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# Copper oxide nanoparticles and copper sulphate act as antigenotoxic agents in drosophila melanogaster.

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## Abstract

The biological reactivity of metal and metal oxide nanomaterials is attributed to their redox properties, which would explain their pro- or anti-cancer properties depending on exposure circumstances. In this sense, copper oxide nanoparticles (CuONP) have been proposed as a potential anti-tumoral agent. The aim of this study was to assess if CuONP can exert antigenotoxic effects using **Drosophila** melanogaster as an in vivo model. Genotoxicity was induced by two well-known genotoxic compounds, namely potassium dichromate (PD) and ethyl methanesulfonate (EMS). The wing-spot assay and the comet assay were used as biomarkers of genotoxic effects. In addition, changes in the expression of Ogg1 and Sod genes were determined. The effects of CuONP cotreatment were compared with those induced by copper sulfate (CS), an agent releasing copper ions. Using the wing-spot assay, CuONP and CS were not able to reduce the genotoxic effects of EMS exposure, but had the ability to decrease the effects induced by PD, reducing the frequency of mutant twin-spots that arise from mitotic recombination. In addition, CuONP and CS were able to reduce the DNA damage induced by PD as determined by the comet assay. In general, similar qualitative antigenotoxic effects were obtained with both copper compounds. The antigenotoxic effects of environmentally relevant and non-toxic doses of CuONP and CS may be explained by their ability to partially restore the expression levels of the repair gene Ogg1 and the antioxidant gene Cu,ZnSod, both of which are inhibited by PD treatment. Environ. Mol. Mutagen. 58:46-55, 2017.



**KEYWORDS:** CuO nanoparticles; antigenotoxic; comet assay; **drosophila**; wing-spots test

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