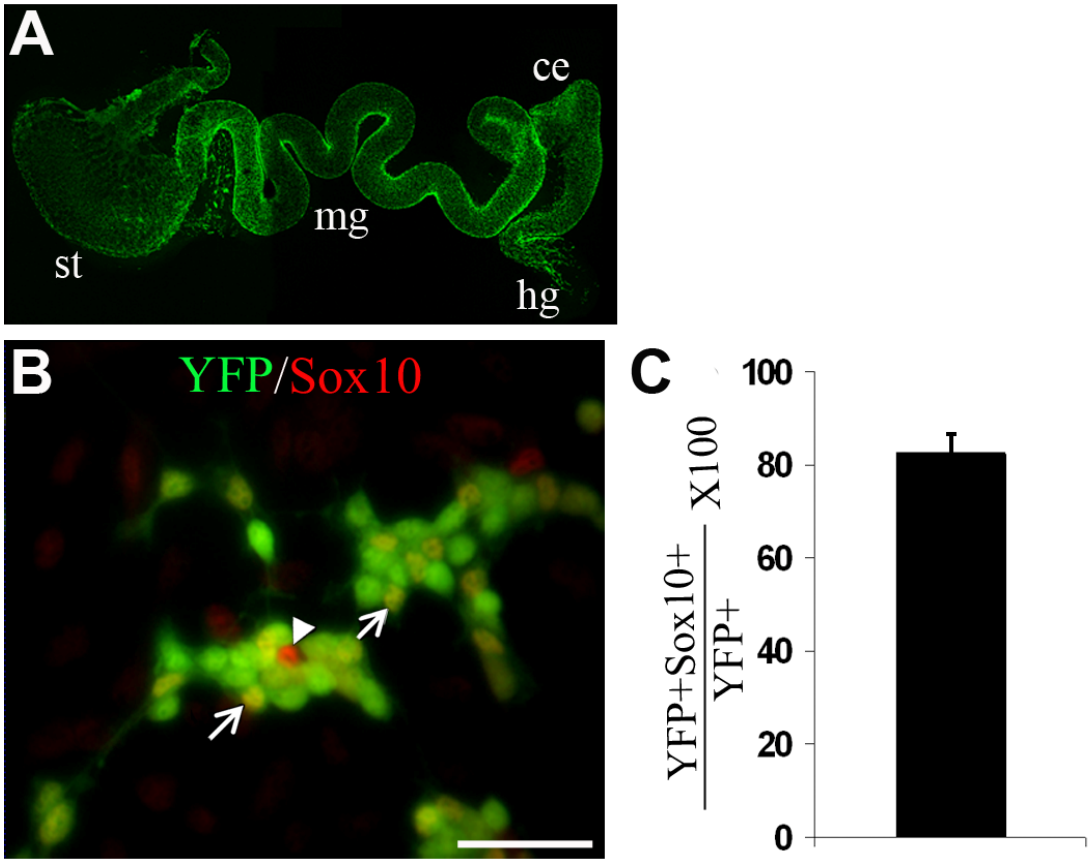
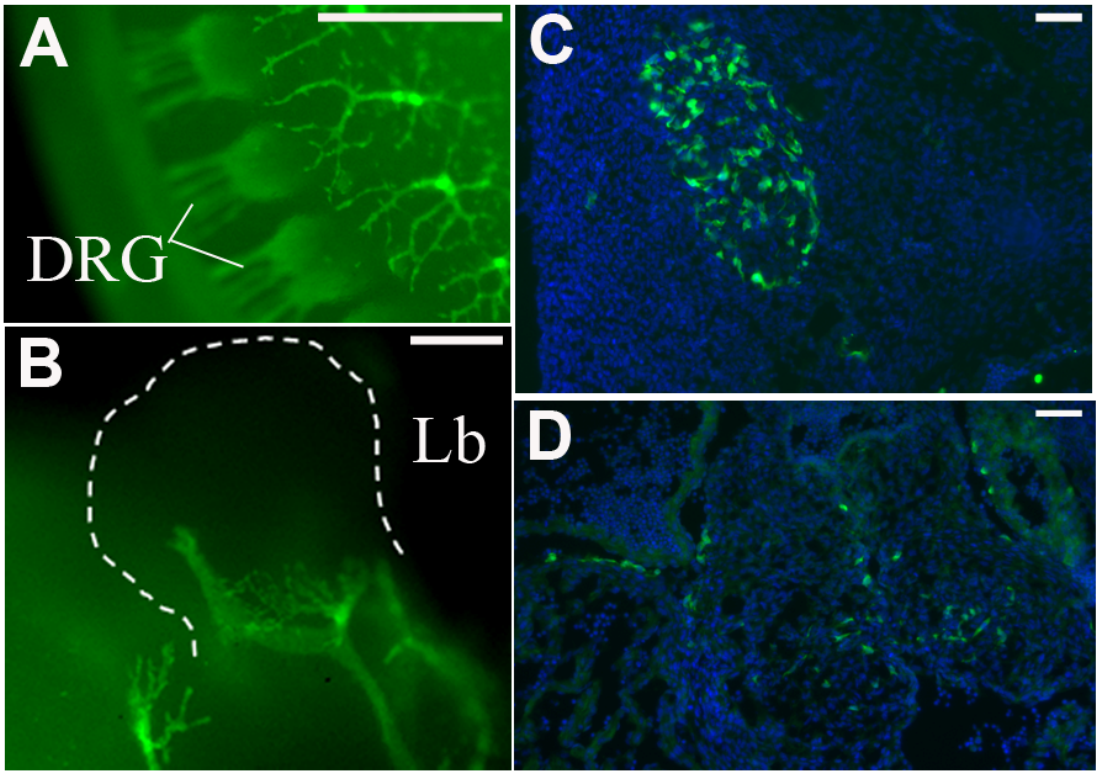


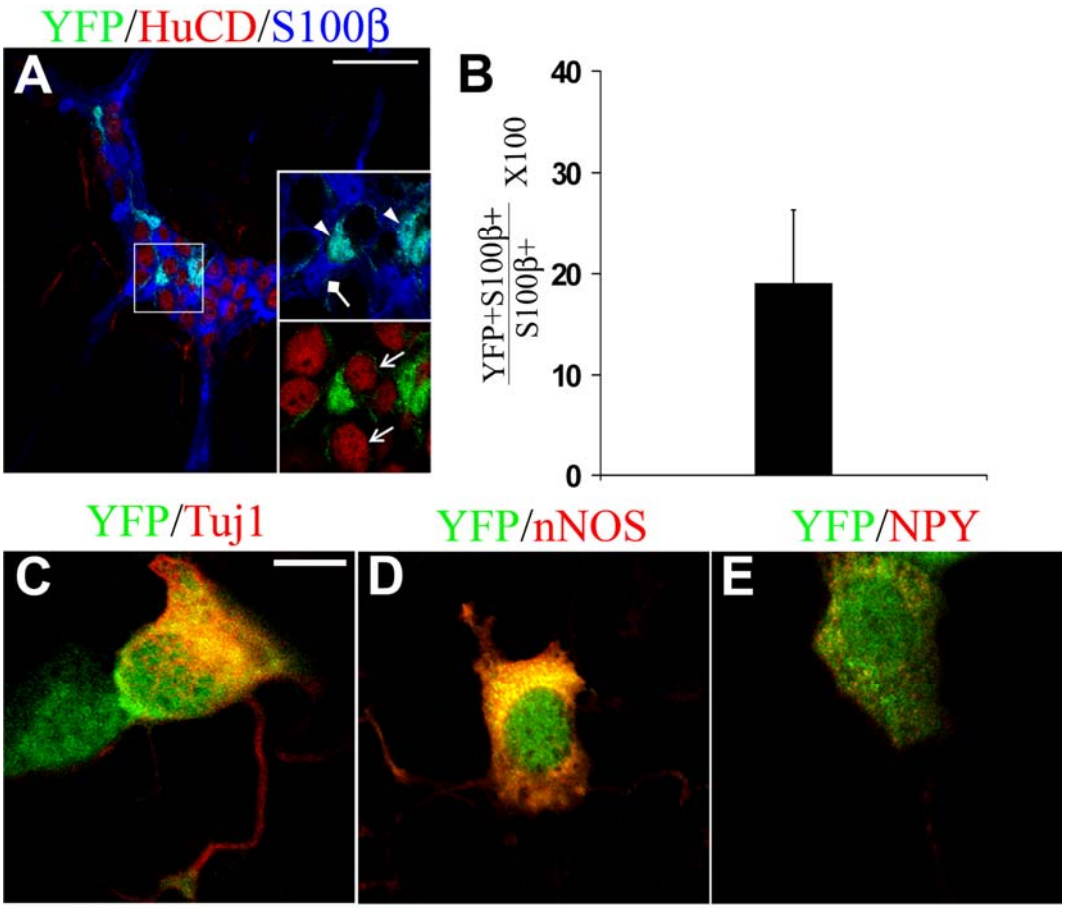
Supplementary Figure 1. ***Sox10::Cre;R26ReYFP transgenic line was used to lineally mark the progeny of Sox10-expressing cells in the ENS.***

(A) Laser confocal microscope image of a whole mount gut preparation from an E12.5 *Sox10::Cre;R26ReYFP* embryo immunostained for YFP. **(B)** Short-term cultures of dissociated gut from E16.5 embryos of the same genotype were immunostained for YFP (green) and Sox10 (red). Most $Sox10^+$ cells undergo Cre-mediated recombination and, therefore, express YFP (arrows). Arrowhead indicates a $Sox10^+$ cell that does not express YFP. **(C)** Quantification of $Sox10^+$ cells that undergo Cre-mediated recombination and, therefore, express YFP. Graph error bars, s.e.m. Oe, oesophagus; St, stomach; Mg, midgut; Ce, caecum; Hg, hindgut. Scale bar, 30 μm.



Supplementary Figure 2. ***YFP is appropriately expressed in the Sox10-expressing cells and their derivatives in Sox10::iCreER^{T2};R26ReYFP transgenics.***

(A-B) YFP immunostaining of E12.5 *Sox10::iCreER^{T2};R26ReYFP* transgenic embryos exposed to 4-OHT at E9.5. YFP expression was detected in DRG, nerve fibers sprouting from the spinal cord area **(A)** and the radial and ulnar nerves of the limb **(B)**. **(C-D)** YFP immunostaining of coronal sections of E12.5 *Sox10::iCreER^{T2};R26ReYFP* transgenic embryos exposed to 4-OHT at E9.5. YFP expression was detected in the cranial ganglia **(C)** and heart **(D)**. Scale bars, 200 µm (**A**, **B**); 100 µm (**C**, **D**).



Supplementary Figure 3. ***YFP$^+$ glial cells from the ENS of hGFAP::iCreER^{T2};R26ReYFP transgenics generate neurons in culture.***

(A) *hGFAP::iCreER^{T2};R26ReYFP* transgenic mice were treated with 4-OHT (0.2mg/g) at P84 and analised at P140. Immunostaining of MS-MP whole mount preparations for YFP (green), HuC/D (red) and S100β (blue) showed that YFP expression is restricted to the S100β$^+$ population (arrowheads in inset of panel **A**). No YFP$^+$HuC/D$^+$ cells were found. Arrows and diamond arrows in insets of panel **A** point to YFP$^-$HuC/D$^+$S100β$^-$ and YFP$^-$HuC/D$^-$S100β$^-$, respectively. **(B)** Quantification of the fraction of YFP$^+$ cells in the S100β$^+$ population. The error bars indicate s.e.m. **(C-E)** Cell cultures from dissociated MS-MP strips were immunostained for YFP (green), the pan-neuronal marker Tuj1 (red, **C**) or the neuronal subtype marker nNOS (red, **D**) and NPY (red, **E**). Scale bars, 60 μm **(A)**; 10 μm **(C-E)**.