

RT-qPCR array for in vitro screening

Commonly used acronym: qPCR

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SCOPE OF THE METHOD

Alternative method relates to	Animal health, Human health
Alternative method is situated in	Basic Research
Type of alternative method	In vitro - Ex vivo
This method makes use of	Human derived cells / tissues / organs
Specify the type of cells/tissues/organs	HepaRG

DESCRIPTION

Method keywords

genotoxicity

Mutagenicity

qPCR array

Toxicogenomics

HepaRG

in vitro

Scientific area keywords

in vitro toxicology

Method description

The RT-qPCR assay is used to identify genotoxic and non-genotoxic compounds.

Herefore metabolic-competent human HepaRG cells are exposed to the IC10 value (measured by the MTT test). A microassay is performed to select 84 genes that show the most robust rates of correct classification of the reference compounds into the genotoxic or non-genotoxic group. Each qPCR array also consists of 5 housekeeping genes.

Lab equipment

Biosafety cabinet

CO2 incubator

Bio-rad CFX qPCR instrument

Method status

Internally validated

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Used genes represent different pathways involved in the DNA damage response

All pro-genotoxins included as reference or test compound were correctly classified

Challenges

Use of microarray/RNAsequencing platforms

Challenging data analysis and interpretation

No standalone test, but an important part of an integrated testing strategy

Further validation needed

Modifications

Use of other cellines

Use of other genes

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

A novel genotoxin-specific qPCR array based on the metabolically competent human

HepaRG cell line as a rapid and reliable tool for improved in vitro hazard assessment.
Gamze Ates, Birgit Mertens, Anja Heymans, Luc Verschaeve, Dimiter Milushev,
Philippe Vanparys, Nancy H. C. Roosens, Sigrid C. J. De Keersmaecker, Vera Rogiers,
Tatyana Y. Doktorova

Associated documents

[Ates2018_Article_ANovelGenotoxin-specificQPCRAr.pdf](#)

PARTNERS AND COLLABORATIONS

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