

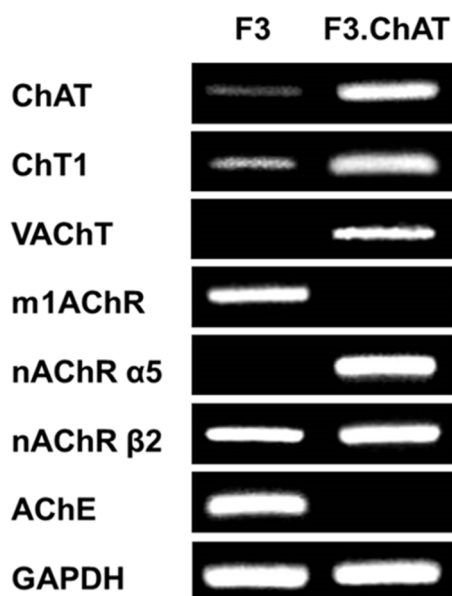


**Supplementary Table 1.** Primer sequences used for RT-PCR analysis

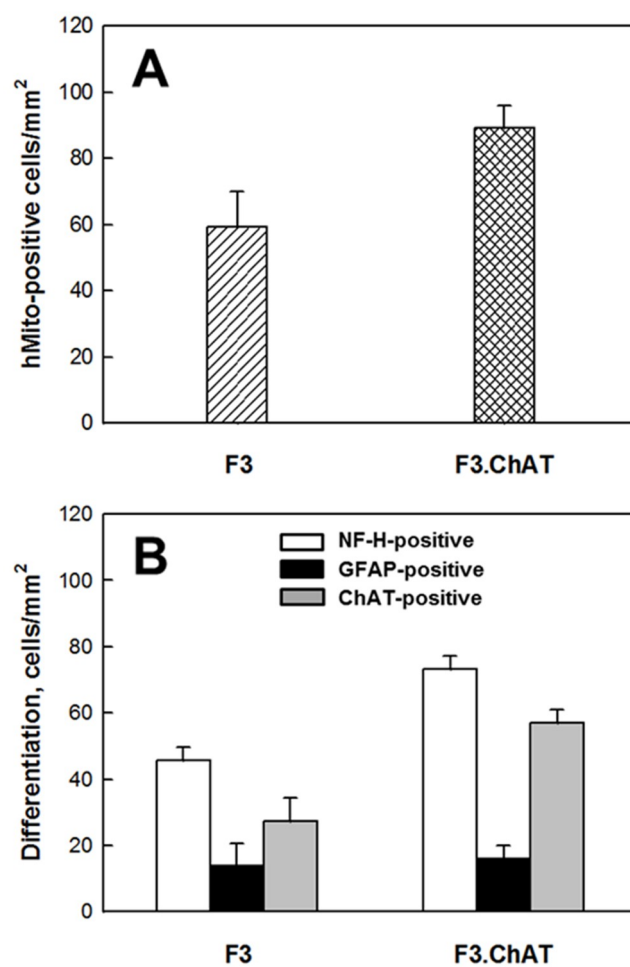
A. Primer sequences used for human NSCs			Accession No.
Gene	Primer	Sequences	
ChAT	Forward	5'-CTGTGCCCCCTTCTAGAGC-3'	NM_001142933
	Reverse	5'-CAAGGTTGGTGTCCCTGG-3'	
ChT1	Forward	5'-ATCCCAGCCATACTCATTGG-3'	NM_021815
	Reverse	5'-CAGAAACTGCACCAAGACCA-3'	
VACHT	Forward	5'-ACGTGGATGAAGCATAACG-3'	NM_003055
	Reverse	5'-CTGAGACATGGCGCACGT-3'	
m1AChR	Forward	5'-AGACGCCAGGCAAAGGGGGTGG-3'	NM_000738
	Reverse	5'-CACGGGGCTTCTGGCCCTTGCC-3'	
nAChR $\alpha$ 5	Forward	5'-TCATGTAGACAGGTACTTC-3'	NM_000745
	Reverse	5'-ATTTGCCCATTTATAAATAA-3'	
nAChR $\beta$ 2	Forward	5'-CAGCTCATCAGTGTGCA-3'	NM_000748
	Reverse	5'-GTGCGGTCGTAGGTCCA-3'	
AChE	Forward	5'-GCTCGGCCGCTCAGACGCCG-3'	NM_000665
	Reverse	5'-TCCTCGCTCAGCTCACGGTTGGG-3'	
B. Primer sequences used for mouse brain tissues			
ChAT	Forward	5'-GAGCGAATCGTTGGTATGACAA-3'	NM_009891
	Reverse	5'-AGGACGATGCCATCAAAAAGG-3'	
ChT1	Forward	5'-GCAGCTTTTGGGTGCCTG-3'	NM_022025
	Reverse	5'-TGTGGAAGCTCCAATAGCTCC-3'	
VACHT	Forward	5'-GGGTGGCTCGGTCAATC-3'	NM_021712
	Reverse	5'-CAAATAGCACGCCTATCTTCACAT-3'	
m1AChR	Forward	5'-CCCCTGGGTCACCTTCCT-3'	NM_007698
	Reverse	5'-TTCCCCGGGTTTCACTCTCT-3'	
nAChR $\alpha$ 5	Forward	5'-CAACATCCACCACCGCTCTT-3'	NM_176844
	Reverse	5'-TTTGGGAAGCTTGTGGAGAAAT-3'	
nAChR $\beta$ 2	Forward	5'-TCGTCGCAAACCGCTCTT-3'	NM_009602
	Reverse	5'-GATGGCCAGCGAGGTGAT-3'	
AChE	Forward	5'-CCTGGATCCCTCGCTGAA-3'	NM_009599
	Reverse	5'-CCTGTGCGGGCAAATG-3'	
TNF- $\alpha$	Forward	5'-GCACAGAAAGCATGATCCG-3'	NM_013693
	Reverse	5'-GCCCCCATCTTTTGGG-3'	
IL-1 $\beta$	Forward	5'-ACCTGTCCTGTGTAATGAAAGACG-3'	NM_008361
	Reverse	5'-TGGGATATGCTTGGGATCCA-3'	
CD11b	Forward	5'-GTGTGACTACAGCACAAGCCG-3'	NM_008401
	Reverse	5'-CCCAAGGACATATTCACAGCCT-3'	
SRA	Forward	5'-TGAACAAGAGGATGCTGACTG-3'	NM_031195

	Reverse	5'- GGAGGGGCCATTTTGTAGTGC-3'	
SRB	Forward	5'- TTTGGAGTGGTAGTAAAAAGGGC-3'	NM_016741
	Reverse	5'- TGACATCAGGGACTCAGAGTAG-3'	
RAGE	Forward	5'- ACTACCGAGTCCGAGTCTACC-3'	NM_007425
	Reverse	5'- GTAGCTTCCCTCAGACACACA-3'	
CD36	Forward	5'- GAACCACTGCTTTCAAAAAGTGG-3'	NM_007643
	Reverse	5'- TGCTGTTCTTTGCCACGTCA-3'	

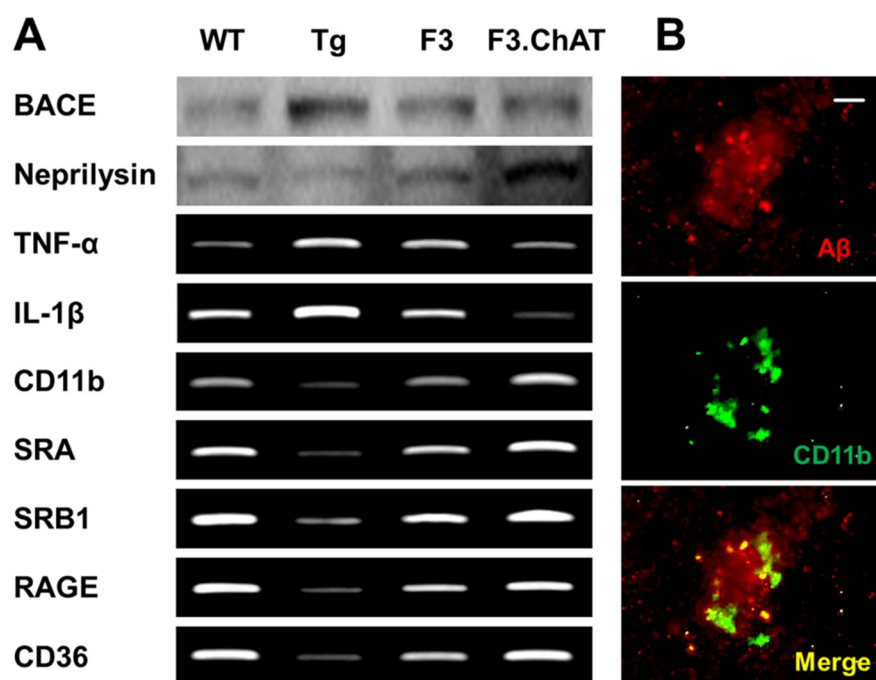
ChAT, choline acetyltransferase; ChT1, choline transporter; VAcChT, vesicular acetylcholine transporter; m1AChR, muscarinic 1 acetylcholine receptor; nAChR, nicotinic acetylcholine receptor; AChE, acetylcholinesterase; TNF- $\alpha$ , tumor-necrosis factor- $\alpha$ ; IL-1 $\beta$ , interleukin-1 $\beta$ ; SR, scavenger receptor; RAGE, receptor for advanced glycation end products.



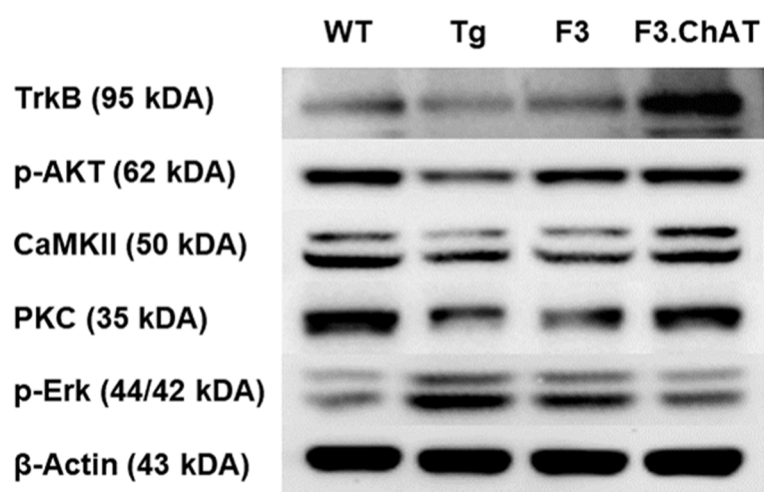
**Supplementary Figure 1.** Cholinergic nervous system markers in human neural stem cells (NSCs). Cholinergic markers in F3 and F3.ChAT NSCs were demonstrated by RT-PCR. ChAT: choline acetyltransferase, ChT1: choline transporter, VAcHT: vesicular acetylcholine transporter, m1AChR: muscarinic 1 acetylcholine receptor, nAChR: nicotinic acetylcholine receptor, AChE: acetylcholinesterase, GAPDH: glyceraldehyde-3-phosphate dehydrogenase.



**Supplementary Figure 2.** Number of NSCs survived (A) and differentiated into neurons and astrocytes, and expressing ChAT protein (B) in the mouse brain environment of APP<sup>swe</sup>/PS1<sup>dE9</sup> mice 4 weeks post-transplantation ( $1 \times 10^6$  cells/mouse).



Supplementary Figure 3. Microglial function in the brain of wild-type (WT) and APPswe/PS1dE9 transgenic (Tg) mice transplanted with F3 or F3.ChAT neural stem cells (NSCs). (A): Microglial functions related to A $\beta$  formation and degradation, cytokine secretion, and A $\beta$  scavenging. (B): A representative finding of CD11b-positive microglia surrounding amyloid plaques in the hippocampus of F3.ChAT NSC-transplanted APPswe/PS1dE9 Tg mouse. Bar = 10  $\mu$ m



Supplementary Figure 4. Production of representative signaling molecules of growth and neurotrophic factors in the brain of wild-type (WT) and APP<sup>swe</sup>/PS1<sup>dE9</sup> transgenic (Tg) mice transplanted with F3 or F3.ChAT neural stem cells.