Supplementary Figure 1: Lack of neuronal progeny from Qkf<sup>gt/gt</sup> mutant neurosphere cells is not due to an increase in cell death. (a, b) Immunofluorescence images of whole primary neurospheres formed from wild type (a) and Qkf<sup>gt/gt</sup> mutant SVZ cells (b) differentiated without dissociation on polyornithine/laminin with 1% fetal bovine serum and without FGF2 or EGF and stained for GFAP (blue), β-tubulin type III (red) and O4 (green). As in the differentiation culture of dissociated primary neurosphere cells in Fig. 9, note the paucity of neurons (red) in differentiated Qkf<sup>gt/gt</sup> mutant neurosphere cells as compared to controls (b vs. a). (e) Measurement of live and dead cells in cultures of differentiated dissociated wild type Qkf<sup>gt/gt</sup> mutant primary neurosphere cells by assessing maintained membrane integrity by exclusion of ethidium homodimer-1 and active metabolism of the esterase substrate calcein AM over 8 days in vitro (DIV, n = cultures from 3 Qkf<sup>gt/gt</sup> and 3 sex- and age-matched controls, 5-6 months of age). Note that cell viability is high and does not differ between mutants and wild type. Data are depicted as means ± s.e.m. and were analyzed by one-factorial ANOVA with genotype as the independent factor followed by Fisher’s post-hoc test. Scale bar equals 100 µm (a, b).

Supplementary Figure 2: Qkf<sup>gt/gt</sup> mutant and wild type control primary neurosphere cells differentiate into neurons with an interneuron-like phenotype in vitro. Wild type (a-d and i-l) and Qkf<sup>gt/gt</sup> mutant SVZ cells (e-h and m-p) were isolated and cultured for 7 days as primary neurospheres, then dissociated and subjected to differentiation conditions as in Fig. 9. The cultures were stained by immunofluorescence for the neuron marker β-tubulin type III (green, a, e, i, m) and the interneuron-specific neurotransmitter γ-aminobutyric acid (red, GABA, b, f) and for glutamate (red, j, n), which is a precursor of GABA apart from its role as a neurotransmitter in glutamatergic neurons. Overlay of the separate fluorescence channels shows that all neurons (β-tubulin type III-positive) are GABA-positive (yellow, c, g) and glutamate-positive (yellow, k, o). Other cell types within the cultures as detected by bisbenzimide counterstain (blue) exhibited astrocyte morphology (arrows in c, d, g, h, k, l, o, p) (n =
cultures from 3 $QkF^{+/-}$ and 3 sex- and age-matched controls, 5-6 months of age). Scale bar equals 25 μm (a-p).