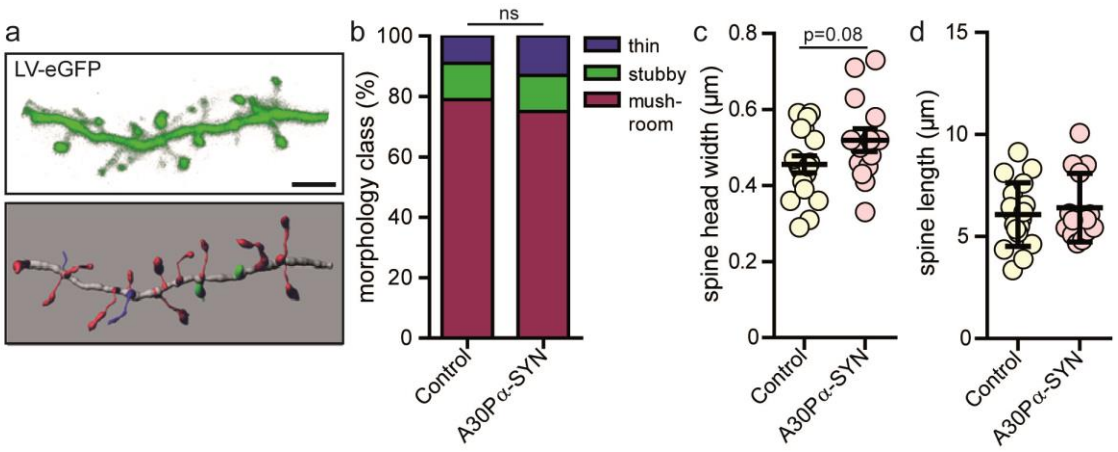
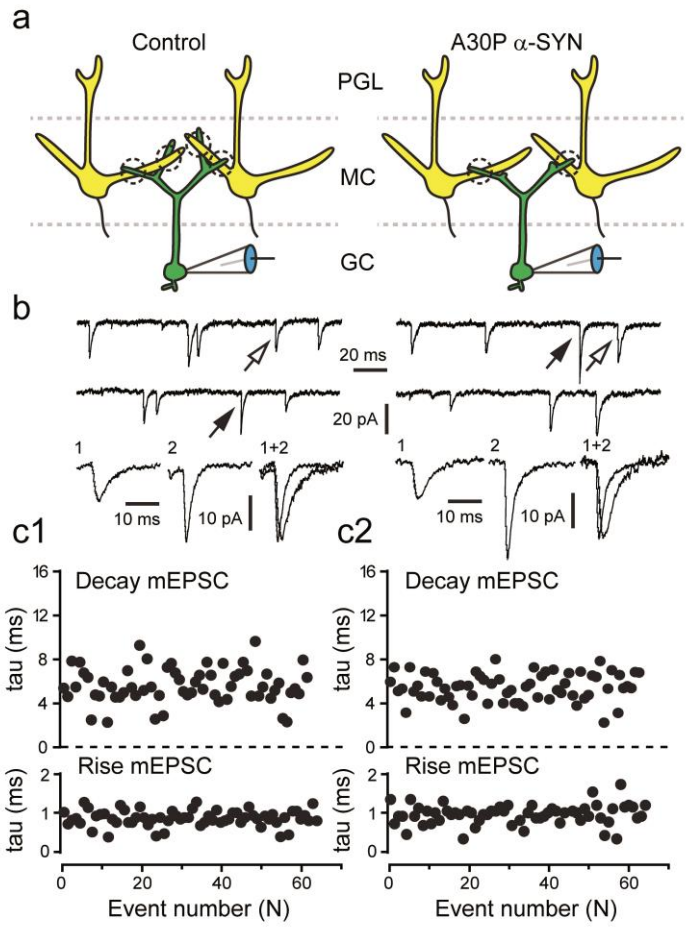


Supplementary Figure 1: Unaltered spine morphology in adult-born GCs of A30P α-SYN mice. (a) Typical example of an eGFP-labelled apical dendrite of adult-born GC (at 28 days post injection): z-projection of an *in vivo* two-photon image (top) with its 3D morphological reconstruction (bottom). Scale - 5 µm. Single spines were traced semi-automatically, and different spine shapes were classified into thin (blue), stubby (green) or mushroom (magenta), based on the automatically assessed spine length, spine head and neck width. (b) Fractional contribution of spines with different morphologies at 28 days post injection in 6-month-old Control (n=416 spines/4 mice) and A30P α-SYN mice (n=223 spines/6 mice; p=0.45). Quantification of (c) the width of the spine head (p=0.08) and (d) the spine length (p=0.56) on adult-born GC dendrites of Control (n=18 dendrites/4 mice) and A30P α-SYN mice (n=14 dendrites/6 mice). Note the trend towards wider spine head in A30P α-SYN mice. Values are presented as mean±SEM. Chi-Square test (b); Student's *t*-test (c,d).



Supplementary Figure 2: Miniature EPSCs in mature adult-born GCs are represented by two populations of events with distinct kinetics. (a) A schematic drawing of the elementary functional MC-GC module, inter-connected via dendro-dendritic synapses with whole-cell voltage-clamp recordings made from adult-born GCs (labelled in green). GL, MC and GC - glomerular layer, mitral cells and granule cells, respectively. Note the reduced arborisation of GC dendrites with smaller number of GC-MC synaptic contacts (dashed circle). (b) Representative recordings of miniature EPSCs from adult-born GCs (~32 days after LV injection) in Control and A30P α-SYN mice (top two traces) with individual slow (predominant, white arrows) and fast (rare, black arrows) mEPSCs shown at expanded time scale. Slow mEPSC constituted 92.1% and 94.4% of all events in adult-born GCs of Controls and A30P α-SYN mice (n=8 and n=12, respectively; p=0.83). (c1 and c2) Graphical representations of the distribution of rise and decay time constants (20-80% rise and decay) of typical adult-born GCs from Control (c1) and A30P α-SYN (c2) mice. Analysis of these parameters revealed their close match between the two genotypes: (τ_{rise} 0.94±0.01 vs. 0.93±0.02 ms; p=0.71; τ_{decay} 5.22±0.02 vs. 5.23±0.04 ms; p=0.84; Control and A30P α-SYN, respectively). Student's *t*-test.