DNA damage repair ability in cell cycle arrested *Saccharomyces cerevisiae* cells

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**Introduction**

The present work investigates DNA damage repair ability in *Saccharomyces cerevisiae* cells (strain BY4741. MATα; his3Δ1; leu2Δ0; met15Δ0; ura3Δ0) arrested in the S phase of the cell cycle. Using the DNA replication blocking drug hydroxyurea (HU) and hydrogen peroxide as an oxidative damage causing agent, cells were analyzed by the comet assay, previously optimized for yeast in our laboratory. DNA damage and DNA damage repair capacity were evaluated. The tail length was chosen as a parameter for determination of the DNA damage extension.

Moreover, the effect of HU was investigated in *S. cerevisiae* cells pre-treated with *Ginkgo biloba* leaf extract (GBE). This extract was showed, by previous studies of our group, to have an antigenotoxic effect on cells exposed to oxidative stress and to improve DNA damage repair.

**Results**

![Graphs and images showing results of DNA damage repair in yeast cells treated with HU and GBE.]

**Concluding remarks**

- The results of yeast comet assay suggest the presence of the protective effect of HU towards oxidative DNA damage provoked by H$_2$O$_2$.
- GBE appears to delay yeast cell cycle, causing an increase of small-budded cells and a transient arrest at an early S phase, showing protective as HU.
- Cell cycle arrest provoked by GBE, permits targeting of yeast cell resources for DNA damage repair, supporting the GBE antigenotoxic effect reported previously by our group (Marques, F. 2009. Master thesis; see also poster #P139).