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Ameliorative effects of *Moringa oleifera* Lam. Leaf extract against Systemic Immune Effects of Titanium Dioxide Nanoparticles in male Albino Rats

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Introduction and aim of the work: The protective effects of *Moringa oleifera* leaves extract (*MOLE*) against orally administered titanium dioxide nanoparticles (TiO₂ NPs) for 3 months on male albino rats were examined.

Methods: The rats were divided into five groups • Group 1: rats were orally administrated with saline as a negative control group, • Group 2: Rats were orally administrated with TiO₂ (1200 mg kg⁻¹) (1\10 LD₅₀), Group 3: Rats were administrated orally by *MOLE* (50 mg kg⁻¹ BW), Group 4: co-treatment of *MOLE* and TiO₂ as a protective group for 3 months and Group 5: post treatment of TiO₂ by *MOLE* for 3 successive month as therapeutic treatment.

Spleen was examined for alterations in cytokines expression as CD3 and TNF- α , histopathology and histochemically by estimation of total proteins and polysaccharides. **Results:** TiO₂ NPs up-regulated CD3 and TNF- α expression in spleen where TNF- α expression was significantly increased ($p < 0.05$) and CD3 expression was significantly ($P < 0.05$) decreased but *MOLE* administration as co-treatment or therapeutic normalized cytokines expression.

Conclusion: present findings confirmed the protective and therapeutic effects of *MOLE* on TiO₂ NPs induced alteration in immune responses in male albino rats.