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Treatment of Pea (*Pisum sativum* L.) Protoplasts with DNA-Damaging Agents Induces a 39-Kilodalton Chloroplast Protein Immunologically Related to *Escherichia coli* RecA

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Abstract:

Organisms must have efficient mechanisms of DNA repair and recombination to prevent alterations in their genetic information due to DNA damage. There is evidence for DNA repair and recombination in plastids of higher plants, although very little is known at the biochemical level. Many chloroplast proteins are of eubacterial ancestry, suggesting that the same could be true for the components of a DNA repair and recombination system. A 39-kD protein, immunologically related to *Escherichia coli* RecA, is present in chloroplasts of pea (*Pisum sativum* L.). Bandshift gel assays suggest that it binds single-stranded DNA. Its steady-state level is increased by several DNA-damaging agents. These results are consistent with it being a plastid homolog of *E. coli* RecA protein, presumably involved in DNA repair and recombination, and with the existence of an SOS-like response in pea leaf cells. Experiments with protein synthesis inhibitors suggest that the 39-kD chloroplast protein is encoded in the nucleus.

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