Sudan Red III in situ staining of cultured primary rat hepatocytes

Created on: 10-03-2019 - Last modified on: 28-02-2022

Contact person

Raf Van Campenhout

Organisation

Name of the organisation Vrije Universiteit Brussel (VUB)
Department Pharmaceutical and Pharmacological Sciences
Specific Research Group or Service In Vitro Toxicology and Dermato-Cosmetology
Country Belgium
Geographical Area Brussels Region

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research, Translational - Applied Research
Type of method	In vitro - Ex vivo
Species from which cells/tissues/organs are derived	Rat
Type of cells/tissues/organs	Primary rat hepatocytes

DESCRIPTION

Method keywords

Formaldehyde fixation
Sudan Red III staining
Hematoxylin nuclear counterstain
Primary rat hepatocytes
Intracellular lipids
in vitro

Scientific area keywords

Toxicology
Hepatotoxicity
Steatosis
Drug-induced cytotoxicity

Method description

The standard operating procedure for Sudan Red III in situ staining of cultured rat hepatocytes describes how to detect one of the aspects of drug-induced cytotoxicity i.e. the intracellular accumulation of lipids or in other words steatosis, in primary rat hepatocyte cultures. It is based on the ability of a lysochrome, i.e. Sudan Red III diazo-dye to stain intracellular lipids. Additionally, subsequent application of hemalum, which is a complex formed by aluminium ions and oxidized haematoxylin, colours nuclei of the cells and thus enables their localisation. Red-coloured lipid droplets and blue nuclei are readily visible upon examination of the cells under a light microscope.

Lab equipment

Inverse-phase light microscope (Nikon Optiphot);
Oven (Thermo electron corporation, Heraeus, 60°C).

PROS, CONS & FUTURE POTENTIAL

Advantages

The standard operating procedure for Sudan Red III in situ staining of cultured primary rat hepatocytes is easily applicable and allows a simultaneous screening of multiple compounds and/or multiple concentrations of the same compounds (to examine chemically induced steatosis).

Challenges

Sudan Red III stain has a high affinity to a broad range of lipids and consequently does not discriminate between e.g. neutral lipids and phospholipids. Therefore, it is of utmost importance to perform more than one assay or use a more specific assay.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

Associated documents

Sudan Red III staining.doc

Coordinated by

sciensano

VUB

Financed by

Vlaanderen
verbeelding werkt

bruxelles environnement
leefmilieu brussel
.brussels