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Mechanisms of the DNA Damage in Rat Kidney after Au Injection

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Abstract:
Au (gold) is a heavy metal and its complexes are one of the more effective medicaments available for rheumatoid arthritis, although many authors have reported serious kidney damage during the chrysotherapy. In this article, the mechanisms of the DNA damage in renal kidney of rats after Au injection are reviewed. Cu content in the kidney of the Au-injected rat dramatically increased in comparison with Au and Zn content and that Cu-binding metallothionein (MT) was predominantly observed in the outer stripe of the outer medulla in the kidney. The signals of terminal deoxynucleotidyl transferase (TdT)-mediated dUTP-biotin nick end labeling (TUNEL) and the immunoreactivity of 8-hydroxydeoxyguanosine (8-OHdG) were located in the cortex of the Au-injected rat. Cu detected by Timm's method was mainly distributed in the cortex of Au-injected rat. These findings suggested that the oxidative DNA damage in the kidneys of rats injected with Au is associated with Cu of the cortex except Cu-MT. I postulate that the DNA cleavage might be caused by hydroxyl radicals formed by a monovalance of copper.

Key words: Gold (Au), Copper (Cu), 8-hydroxydeoxyguanosine (8-OHdG), DNA damage, Metallothionein (MT)

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