

Cell Proliferation Reagent WST-1

Cat. No. 11 644 807 001 2500 tests

Type	Colorimetric, microplate format
Useful for	Quantitation of cell viability, proliferation, or cytotoxicity
Samples	Adherent or suspension cell cultures
Method	Incubation of cells with WST-1, followed by spectrophotometric assay of colored product
Time	0.5–4 h

Significance of reagent: The Cell Proliferation Reagent WST-1 is a ready-to-use substrate which measures the metabolic activity of viable cells. The WST-1 assay is nonradioactive and can be performed entirely in a microplate. It is suitable for measuring cell proliferation, cell viability or cytotoxicity.

Test principle: The assay is based on the reduction of WST-1 by viable cells. The reaction produces a soluble formazan salt. The procedure involves:

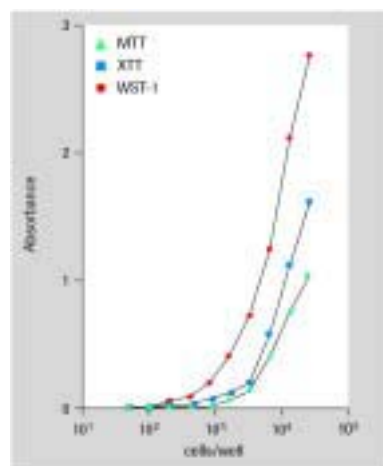
- 1 Culturing the cells in a 96-well microplate, then incubating them with WST-1 for approx. 0.5–4 h. During this incubation period, viable cells convert WST-1 to a water-soluble formazan dye.
- 2 Quantitating the formazan dye in the microplate with an ELISA plate reader. The absorbance directly correlates with the cell number.

For a detailed comparison of the WST-1 assay procedure with the MTT and XTT assays, see Flow Chart 15 and Figure 58.

Can be used to assay:

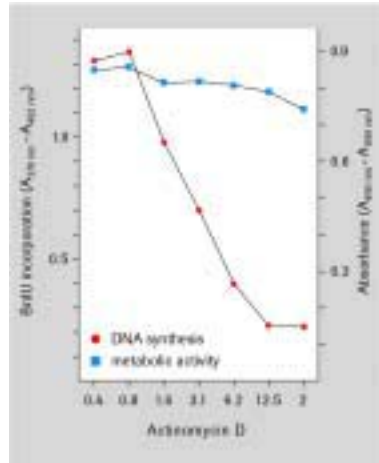
- Adherent and suspension cells cultured in microplate.

Typical results: see Figures 58 and 59.



◀ **Figure 58: Comparison of the sensitivity of various tetrazolium salts.** P815 cells were preincubated at various concentrations for 20 h before MTT (▲), XTT (■) or Cell Proliferation Reagent WST-1 (●) was added. After 4 h substrate reaction, the absorbance was determined at the respective wavelength with an ELISA plate reader.

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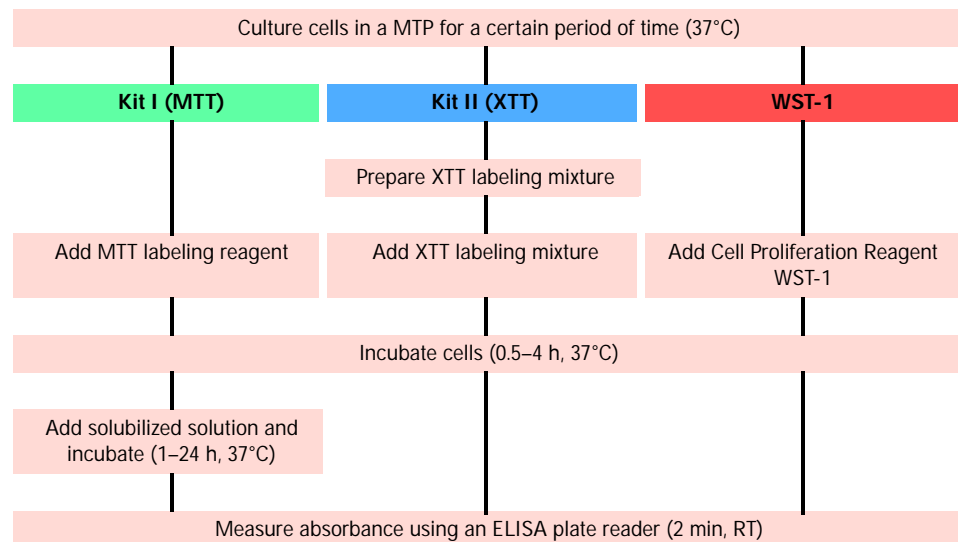


◀ **Figure 59: Combined use of the Cell Proliferation Reagent WST-1 and the Cell Proliferation ELISA, BrdU (colorimetric) for the simultaneous measurement of cell viability and cell proliferation.** A549 cells (1×10^4 /well in $100 \mu\text{l}$) were incubated in the presence of various amounts of actinomycin D for 20 h. After labeling the cells with BrdU for 2 h, additionally Cell Proliferation Reagent WST-1 (■) was added and cells were reincubated for another 2 h. Thereafter, the formazan formed was quantitated at 450 nm with an ELISA plate reader. Subsequently, BrdU incorporation was determined using the Cell Proliferation ELISA, BrdU (colorimetric) (●).

Result: Actinomycin D inhibits DNA synthesis (●), but it does not inhibit the metabolic activity of the cell (■). Thus, actinomycin D is cytostatic (inhibition of DNA synthesis) but not cytotoxic (no inhibition of metabolic activity).

Other applications: For more examples of how the Cell Proliferation WST-1 can be used in the lab, see Appendix, pages 146–147.

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Flow Chart 15: Assay procedures for Cell Proliferation Kit I (MTT), Cell Proliferation Kit II (XTT), and Cell Proliferation Reagent WST-1.