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Applying a test strategy to investigate toxic effects using Schyzosacchromyces pombe

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The yeast Schizosaccharomyces pombe is a good alternative model organism for the study of substance toxicity and, more specifically, for the investigation of toxic mechanisms. The objective of this study was the validation of a test strategy to investigate the main effects of various toxic compounds using several strains.

A series of chemical compounds whose mechanism of action is perfectly known and that act as inducers of different toxicity mechanisms was used: carbendazime, which causes interference in microtubules, hydrogen peroxide and potassium chloride which cause cellular stress, and hydroxyurea, which induces DNA damage.

The growth in liquid media of different strains of S. pombe deficient in the genes of interest exposed to the compounds for 16, 18 and 20 hours have been compared. Thus, in cases where particular sensitivity was detected in the MPH1Δ strain, interference in microtubules was considered; for Sty1Δ, Sty1Δpmk1Δ and Pap1Δ, oxidative stress was stablished; DNA damage was correlated with the Rad3Δ strain; global sensitivity was obtained for a strain deficient in several MDR proteins; and the defence mediated by specific efflux pumps was identified with PMD1, BFR1, MFS1 and CAF5 deficient strains.

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