

Supplementary data to:

Original article:

**ALUMINIUM OXIDE NANOPARTICLES COMPROMISE SPATIAL
LEARNING AND MEMORY PERFORMANCE IN RATS**

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Table 1: Reference Memory: Raw data in Morris water maze test

Groups	Day 1	Day 2	Day 3	Day 4	Day 5 (Probe test)
T1	15,75	6,25	5,25	2,75	21,5
T2	6,5	8	4	3,25	21
T3	6,5	9,75	3,75	4,5	20
T4	11,5	6,5	4,25	5,5	28
T5	9	9	2,25	4,25	36,8
T6	10	11,5	3,25	3,25	26,1
Average	9,875	8,5	3,79166667	3,91666667	25,5666667
SEM	1,4226589	0,819044158	0,41036908	0,41666667	2,58697593
AI1	19,5	11	7,25	7	12,3
AI2	8,75	17	4,5	5,75	20
AI3	7,75	6	4,75	6,75	20,1
AI4	8	7	5,25	6,5	18
AI5	10,75	6,5	4,75	3,75	17,3
AI6	11,75	9,25	4,75	7,25	15,7
Average	11,08333333	9,458333333	5,208333333	6,16666667	17,23333333
SEM	1,80239039	1,693635964	0,42039994	0,52704628	1,19935168

- T1, T2, T3, T4, T5 and T6 refer to control rats
- AI1, AI2, AI3, AI4, AI5 and AI6 refer to Al₂O₃ nanoparticles treated rats
- Day 1, day 2, day 3, day 4: refer to the latency (per second) to reach the platform refuge in the water maze during the 4 training days
- Day 5: refers to the time spent (in second) by each rat in the target quadrant (North-East)

Table 2: Oxidative stress indicators and acetylcholinesterase activity (n=6)

Groups	MDA (nmol/mg protein)	SOD (U SOD/min/mg protein)	CAT (μ mole H ₂ O ₂ /min/mg protein)	GPx (U/mg protein/min)	Thiol (Mm)	AChE (UACHe)
T1	45,8511891	1,578868124	16,6658302	0,34564182	0,04553	0,00949785
T2	46,196689	1,331595656	12,4939839	0,17202453	0,08478	0,00731504
T3	25,2355193	0,640643087	9,49100869	0,17960151	0,03768	0,00687069
T4	35,3126951	1,415475697	33,2025164	0,21528923	0,07693	0,00692464
T5	47,0773299	1,298614958	16,7537362	0,22065493	0,07065	0,008999
T6	49,2729922	0,899503386	19,9889641	0,24042193	0,02355	0,00633494
Average	41,4910691	1,194116818	18,0993399	0,22893899	0,05652	0,00765205
SEM	3,8093453	0,143757186	3,37177302	0,02561236	0,009962595	0,00062318
AI1	50,7043338	0,718650996	11,8000719	0,13994631	0,02041	0,00279915
AI2	43,3549074	0,819075026	24,2688897	0,20328731	0,02512	0,00248182
AI3	55,9006263	0,818234086	15,1524831	0,17594664	0,0471	0,00443666
AI4	43,4337607	0,845132556	20,3457837	0,21145298	0,03925	0,00466393
AI5	66,5025694	0,364908425	21,2863248	0,18788091	0,08949	0,00454963
AI6	47,9204454	0,701425805	16,8861768	0,17761184	0,07693	0,0039848
Average	51,3027738	0,711237816	18,289955	0,18268766	0,049716667	0,00381933
SEM	3,60121395	0,073280317	1,85189299	0,01029043	0,011405786	0,00035797

- T1, T2, T3, T4, T5 and T6 refer to control rats
- AI1, AI2, AI3, AI4, AI5 and AI6 refer to Al₂O₃ nanoparticles treated rats
- MDA (nmol/mg protein): Malondialdehyde levels in hippocampi expressed in nmol per mg of protein in hippocampus
- SOD (U SOD/min/mg protein): superoxide activity in hippocampus was expressed in arbitrary unit per minute per mg of protein in hippocampus
- CAT (μ mole H₂O₂/min/mg protein): Catalase activity expressed in μ mol of H₂O₂ per minute per mg of protein in hippocampus
- GPx (U/mg protein/min): glutathione peroxidase activity in hippocampus expressed in arbitrary unit per mg of protein in the same structure per minute
- Thiol (Mm): Thiol groups levels are expressed per Mm
- AChE (UACHe): acetylcholinesterase activity expressed by arbitrary unit of acetylcholinesterase

Table 3: Fe, Ca, Mg and Al content of hippocampus (n=3-5)

Groups	Fe level .10 ⁻³ mg/mg fresh weight	Ca level .10 ⁻³ mg/mg fresh weight	Mg level .10 ⁻³ mg/mg fresh weight	Al level (mg/mg fresh weight)
T1	0,00186813	0,03749044	0,0952381	0,59124424
T2	0,00120879	0,03978577	0,07368421	0,44009662
T3	0,0043956	0,02448355	0,07046632	0,61116279
T4	0,00428571	0,02754399	0,07564767	
T5	0,00444444	0,03350785	0,09015544	
Average	0,00293956	0,03269232	0,08103835	0,54750122
SEM	0,00073374	0,00304313	0,00489727	0,05400925
AI1	0,00021978	0,02371844	0,0952381	1,16694215
AI2	0,00032967	0,0283091	0,1047619	0,69292929
AI3	0,00076923	0,02524866	0,1047619	0,81215278
AI4	0,00032967	0,02218822	0,07619048	
AI5	0,00054945	0,02601377	0,12380952	
Average	0,00043956	0,02509564	0,10095238	0,89067474
SEM	9,8289E-05	0,00103785	0,00773718	0,14235674

- T1, T2, T3, T4 and T5 refer to control rats
- AI1, AI2, AI3, AI4 and AI5 refer to Al₂O₃ nanoparticles treated rats
- Fe level: iron level in one mg fresh tissue of hippocampus
- Ca level: calcium level in one mg fresh tissue of hippocampus
- Mg level: magnesium level in one mg fresh tissue of hippocampus
- Al level: aluminium level in one mg fresh tissue of hippocampus