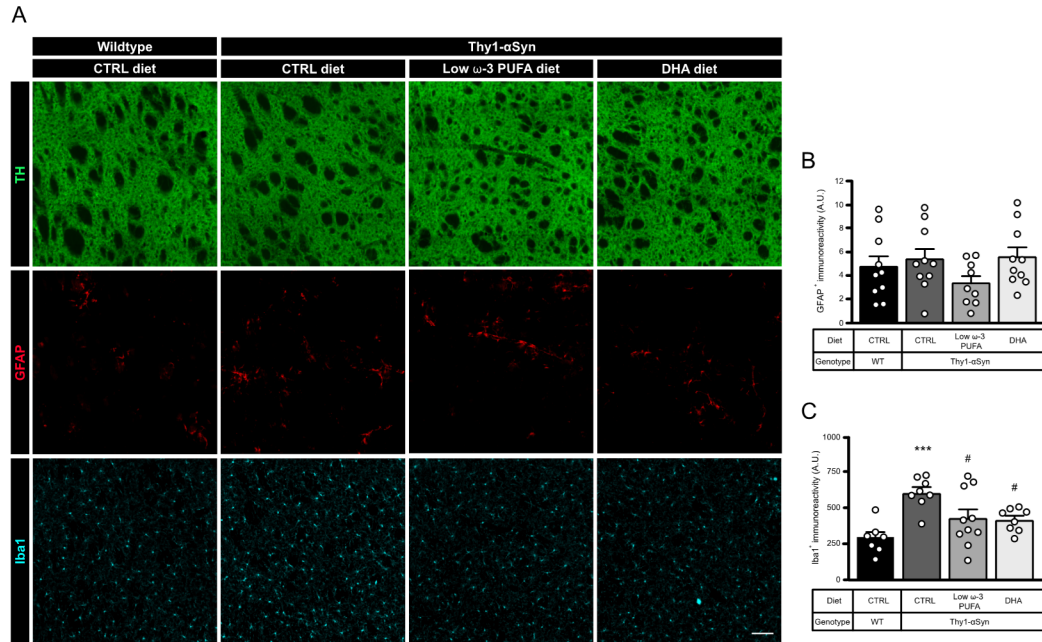


**Figure S1. Detection of  $\alpha$ Syn in murine Thy1- $\alpha$ Syn brains.** Immunofluorescence for wild-type human  $\alpha$ Syn and TH in brain slices from both wildtype littermates and Thy1- $\alpha$ Syn mice. Sections selected at the striatum and SNpc level revealed the presence of  $\alpha$ Syn only in the Thy1- $\alpha$ Syn model. Scale bar = 30  $\mu$ m. **Abbreviations:** h- $\alpha$ Syn, human alpha-synuclein; SNpc, substantia nigra *pars compacta*; TH, tyrosine hydroxylase.



**Figure S2. A DHA-rich diet prevents inflammation in Thy1- $\alpha$ Syn mice brain. A.** Photomicrographs of TH (green), GFAP<sup>+</sup> astrocytes (red) and Iba1<sup>+</sup> microglia (cyan) immunofluorescence in the striatum of wild-type and Thy1- $\alpha$ Syn mice. Scale bar = 100  $\mu$ m. **B.** Quantification of GFAP<sup>+</sup> astrocytes immunoreactivity shows no significant difference between each group (one-way ANOVA:  $p = 0.245$ ). **C.** Quantification of Iba1<sup>+</sup> macrophages by immunoreactivity reveals an increase of these cells in Thy1- $\alpha$ Syn mice compared to wild-type littermates, both on control diet. Interestingly, transgenic mice on both low  $\omega$ -3 PUFA or DHA-enriched diet show a decrease of macrophages compared to those on control diet (one-way ANOVA:  $p = 0.0011$ ). Tukey's post-hoc tests: \*\*\* $p < 0.001$  compared with wild-type mice; # $p < 0.05$  compared with Thy1- $\alpha$ Syn on control diet. **Abbreviations:** CTRL, control; DHA, docosahexaenoic acid; GFAP, glial fibrillary acidic protein; Iba1, ionized calcium-binding adapter molecule 1; TH, tyrosine hydroxylase.