

P029 Studies on the 5' untranslated regions of mRNAs that remain associated with polysomes following UV irradiation
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Following exposure of cells to a non-lethal dose of UV light there is a reduction in the global rates of protein synthesis to 30% of that observed in the control cells by four hours. This is mostly brought about by a large increase in phosphorylation of the alpha sub unit of eIF2 which would have the net effect of reducing the amount of ternary complex that is available. However, under these conditions we find that there is an increased recruitment to the polysomes of mRNAs that encode DNA repair enzymes and subsequently an increase in the synthesis of the corresponding proteins.

To identify the mechanism(s) that permit the selective synthesis of these mRNAs we have examined the 5' and 3' UTRs of a number of these mRNAs including those that encode CKNH, DDB1, XPD and XPG. A number of putative regulatory elements have been identified including internal ribosome entry segments in the 5' UTRs, miRNA target sites in the 3' UTRs and a prevalence of upstream open reading frames. A series of experiments has been performed to identify how these elements allow the selective translation of DNA repair enzymes as part of the DNA damage response.