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CHARACTERIZATION OF A *Saccharomyces cerevisiae* STRAIN DELETED FOR THE *RAD27* GENE; A STRUCTURAL HOMOLOG OF THE *RAD2* NUCLEOTIDE EXCISION REPAIR GENE

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We have constructed a strain of the yeast *Saccharomyces cerevisiae* which is deleted of the YKL510 open reading frame, initially identified in chromosome XI as a homolog of the *RAD2* nucleotide excision repair gene (A. Jacquier, P. Legrain, and B. Dujon, *Yeast* 8:121-132, 1992). The mutant strain exhibits moderate sensitivity to ultraviolet (UV) light and severe sensitivity to the alkylating agents methylmethane sulfonate, methylnitrosourea, and N-methyl-N'-nitro-N-nitrosoguanidine, but is not sensitive to ionizing radiation. We have renamed the YKL510 open reading frame the *RAD27* gene, in keeping with the accepted nomenclature for radiation-sensitive yeast mutants. Epistasis analysis indicates that the gene is in the *RAD6* group of genes involved in DNA damage tolerance and mutagenesis. The mutant strain is temperature-sensitive, with the cells arresting uniformly as large-budded dumbbell shaped cells containing a single nucleus with a 2N DNA content. The strain also exhibits increased plasmid loss and increased spontaneous mutagenesis, but is normal with respect to UV-induced mutagenesis. Transcript levels of the *RAD27* gene are cell cycle regulated in a manner similar to that of several other genes whose products are known to be involved in DNA replication. These data are consistent with the *Rad27* protein having a role in both DNA replication and DNA repair.