

Table S1. Correlation analysis of all blood immune parameters and scales of MCI patients before cognitive training. Significant relationships are highlighted in red ( $r < -0.7$  or  $r > 0.7$ , and  $p < 0.01$ ).

		MMSE	HADS	MoCa	EGF	FGF-2	Eotaxin	TGF- $\alpha$	G-CSF	Flt-3L	GM-CSF	Fractalkine	INF $\alpha$ 2	IFN $\gamma$	GRO	IL-10	MCP-3	MDC	IL-12P70	sCD40L	IL-1RA	IL-1a	IL-4	IL-6	IL-7	IL-8	IP-10	MCP-1	MIP-1b	TNF $\alpha$	VEGF
MMSE	Pearson r	—																													
	p-value	—																													
HADS	Pearson r	-0.049	—																												
	p-value	0.606	—																												
MoCa	Pearson r	0.479	-0.083	—																											
	p-value	<.001	0.379	—																											
EGF	Pearson r	0.188	-0.088	0.010	—																										
	p-value	0.042	0.352	0.912	—																										
FGF-2	Pearson r	-0.010	-0.085	-0.046	0.436	—																									
	p-value	0.922	0.409	0.652	<.001	—																									
Eotaxin	Pearson r	-0.050	-0.096	-0.135	0.281	0.069	—																								
	p-value	0.593	0.310	0.147	0.002	0.498	—																								
TGF- $\alpha$	Pearson r	0.122	-0.048	-0.007	0.090	0.340	0.177	—																							
	p-value	0.270	0.672	0.951	0.415	0.002	0.108	—																							
G-CSF	Pearson r	0.014	-0.125	-0.073	0.519	0.950	0.162	0.390	—																						
	p-value	0.903	0.271	0.522	<.001	<.001	0.153	0.001	—																						
Flt-3L	Pearson r	-0.064	-0.170	-0.014	0.389	0.821	0.214	0.181	0.836	—																					
	p-value	0.571	0.135	0.902	<.001	<.001	0.056	0.115	<.001	—																					
GM-CSF	Pearson r	0.003	-0.133	-0.034	0.485	0.949	0.132	0.391	0.984	0.857	—																				
	p-value	0.977	0.248	0.765	<.001	<.001	0.249	<.001	<.001	<.001	—																				
Fractalkine	Pearson r	0.007	-0.119	-0.057	0.495	0.949	0.122	0.354	0.983	0.842	0.990	—																			
	p-value	0.949	0.264	0.595	<.001	<.001	0.252	0.002	<.001	<.001	<.001	—																			
INF $\alpha$ 2	Pearson r	0.045	-0.121	-0.024	0.470	0.919	0.156	0.274	0.921	0.762	0.913	0.940	—																		
	p-value	0.677	0.264	0.825	<.001	<.001	0.146	0.020	<.001	<.001	<.001	<.001	<.001	—																	
IFN $\gamma$	Pearson r	-0.050	0.021	-0.244	0.267	0.617	0.162	0.258	0.561	0.523	0.552	0.600	0.555	—																	
	p-value	0.633	0.844	0.018	0.010	<.001	0.122	0.022	<.001	<.001	<.001	<.001	<.001	—																	
GRO	Pearson r	0.269	-0.037	0.109	0.337	0.029	0.131	0.194	-0.002	0.074	0.000	0.006	-0.011	-0.038	—																
	p-value	0.004	0.695	0.244	<.001	0.778	0.160	0.076	0.985	0.517	0.997	0.953	0.921	0.719	—																
IL-10	Pearson r	0.114	-0.165	0.043	0.273	0.690	0.158	0.159	0.711	0.572	0.702	0.712	0.759	0.468	0.006	—															
	p-value	0.268	0.111	0.681	0.007	<.001	0.125	0.158	<.001	<.001	<.001	<.001	<.001	<.001	0.955	—															
MCP-3	Pearson r	0.007	0.019	-0.099	0.239	0.554	-0.024	0.179	0.565	0.478	0.542	0.569	0.511	0.539	-0.122	0.498	—														
	p-value	0.989	0.925	0.001	0.001	0.001	0.989	0.989	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	

[illegible]

Table S2. Correlation analysis of all blood immune parameters and scales of MCI patients after cognitive training. Significant relationships are highlighted in red ( $r < -0.7$  or  $r > 0.7$ , and  $p < 0.01$ ).

		MoCA	MMSE	HADS	EGF	FGF-2	Eotaxin	TGF- α	G- CSF	Flt-3L	GM- CSF	Fractalkine	INFα2	IFNγ	GRO	IL-10	MCP-3	MDC	IL-12P70	sCD40L	IL-1RA	IL-1α	IL-4	IL-6	IL-7	IL-8	IP-10	MCP-1	MIP-1b	TNFα	VEGF
MoCA	Pearson r	—																													
	p-value	—																													
MMSE	Pearson r	0.545	—																												
	p-value	<.001	—																												
HADS	Pearson r	0.014	-0.006	—																											
	p-value	0.869	0.947	—																											
EGF	Pearson r	-0.007	0.008	-0.089	—																										
	p-value	0.935	0.929	0.306	—																										
FGF-2	Pearson r	-0.016	-0.042	-0.150	0.131	—																									
	p-value	0.864	0.655	0.112	0.159	—																									
Eotaxin	Pearson r	-0.236	-0.323	-0.094	0.066	-0.021	—																								
	p-value	0.006	<.001	0.285	0.445	0.826	—																								
TGF-α	Pearson r	-0.037	0.083	-0.151	0.115	0.600	0.017	—																							
	p-value	0.685	0.362	0.095	0.202	<.001	0.848	—																							
G-CSF	Pearson r	-0.020	-0.008	-0.230	0.132	0.669	-0.008	0.779	—																						
	p-value	0.836	0.936	0.017	0.172	<.001	0.932	<.001	—																						
Flt-3L	Pearson r	-0.133	-0.045	-0.207	0.221	0.407	0.098	0.462	0.478	—																					
	p-value	0.147	0.625	0.024	0.015	<.001	0.287	<.001	<.001	—																					
GM-CSF	Pearson r	0.029	0.072	-0.179	0.108	0.692	0.017	0.847	0.822	0.461	—																				
	p-value	0.762	0.461	0.064	0.261	<.001	0.857	<.001	<.001	<.001	—																				
Fractalkine	Pearson r	-0.073	0.075	-0.189	0.188	0.725	0.069	0.857	0.688	0.381	0.792	—																			
	p-value	0.484	0.474	0.068	0.066	<.001	0.505	<.001	<.001	<.001	<.001	—																			
INFα2	Pearson r	-0.052	-0.005	-0.171	0.129	0.799	0.054	0.444	0.468	0.286	0.429	0.587	—																		
	p-value	0.622	0.958	0.103	0.214	<.001	0.607	<.001	<.001	0.008	<.001	<.001	—																		
IFNγ	Pearson r	-0.260	-0.196	-0.015	0.199	0.697	0.062	0.280	0.347	0.290	0.251	0.466	0.661	—																	
	p-value	0.009	0.052	0.882	0.047	<.001	0.540	0.007	0.001	0.005	0.019	<.001	<.001	—																	
GRO	Pearson r	-0.097	-0.107	-0.090	0.382	0.016	0.192	-0.065	-0.092	0.099	-0.048	-0.030	-0.017	0.027	—																
	p-value	0.265	0.218	0.305	<.001	0.866	0.025	0.469	0.344	0.276	0.622	0.772	0.870	0.786	—																
IL-10	Pearson r	-0.018	-0.035	-0.061	0.103	0.663	0.064	0.186	0.220	0.112	0.241	0.431	0.833	0.601	0.035	—															
	p-value	0.839	0.691	0.493	0.239	<.001	0.470	0.041	0.024	0.228	0.013	<.001	<.001	<.001	0.687	—															
MCP-3	Pearson r	-0.119	-0.142	-0.051	0.197	0.490	0.009	0.393	0.425	0.277	0.499	0.503	0.331	0.487	0.030	0.227	—														
	p-value	0.187	0.116	0.579	0.027	<.001	0.924	<.001	<.001	0.003	<.001	<.001	<.001	0.001	<.001	0.737	0.011	—													

[illegible]

Table S3. Correlation analysis of difference in concentrations of immune parameters between the first and second visits in MCI patients. Significant relationships are highlighted in red ( $r < -0.7$  or  $r > 0.7$ , and  $p < 0.01$ ).

		EGF	FGF-2	Eotaxin	TGF-α	G-CSF	Flt-3L	GM-CSF	Fractalkine	INFα2	IFNγ	GRO	IL-10	MCP-3	MDC	IL-12P70	sCD40L	IL-1RA	IL-1α	IL-4	IL-6	IL-7	IL-8	IP-10	MCP-1	MIP-1b	TNFα	VEGF
EGF	Pearson r	—																										
	p-value	—																										
FGF-2	Pearson r	0.324	—																									
	p-value	0.002	—																									
Eotaxin	Pearson r	0.259	0.137	—																								
	p-value	0.004	0.203	—																								
TGF-α	Pearson r	0.199	0.293	0.387	—																							
	p-value	0.077	0.019	< .001	—																							
G-CSF	Pearson r	0.373	0.873	0.214	0.494	—																						
	p-value	0.001	< .001	0.078	< .001	—																						
Flt-3L	Pearson r	0.336	0.734	0.434	0.517	0.738	—																					
	p-value	0.004	< .001	< .001	< .001	< .001	—																					
GM-CSF	Pearson r	0.373	0.853	0.309	0.744	0.974	0.816	—																				
	p-value	0.002	< .001	0.013	< .001	< .001	< .001	—																				
Fractalkine	Pearson r	0.378	0.807	0.291	0.901	0.894	0.736	0.927	—																			
	p-value	0.002	< .001	0.018	< .001	< .001	< .001	< .001	—																			
INFα2	Pearson r	0.359	0.818	0.254	0.385	0.629	0.558	0.605	0.663	—																		
	p-value	0.003	< .001	0.038	0.004	< .001	< .001	< .001	< .001	—																		
IFNγ	Pearson r	0.266	0.811	0.163	0.457	0.615	0.507	0.601	0.687	0.967	—																	
	p-value	0.034	< .001	0.202	< .001	< .001	< .001	< .001	< .001	< .001	—																	
GRO	Pearson r	0.507	0.128	0.369	0.068	0.145	0.401	0.185	0.129	0.180	0.132	—																
	p-value	< .001	0.234	< .001	0.553	0.228	< .001	0.139	0.295	0.139	0.294	—																
IL-10	Pearson r	0.219	0.660	0.245	0.222	0.457	0.462	0.470	0.525	0.855	0.831	0.130	—															
	p-value	0.033	< .001	0.017	0.054	< .001	< .001	< .001	< .001	< .001	< .001	0.206	—															
MCP-3	Pearson r	0.438	0.641	0.253	0.330	0.560	0.658	0.557	0.568	0.513	0.490	0.269	0.327	—														
	p-value	< .001	< .001	0.015	0.005	< .001	< .001	< .001	< .001	< .001	< .001	0.009	0.003	—														
MDC	Pearson r	0.288	0.225	0.181	0.150	0.200	0.131	0.178	0.210	0.455	0.592	0.223	0.415	0.219	—													
	p-value	0.001	0.034	0.038	0.186	0.096	0.274	0.159	0.087	< .001	< .001	0.010	< .001	0.034	—													
IL-12P70	Pearson r	0.336	0.797	0.297	0.506	0.715	0.581	0.680	0.738	0.900	0.909	0.147	0.864	0.440	0.438	—												
	p-value	0.005	< .001	0.015	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.232	< .001	< .001	< .001	—												
sCD40L	Pearson r	0.173	0.098	0.320	0.411	0.099	0.367	0.188	0.227	0.200	0.070	0.227	0.096	0.179	0.179	0.159	—											
	p-value	0.082	0.415	< .001	0.001	0.463	0.005	0.173	0.098	0.148	0.617	0.015	0.404	0.124	0.056	0.265	—											
IL-1RA	Pearson r	0.345	0.884	0.258	0.699	0.970	0.744	0.992	0.928	0.653	0.649	0.166	0.491	0.588	0.197	0.710	0.198	—										

IL-1a	p-value	< .001	< .001	0.015	< .001	< .001	< .001	< .001	< .001	< .001	0.118	< .001	< .001	0.062	< .001	0.095	—										
	Pearson r	0.439	0.688	0.350	0.812	0.795	0.694	0.831	0.889	0.629	0.584	0.298	0.421	0.654	0.274	0.682	0.345	0.692	—								
IL-4	p-value	< .001	< .001	0.002	< .001	< .001	< .001	< .001	< .001	< .001	0.010	< .001	< .001	0.017	< .001	0.006	< .001	—									
	Pearson r	0.437	0.635	0.269	0.622	0.768	0.578	0.782	0.843	0.584	0.557	0.281	0.347	0.654	0.258	0.594	0.237	0.636	0.950	—							
IL-6	p-value	< .001	< .001	0.007	< .001	< .001	< .001	< .001	< .001	< .001	0.005	< .001	< .001	0.010	< .001	0.034	< .001	< .001	—								
	Pearson r	0.532	0.625	0.541	0.829	0.731	0.766	0.738	0.849	0.611	0.564	0.363	0.380	0.698	0.276	0.649	0.419	0.636	0.972	0.943	—						
IL-7	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.011	0.012	< .001	0.060	< .001	0.008	< .001	< .001	< .001	—							
	Pearson r	0.442	0.676	0.488	0.766	0.704	0.779	0.747	0.831	0.683	0.650	0.332	0.564	0.542	0.315	0.727	0.364	0.725	0.823	0.715	0.865	—					
IL-8	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.002	< .001	< .001	0.004	< .001	0.002	< .001	< .001	< .001	< .001	—						
	Pearson r	0.402	0.567	0.398	0.800	0.605	0.716	0.678	0.762	0.611	0.562	0.323	0.397	0.648	0.278	0.626	0.359	0.615	0.924	0.848	0.964	0.847	—				
IP-10	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.002	< .001	< .001	< .001	< .001	< .001	< .001	—					
	Pearson r	-0.332	0.149	-0.054	-0.315	-0.109	0.324	-0.040	-0.123	-0.008	0.089	-0.151	0.081	0.074	-0.096	0.066	-0.015	-0.005	-0.216	-0.170	-0.275	-0.154	-0.165	—			
MCP-1	p-value	< .001	0.160	0.538	0.004	0.364	0.005	0.749	0.318	0.948	0.482	0.081	0.430	0.475	0.266	0.592	0.872	0.963	0.060	0.090	0.059	0.161	0.063	—			
	Pearson r	0.289	0.151	0.482	0.535	0.160	0.389	0.311	0.329	0.301	0.177	0.432	0.249	0.334	0.334	0.311	0.393	0.279	0.484	0.345	0.561	0.506	0.535	-0.069	—		
MIP-1b	p-value	0.001	0.155	< .001	< .001	0.182	< .001	0.012	0.006	0.012	0.159	< .001	0.014	< .001	< .001	0.010	< .001	0.007	< .001	< .001	< .001	< .001	< .001	0.421	—		
	Pearson r	0.071	0.115	0.346	0.219	0.056	0.477	0.166	0.169	0.062	-0.006	0.343	0.219	0.407	0.091	0.130	0.342	0.122	0.034	-0.009	0.092	0.407	0.197	0.330	0.380	—	
TNFα	p-value	0.439	0.280	< .001	0.051	0.645	< .001	0.186	0.167	0.615	0.963	< .001	0.031	< .001	0.297	0.292	< .001	0.251	0.769	0.928	0.534	< .001	0.027	< .001	< .001	—	
	Pearson r	0.209	0.560	0.266	0.539	0.351	0.363	0.368	0.513	0.902	0.891	0.138	0.791	0.323	0.350	0.827	0.230	0.403	0.514	0.424	0.516	0.626	0.538	-0.037	0.310	0.220	—
VEGF	p-value	0.033	< .001	0.005	< .001	0.003	0.002	0.003	< .001	< .001	< .001	0.150	< .001	0.002	< .001	< .001	0.027	< .001	< .001	< .001	< .001	< .001	< .001	0.696	< .001	0.020	—
	Pearson r	0.391	0.807	0.286	0.610	0.900	0.788	0.928	0.884	0.653	0.663	0.260	0.471	0.641	0.318	0.692	0.264	0.889	0.847	0.799	0.826	0.800	0.800	-0.110	0.455	0.123	0.399
	p-value	< .001	< .001	0.012	< .001	< .001	< .001	< .001	< .001	< .001	0.023	< .001	< .001	0.005	< .001	0.036	< .001	< .001	< .001	< .001	< .001	< .001	< .001	0.342	< .001	0.287	< .001

Table S4. Evaluation of the relationship between the concentration of immune parameters before and after cognitive training in patients with different APOE genotypes. ANOVA was used for analysis. Significant differences in p-values are highlighted in bold.

Immune parameters / Scales	APOE genotypes			
	First visit		Second visit	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
EGF	0.60	0.66	1.87	0.12
FGF-2	3.83	<b>0.007</b>	0.73	0.57
Eotaxin	0.58	0.68	0.20	0.94
TGF-a	2.23	0.07	0.29	0.88
G-CSF	1.82	0.13	0.73	0.58
Fractalkine	0.88	0.48	1.07	0.37
INFa2	0.17	0.95	0.44	0.78
IFNy	0.30	0.87	0.40	0.81
GRO	0.33	0.86	1.03	0.39
IL-10	0.17	0.95	0.27	0.89
MCP-3	0.35	0.85	0.85	0.49
MDC	0.44	0.78	1.10	0.36
IL-12P70	0.25	0.91	0.34	0.85
sCD40L	0.38	0.82	0.31	0.87
IL-1RA	1.60	0.18	0.71	0.59
IL-1a	1.55	0.19	2.17	0.08
IL-4	1.16	0.33	0.53	0.71
IL-6	1.22	0.32	0.78	0.54
IL-7	0.25	0.91	0.78	0.54
IL-8	1.19	0.32	0.53	0.71
IP-10	0.15	0.96	2.93	<b>0.02</b>
MCP-1	0.35	0.84	2.08	0.09
MIP-1b	0.45	0.77	0.52	0.72
TNFa	0.46	0.76	0.44	0.78
VEGF	4.50	<b>0.002</b>	0.94	0.44
Flt-3L	1.12	0.35	0.38	0.82
GM-CSF	0.94	0.42	0.49	0.74
HADS	1.16	0.33	0.59	0.67
MMSE	1.32	0.27	2.36	0.57
MoCa	4.49	<b>0.002</b>	3.81	<b>0.006</b>