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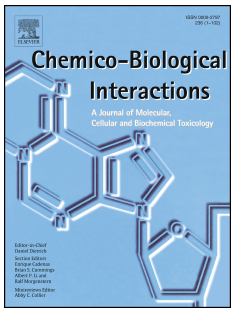

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Erythrocytes as a biological model for screening of xenobiotics toxicity

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Abstract

Erythrocytes are the main cells in circulation. They are devoid of internal membrane structures and easy to be isolated and handled providing a good model for different assays. Red blood cells (RBCs) plasma membrane is a multi-component structure that keeps the cell morphology, elasticity, flexibility and deformability. Alteration of membrane structure upon exposure to xenobiotics could induce various cellular abnormalities and releasing of intracellular components. Therefore the morphological changes and extracellular release of haemoglobin [hemolysis] and increased content of extracellular adenosine triphosphate (ATP) [as signs of membrane stability] could be used to evaluate the cytotoxic effects of various molecules. The nucleated RBCs from birds, fish and amphibians can be used to evaluate genotoxicity of different xenobiotics using comet, DNA fragmentation and micronucleus assays. The RBCs could undergo programmed cell death (eryptosis) in response to injury providing a useful model to analyze some mechanisms of toxicity that could be implicated in apoptosis of nucleated cells. Erythrocytes are vulnerable to peroxidation making it a good biological membrane