

Supplemental Information

**Decreased Expression of Cilia Genes in
Pancreatic Islets as a Risk Factor for Type 2
Diabetes in Mice and Humans**

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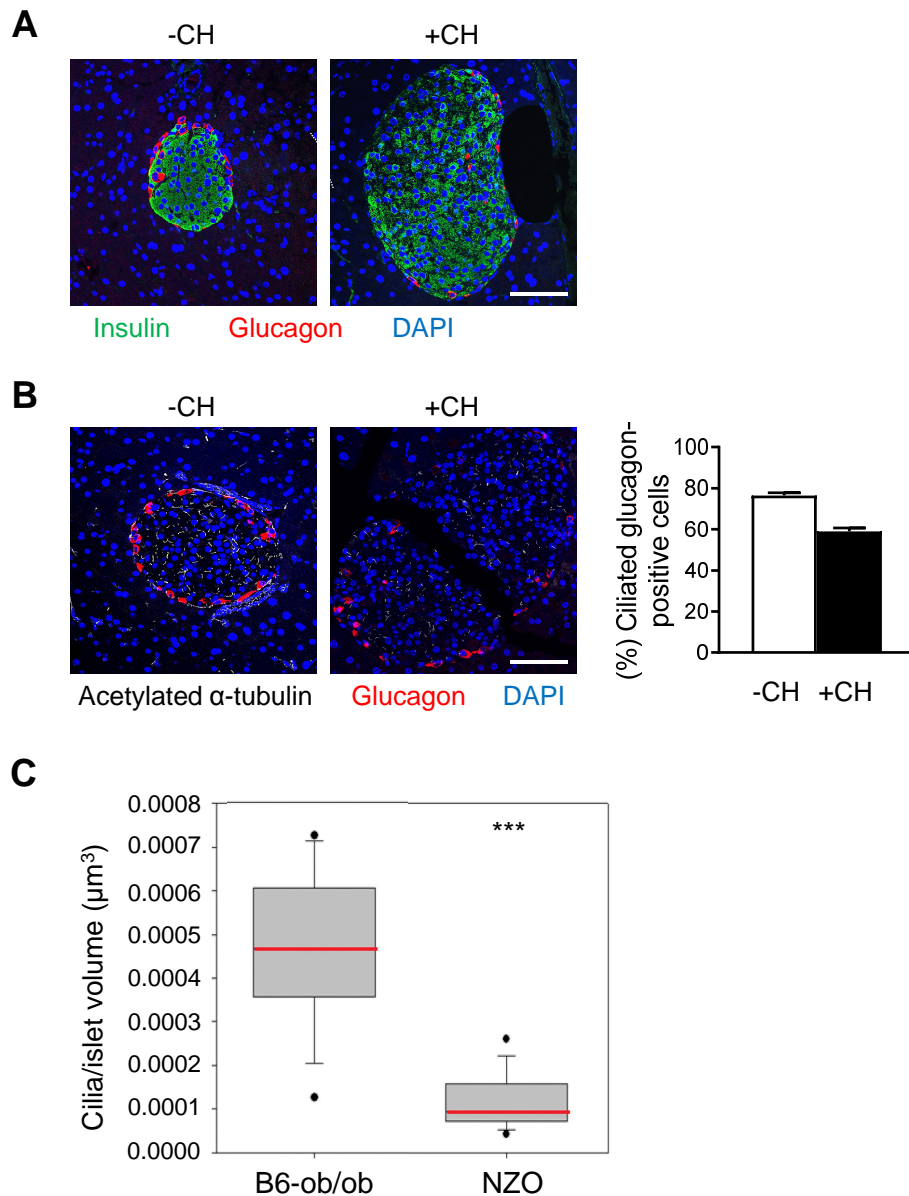


Figure S1. Ciliation of whole mounted islets of B6-ob/ob and NZO mice. Related to Figure 3.

(A) Representative insulin and glucagon co-staining in pancreatic islets of B6-ob/ob mice fed without carbohydrates (-CH) or 2 days after the carbohydrate intervention (+CH), $n = 2$ mice per condition. Scale bar, 50 μM .

(B) Representative acetylated α -tubulin and glucagon co-staining in pancreatic islets of B6-ob/ob mice fed without carbohydrates (-CH) or 2 days after the carbohydrate intervention (+CH) with corresponding quantification, $n = 2$ mice per condition. Scale bar, 50 μM .

(C) Quantification of beta-cell primary cilia of whole mounted B6-ob/ob and NZO islets stained for the cilia marker Arl13b (maximum projection). Data are mean \pm SD, *** $p < 0.001$.

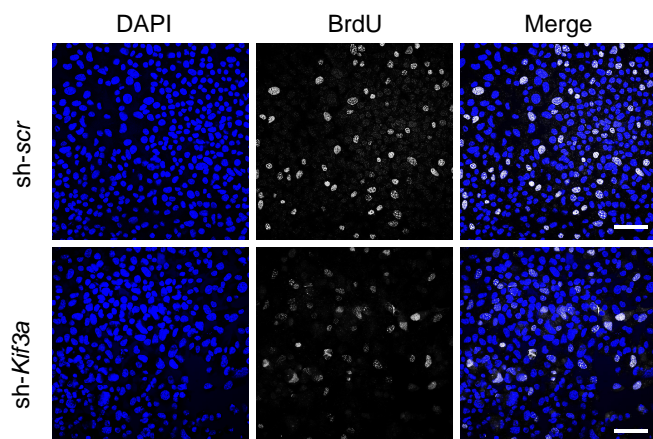


Figure S2. Adenoviral-mediated suppression of *Kif3a* in MIN6 cells reduces the incorporation of BrdU. Related to Figure 6.

Representative immunocytochemical stains of MIN6 cells transfected with scrambled control (sh-scr) or *Kif3a*-specific (sh-*Kif3a*) adenovirus stained for DAPI (left panel) and BrdU (middle panel) with the respective merge (right panel). Multiplicity of infection (MOI): 250, scale bars, 20 μ m.

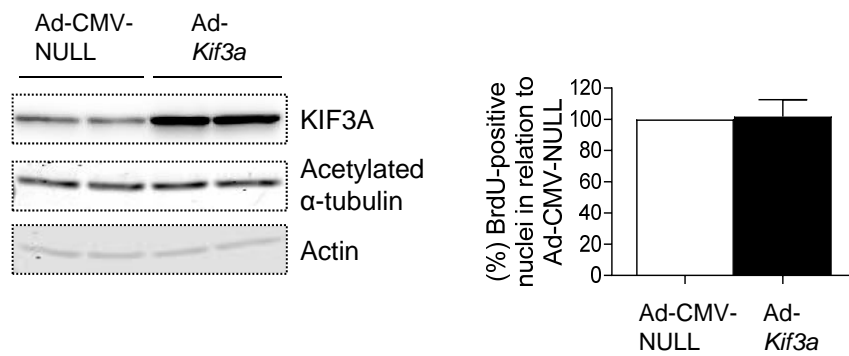


Figure S3. Adenoviral-mediated overexpression of *Kif3a* does not alter beta-cell proliferation. Related to Figure 6.

KIF3A was overexpressed in the MIN6 beta-cell line (left panel, MOI 250) and proliferation capacity was assessed via BrdU incorporation (right panel). Actin was used as loading control.

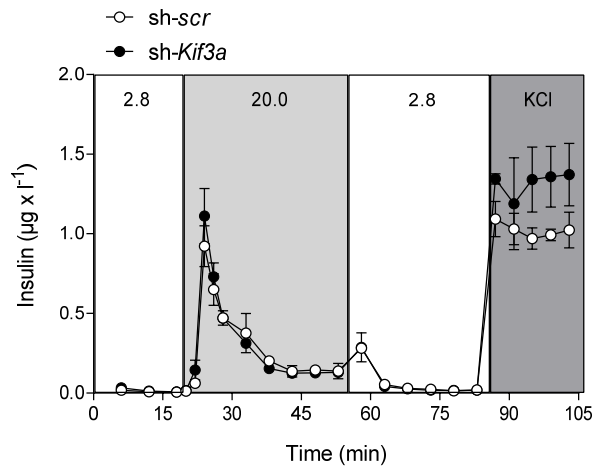


Figure S4. Adenoviral-mediated suppression of *Kif3a* does not affect glucose-stimulated insulin secretion in primary mouse islets. Related to Figure 6.

Primary mouse islets of B6 animals were infected with scrambled control (sh-scr) or *Kif3a*-specific (sh-*Kif3a*) adenovirus and 24 h later perfusion experiments were performed (MOI 5,000, 100 islets per group, n = 2).

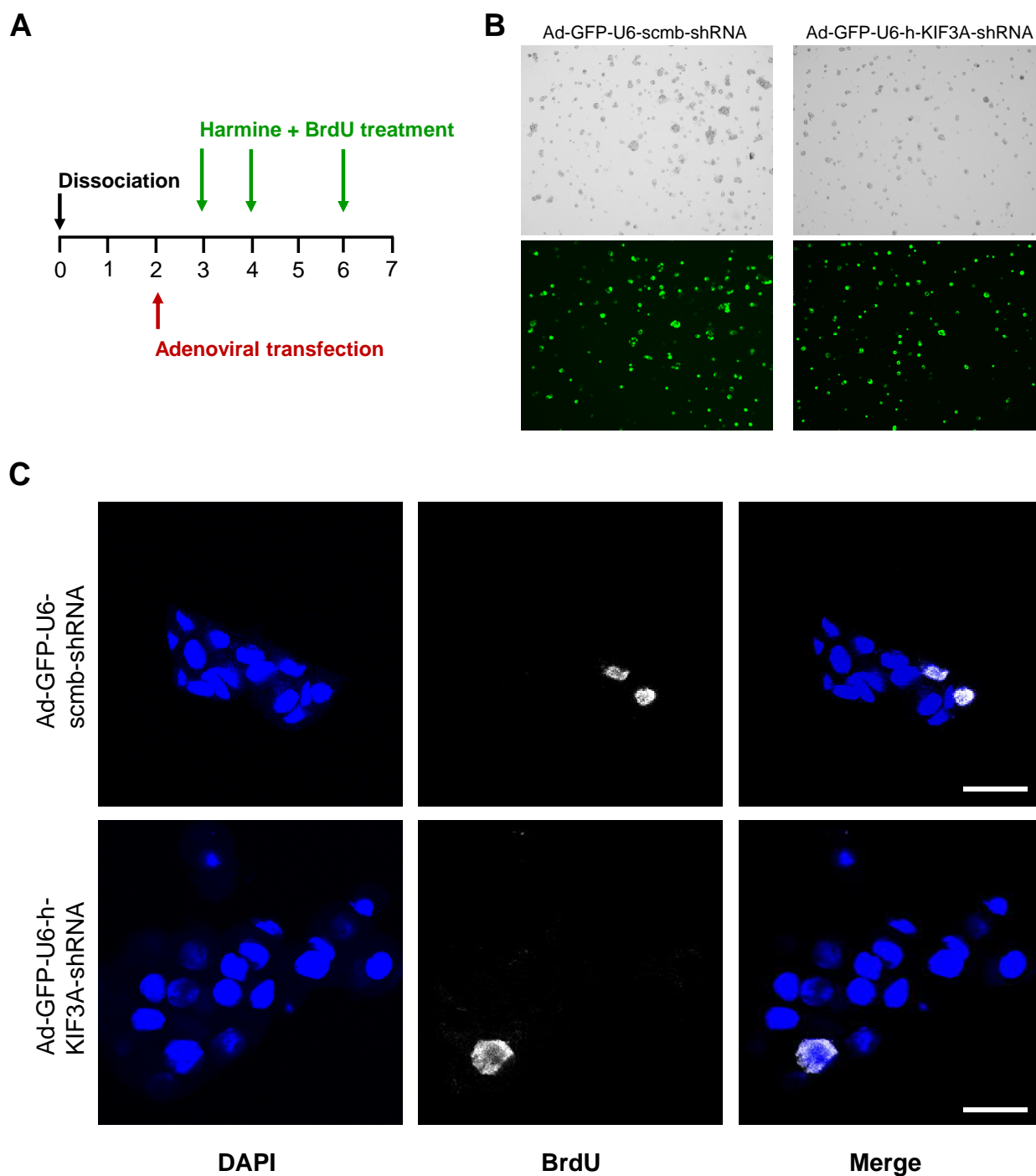


Figure S5. Silencing of KIF3A in primary human islet cells. Related to Figure 6.

(A) Primary human islet cells were dispersed and transfected with control or *KIF3A*-specific adenovirus (multiplicity of infection: 500) and treated with harmine and BrdU for 4 days.

(B) 24 h after infection, transfection efficiency in control (Ad-GFP-U6-scmb-shRNA) and *KIF3A*-depleted (Ad-GFP-U6-h-KIF3A-shRNA) islet cells was recorded via the detection of GFP fluorescence.

(C) Representative images of BrdU-positive nuclei in dispersed primary human islet cells 5 days after *KIF3A* suppression. Scale bar, 20 μ m.