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MOLECULAR CLONING AND CHARACTERIZATION OF LEA GENES FROM DEINOCOCCI

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Bacteria in the genus Deinococcus are known for their ability to resist extreme environmental challenges such as radiation, oxidation, and desiccation. Resistance to desiccation, in Deinococcus radiodurans is known to be attributed, in part, to the expression of group 3 Late Embryogenesis Abundant Protein (LEA). Little is known about group 3 LEA proteins in D. radiodurans, but their function may be related to the hydrophilic structure of the protein and changes to that structure during desiccation.

Several new species of Deinococcus have been discovered in the Sonoran desert. The functional role of LEA proteins in these species is unknown. However, the extreme nature of their habitat suggests these species may share similar desiccation resistance strategies to that of D. radiodurans.

This study is aimed at cloning and characterizing LEA proteins from D. radiodurans and D. hopiensis as well as other desert Deinococcus species. In order to investigate the role of LEA proteins in the desiccation tolerance of Deinococci, the lea1 gene was isolated and cloned into an expression vector and transformed into E. coli. Sequencing results have verified the successful cloning of lea1 from both D.
radiodurans and D. hopiensis.

Sequence analysis and expression studies of the LEA protein are in progress to determine the role of the protein in desiccation resistance in the Deinococci.