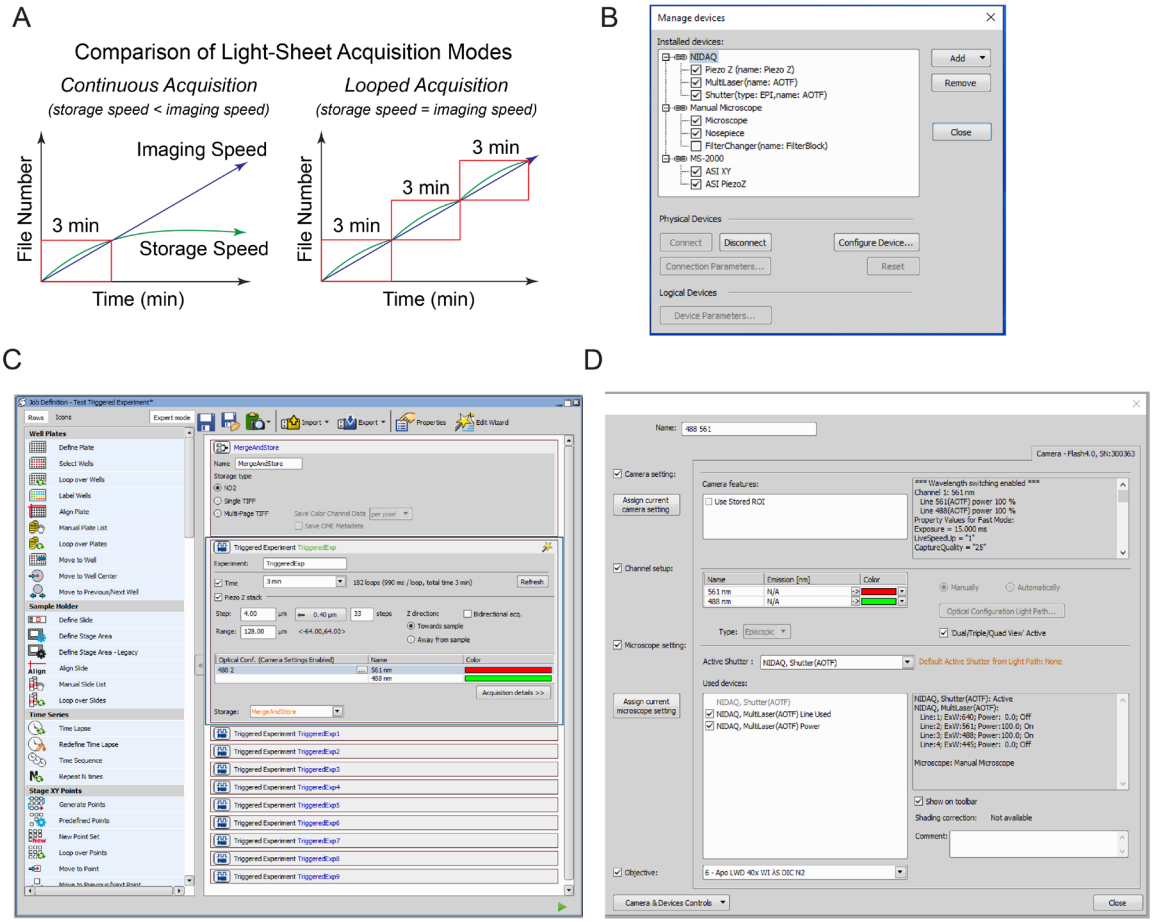
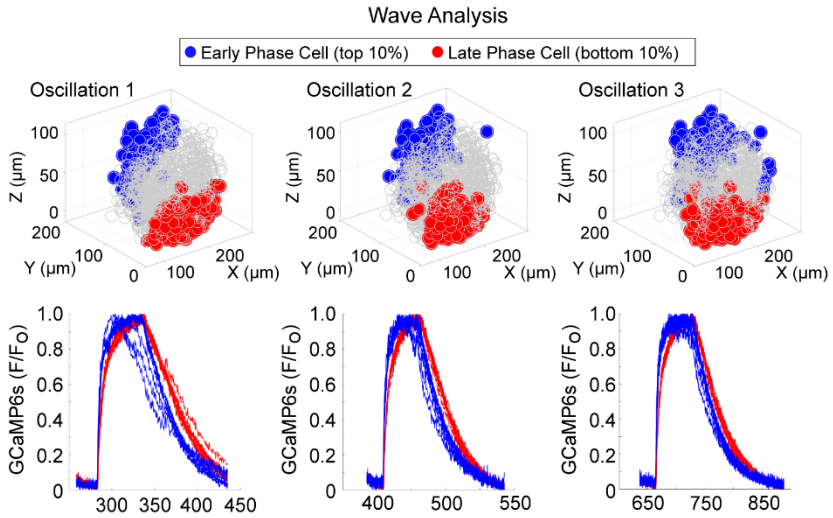


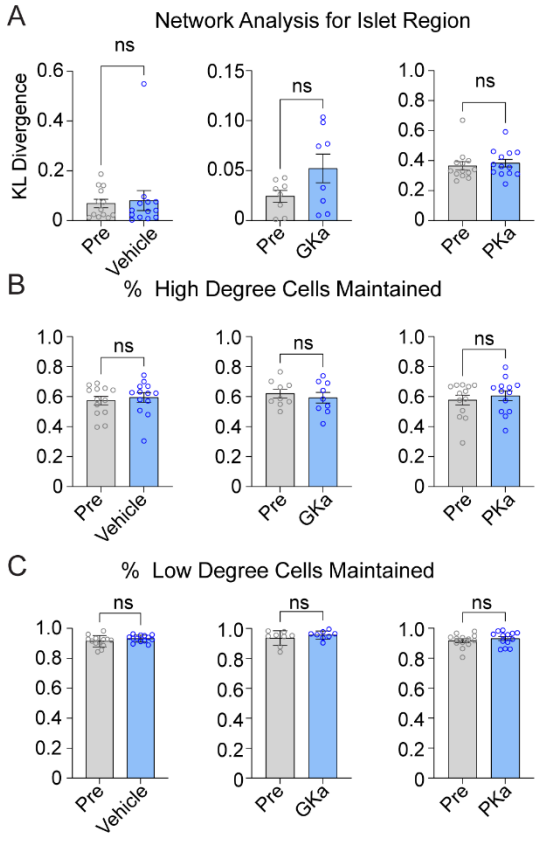
Suppl. Fig. 1. Hardware wiring diagram of the light-sheet microscope. Hardware integration (top panel) for camera-triggered activation of the excitation lasers and piezo z-stage that limits communication to a single instruction from the computer every 3 minutes. Wiring diagram (bottom panel): two Nikon 'standard cables' connect to the NiDAQ card installed in the computer. These two cables link to the laser control box, stage controller and camera. The images captured are received by the computer through a camera link PCIe card. and



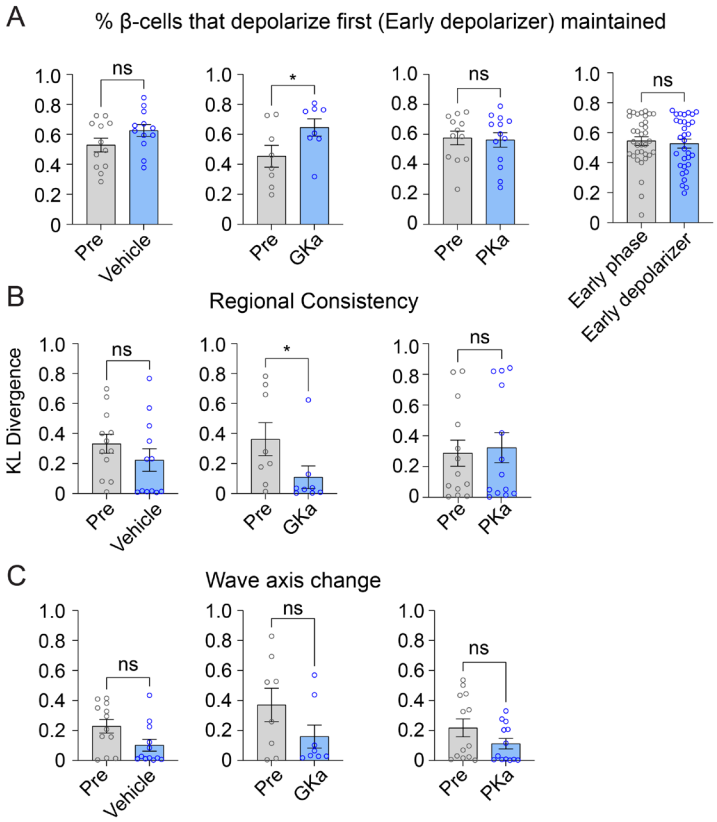
Suppl. Fig. 2. NIS-Elements software configuration. (A) Schematic for comparing continuous acquisition and looped acquisition. The red box indicates the 3-minute window where storage speed is higher than imaging speed. (B) Devices linked to NIS-Elements. (C) NIS-Elements JOBS module configured for looped acquisition. (D) Optical configuration for simultaneous GCaMP6s/H2B-mCherry excitation.



Suppl. Fig. 3. Location of early and late phase cells in an islet with stable wave axis. 3D representation of the islet showing the location of early phase cells (blue) and late phase cells (red) over three consecutive oscillations (top panel) and their corresponding Ca^{2+} traces (bottom panel).



Suppl. Fig. 4. Effect of glycolytic activators on the β-cell network. (A-C) Effect of vehicle, glucokinase activator (GKa), and pyruvate kinase activator (PKa) on regional consistency of the β-cell network (A), high degree cell retention (B), and low degree cells retention (C). Data are displayed as mean ± SEM.



Suppl. Fig. 5. Effect of glycolytic activators on the β-cells that depolarize first. (A-C) Effect of vehicle, glucokinase activator (GKa), and pyruvate kinase activator (PKa) on the retention (A), regional consistency (B), and wave axis change (C) of the β-cells that depolarize first (Early depolarizer). The retention of β-cells that depolarize first (Early depolarizer) is similar to cells that depolarize and repolarize first (Early phase). Data are displayed as mean ± SEM.