

Metabolites	APOE ε4		NC vs AD		cMCI vs sMCI		NC vs cMCI&AD		MMSE		ROD	
	OR	p	OR	p	OR	p	OR	p	Beta	p	Beta	p
12,13-DiHOME	1.035	6.76×10 ⁻⁰¹	1.385	9.90×10 ⁻⁰³	0.659	2.83×10 ⁻⁰²	1.231	6.26×10 ⁻⁰²	0.015	9.24×10 ⁻⁰¹	-0.061	2.46×10 ⁻⁰¹
9,10-DiHOME	1.037	6.62×10 ⁻⁰¹	1.316	3.16×10 ⁻⁰²	0.856	3.18×10 ⁻⁰¹	1.198	1.13×10 ⁻⁰¹	0.125	4.33×10 ⁻⁰¹	-0.052	3.42×10 ⁻⁰¹
Argininate	0.759	1.55×10 ⁻⁰³	0.496	*2.06×10⁻⁰⁶	1.005	9.80×10 ⁻⁰¹	0.490	*7.09×10⁻⁰⁸	0.836	*2.06×10⁻⁰⁷	-0.217	3.03×10 ⁻⁰⁴
Aspartate	0.840	4.77×10 ⁻⁰²	0.495	*2.84×10⁻⁰⁶	0.988	9.51×10 ⁻⁰¹	0.452	*3.64×10⁻⁰⁹	1.039	*3.08×10⁻¹⁰	-0.221	8.19×10 ⁻⁰⁵
Glutamate	0.889	1.74×10 ⁻⁰¹	0.527	*8.62×10⁻⁰⁶	1.008	9.68×10 ⁻⁰¹	0.499	*4.77×10⁻⁰⁸	0.865	*9.72×10⁻⁰⁸	-0.240	*4.27×10⁻⁰⁵
Linoleamide (18:2n6)	1.032	7.22×10 ⁻⁰¹	1.842	5.44×10 ⁻⁰⁴	1.204	2.53×10 ⁻⁰¹	2.345	*2.23×10⁻⁰⁷	-0.980	*5.92×10⁻⁰⁹	0.174	2.43×10 ⁻⁰³
Oleamide	1.043	6.29×10 ⁻⁰¹	1.711	1.27×10 ⁻⁰³	1.367	6.54×10 ⁻⁰²	2.340	*3.47×10⁻⁰⁸	-1.000	*2.06×10⁻⁰⁹	0.198	6.02×10 ⁻⁰⁴
Palmitamide	1.102	2.66×10 ⁻⁰¹	1.526	9.61×10 ⁻⁰³	1.405	3.34×10 ⁻⁰²	2.196	*1.07×10⁻⁰⁷	-0.938	*1.57×10⁻⁰⁸	0.183	1.07×10 ⁻⁰³
Stearamide	1.116	2.03×10 ⁻⁰¹	1.160	2.90×10 ⁻⁰¹	0.659	2.83×10 ⁻⁰²	1.564	4.60×10 ⁻⁰⁴	-0.621	1.53×10 ⁻⁰⁴	0.139	2.11×10 ⁻⁰²

Supp. Table 1. Association between metabolites (from Table 2 and S1) with APOE ε4, diagnosis and MMSE. Positive Beta value denotes higher metabolite levels associate higher MMSE and ROD.

* Passed Bonferroni Procedure ($p < 7.72 \times 10^{-5}$)

Abbreviations: APOE ε4, ApolipoproteinE ε4; NC, Normal Cognition; cMCI, Converting Mild Cognitive Impairment; AD, Alzheimer's Disease, MMSE, Mini Mental State Examination; ROD, Rate of cognitive decline.

Metabolites	Attention		Executive		Language		Memory Delayed Delayed		Memory Immediate Immediate		Visuoconstruction	
	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p
12,13-DiHOME	0.132	6.27×10 ⁻⁰²	-0.038	6.65×10 ⁻⁰¹	-0.055	3.48×10 ⁻⁰¹	-0.078	2.61×10 ⁻⁰¹	0.093	2.20×10 ⁻⁰¹	0.195	2.95×10 ⁻⁰²
9,10-DiHOME	-0.013	8.52×10 ⁻⁰¹	-0.023	7.77×10 ⁻⁰¹	-0.069	2.34×10 ⁻⁰¹	-0.105	1.30×10 ⁻⁰¹	0.095	1.94×10 ⁻⁰¹	0.086	2.94×10 ⁻⁰¹
Argininate	0.003	9.66×10 ⁻⁰¹	0.086	3.38×10 ⁻⁰¹	0.277	*2.21×10⁻⁰⁶	0.184	1.07×10 ⁻⁰²	0.163	3.13×10 ⁻⁰²	-0.004	9.65×10 ⁻⁰¹
Aspartate	0.147	4.84×10 ⁻⁰²	0.336	2.28×10 ⁻⁰⁴	0.250	*3.36×10⁻⁰⁵	0.096	1.76×10 ⁻⁰¹	-0.036	6.44×10 ⁻⁰¹	-0.060	4.84×10 ⁻⁰¹
Glutamate	0.149	3.93×10 ⁻⁰²	0.210	1.59×10 ⁻⁰²	0.244	*2.75×10⁻⁰⁵	0.133	6.37×10 ⁻⁰²	0.034	6.52×10 ⁻⁰¹	-0.016	8.47×10 ⁻⁰¹
Linoleamide (18:2n6)	-0.396	*2.89×10⁻⁰⁷	-0.027	8.26×10 ⁻⁰¹	-0.239	9.88×10 ⁻⁰⁵	-0.057	6.47×10 ⁻⁰¹	-0.491	*1.03×10⁻⁰⁹	0.080	3.83×10 ⁻⁰¹
Oleamide	-0.404	*1.02×10⁻⁰⁷	-0.159	1.47×10 ⁻⁰¹	-0.245	*5.87×10⁻⁰⁵	-0.041	6.89×10 ⁻⁰¹	-0.431	*5.35×10⁻⁰⁸	0.064	4.82×10 ⁻⁰¹
Palmitamide	-0.427	*1.41×10⁻⁰⁸	-0.214	5.34×10 ⁻⁰²	-0.228	1.70×10 ⁻⁰⁴	-0.012	9.07×10 ⁻⁰¹	-0.376	*1.58×10⁻⁰⁶	0.042	6.62×10 ⁻⁰¹
Stearamide	-0.376	*1.84×10⁻⁰⁷	-0.097	3.15×10 ⁻⁰¹	-0.156	8.43×10 ⁻⁰³	0.039	6.28×10 ⁻⁰¹	-0.279	2.62×10 ⁻⁰⁴	0.025	7.69×10 ⁻⁰¹

Supp. Table 2. Association between the nine selected metabolites and cognitive function measurements. Positive Beta value denotes higher metabolite levels associate higher cognitive function measurements.

* Passed Bonferroni Procedure ($p < 7.72 \times 10^{-5}$)

Metabolites	Hippo R		Hippo L		Hippo Sum		Cortical Whole		Cortical in AD	
	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p
12,13-DiHOME	17.313	5.20×10 ⁻⁰¹	7.733	7.79×10 ⁻⁰¹	25.055	6.31×10 ⁻⁰¹	0.005	3.55×10 ⁻⁰¹	0.002	8.26×10 ⁻⁰¹
9,10-DiHOME	23.698	3.75×10 ⁻⁰¹	14.255	6.01×10 ⁻⁰¹	37.971	4.63×10 ⁻⁰¹	0.011	4.12×10 ⁻⁰²	0.016	3.71×10 ⁻⁰²
Argininate	82.386	5.05×10 ⁻⁰³	85.369	4.48×10 ⁻⁰³	167.758	3.18×10 ⁻⁰³	0.004	5.62×10 ⁻⁰¹	0.017	5.32×10 ⁻⁰²
Aspartate	117.334	2.90×10 ⁻⁰⁴	97.135	3.43×10 ⁻⁰³	214.471	6.32×10 ⁻⁰⁴	-0.009	2.10×10 ⁻⁰¹	0.001	9.27×10 ⁻⁰¹
Glutamate	146.097	* 8.38×10⁻⁰⁶	127.015	1.60×10 ⁻⁰⁴	273.101	* 1.73×10⁻⁰⁵	-0.002	7.73×10 ⁻⁰¹	0.006	5.22×10 ⁻⁰¹
Linoleamide (18:2n6)	-154.910	* 1.93×10⁻⁰⁶	-120.036	3.36×10 ⁻⁰⁴	-274.928	* 1.34×10⁻⁰⁵	-0.015	5.71×10 ⁻⁰²	-0.025	2.56×10 ⁻⁰²
Oleamide	-145.327	* 6.11×10⁻⁰⁶	-123.226	1.87×10 ⁻⁰⁴	-268.552	* 1.63×10⁻⁰⁵	-0.017	1.83×10 ⁻⁰²	-0.032	3.09×10 ⁻⁰³
Palmitamide	-132.323	* 1.60×10⁻⁰⁵	-114.065	2.88×10 ⁻⁰⁴	-246.379	* 3.40×10⁻⁰⁵	-0.013	6.11×10 ⁻⁰²	-0.029	4.52×10 ⁻⁰³
Stearamide	-105.492	4.21×10 ⁻⁰⁴	-81.044	8.27×10 ⁻⁰³	-186.530	1.30×10 ⁻⁰³	-0.012	7.12×10 ⁻⁰²	-0.022	2.13×10 ⁻⁰²

Supp. Table 3. Association between the nine selected metabolites with Brain measurements. Positive Beta value denotes higher metabolite levels associate higher brain volume measurements.

* Passed Bonferroni Procedure ($p < 7.72 \times 10^{-5}$)