

**Supplementary Figure 1: Difference of functional connectivity strength (FCS) map between APOE ε3ε3carriers and APOE ε4+carriers corrected by grey matter** Compared with the APOE ε3ε3 carriers, the APOE ε4+ carriers showed significantly increased FCS values in the right hippocampus/parahippocampus. The color bar represents the strength of positive FCS. APOE, apolipoprotein E; HIP, hippocampus; PHG, parahippocampal gyrus

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|  | **HC** | ***P* value** | **Cohen’s *d*** |
| **APOE ε3ε3** (n=45) | **APOE ε4+**(n=45) |
| **Percentage female** | 21 (46.67%) | 23 (51.11%) | 0.916 a | - |
| **Age** (years) | 69.39±5.94 | 68.67±6.00 | 0.303 b | - |
| **Education level** (category) | 7-17 years | 6-17 years | 0.286 b | - |
| **General cognition** |
| MMSE | 28.45±1.13 | 28.09±1.52 | 0.276 c | 0.27 |
| MDRS-2 total | 137.76±3.54 | 137.76±3.32 | 0.663 c | 0.00 |
| **Composite Z scores of each cognition domain** |
| Episodic Memory | 0.01±0.78 | -0.00±0.68 | 0.945 c | 0.01 |
| AVLT-20min DR | 0.01±0.97 | -0.01±1.94 | 0.968 c | 0.01 |
| LMT-20min DR | 0.00±1.04 | -0.00±0.97 | 0.805 c | 0.00 |
| CFT-20min DR | 0.00±1.10 | -0.00±0.90 | 0.897 c | 0.00 |
| Visuospatial Function | -0.09±0.76 | 0.08±0.70 | 0.243 c | -0.01 |
| CDT | -0.04±0.99 | 0.04±1.02 | 0.658 c | -0.08 |
| CFT | -0.13±1.06 | 0.13±0.93 | 0.210 c | -0.26 |
| Information Processing Speed | -0.00±0.74 | 0.00±0.85 | 0.743 c | 0.00 |
| DSST | -0.02±0.99 | 0.02±1.02 | 0.618 c | -0.04 |
| TMT-A | -0.04±0.96 | 0.04±1.05 | 0.622 c | -0.08 |
| Stroop A | -0.04±0.87 | 0.04±1.12 | 0.504 c | -0.08 |
| Stroop B | 0.09±0.94 | -0.08±1.06 | 0.509 c | 0.17 |
| Executive Function | 0.01±0.60 | -0.01±0.73 | 0.926 c | 0.03 |
| VFT-objects | 0.10±0.97 | -0.09±1.03 | 0.354 c | 0.19 |
| VFT-animals | 0.14±1.01 | -0.14±0.98 | 0.317 c | 0.28 |
| DST-backward | -0.17±0.95 | 0.17±1.03 | 0.113 c | -0.34 |
| TMT-B | 0.01±0.95 | -0.01±1.05 | 0.953 c | 0.02 |
| Stroop C | 0.06±0.88 | -0.06±1.11 | 0.528 c | 0.12 |
| Similarity | -0.07±1.07 | 0.07±0.93 | 0.322 c | -0.14 |

**Supplementary Figure 2 (only for reviewer):** Data are presented as mean ± standard deviation. The level of each cognitive domain and performance of each neuropsychological test are expressed as Z scores. HC, healthy control; APOE, apolipoprotein E; MMSE, mini-mental state exam; MDRS-2, mattis dementia rating scale-2. AVLT, auditory verbal learning test; LMT: logical memory test; CFT: Rey-Osterrieth complex figure test; CDT, clock drawing test; DSST, digital symbol substitution test; TMT-A, trail making test-A; Stroop, stroop color test; VFT, verbal fluency test; DST, digit span test; TMT-B, trail making test-B; Similarity, semantic similarity test. a *P* values were obtained by χ2 tests. b *P* values were obtained by independent samples t-test. c *P* values were obtained by one-way analysis of covariance (ANCOVA)