

Assessment of metal compounds potential to induce DNA breaks

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Abstract

Metal complexes and metal nanoparticles are being widely explored in nanotechnology with a remarkable use in biomedicine and cancer therapy. Up to date, an increasing number of papers report the beneficiary effects of Au and Cu particles in several biological application ranging from diagnostics to therapeutics including infectious diseases and cancer. However, on the other side the application of metal complexes and nanoparticles has been challenged by the accompanying risks such as genotoxicity, cytotoxicity and immunotoxicity. Side effects are promotion of ROS activity, induction of DNA breaks and apoptosis. It has been noted that size of the metal particles, time of exposure, concentration and type of administration are the key characteristics that should be taken into account to minimizing the undesirable side effects. This study explores the potential risks of causing DNA breaks upon treatment with heavy metal complexes and nanoparticles. We have used amphibians as a model organism to investigate the induction of DNA breaks upon treatment with copper (Cu) complexes and gold (Au) nanoparticles respectively. In addition to *in vitro* and *in vivo* assays, we have performed an *in silico* approach in order to predict the level of toxicity for each compound.

References

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