How does heat-shock affec
growth and antioxidant po

J Capela-Pires[1,2], R Ferreira[1,2], I

[1]ICAAM – Instituto de Ciências Agrári
[2]Departamento de Química, Escola de

Nanomaterials include all substa
this size, the characteristics of
differ substantially from macro-
to the sidelines. Although, the g
earth crust can lead to suppose a
unique charateristics of nanopar
The industrial development cou
raise their environmental level
nanoparticles in certain regions
years, since its reactivity with bi
physicochemical factors such as

Thus, the main objective of th
antioxidant response of *S. ce*
nanoparticles (TiO2-NPs). Cells
(w/v) glucose at 28 °C are expo
min at 40 °C. Samples from eac
used for protein content, DPPH,
determinations.

The results show that the prese
evidenced by a decrease of pr
3.1.3.1) activity, loss of redox
GSH+GSSG contents and GSH
loss of ability to scavenge free
lipoxygenase (LOX, EC 1.13.11
a loss of antioxidant power me
slowdown of β-oxidation. Finall
(CAT T, EC 1.11.1.6) in cells e
this enzyme activity in cells exp
a loss of proliferative capacity b
for 1 mg/mL TiO_2-NPs level, ap

Keywords: yeast; alkaline phosphatase

References

[1] Bretaudiere J, Spillman T (1984) B
[2] Hissin A, Hilf P (1976) Anal. Bioch
[3] Brand-William W, Cuvelier M, Ber
Press. 28, 25-30.
[4] Carru C, Zinellu A, Sotgia S, Marc
233–238.
[5] Gata J, Pinto M, Macías P (1996) J.
[6] Beers R, Sizer I (1952) J. Biol. Che

fluence of titanium dioxide nanoparticles in
Saccharomyces cerevisiae BY4741 ?

eira[1,2]

entais Mediterrânicas, Universidade de Évora, Évora, Portugal
Tecnologia, Universidade de Évora, Évora, Portugal

contain nanoscale structures sized between 1 and 100 nm. At
s change: their strength, conductivity, and reactivity, which
n- sized materials, shifting the rules of physics and chemistry
l origin and the ubiquitous occurrence of nanoparticles in the
ylogenetic adaptation of living beings to such substances, the
Ps) bring a new dimension to environmental effects testing.
vast new applications of nanomaterials, have contributed to
because, concern over the environmental pressure of the
rld as well as its effects on the biosphere has grown in recent
es mainly depends on the surface area/molecular size ratio and
emperature.

was to evaluate how heat-shock affects cell survival and
BY4741, a Eurocast strain, exposed to titanium dioxide
nential phase were inoculated in liquid YEPD medium 2 %
.1 or 1.0 µg/mL NP-TiO_2 prepared by sonication, during 200
nt were used to obtain the post-12000 *g* fractions, which were
ne antioxidant capacity and, ALP, catalase and LOX activities

iO_2-NPs in the culture medium induced cell death, response
e capacity detected by the alkaline phosphatase (ALP, EC
apacity mediated by glutathione, evidenced by a decrease of
atio. On the other hand, cell death also appears depend on the
estimated by DPPH method. We also observed an increase of
ity, a marker of lipid peroxidation, which may be related with
peroxisomal catalase (CAT A, EC 1.11.1.6), probably due a
observed an increase of the antioxidant cytoplasmic catalase
concentrations of 0.1 mg/mL, but a significantly decrease of
mg/mL TiO_2-NPs. This apparently bimodal response indicates
ve process when the level exposure was 0.1 mg/mL. However,
ccur a transition for necrosis.

ne; lipoxygenase; catalase

nethods of enzymatic analysis, vol. II, 3rd ed., Verlag Chemie, Florida.
4–226.
5) Use of a free radical method to evaluate antioxidant activity. Academic

arina M, Usai M, Pes G, Tadolini B, Deiana L (2003) J. Chrom. A. 1017,

od Chem. 44, 2573–2577.
3-140.