

Activity Name: Micronucleus assay

Category:
D. In-vitro toxicity studies

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Short technology description/Overview (approx 300 words):

The *in vitro* micronucleus assay is a genotoxicity test system used for the detection of micronuclei in the cytoplasm of interphase cells. These micronuclei may originate from acentric fragments (chromosome fragments lacking a centromere) or whole chromosomes that are unable to migrate with the rest of the chromosomes during the anaphase of cell division. The assay detects the chromosomal damage of both clastogenic and aneugenic chemicals in cells that have undergone cell division after exposure to the test substance.

Cell cultures are exposed to the test substances. After exposure, cell cultures are grown for a period sufficient to allow chromosome or spindle damage to lead to the formation of micronuclei in interphase cells and to trigger the aneuploidy sensitive cell stage. Harvested and stained interphase cells are analysed microscopically for the presence of micronuclei. Development of the cytokinesis-block methodology, by addition of the actin polymerization inhibitor cytochalasin B during the targeted mitosis, allows the identification and selective analysis of micronucleus frequency in cells that have completed one cell division as such cells are binucleated (OECD 487).

Nanoparticles:

In our lab we used cytochalasin-block micronucleus assay for evaluation of the potential genotoxic effect of nanoparticles: titanium dioxide (TiO₂), poly (D, L-lactide-co-glycolide) (PLGA) and iron oxide (Fe₃O₄) in human peripheral blood lymphocytes and TK6 cells.

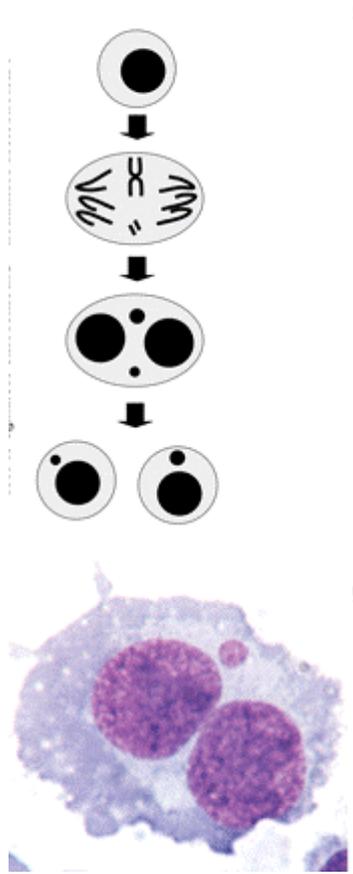
This test will focus on the subsequent use of method for monitoring genotoxic effects of nanoparticles in human lymphocytes or cultured cells.

Test systems: human peripheral blood lymphocytes, cells cultured *in vitro* (e.g. TK6)

Main Features (Equipment Capabilities):

- Biohazard laminar box
- Centrifuge with swing-out rotor – Lettich, Hermle
- Incubator with CO₂ atmosphere - Jouan
- Light microscope - Olympus

Typical Samples & Images:



Any further Information: