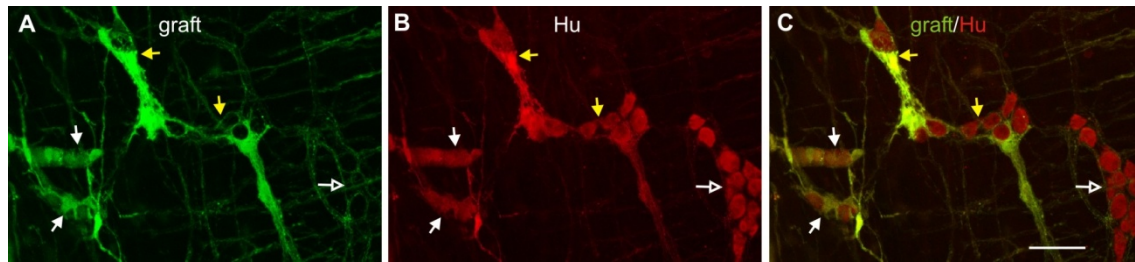
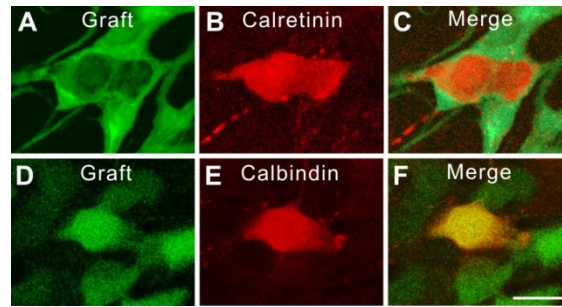


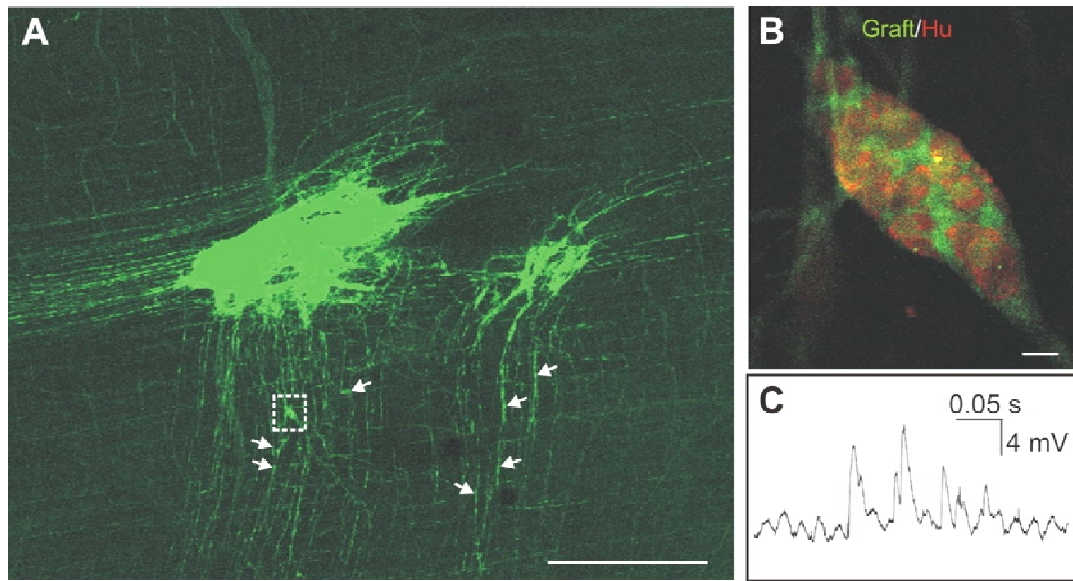
Supplementary Figure 1: *In vitro* characterization of fNSs derived from *Ednrb*^{Kik} cells from the intestine of E14.5 mice. Following 2 days of culture on fibronectin, a sub-population of *Ednrb*^{Kik}+ cells (**A,E**) show immunoreactivity to the pan neuronal marker, Tuj1 (**B,D,F,H**) or the glial cell markers, S100β (**C,D**) and GFAP (**G,H**). Scale bars: 100 μm.



Supplementary Figure 2: Wholemount preparation of colon 3 weeks following transplantation of a fNS and immunostaining for the pan-neuronal marker, Hu. In addition to a ganglion composed only of endogenous neurons of the recipient (*white open arrow*), there are ganglia consisting of only of graft-derived cells (*white arrows*) and ganglia that contain both graft-derived and endogenous neurons (*yellow arrows*). Scale bar: 50 μm



Supplementary Figure 3: Wholemout preparations of graft-derived cells following implantation of fNSs into the colon. **A-C:** Some graft-derived cells show calretinin (**A,C**) or calbindin (**C,F**) immunoreactivity. Scale bar: 20 μm .



Supplementary Figure 4: Preliminary data from transplantation of neurospheres generated from *Ednrb*^{Kik} mice part backcrossed (N4) onto an SSL/LeJ background, which is the genetic background of *s'/s'* mice, and transplanted into the aganglionic region of *s'/s'* mice. **A.** Montage of low magnification images of a wholemount preparation of the aganglionic region of distal colon of an *s'/s'* mouse showing graft-derived cells and fibers 4 weeks following the transplantation of two fNSs. Graft-derived cells had migrated away from the transplant site and formed ganglia (*arrows*). Scale bar: 1 mm. **B.** Higher magnification of a graft-derived ganglion (boxed in **A**) showing Hu immunoreactivity in many of the graft-derived cells. Scale bar: 20 μ m. **C.** A brief impalement of a graft-derived neuron for electrophysiological recording revealed fast EPSPs. The impalement was not held long enough to examine the firing properties of the neuron.