Supplementary methods

Transmission electron microscopy

Tissue samples were fixed in 2% glutaraldehyde in 0.1M cacodylate (pH=7.4). After postfixation in 1% osmium tetroxide and preembedding staining with 1% uranyl acetate, the samples were dehydrated in EtOH and propylenoxyd and embedded in Agar 100. Thin sections were counterstained with lead citrate and examined with a Philips CM 120 transmission electron microscope (Philips Inc., The Netherlands). Pictures were taken at the eucentric height at a constant defocus using a TemCam 224A camera (TVIPS, Germany). The shortest and longest diameter (outer rim) of the organelles was measured using Digital Migrograph 3.4 software (Gatan, Inc.) and averaged to produce the mean vesicle diameter. To avoid capping effect due to sectioning, only the vesicles with a clear delineated vesicle membrane were measured.

Supplementary Table legend

Supplementary Table 1. Validated primers used for quantitative RT-PCR. These were ordered from Qiagen (Germany) and used according to the manufacturer's instructions.

Supplementary Figure legends

Supplementary Figure 1. Analysis of *MafA* and *MafB* expression in cArxOE::Pdx1Cre and cArxOE::Pax6Cre pancreata. Using immunohistochemistry, a clear decrease in the population of MafA-labeled β-cells (B-C compared to A) concurrent with an augmentation in the number of MafB-marked α-cells (E-F compare to D) is evidenced in the pancreta of cArxOE::Pdx1Cre and cArxOE::Pax6Cre animals.

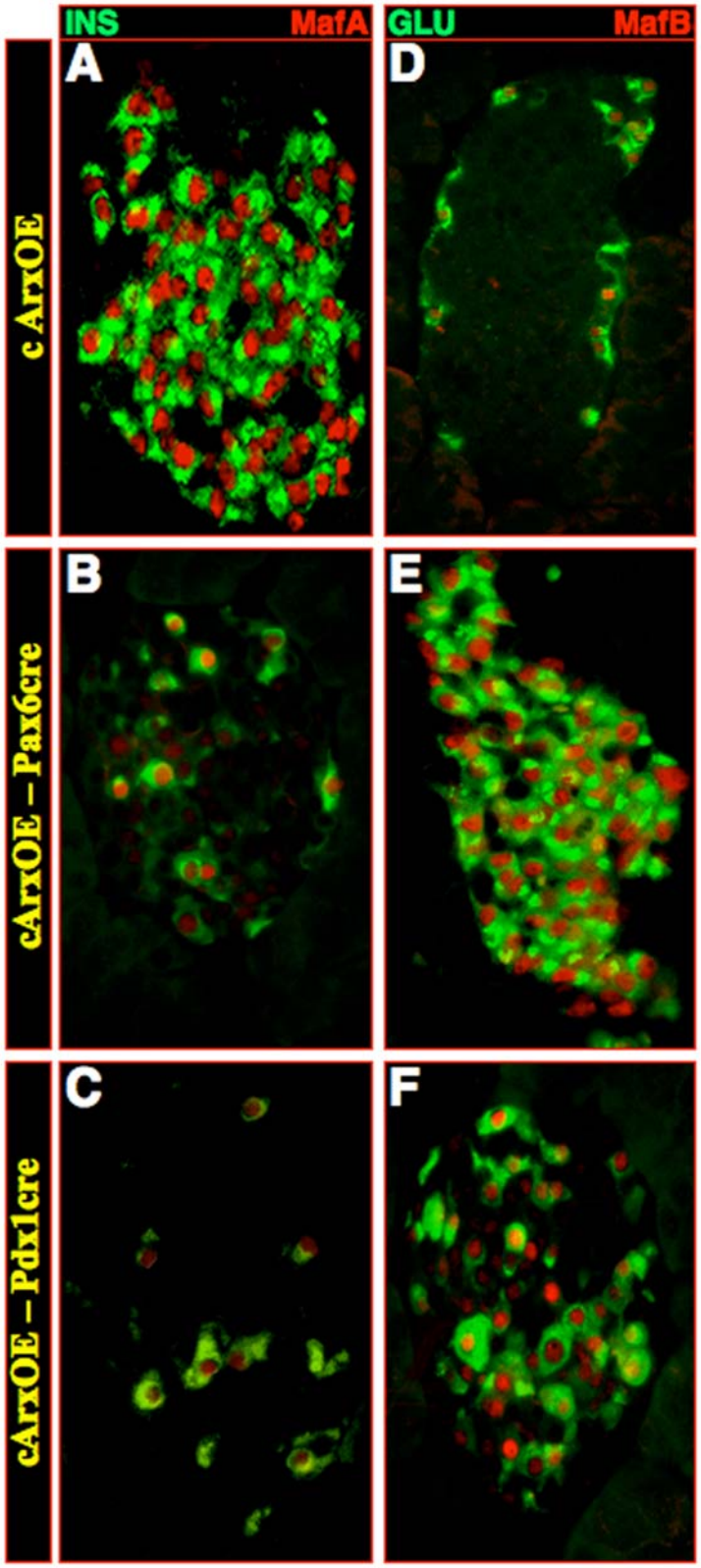
Supplementary Figure 2. Characterization of the identity of the cells present in the pancreas of cArxOE::Pax6Cre mice using transmission electron microscopy. (Top) Representative picture of controls (Left) and cArxOE::Pax6Cre (Right) pancreata with indication of the specific cell subtypes. (Bottom) Determination of the cellular content of cArxOE::Pax6Cre islets based on cell size and vesicle aspect as compared to controls. Note the lack of β-cells and the concomitant increase in the numbers of cells exhibiting α- or PP-cell features. (**) Statistically significant differences compared to control animals using the student's t-test ($p<0.01$).

Supplementary Figure 3. *In vitro* misexpression of *Arx* in MIN6 and βTC3 insulin-producing cell lines. (A, D, G, J) MIN6 cells transfected with the construction described in Figure 1 (Top). Note GFP expression in green and the absence of glucagon (D), PP (G) or Arx (J) expression in these cells. The same was observed in βTC3 cells (data not shown). MIN6 (B, E, H, K) or βTC3 (C, F, I, L) cells transfected with a construction (Fig. 1 - Bottom) allowing the constitutive expression of *Arx* clearly produce glucagon (E-F), PP (H-I) or Arx (K-L) 48h following transfection.

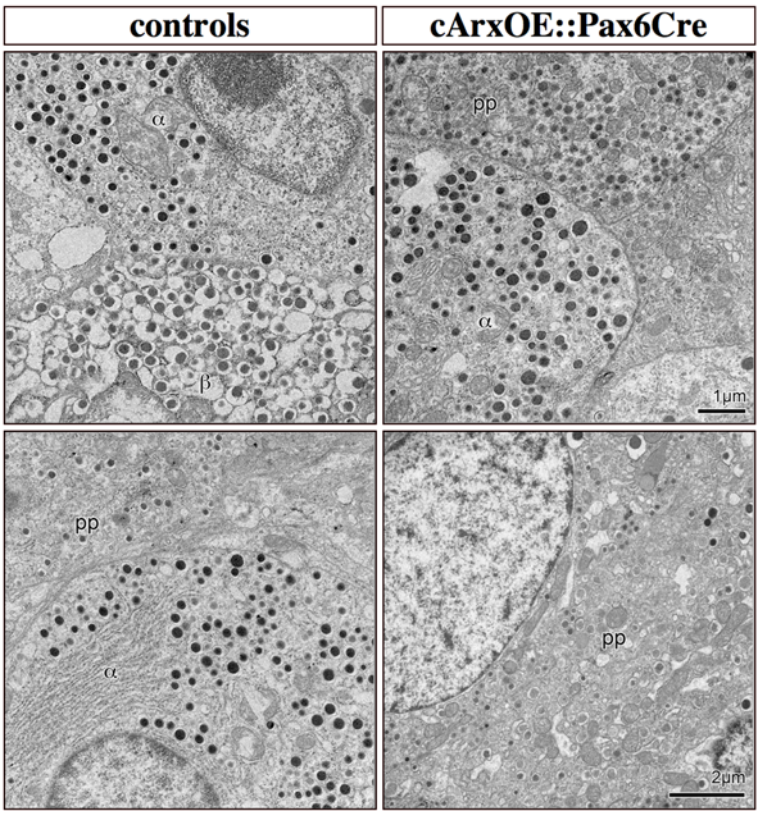
Supplementary Table 1 – Collombat et al., 2006

Gene name	Reference
GAPDH	QT00309099
HPRT	QT00166768
Insulin	QT00258083
Glucagon	QT00124033
Somatostatin	QT00239295
PP	QT00103999
Arx	QT00162904
Pax4	QT00052772
Nkx6.1	QT00143318
Nkx2.2	QT00495502
Pax6	QT01052786

Supplementary Figure 1 – Collombat et al., 2006



Supplementary Figure 2 – Collombat et al., 2006



average size (nm) of the cells present in each genotype		
	controls	*cArxOE::Pax6cre*
β	35.3+0.3 (n=423)	0
α	28.5+0.3 (n=282)	27.5+0.3 (n=435) **
PP	21.9+1.0 (n=23)	21.1+0.2 (n=285) **

Supplementary Figure 3 – Collombat et al., 2006