**Supplementary Materials for “Alterations in intra- and inter-regional intrinsic brain connectivity are differentially associated with memory performance in amnestic mild cognitive impairment: resting-state functional MRI study**

**,” by Kang et al.**

* **Supplementary Methods**

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groups

**Supplementary Methods**

***1. Neuropsychological evaluation***

Cognitive status was assessed by neuropsychological testing at Seoul St. Mary’s Hospital, The Catholic University of Korea. The cognitive functions of all the subjects were assessed with the Korean version of the Consortium to Establish a Registry for Alzheimer’s Disease (CERAD-K), which included Verbal Fluency (VF), the 15-item Boston Naming Test (BNT), MMSE-K, Word List Memory (WLM), Word List Recall (WLR), Word List Recognition (WLRc), Constructional Praxis (CP), and Constructional Recall (CR). The CERAD is the standardized clinical and neuropsychological assessment battery for the evaluation of patients with Alzheimer's disease. The results were reviewed by a neuropsychologist to determine whether there was evidence of cognitive impairment.

The VF score is the number of animal names that the subject could name in one minute. The BNT score ranges from 0 to 15 points. The MMSE-K score ranges from 0 to 30 points. The WLM score ranges from 0 to 30 points. The WLR score ranges from 0 to 10 points. The WLR score ranges from 0 to 10 points. The WLRc score ranges from 0 to 10 points. The CP score ranges from 0 to 11 points. The CR score ranges from 0 to 11 points.

***2. APO E genotyping***

DNA was isolated from blood using the QIAmp Blood DNA Maxi Kit protocol (Qiagen, Valencia, CA). Genotypes for two APOE SNPs, rs429358 (E\*4) and rs7412 (E\*2) were determined using TaqMan SNP genotyping assays (Applied Biosystems, Foster City, California).

***3. FC analysis***

For each subject, a mean time series of each seed region was computed as the reference time course for each network. Pearson cross-correlation analysis was performed between the seed time course and the time course of the whole-brain voxels. A Fisher’s z-transformation was applied to improve the normality of the correlation coefficients

z =. Finally, the individual maps of each network were obtained.

**Supplementary Results**

**1. Nonsignificant group by memory performances interaction for mean ReHo values of ROIs in healthy control group**

**1.1 mean ReHo values of left gyrus rectus (WLM):** A group by WLM interaction was not selected as a variable in the finally selected model by stepwise back ward regression

| **Result of Stepwise Backward Regression**  Analysis of Variance Table | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Model 1: mean ReHo values of left gyrus *rectus* ~ WLM Model 2: mean ReHo values of left gyrus *rectus* ~ WLM | | | | | | |
|  | **Res.Df** | **RSS** | **Df** | **Sum of Sq** | **F** | **Pr(>F)** |
| 1 | 70 | 2.36 |  |  |  |  |
| 2 | 70 | 2.36 | 0 | 0 |  |  |

| **Finally Selected Model**  Result of Multiple Regression Analysis | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Beta** | **lwr** | **upr** | **SE** | **std.Beta** | **lwr** | **upr** | **SE** | **t value** | ***p*** |
| (Intercept) | 1.07 | 0.93 | 1.21 | 0.07 |  |  |  |  | 15.03 | < 0.001 |
| WLM | -0.01 | -0.02 | 0.00 | 0.00 | -0.17 | -0.4 | 0.06 | 0.12 | -1.48 | 0.144 |
| *R2=0.0303, adj.R2=0.0164, F=2.18, p=0.144, AIC =-35.8* | | | | | | | | | | |

**1.2 mean ReHo values of right middle frontal gyrus (WLR):** A group by WLR interaction was not selected as a variable in the finally selected model by stepwise back ward regression

**Result of Stepwise Backward Regression**

| Analysis of Variance Table | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Model 1: mean ReHo values of right middle frontal gyrus ~ age Model 2: mean ReHo values of right middle frontal gyrus ~ age + WLR* | | | | | | | |
|  | **Res.Df** | **RSS** | **Df** | **Sum of Sq** | **F** | **Pr(>F)** |
| 1 | 70 | 0.98 |  |  |  |  |
| 2 | 69 | 0.98 | 1 | 0 | 0.16 | 0.6918 |

| **Finally Selected Model**  Result of Multiple Regression Analysis | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Beta** | **lwr** | **upr** | **SE** | **std.Beta** | **lwr** | **upr** | **SE** | **t value** | ***p*** |
| (Intercept) | 1.52 | 1.17 | 1.87 | 0.18 |  |  |  |  | 8.65 | < 0.001 |
| age | -0.01 | -0.01 | 0.00 | 0.00 | -0.32 | -0.54 | -0.1 | 0.11 | -2.85 | 0.006 |
| *R2=0.1041, adj.R2=0.0913, F=8.14, p=0.006, AIC =-98.73* | | | | | | | | | | |

**1.3 mean ReHo values of right middle frontal gyrus (TM):** A group by TM interaction was not selected as a variable in the finally selected model by stepwise back ward regression

**Result of Stepwise Backward Regression**

Analysis of Variance Table

| *Model 1: mean ReHo values of right middle frontal gyrus ~ age Model 2: mean ReHo values of right middle frontal gyrus ~ age + TM* | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Res.Df** | **RSS** | **Df** | **Sum of Sq** | **F** | **Pr(>F)** |
| 1 | 70 | 0.98 |  |  |  |  |
| 2 | 69 | 0.98 | 1 | 0 | 0.2 | 0.6593 |

**Finally Selected Model**

Result of Multiple Regression Analysis

|  | **Beta** | **lwr** | **upr** | **SE** | **std.Beta** | **lwr** | **upr** | **SE** | **t value** | ***p*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Intercept) | 1.52 | 1.17 | 1.87 | 0.18 |  |  |  |  | 8.65 | < 0.001 |
| age | -0.01 | -0.01 | 0.00 | 0.00 | -0.32 | -0.54 | -0.1 | 0.11 | -2.85 | 0.006 |
| *R2=0.1041, adj.R2=0.0913, F=8.14, p=0.006, AIC =-98.73* | | | | | | | | | | |

Res. Df, residual degrees of freedom; RSS, residual sum of squares; Df, degree of freedom; Sq, squares; Pr (> F), Probability of F value. WLM, Word List Memory; WLR, Word List Recall; TM, total scores of memory domains including CERAD-K WLM, WLR, WLRc, CR.