



HP-11: Nephrotoxicity of TiO₂-NPs on Wistar rats

BOUZENZANA Sara ^{1*}, ROUABHI Rachid ²

¹ *Tebessa University, Exact Sciences and Natural and Life Sciences Faculty, Living Beings Department, Tebessa, Algeria*

² *Tebessa University, Exact Sciences and Natural and Life Sciences Faculty, Applied Biology Department, Tebessa, Algeria*

Email : sara.bouzenzana@univ-tebessa.dz*

Subject description: Nanotoxicology was proposed as a new branch of toxicology to address the adverse health effects caused by the exposure of nanoparticles. Titanium dioxide nanoparticles (TiO₂ NPs) are among the most widely used nanomaterials in the consumer products, agriculture, and energy sectors. Their great demand and widespread applications will inevitably cause damage to organisms and ecosystems (Christina L.W et al.,2015).

Moreover, when the scale comes to nanomaterials, TiO₂ nanoparticles (nano-TiO₂) exhibit multiple specific characteristics coupled with unknown risks to health.

Objectives: The purpose of this study was to systematically research the influence of nephrotoxicity of TiO₂-NPs on Wistar rats.

Methods: The study was looking for administering rats with two doses of titanium dioxide (TiO₂) for 90 days at the renal level The experiment was conducted on a sample of 21 Wistar rats (males) divided into three groups.

the results determined the toxic effects of TiO₂ showed that titanium dioxide due to harmful effects on the body by increasing the activity of biological indicators of oxidation, a significant increase in the activity of antioxidants in renal cells compared to biological characteristics and the severity of toxicity increases with increased dose, and this is shown by results between the two doses all the indicators are signs of potential nephrotoxicity.

Results and discussion:

The variation in the activity of GST treated with TiO₂ NPs compared to the controls, in our work we observe that there is a highly significant increase ($P < 0.01$) in the batch treated with TiO₂ NPs at a dose (2.5 ml/kg/day) and a significant increase ($p < 0.05$) in the batch treated with TiO₂ NPs at a dose (1.25 ml/kg/day) by intake or control group.

Conclusion: This study showed that TiO₂ NPs exposure following oral administration led to ROS accumulation in the kidney. Our findings suggest the need for caution in workers and consumers when handling nanomaterials.

Keywords: Oxidative Stress, Wister rats, TiO₂ NPs, MDA, Nephrotoxicity, Nanotoxicity.