

P033 Defective DNA ligation during chromosomal short-patch single-strand break repair in ataxia oculomotor apraxia-1
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Ataxia oculomotor apraxia 1 (AOA1) is a hereditary neurodegenerative disorder resulting from mutations in aprataxin, a DNA repair protein that resolves abortive ligation intermediates *in vitro*. However, chromosomal DNA strand break repair is normal in a variety of aprataxin-defective cells and AOA1 cells *in vivo*. We show that short-patch single-strand break repair (SSBR) in AOA1 cell extracts exhibits a ligation defect which can be completely rescued by addition of recombinant DNA ligase. This suggests that insufficient levels of non-adenylated DNA ligase are responsible for the observed defect. Adenylated DNA nicks are substrates for long-patch repair which we reasoned might explain the apparent absence of a chromosomal SSBR defect in AOA1 cells. Indeed a significant SSBR repair defect was uncovered in *Aptx*^{-/-} cells upon inhibition of long-patch repair with aphidicolin. Together this demonstrates aprataxin is required for short-patch SSBR *in vivo* and suggests that insufficient levels of non-adenylated DNA ligase result in repair arresting at the ligation step *in vitro*.