

EFFECTS OF CALORIC RESTRICTION ON OXIDATIVE DAMAGE AND NON-HOMOLOGOUS END JOINING IN AGED F344 RATS

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Previous studies have demonstrated a decline of base excision repair and non-homologous end joining (NHEJ) with age. The cause of this decline has yet to be elucidated; however, oxidative damage may play a role in this age-related deficit. Caloric restriction (CR) is the only regimen known to extend the life of several organisms including rats. However, it remains to be determined whether caloric restriction started late in life will have a beneficial effect on NHEJ activity in Fisher 344 rats. We investigated the effects of caloric restriction on oxidative damage and NHEJ activity in the hippocampus of male aged Fischer 344 rats. Animals were 40% calorically restricted for 3 months beginning at 18 months of age. Using a modified protein carbonyl detection assay via Western analysis, our data revealed a decline of oxidative damage to hippocampal proteins. A subsequent increase in NHEJ activity was also found in the hippocampus of these calorically restricted rats. Ad lib rats were used as controls and showed neither a decline of oxidative damage nor any significant changes in NHEJ activity. These results are consistent with the hypothesis that caloric restriction attenuates age-related oxidative damage to macromolecules. More importantly, CR appears to have a beneficial effect when started late in life.