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Compounds 2,4,6-trinitrotoluene and 2,4-diamino-6-nitrotoluene: The absence of recA-dependent mutagenesis?

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Abstract

The genotoxicity of 2,4,6-trinitrotoluene (2,4,6-TNT) and its amino derivative, 2,4-diamino-6-nitrotoluene (2,4-DA-6-NT), was studied using the Escherichia coli tester strain PQ37 in the SOS chromotest. The compound 2,4,6-TNT, without metabolic activation, virtually failed to induce an SOS effect in cells of the tester bacteria. Consequently, mutagenic activity of 2,4,6-TNT, which was shown earlier in the Ames test, does not depend on SOS mutagenesis. It was demonstrated that metabolic activation with the microsomal S9 human placenta fraction results in a threefold increase in the induction factor of the SOS effect caused by 2,4,6-TNT. The absence of the SOS-inducing activity of 2,4-DA-6-NT, regardless of the presence of a microsomal activating mixture, is shown. Thus, 2,4-DA-6-NT does not belong to metabolites of 2,4,6-TNT, responsible for the genotoxicity of this compound.