Supplementary Information

Human neural stem cell transplantation improves cognition in a murine model of Alzheimer's disease

Authors: Lisa M. McGinley Ph.D.[1], Osama N. Kashlan M.D.[2], Elizabeth S. Bruno B.S.[1], Kevin S. Chen M.D.[2], John M. Hayes B.S.[1], Samy R. Kashlan M.D.[1], Julia Raykin Ph.D.[3], Karl Johe Ph.D.[4], Geoffrey G. Murphy Ph.D.[5] and Eva L. Feldman M.D. Ph.D.*[1]

Affiliations:

[1] Department of Neurology, University of Michigan, Ann Arbor, MI

[2] Department of Neurosurgery, University of Michigan, Ann Arbor, MI

[3] Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA

[4] Neuralstem, Inc., Germantown, MD

[5] Department of Molecular & Integrative Physiology, Molecular & Behavioral Neuroscience Institute, University of Michigan, Ann Arbor, MI

Address correspondence to:

Eva L. Feldman, M.D. Ph.D., 5017 AAT-BSRB, 109 Zina Pitcher Place, Ann Arbor, MI 48109

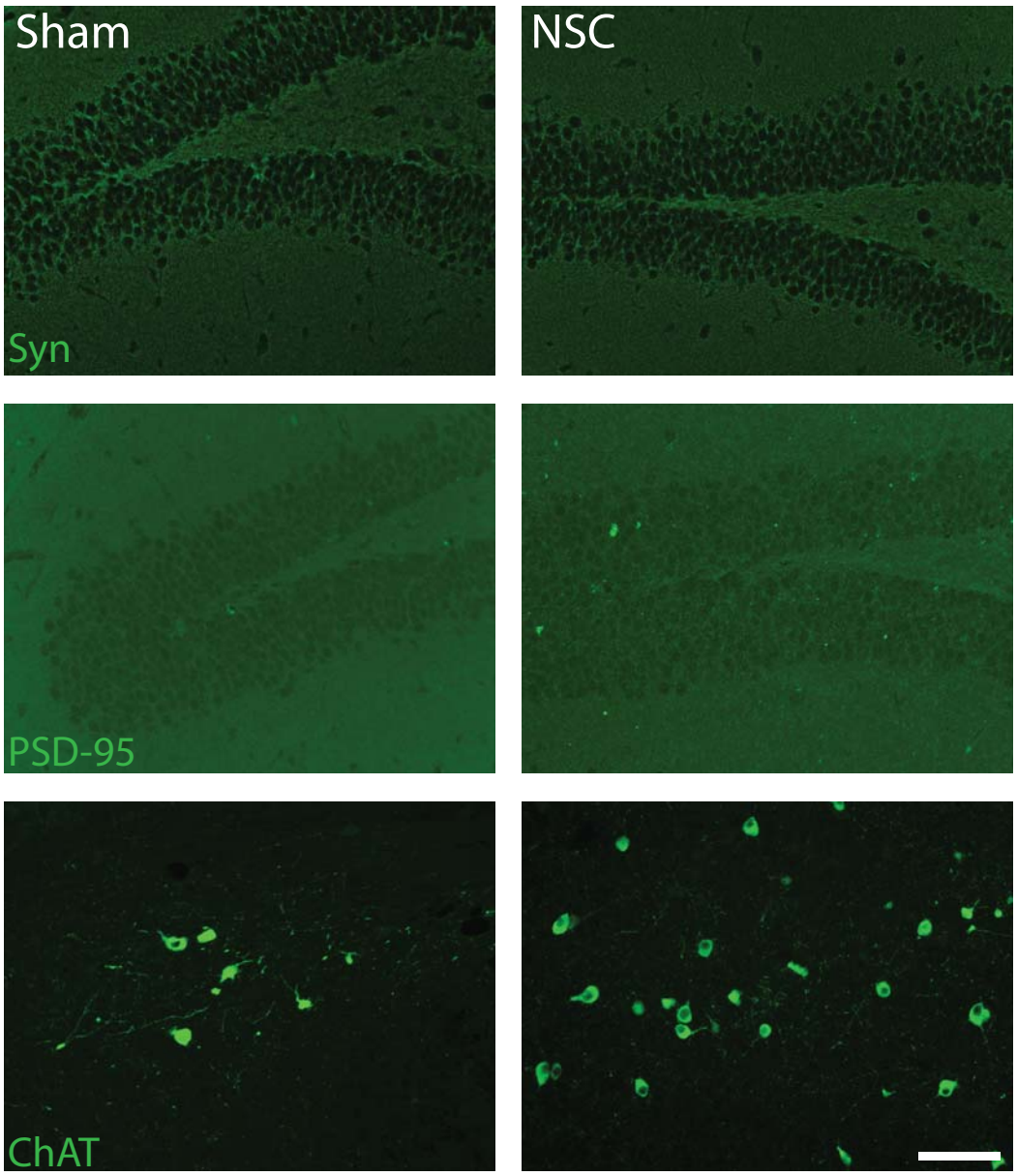
Phone: 734-763-7274 / Fax: 734-763-7275

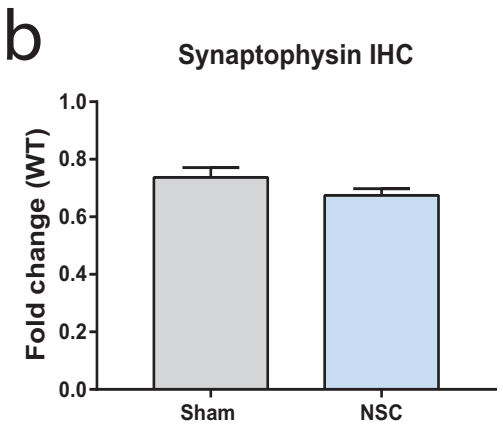
Email: efeldman@umich.edu

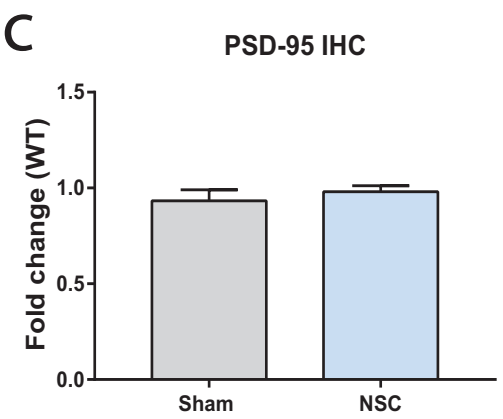
Table S1: List of primary antibodies used for immunohistochemistry (IHC).

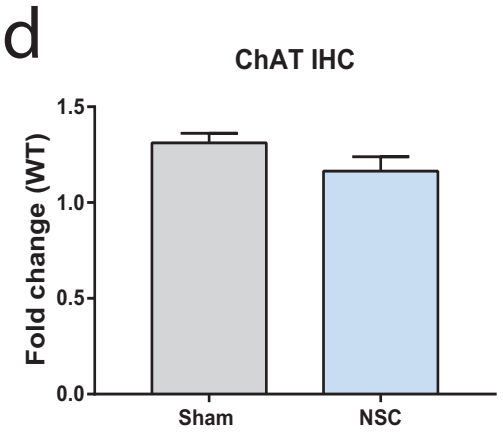
Antibody	Vendor	Cat. #	Species	Dilution
Aβ	Abcam	Ab10148	Rabbit	1:1500
ChAT	Millipore	AB-144-P	Rabbit	1:100
IBA-1	Wako	019-19741	Rabbit	1:500
PSD95	Abcam	Ab18258	Rabbit	1:100
Synaptophysin	Abcam	Ab32127	Rabbit	1:500

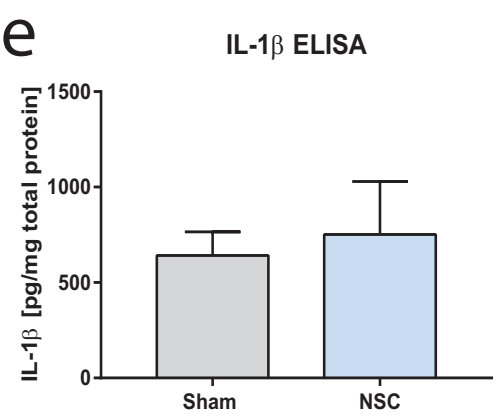
Supplementary Figure S1: Effect of NSC transplantation on synapse density, cholinergic neurons, and pro-inflammatory cytokines. Representative IHC images (a) and quantification of IHC fluorescent intensity of synaptophysin (b), PSD-95 (c), and ChAT (d) in APP/PS1 mice at 29 weeks (17 weeks post-NSC/vehicle transplant). Synapse density and ChAT levels were unchanged by NSC transplantation, with no significant differences detected between groups (synaptophysin; $p = 0.1297$; PSD-95; $p = 0.4580$; ChAT; $p = 0.1539$; NSC vs. sham; t-test). ELISA quantification on whole brain homogenate of IL-1β (e) and TNF-α (f) shows equivalent levels between treatment groups (IL-1β; $p = 0.4082$ and TNF-α; $p = 0.2115$; NSC vs. sham, Mann-Whitney test). Data are representative images or mean ± SEM. Scale bar 100 μm. Sample size: WT n=5, NSC n=10, and sham n=10.

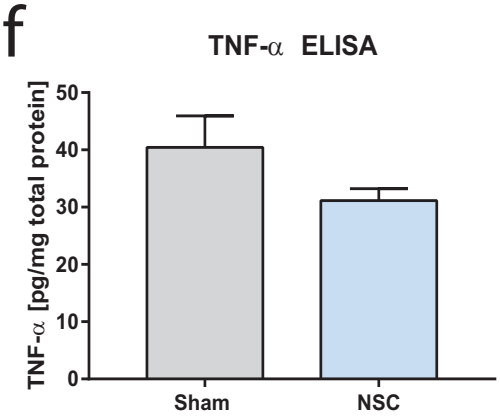

a
Sham
NSC
Syn
PSD-95
ChAT


b
Synaptophysin IHC
Fold change (WT)
1.0
0.8
0.6
0.4
0.2
0.0
Sham
NSC


c
PSD-95 IHC
Fold change (WT)
1.5
1.0
0.5
0.0
Sham
NSC


d
ChAT IHC
Fold change (WT)
1.5
1.0
0.5
0.0
Sham
NSC


e
IL-1β ELISA
IL-1β [pg/mg total protein]
1500
1000
500
0
Sham
NSC


f
TNF-α ELISA
TNF-α [pg/mg total protein]
50
40
30
20
10
0
Sham
NSC