



Melanomacrophage centers in *Clarias gariepinus* as an immunological biomarker for toxicity of silver nanoparticles

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Abstract:

Although there are many applications of silver nanoparticles (Ag-NPs) in human activities, there is still little known about their potential environmental toxicity, particularly to fish. In the present study, the effects of Ag-NPs on African catfish (*Clarias gariepinus*) were studied using melanomacrophage centers as immunohistological biomarkers. Fish were exposed to 25 mg/L, 50 mg/L and 75 mg/L 100-nm Ag-NPs. We studied the effects on the size and number of melanomacrophage centers in all target tissues. Many histopathological alterations in those tissues were observed. The histological changes were represented as dislocation of the epithelium, dilatation of central veins associated with inflammatory leukocytic infiltration, necrosis, and pyknotic nuclei of hepatocytes. There was shrinkage of Malpighian corpuscles, dislocation of nuclei of convoluted tubules, cellular degeneration, and dispersed infiltration of leukocytes in kidney tissue. Examination of spleen sections after exposure to Ag-NPs showed rupture within the red pulp and hemorrhage, dislocation of nuclei, accumulation of inflammatory leukocytes, and congestion in blood vessels. In conclusion, exposure to Ag-NPs induced alterations in tissues, suggesting a possible increase in oxidative stress in those tissues.

Keywords:

Clarias gariepinus, DNA, liver, melanomacrophages, silver nanoparticles

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