

P057 Genetic analysis of *hef* (*xpf*) and *xpg* genes in the archaeon *Haloferax volcanii*

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The helicase/nuclease *hef* gene in *Haloferax volcanii* is the archaeal homologue of human *XPF*. In human cells, *XPF* is one component of the nucleotide excision repair (NER) complex and forms part of a structure-specific endonuclease that is responsible for a 5' incision at the DNA lesion. Interestingly, *H. volcanii* encodes homologues of both the eukaryotic NER genes (*XPF*, *XPG*, *XPB* and *XPD*) and bacterial NER genes (*uvrA*, *uvrB*, *uvrC* and *uvrD*). Our studies demonstrate that in *H. volcanii*, *UvrA* is involved in the major pathway for repair of UV induced DNA damage. By contrast, repair of mitomycin C induced DNA crosslinks involves two different pathways, using *Hef* and *UvrA* respectively.

In human cells, *XPG* acts in NER to carry out the 3' incision at the DNA lesion. *XPG* is related to *FEN1*, a structure-specific 5' flap endonuclease that acts in Okazaki fragment maturation. *H. volcanii* has a single gene with homologous to both *XPG* and *FEN1*. We have deleted the *H. volcanii xpg* gene, by itself and in combination with *hef* deletion. Our results suggest that *Hef* and *Xpg* have overlapping functions for the repair of DNA cross-links but not oxidative damage.