monkeys received repeated (every 2 weeks for a total of 4 doses) intravitreal injections of 10 or 20 μL of a placebo. The animals were assessed using measurements of intraocular pressure (IOP), standard ophthalmological investigations, and electroretinography (ERG). At the end of the dosing period, the animals were sacrificed and the retina was assessed histologically. ERG assessment revealed similar results when comparing pre-dose to end of study data, and there was no difference between the two dose volumes. A transient increase in the IOP was seen immediately after dosing which was more pronounced after dosing of 20 μL compared to 10 μL. It is concluded that based on ophthalmologic and microscopic observations, 10 μL as well as 20 μL intravitreal injection of a placebo are well tolerated in the marmoset. We conclude that the common marmoset is an interesting alternative to the cynomolgus monkey for ocular toxicity testing.

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P14-022
Assessment of cyto/genotoxicity of the antibacterial heptyl gallate in HepG2 cells and the possible target in bacteria

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Gallic acid is an intermediate component of plant metabolism and together with its analogs, has been associated with a wide variety of biological actions including antibacterial, antioxidant, antifungal, and antiviral. The heptyl gallate showed an antibacterial activity against the Gram-negative bacteria *Xanthomonas citri* subsp *citri* (Xac), a plant pathogen and the causal agent of citrus canker, and the Gram-positive *Bacillus subtilis*. Artificial inoculation of citrus with Xac pretreated with heptyl gallate showed that the bacterium loses the ability to colonize its host, which indicates the potential of this ester to protect citrus plants against Xac infection (Silva et al., 2013). Here, we present data on the possible mechanism of action of heptyl gallate in *B. subtilis* that might have the cell division apparatus as a target, and Cyto/Genotoxic potential in HepG2 cells using REMA (Resazurin Microtiter assay) and Comet assay, respectively. For genotoxicity assessment, HepG2 cells were treated with non-cytotoxic concentrations (5, 2.5 and 1.2 μg mL^{-1}) established based on cytotoxic assay. The localization of the most important protein involved in cell division process (FtsZ) is rapidly perturbed after the treatment. When studied *in vitro*, the drug affected FtsZ by forming structures that could easily be spun down at high velocity. Also, GTP hydrolysis, an indicator of FtsZ dynamics, was inhibited by this gallate. Combined, these data indicate that heptyl gallate is a good candidate to treat bacterial infections and probably have the cell division machinery as a target.

Reference

Silva, I.C., et al., 2013. Antibacterial activity of alkyl gallates against *Xanthomonas citri* subsp. citri. J. Bacteriol. 195 (1), 85–94, http://dx.doi.org/10.1128/JB.01442-12, Epub 2012 Oct 26.

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P14-023
Comparative study of toxicological effects of lindane and isoproturon pesticides in the *Saccharomyces cerevisiae*

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Organochlorine insecticides and phenylurea herbicides such as lindane (hexachlorocyclo-hexane, γ-HCH) and isoproturon (3-(4-isopropylphenyl)-1,1-dimethylurea, IPU), used in agricultural applications for the pest and broad-leaved control, are often found in contaminated groundwater and surface water. Unfortunately, the toxicity of these pesticides in eukaryotic cells is still poorly understood. *Saccharomyces cerevisiae* is a promising eukaryotic organism for the toxicological evaluation of pollutants, because its metabolism is similar to that of high-level organisms. Thus the aim of this study was to compare the effects of two pesticides on yeast-cell viability and its antioxidant power. *S. cerevisiae* UE-ME_3, a wild-type strain belonging to Oenology Laboratory of the University of Évora, grown in the presence of 50 μM γ-HCH and 100 μM IPU in 2% glucose and peptone deprivation medium (YED), at 28 °C were compared with control cells. CFU were determined at the end of the experiment and remaining cells disintegrated in 10 mM phosphate buffer pH 7.0 by sonication. Post-12,000 × *g* supernatant was used for determination of glutathione (GSH), glutathione disulphide (GSSG) and malondialdehyde (MDA) content and glutathione reductase (GR), glutathione peroxidase (GPx) and cytoplasmic catalase (CTT1) activity. The results showed that 50 μM γ-HCH exposures, in YED medium, did not affect cell viability, CTT1 activity, non-protein thiols (GSH + GSSG) and MDA content of *S. cerevisiae*. However, the 50 μM γ-HCH exposure caused a decrease in GSH/GSSG ratio, GR and GPx activity. In contrast, 100 μM IPU exposures caused an increase in the cell viability, (GSH + GSSG), GSH/GSSG ratio and GR activity. Additionally, there was a decrease in the MDA levels, GPx and CTT1 activity, under the same growth conditions. In conclusion, the presence of lindane, in YED medium, caused a reducing-oxidizing transition, a slowdown of the glutathione redox cycle without disturbing the survival of *S. cerevisiae*. However, the increase in the cell viability, the redox buffer power and the lipid peroxidation attenuation caused by IPU in nitrogen deprivation, appears to be due to the high regeneration capacity of GSH via GR activity, pointing out a possible use of isoproturon as nitrogen source.

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Spontaneous pathology of the athymic Rowett nude rat

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Athymic nude rats have historically been used for research into tumor biology, immunology and xenograft research. More recently they have been used in toxicology studies, where test article administration to immune-competent animals would result in an inappropriate immune response. While there are numerous