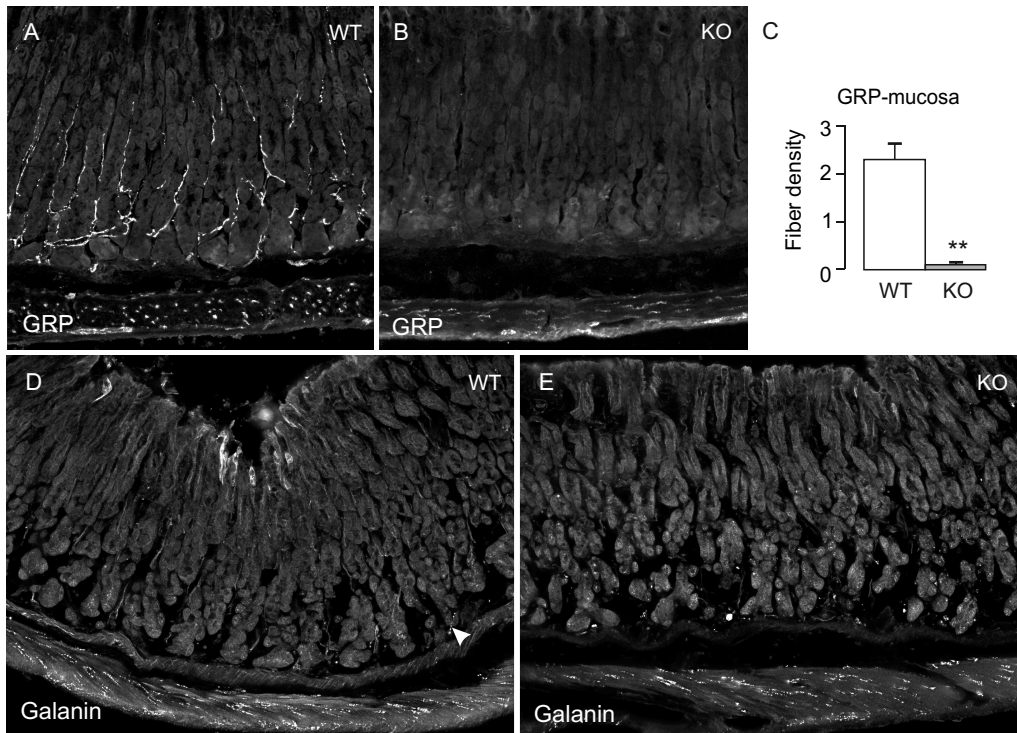


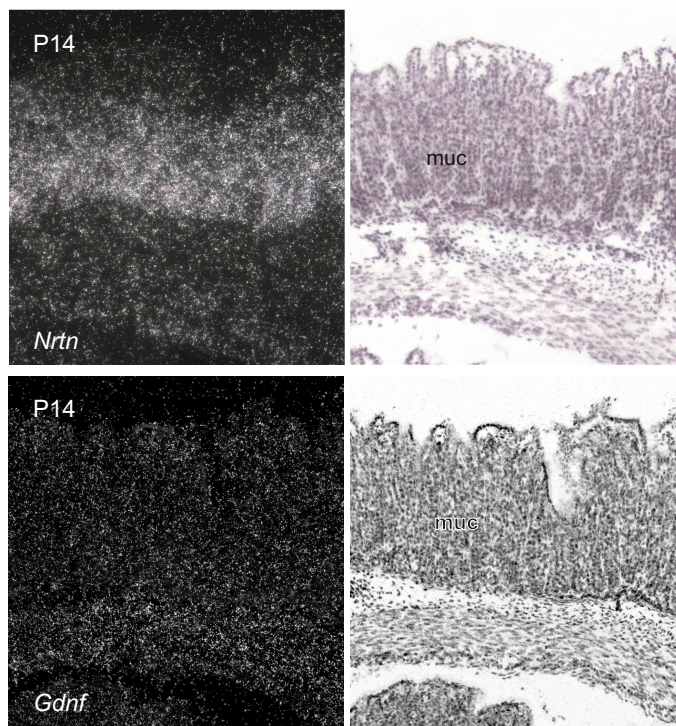
### Suppl. Figure 1

Sections from wild-type mouse gastric wall double-stained for (A-C) VACht and GRP, (D-F) VACht and VIP, (G-I) GFRα2 and VACht, and (J-L) GFRα2 and TH. A-C: Most if not all cholinergic fibers (A, green) in the mucosa appear to contain GRP (B, magenta). Colocalization is seen as white in the merged image (C). D-F: Most of the VIP-positive fibers (E, magenta) colocalize with VACht (D, green). G-I: A section from wild-type mouse gastric mucosa double-stained for GFRα2 and VACht. Many GFRα2-positive (G, green) fibers in the mucosa are also labeled with VACht (H, magenta). The arrow (I) indicates a GFRα2-positive glial cell associated with VACht-positive cholinergic nerve fibers. J-L: GFRα2 (J, green) is not expressed in the TH-positive sympathetic nerve fibers (K, magenta) that innervate a blood vessel at the border of mucosa and submucosa (L, arrow).



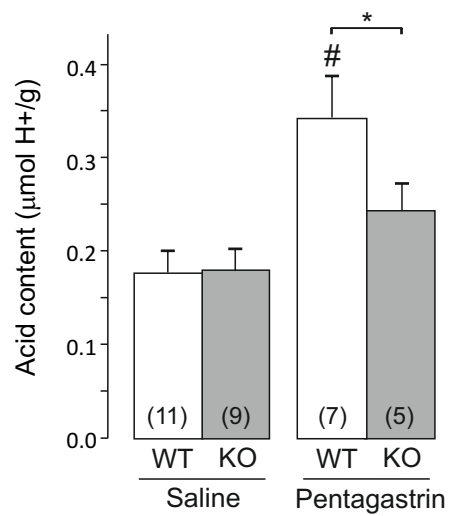
### Suppl. Figure 2

Sections through the oxyntic part of gastric mucosa from adult wild-type (WT, A and D)) and  $GFR\alpha 2$ -KO (B and E) mice immunostained for GRP (A-B) and galanin (D-E). (C) The density of GRP-positive nerve fibers in the gastric mucosa is reduced by >90% in the KO mice. \*\*,  $P = 0.015$  between the genotypes using t-test,  $n = 3$  mice in both groups. Galanin-positive nerve fibers are abundant in the muscle layers in both genotypes but only few can be found in the mucosa (arrowhead).



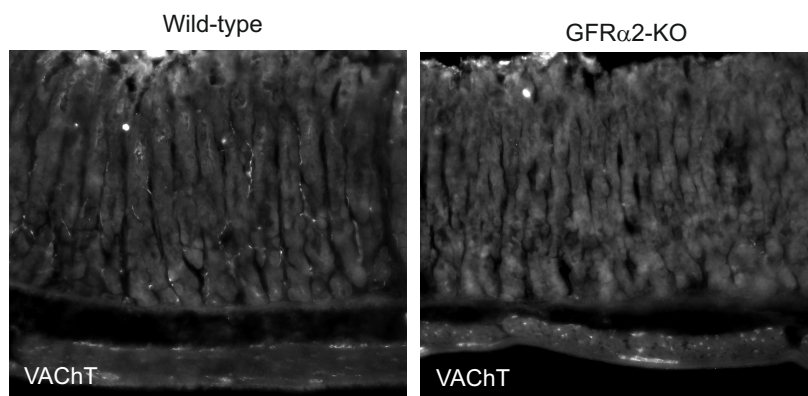
**Suppl. Figure 3**

*In situ* hybridization of adjacent stomach sections from postnatal day 14 (P14) mouse shows that neurturin (*Nrtn*) mRNA is selectively expressed in the basal half of the gastric mucosa but not in the muscle layers. In contrast, *Gdnf* mRNA is not expressed in the gastric mucosa. Corresponding bright-field images (right) of the dark-field images (left) muc; mucosa.



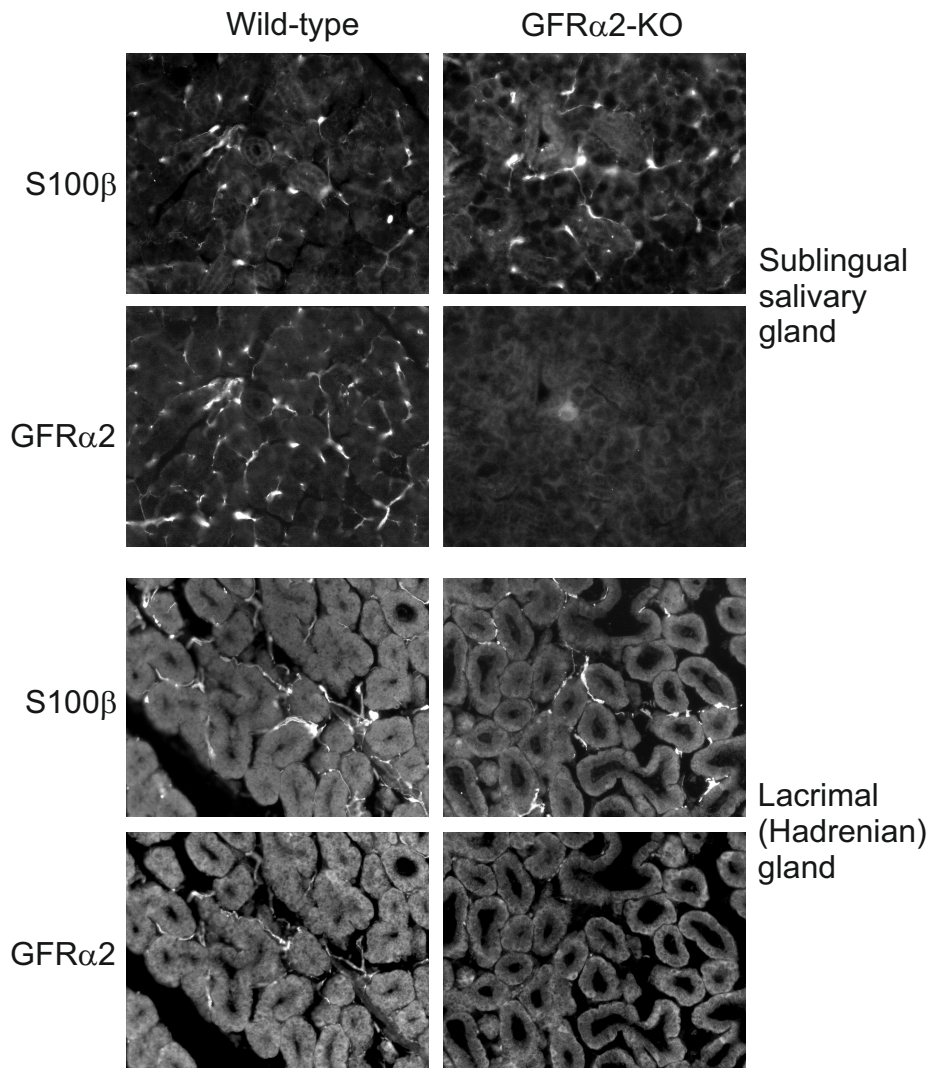
#### Suppl. Figure 4

Effect of pentagastrin on gastric acid output in fasted wild-type (WT) and GFR $\alpha$ 2-KO mice without anesthesia. Pentagastrin (0.5 mg/kg) or saline were administered subcutaneously 40 min before sacrifice and analysis of gastric acid content. Pentagastrin stimulated acid secretion in wild-type mice ( $\# P = 0.003$  compared to saline) but not in the GFR $\alpha$ 2-KO mice ( $P = 0.12$  compared to saline).  $** P = 0.025$  between the genotypes. Statistical analysis was done using two-way ANOVA followed by Student-Newman-Keuls test. Values are mean  $\pm$  SEM. Number of animals per group is shown in parenthesis.



**Suppl. Figure 5**

Deficient cholinergic innervation of the gastric mucosa in 2-week-old GFR $\alpha$ 2-KO mice. Sections through the oxyntic part of stomach from postnatal day P14 wild-type and KO littermate mice were immunostained for VChT.



**Suppl. Figure 6**

GFR $\alpha$ 2-KO mice have apparently normal number of Schwann cells in the sublingual salivary and lacrimal (Hadrenian) glands. Sections from adult wild-type (WT) and KO mice were double-stained for GFR $\alpha$ 2 and the Schwann cell marker S100 $\beta$ .