

Online Resources

Supplementary Material

Tau pathology in the brainstem monoaminergic neurons reflect resilience to Alzheimer's disease pathology in the Nun Study cases.

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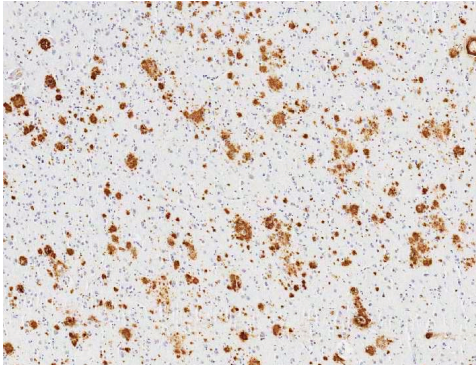
Supplementary Table S1 and Figures S1-S4

	AD (N=15)	NDAP (N=15)	P-value
Age at death (Year)	94	91	0.09
Age at last visit (Year)	93	90	0.07
Last visit to death (years)	0.70	0.94	0.22
Education (Year)	16	16	0.75
Brain Weight (Gram)	1079	1113	0.34
% With 1+ APOE e4 allele	33%	21%	0.49

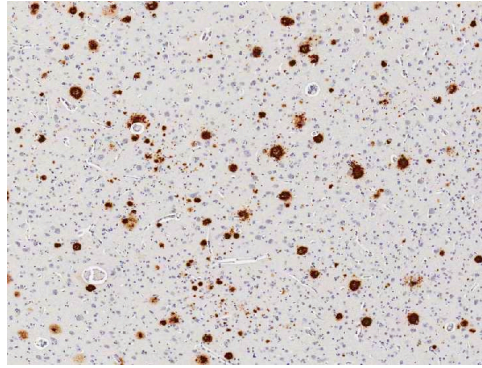
Supplementary Table S1. NDAP and AD group comparisons.

Numbers are either mean or percentage. AD=Alzheimer's disease, NDAP=Not Demented with Alzheimer's disease Pathology. P-values were calculated using unpaired t-test.

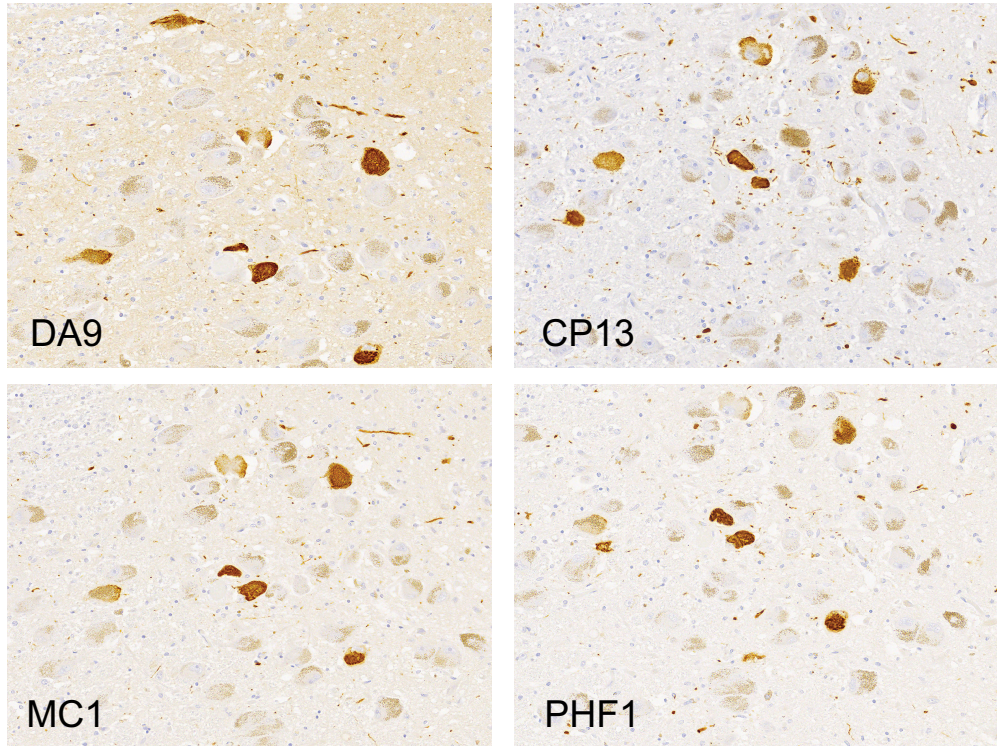
AD



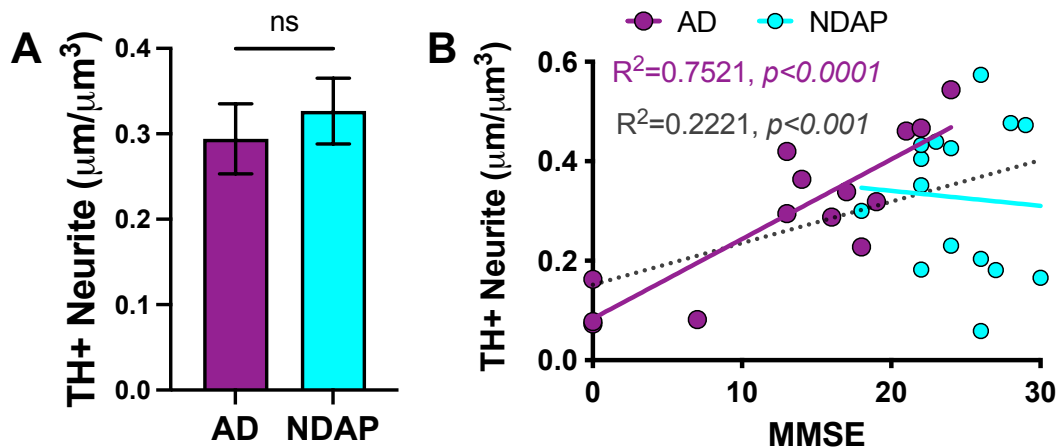
NDAP



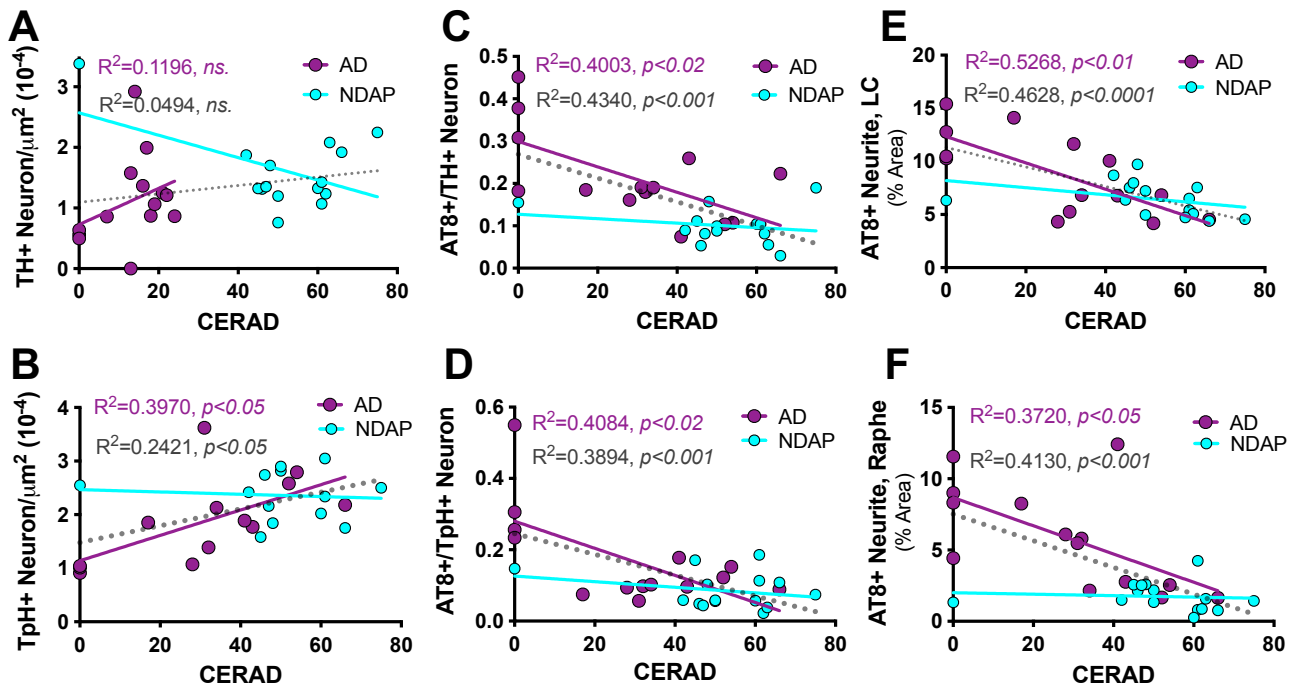
Supplementary Figure S1. A β immunostained sections from AD and NDAP cases. Cortical sections were immunostained with 4G8.



Supplementary Figure S2. Representative immunoreactivity of LC neurons to various tau antibodies. DA9 is reactivity for total tau where as C13, MC1, and PHF1 reacts to AD pathology related confirmations.



Supplementary Figure S3. TH+ neurite density correlate with cognitive function in Nun Study subjects. **A)** The average density of TH+ neurites in LC is not different between AD and NDAP cases (n=14 for AD, n=15 for NDAP, unpaired *t*-test). **B)** Plotting of TH+ neurite density versus MMSE scores show correlation between TH+ neurite density and MMSE scores of all subjects (gray), which is largely accounted by the significant correlation in AD cases (purple) cases. No significance is seen with NDAP cases alone. Simple linear regression analysis.



Supplementary Figure S4. Neuropathology in LC and Raphe correlate with CERAD Score in AD cases but not in NDAP cases. Indicated neuropathology was plotted against the CERAD scores. AD cases are plotted in purple and NDAP cases are plotted in magenta. Linear regression results (R^2 and the p -value) for AD (purple) and all cases (AD+NDAP, gray) are shown. There was no significant correlation with NDAP cases. **A)** Linear regression analysis of TH+ neuron density in LC do not correlate with CERAD scores. **B)** Density of TpH neurons in Raphe show significant correlation with CERAD score in AD cases but not in NDAP cases. **C, D)** Relative abundance of AT8+ neurons in LC (**C**) and Raphe (**D**) negatively correlates with CERAD scores in AD (purple) but not in NDAP cases. **E, F)** Abundance of AT8+ neurites in LC (**E**) and Raphe (**F**) show significant negative correlation with CERAD scores in AD cases but not in NDAP cases. $n=14$ or AD and $n=15$ for NDAP.