ATP cell viability assay

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Organisation

Name of the organisation Sciensano
Department Chemical and physical health risks
Country Belgium

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	TK6 and HepaRG cell line
Used species	Human cell line

DESCRIPTION

Method keywords

cell viability test
in vitro
ATP

Scientific area keywords

in vitro cytotoxicity

Method description

The ATP cell viability assay (CellTiter-Glo assay test kit) provides a quantitative measurement of the ATP content directly proportional to the number of cells present in culture. The homogeneous assay procedure involves adding one single reagent, CellTiter-Glo Reagent directly to cells cultured in serum-supplemented medium. This results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. Luminescence can be measured already 10 minutes after adding reagent & mixing. The half-life of the luminescent signal is greater than five hours so the measurement can be performed even hours after adding the reagent. The CellTiter-Glo® Assay relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase), which generates a stable “glow-type” luminescent signal. % Cell viability after exposure is calculated through comparison of measured RLU of unexposed control cells (set to 100% viability) and exposed cells.

Lab equipment

Standard equipment for working with cell cultures, luminometer

Method status

History of use
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Sensitive (even few cells can be detected),
Fast (data available 10 minutes after adding reagent),
Easy,
Very stable luminescent signal flexible (ATP content from both adherent and suspension cells in different well formats can be measured),
No interference with compounds with oxido-reductive potential (MTT) or colored compounds (NRU).

Challenges

Expensive (test kit),
Sensitivity can be a disadvantage (the occurrence of metabolic oscillations can cause fluctuations of the ATP content per cells).

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

J Shi, S Springer, P Escobar (2010) Coupling cytotoxicity biomarkers with DNA damage assessment in TK6 human lymphoblast cells 10.1016/j.mrgentox.2010.01.008

Associated documents

CellTiterGlo Luminescent Cell Viability Assay TB288.pdf
Coupling_cytotoxicity_biomarkers_with_DNA_damage_assessment_in_TK6_human_lymphoblast_c

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