

Supplementary Table S1. Summary of one-way ANOVA tests for different γ H2AX parameters measured using LSC in different types of buccal cell nuclei.

LSC	Con	MCI	AD	Con v MCI	Con vs AD	MCI vs AD
	Mean $\pm$ SEM	Mean $\pm$ SEM	Mean $\pm$ SEM	p-value	p-value	p-value
<u>All nuclei</u>						
γ H2AX integral ($\times 10^6$ a.u.)	3.873 $\pm$ 1.733	2.280 $\pm$ 0.6092	5.088 $\pm$ 1.611	NS	0.0332	0.0512
γ H2AX MaxPixel (a.u.)	3365 $\pm$ 458.5	3931 $\pm$ 673.5	6477 $\pm$ 1244	NS	0.0199	0.0458
γ H2AX area	51.47 $\pm$ 21.94	29.34 $\pm$ 6.624	51.62 $\pm$ 9.776	NS	0.0645	0.1633
γ H2AX foci/nucleus	1.510 $\pm$ 0.2912	1.943 $\pm$ 0.3310	2.940 $\pm$ 0.3316	NS	0.0234	0.1176
<u><2N nuclei</u>						
γ H2AX integral	2.827 $\pm$ 1.105	2.098 $\pm$ 0.559	4.253 $\pm$ 0.983	NS	0.0406	0.0619
γ H2AX MaxPixel	3459 $\pm$ 476.9	3922 $\pm$ 629.8	6498 $\pm$ 1263	NS	0.0216	0.0745
γ H2AX area	40.29 $\pm$ 16.22	27.72 $\pm$ 5.742	46.54 $\pm$ 7.902	NS	0.0498	0.1975
γ H2AX foci/nucleus	0.8886 $\pm$ 0.1652	1.366 $\pm$ 0.1802	1.851 $\pm$ 0.2257	NS	0.0064	0.6317
<u>2N nuclei</u>						
γ H2AX integral	3.954 $\pm$ 1.914	2.201 $\pm$ 0.592	5.057 $\pm$ 1.788	NS	0.0485	0.1273
γ H2AX MaxPixel	3309 $\pm$ 445.8	3764 $\pm$ 625.2	6465 $\pm$ 1266	NS	0.0159	0.0281
γ H2AX area	51.56 $\pm$ 23.32	29.29 $\pm$ 6.655	50.13 $\pm$ 10.96	NS	0.1018	0.2603
γ H2AX foci/nucleus	1.660 $\pm$ 0.3251	2.068 $\pm$ 0.3792	3.145 $\pm$ 0.3631	NS	0.0211	0.1173
<u>$\geq 2N$ nuclei</u>						
γ H2AX integral	12.58 $\pm$ 6.035	3.842 $\pm$ 1.039	18.20 $\pm$ 4.103	NS	0.0069	0.0174
γ H2AX MaxPixel	3580 $\pm$ 728.9	4879 $\pm$ 921.7	8227 $\pm$ 1388	NS	0.0008	0.0552
γ H2AX area	128.8 $\pm$ 53.45	52.24 $\pm$ 16.46	195.4 $\pm$ 40.74	NS	0.0187	0.0414
<u>Round nuclei</u>						
γ H2AX integral ($\times 10^6$ a.u.)	3.440 $\pm$ 1.820	2.182 $\pm$ 0.669	4.514 $\pm$ 1.722	NS	0.1424	0.4755
γ H2AX MaxPixel (a.u.)	3414 $\pm$ 449.2	4061 $\pm$ 695	6673 $\pm$ 1274	NS	0.0207	0.0586
γ H2AX area	35.76 $\pm$ 17.92	22.85 $\pm$ 6.45	42.71 $\pm$ 10.41	NS	0.2046	0.1749
γ H2AX foci/nucleus	1.552 $\pm$ 0.287	1.716 $\pm$ 0.313	2.934 $\pm$ 0.403	NS	0.0420	0.0703
<u>Long nuclei</u>						
γ H2AX integral	2.266 $\pm$ 0.9230	2.168 $\pm$ 0.6196	4.487 $\pm$ 1.253	NS	0.0804	0.2344

LSC	Con	MCI	AD	Con v MCI	Con vs AD	MCI vs AD
	Mean $\pm$ SEM	Mean $\pm$ SEM	Mean $\pm$ SEM	p-value	p-value	p-value
γ H2AX MaxPixel	3631 $\pm$ 586.4	3911 $\pm$ 647.2	7692 $\pm$ 1437	NS	0.0119	0.2690
γ H2AX area	35.76 $\pm$ 15.19	27.54 $\pm$ 6.82	42.02 $\pm$ 8.43	NS	0.1659	0.5273
γ H2AX foci/nucleus	1.095 $\pm$ 0.2044	1.522 $\pm$ 0.6077	2.132 $\pm$ 0.2940	NS	0.0209	0.5141
Oval nuclei						
γ H2AX integral	3.917 $\pm$ 1.734	2.341 $\pm$ 0.608	5.407 $\pm$ 1.635	>0.9999	0.0264	0.0574
γ H2AX MaxPixel	3398 $\pm$ 495.1	3885 $\pm$ 655.5	6366 $\pm$ 1123	>0.9999	0.0135	0.0527
γ H2AX area	56.62 $\pm$ 23.98	30.40 $\pm$ 6.755	58.62 $\pm$ 12.99	>0.9999	0.0535	0.1500
γ H2AX foci/nucleus	1.580 $\pm$ 0.3293	2.061 $\pm$ 0.3624	3.248 $\pm$ 0.3491	>0.9999	0.0091	0.0862

Parameters highlighted in bold text were considered statistically significant. Data were expressed as mean $\pm$ SEM. Abbreviations: a.u., Arbitrary units; AD, Alzheimer's disease; MCI, Mild cognitive impairment; NS = non-significant.

Supplementary Table S2. Summary of the one-way ANOVA tests for different γ H2AX parameters in putative senescent nuclei.

Senescent nuclei	Con	MCI	AD	Con vs MCI	Con vs AD	MCI vs AD
	Mean $\pm$ SEM	Mean $\pm$ SEM	Mean $\pm$ SEM	p-value	p-value	p-value
γ H2AX integral ($\times 10^6$ a.u.)	6.921 $\pm$ 2.693	3.590 $\pm$ 0.864	12.87 $\pm$ 2.87	NS	0.0123	0.0349
γ H2AX MaxPixel (a.u.)	3611 $\pm$ 594	4342 $\pm$ 734	7613 $\pm$ 1058	NS	0.0014	0.0134
γ H2AX area (μm^2)	73.18 $\pm$ 27.08	49.93 $\pm$ 13.34	152.8 $\pm$ 30.1	NS	0.0062	0.0345
γ H2AX foci/nucleus	2.181 $\pm$ 0.599	3.635 $\pm$ 1.027	5.571 $\pm$ 0.671	NS	0.0015	0.0761

Parameters highlighted in bold text were considered statistically significant. Data were expressed as mean $\pm$ SEM. Abbreviations: a.u., Arbitrary units; AD, Alzheimer's disease; MCI, Mild cognitive impairment; NS = non-significant.

Supplementary Table S3. Summary of the one-way ANOVA tests for % of senescent nuclei across Control, MCI, and AD.

Senescent nuclei	Con	MCI	AD	Con vs MCI	Con vs AD	MCI vs AD
	Mean $\pm$ SEM	Mean $\pm$ SEM	Mean $\pm$ SEM	p-value	p-value	p-value
Frequency (%) of cells	14.59 $\pm$ 4.047	16.11 $\pm$ 4.430	11.13 $\pm$ 3.150	NS	NS	NS

Data were expressed as mean $\pm$ SEM. Abbreviations: a.u., Arbitrary units; AD, Alzheimer's disease; MCI, Mild cognitive impairment; NS = non-significant.