**Supplemental Table 1.** Median (IQR) of α- and γ-tocopherol concentrations in frontal cortex, temporal cortex, occipital cortex, and averages of three brain regions (n = 43).

|  |  |  |
| --- | --- | --- |
| **Brain region** | **α-Tocopherol (pmol/g)** | **γ-Tocopherol (pmol/g)** |
| Frontal cortex  Temporal cortex  Occipital cortex  Average of three regions | 65,855 (58,812-74,645)  66,753 (55,907-76,093)  72,049 (60,466-83,467)  69,063 (60,627-77,399) | 1,398 (1,092-1,987)  1,578 (1,211-2,169)  1,519 (1,167-2,125)  1,441 (1,215-2,064) |

**Supplemental Table 2.** Pearson’s correlation coefficients (r) and p values of α- and γ-tocopherol concentrations (log transformed) among three brain regions (n = 43).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Brain region** | **Frontal cortex** | | **Temporal cortex** | |
|  | α-tocopherol | γ-tocopherol | α-tocopherol | γ-tocopherol |
| Temporal cortex  Occipital cortex | r = 0.43  p = 0.004  r = 0.58  p < 0.001 | r = 0.89  p < 0.001  r = 0.88  p < 0.001 | r = 0.51  p < 0.001 | r = 0.84  p < 0.001 |

**Supplemental Table 3.** β coefficients and p values demonstratingno associations were observed between global α- or γ-tocopherol concentrations (averaged from frontal, temporal, and occipital cortices) and neuritic plaque (NP) or neurofibrillary tangle (NFT) counts in 8 brain regions (n = 43, no adjustment for covariates). Tocopherol concentrations and NP or NFT counts were log transformed before model fitting.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Brain region** | **α-Tocopherol & NP counts** | | **γ-Tocopherol & NFT counts** | | **γ-Tocopherol & NP counts** | |
| **β coefficient (SE)** | **p value** | **β coefficient (SE)** | **p value** | **β coefficient (SE)** | **p value** |
| Frontal cortex  Temporal cortex  Parietal cortex  Amygdala  Entorhinal cortex  Hippocampus  Subiculum | -1.03 (0.84)  -0.71 (0.84)  -0.19 (0.88)  -1.22 (0.71)  -0.43 (0.36)  -0.14 (0.41)  -0.68 (0.44) | 0.225  0.404  0.834  0.093  0.240  0.734  0.130 | -0.16 (0.30)  -0.42 (0.34)  -0.02 (0.32)  -0.53 (0.46)  -0.40 (0.41)  -0.04 (0.39)  -0.13 (0.46) | 0.597  0.222  0.955  0.259  0.324  0.923  0.777 | 0.13 (0.38)  -0.24 (0.38)  -0.07 (0.39)  -0.06 (0.33)  -0.31 (0.16)  -0.21 (0.18)  -0.27 (0.20) | 0.732  0.525  0.859  0.846  0.053  0.254  0.181 |

**Supplemental Table 4.** Characteristics of subjects from the Georgia Centenarian Study by Braak stages. Medians that do not share superscription are significantly different with post-hoc comparisons (FDR-adjusted p<0.05).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Characteristics** | **Braak I-II**  **n = 15** | **Braak III-IV**  **n = 13** | | **Braak V-VI**  **n = 13** | | **p value \*** | |
| Age in years, mean (SD)  Sex, n (%)  Male  Female  Race, n (%)  Caucasian  Black  BMI in kg/m2, mean (SD)  Hypertension, n (%)  Diabetes, n (%)  Education, n (%)  < High school  High school  > High school  No data  Living, n (%)  Community dwelling  Institutionalized  Anti-inflammatory medications  Smoking, n (%)  Never  Past  Present  No data  Alcohol use, n (%)  Never  Past  Present  No data  *APOE* ε4 allele carrier, n (%)  Mini-Mental State Examination, mean (SD)  NIARI criteria for AD diagnosis, n (%)  No likelihood  Low likelihood  Intermediate likelihood  High likelihood | 101.4 (2.6)  3 (20%)  12 (80%)  14 (93%)  1 (7%)  23.2 (3.8)  8 (53%)  1 (7%)  7 (47%)  3 (20%)  5 (33%)  0  5 (33%)  10 (67%)  2 (13%)  8 (80%)  1 (10%)  1 (10%)  5  6 (60%)  3 (30%)  1 (10%)  5  1 (7%)  22.5 (6.2)a  5 (33%)  10 (67%)  0 (0%)  0 (0%) | | 102.9 (1.7)  0 (0%)  13 (100%)  13 (100%)  0 (0%)  21.8 (4.3)  7 (54%)  2 (15%)  6 (46%)  4 (31%)  3 (23%)  0  3 (23%)  10 (77%)  2 (15%)  10 (91%)  1 (9%)  0 (0%)  2  5 (45%)  2 (18%)  4 (36%)  2  3 (23%)  17.4 (8.9)a,b  0 (0%)  3 (23%)  10 (77%)  0 (0%) | | 102.5 (2.6)  2 (15%)  11 (85%)  11 (85%)  2 (15%)  20.5 (3.7)  7 (54%)  0 (0%)  7 (58%)  3 (25%)  2 (17%)  1  5 (38%)  8 (62%)  0 (0%)  9 (90%)  1 (10%)  0 (0%)  3  8 (80%)  0 (0%)  2 (20%)  3  3 (23%)  11.7 (8.0)b  1 (8%)  0 (0%)  0 (0%)  12 (92%) | | 0.251  0.343  0.506  0.214  1  0.506  0.921  0.770  0.524  0.913  0.285  0.395  0.003  <0.001 |

\*Kruskal-Wallis test for continuous variables and Fisher exact test for count variables.

**Supplemental Table 5.** β coefficients and p values demonstratingassociations between global α- or **γ**-tocopherol concentration (averaged from frontal, temporal, and occipital cortices) as an independent variable and Braak stages (I-VI) as a dependent variable in a linear regression model (n = 41). Tocopherol concentrations were log transformed before model fitting.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **α-Tocopherol tertiles** | | | **As linear term** | **γ-Tocopherol tertiles** | | | **As linear term** |
| **1** | **2** | **3** | **1** | **2** | **3** |
| Concentration, median (IQR) in pmol/g | 56531 (52781-60309) | 68992 (67799-71148) | 82004 (77399-84219) | 1067 (908-1158) | 1417 (1337-1551) | 2272 (2064-2747) |
| **Model I** a  β (SE)  p value  **Model II** a  β (SE)  p value | 1.00 (ref)  1.00 (ref) | -0.21 (0.56)  0.704  -0.21 (0.70)  0.762 | -0.57 (0.57)  0.328  -0.67 (0.69)  0.339 | -1.65 (1.17)  0.166  -2.43 (1.43)  0.100 | 1.00 (ref)  1.00 (ref) | -0.34 (0.58)  0.558  -0.03 (0.72)  0.962 | -0.21 (0.57)  0.707  0.11 (0.68)  0.872 | -0.57 (0.51)  0.278  -0.44 (0.58)  0.453 |

a Model I: no adjustment for covariate; Model II: adjustment for sex, race, education, presence of *APOE* ε4 allele, diabetes, and hypertension