

Alterations in hematological parameters of rats exposed to metal-oxide nanoparticles

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Abstract

In the last years, titanium dioxide (TiO₂), silica dioxide (SiO₂) and tin-indium oxide (ITO) nanoparticles (NPs) have important applications including in paints, solar cells, food products among others. Workers are susceptible in the occupational settings during the manufacture of these NPs, and due to this exposure nanomaterials may reach the bloodstream and accumulate in different organs. The aim of this work is to evaluate the hematological parameters in Wistar rats exposed to TiO₂, SiO₂ and ITO NPs by one single intravenously administration of 2.5 mg/kg_{BW}. The hematological parameters such as leukocytes, hematocrit, hemoglobin, reticulocytes, basophils, eosinophils, monocytes, lymphocytes and neutrophils were measured at 1 and 7 days after the injection. The findings indicated decrease in the number of total leukocytes in rats treated with TiO₂ and ITO NPs at 1 and 7 day. In conclusion SiO₂ NPs had no effects in hematological parameters under these conditions, but TiO₂ and ITO NPs decreased the number of total leukocytes at 1 and 7 days with no changes in hematocrit, hemoglobin, reticulocytes, basophils, eosinophils, monocytes, lymphocytes and neutrophils.

Key words: Nanoparticles, leukocytes, titanium oxide, silica, indium-tin oxide.