Use of fluorescent redox indicators to evaluate cell proliferation and viability

Use of fluorescent redox indicators to evaluate cell proliferation and viability

The performance of two cell viability test kits based on the use of redox indicators yielding fluorescent products, the AlamarBlue assay and a resazurin-based in vitro toxicology assay kit from Sigma, was compared in the present study. Cultures of human neonatal foreskin fibroblasts were exposed to equal concentrations of the two dye solutions in the cell culture media. The fluorescence intensities of the cell culture media obtained in response to cell proliferation with the two dyes showed a pronounced similarity. Both dyes were noncytotoxic to cell cultures with high initial cell densities for 168 h of continuous exposure, but showed equal levels of cytostatic effects in cultures with a low initial cell density after 72 h of exposure. Similar characteristics of the dye solutions were observed by high-performance Liquid chromatography (HPLC) separation and UV spectroscopy, and the major components were tentatively identified as resazurin and resorufin. The AlamarBlue assay has gained wide application as a cell viability indicator that allows continuous monitoring of cell proliferation or cytotoxicity in human and animal cells, bacteria, and fungi, but no studies with the deliberate use of resazurin reduction to measure cell proliferation in cultures of somatic mammalian cells have been published. In the AlamarBlue dye solution, resazurin is supplemented with various stabilizing agents, but the need for their use is questioned.