

Supplemental Material

Brain Region	DTI Measure	ANOVA Comparison	F Value	P Value
Anterior Amygdala	FA	Genotype	$F_{(1, 14)} < 1$	P = 0.384
		Hemisphere	$F_{(1, 14)} = 2.76$	P = 0.095
Posterior Amygdala	FA	Genotype	$F_{(1, 14)} < 1$	P = 0.300
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.184
BLA	FA	Genotype	$F_{(1, 14)} < 1$	P = 0.268
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.168
Anterior Amygdala	MD	Genotype	$F_{(1, 14)} < 1$	P = 0.179
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.353
Posterior Amygdala	MD	Genotype	$F_{(1, 14)} < 1$	P = 0.274
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.226
BLA	MD	Genotype	$F_{(1, 14)} = 3.23$	P = 0.084
		Hemisphere	$F_{(1, 14)} = 1.55$	P = 0.137
Anterior Amygdala	AD	Genotype	$F_{(1, 14)} < 1$	P = 0.173
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.242
Posterior Amygdala	AD	Genotype	$F_{(1, 14)} < 1$	P = 0.221
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.252
BLA	AD	Genotype	$F_{(1, 14)} = 5.81$	P = 0.053
		Hemisphere	$F_{(1, 14)} = 2.55$	P = 0.105
Anterior Amygdala	RD	Genotype	$F_{(1, 14)} < 1$	P = 0.189
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.247
Posterior Amygdala	RD	Genotype	$F_{(1, 14)} < 1$	P = 0.332
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.194
BLA	RD	Genotype	$F_{(1, 14)} = 2.67$	P = 0.100
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.205

Table S1 Statistical analysis of the anterior (Bregma -1.94 mm) and posterior (Bregma -3.28 mm) amygdala, analysed for fractional anisotropy (FA), mean diffusion (MD), axial diffusion (AD) and radial diffusion (RD). Corrected P values stated (Benjamini-Hochberg corrected).

Brain Region	DTI Measure	ANOVA Comparison	F Value	P Value
Anterior Hippocampus	FA	Genotype	$F_{(1,14)} < 1$	P = 0.342
		Hemisphere	$F_{(1, 14)} = 2.18$	P = 0.116
Posterior Hippocampus	FA	Genotype	$F_{(1, 14)} < 1$	P = 0.263
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.305
Anterior Hippocampus	MD	Genotype	$F_{(1, 14)} = 2.89$	P = 0.089
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.311
Posterior Hippocampus	MD	Genotype	$F_{(1, 14)} = 12.18$	P = 0.011
		Hemisphere	$F_{(1, 14)} = 1.07$	P = 0.163
Anterior Hippocampus	AD	Genotype	$F_{(1, 14)} = 7.56$	P = 0.047
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.316
Posterior Hippocampus	AD	Genotype	$F_{(1, 14)} = 4.45$	P = 0.068
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.211
Anterior Hippocampus	RD	Genotype	$F_{(1, 14)} = 1.52$	P = 0.142
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.237
Posterior Hippocampus	RD	Genotype	$F_{(1, 14)} < 1$	P = 0.005
		Hemisphere	$F_{(1, 14)} < 1$	P = 0.158

Table S2 Statistical analysis of the anterior (Bregma -1.94 mm) and posterior (Bregma -3.28 mm) hippocampus for fractional anisotropy (FA), mean diffusion (MD), axial diffusion (AD) and radial diffusion (RD). Corrected P values stated (Benjamini-Hochberg corrected).

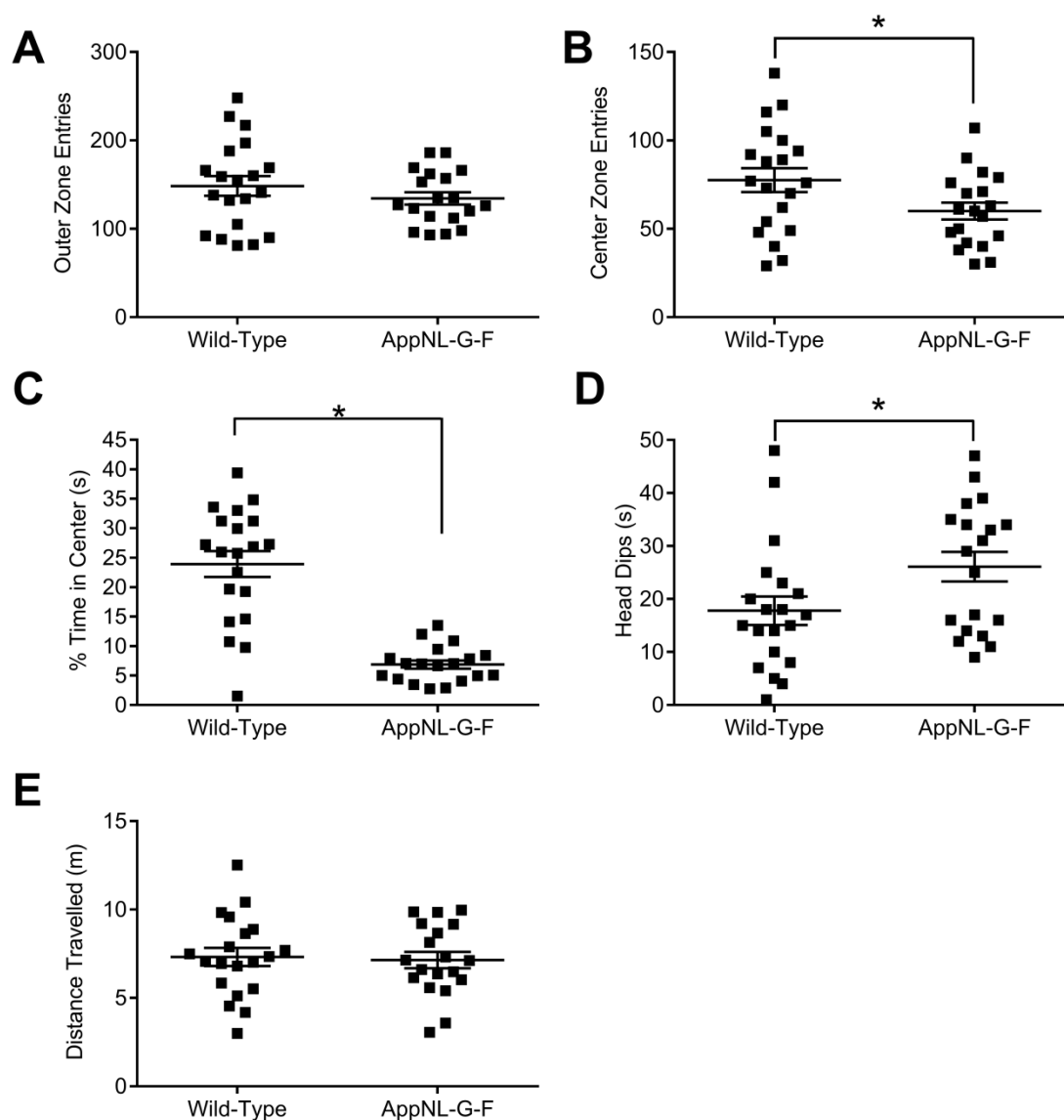


Figure S1. **A.** No significant differences were observed for entries made to the outer zone (genotype $F_{(1, 35)} = 1.43$, $p = 0.240$, genotype \times sex $F_{(1, 35)} < 1$, $p = 0.928$). **B.** *App^{NL-G-F}* KI mice made fewer entries into the centre zone (genotype $F_{(1, 35)} = 5.12$, $p = 0.030$, genotype \times sex $F_{(1, 35)} < 1$, $p = 0.727$). **C.** *App^{NL-G-F}* KI mice spent significantly less time in the centre zone in the elevated plus maze (genotype $F_{(1, 35)} = 5.39$, $p = 0.030$, genotype \times sex $F_{(1, 35)} < 1$, $p = 0.850$). **D.** There was a main effect of genotype for the number of head dips made in the elevated plus maze (genotype $F_{(1, 35)} = 5.13$, $p = 0.030$, genotype \times sex $F_{(1, 35)} < 1$, $p = 0.577$). **E.** Distance travelled in the elevated plus maze was similar between the genotypes (genotype $F_{(1, 35)} < 1$, $p = 0.861$, genotype \times sex $F_{(1, 35)} < 1$, $p = 0.400$).

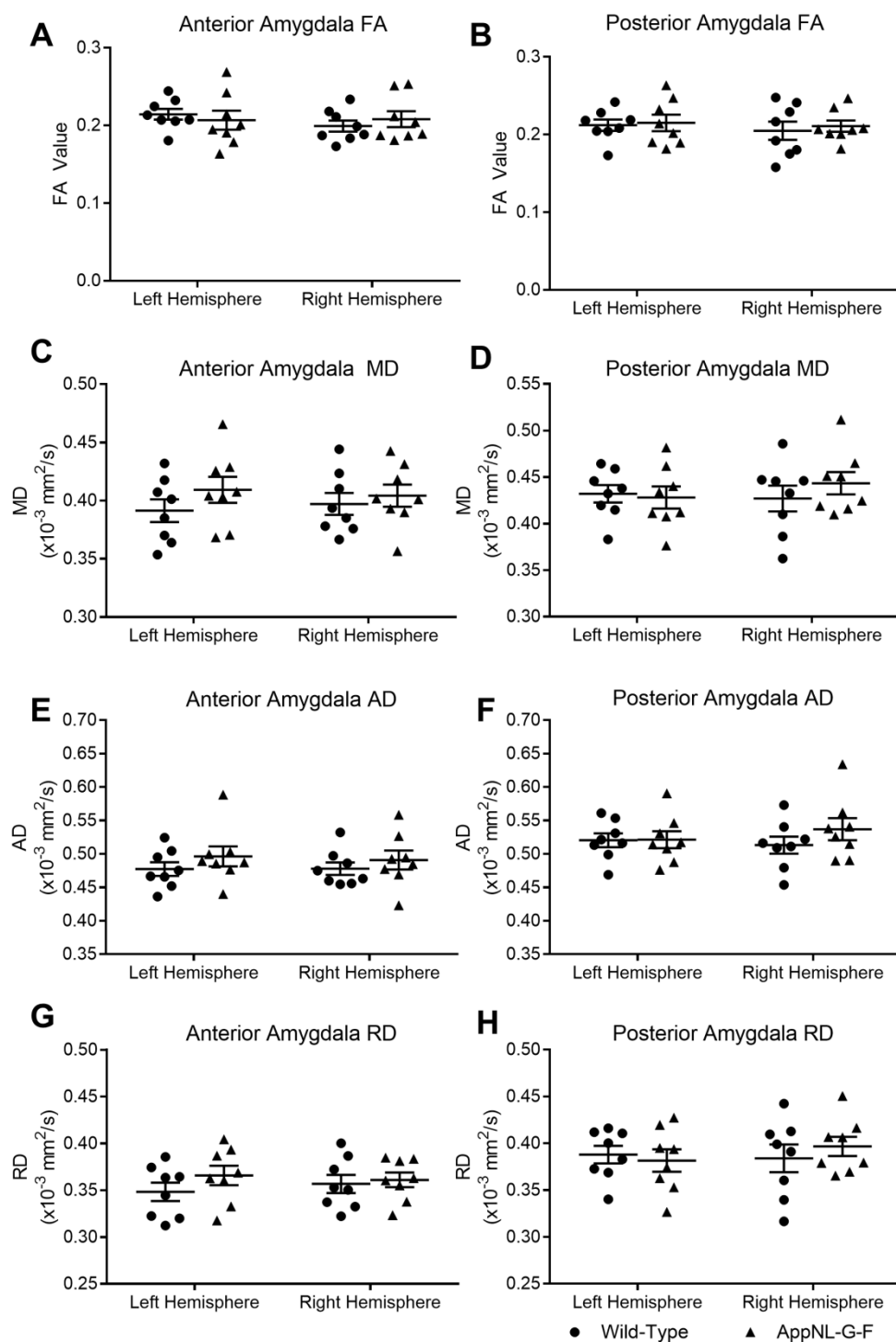


Figure S2. Fractional anisotropy (FA), mean diffusivity (MD), axial diffusivity (AD) and radial diffusivity (RD) in the amygdala. The entire amygdala was segmented from DTI images at two regions; anterior (A, C, E, G: Bregma -1.94 mm) and posterior (B, D, F, H: Bregma -2.46 mm). No significant differences were observed between the genotypes for anterior or posterior regions. Error bars represent s.e.m. Wild-type n=8, *App^{NL-G-F}* KI n=8.

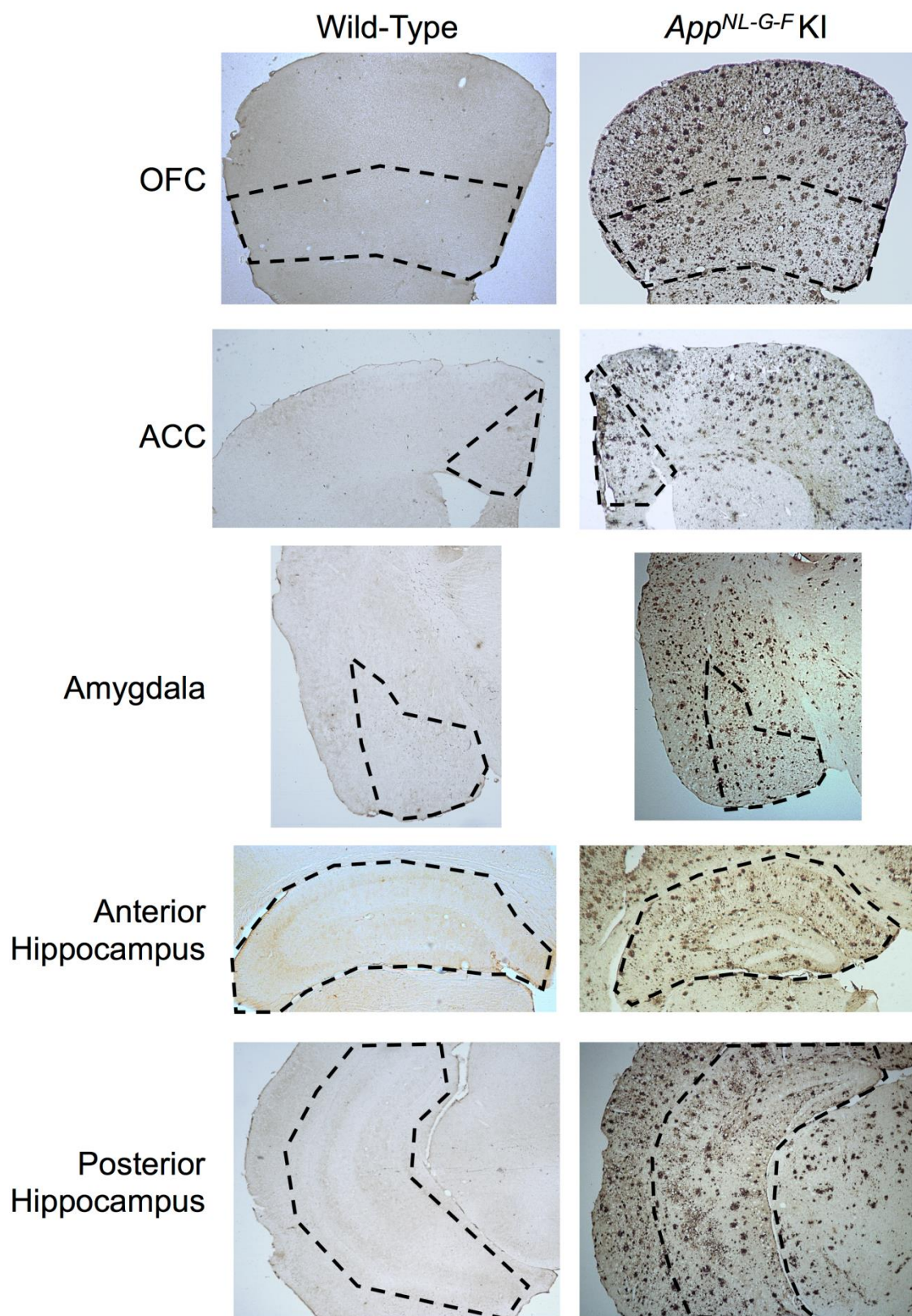


Figure S3. Amyloid plaque staining in wild-type and *App^{NL-G-F} KI* mice in the orbitofrontal cortex (OFC), the anterior cingulate cortex (ACC) the amygdala, and the anterior and posterior hippocampus. Dashed line represents the brain regions of interest.