



Analysis of DNA damage response following proton radiation exposure in an *in vitro* neuronal model

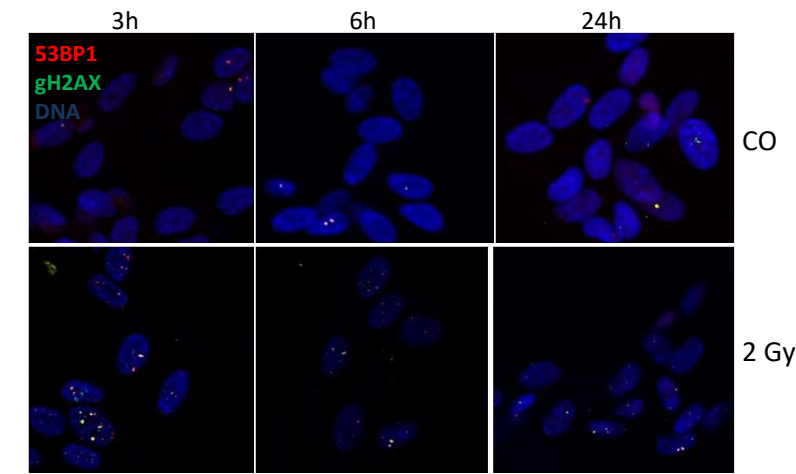
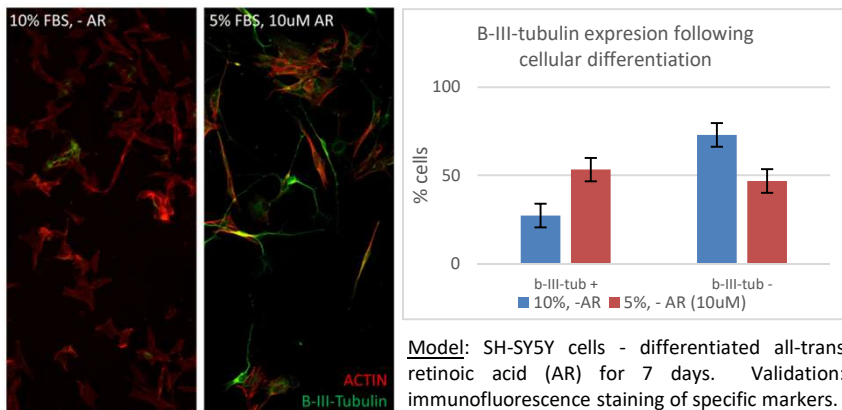
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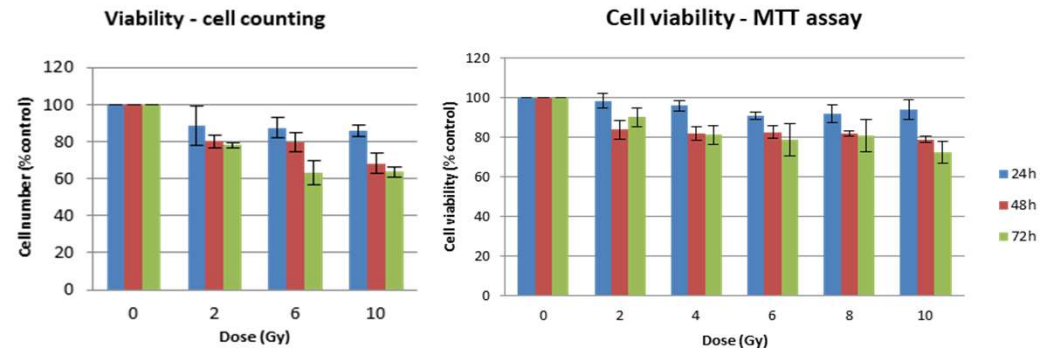
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Several studies from the field of space radiobiology linked neurodegeneration with exposure to particle radiation in the head area. The non-dividing neural cells seems to show particular sensitivity to protons exposure.

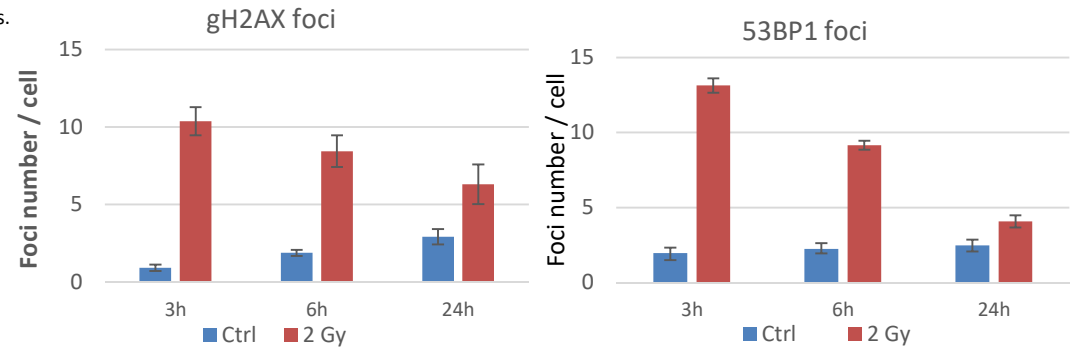
Aim: to analyse proton radiation effects on DNA damage response and cellular death/survival in a differentiated neuronal model.



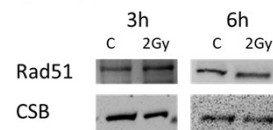
DNA Damage – Fluorescence microscopy images of phosphorylated H2AX (green), 53BP1 (red) or colocalization (yellow) of the proteins accumulated in the cellular nucleus, indicating sites of DNA DSB.



Cellular viability of differentiated SH-SY5Y cells at 24-72 hours following proton irradiation with doses of 0-10Gy. Left – viability evaluated by detaching and counting cells using a haemocytometer; Right – viability evaluated by MTT assay showing metabolic activity of cells.



DNA Damage foci measured by immunofluorescence indicate a high level of DNA DSB induction by proton irradiation (2Gy) followed by activation of DNA repair mechanisms leading to a time dependent decrease of accumulation of signaling proteins in the nucleus.



Preliminary results of Western blot analysis indicate activity of both Rad51 (involved in Homologous recombination repair) and CSB (involved in transcription-coupled repair) in SH-SY5Y cells following proton irradiation.