

Bovine Corneal Opacity and Permeability

Commonly used acronym: BCOP

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SCOPE OF THE METHOD

Alternative method relates to	Human health
Alternative method is situated in	Regulatory use - Routine production
Type of alternative method	In vitro - Ex vivo
This method makes use of	Animal derived cells / tissues / organs

DESCRIPTION

Method keywords

serious eye damage

no classification for eye irritation or serious eyedamage

eye irritation

corneal opacity

Permeability

isolatedcornea

Bovine

Scientific area keywords

Toxicity and other safety testing including pharmacology

Method description

The Bovine Corneal Opacity and Permeability test method (BCOP) is an in vitro test method that can be used to identify chemicals (substances or mixtures) as either 1)

causing “serious eye damage” (category 1 of the Globally Harmonised System for the Classification and Labelling of chemicals (GHS)), or 2) not requiring classification for eye irritation or serious eye damage according to the GHS. The BCOP uses isolated corneas from the eyes of cattle slaughtered for commercial purposes, thus avoiding the use of laboratory animals. Each treatment group (test chemical, negative/positive controls) consists of a minimum of three eyes where the cornea has been excised and mounted to a holder. Depending on the physical nature and chemical characteristics of the test chemical, different methods can be used for its application since the critical factor is ensuring that the test chemical adequately covers the epithelial surface. Toxic effects to the cornea are measured as opacity and permeability, which when combined gives an In Vitro Irritancy Score (IVIS) for each treatment group. With the OP-KIT, a chemical that induces an IVIS ≥ 55.1 is defined as a category 1 (“causing serious eye damage” according to the GHS); a chemical that induces an IVIS ≤ 3 is considered as not requiring classification for eye irritation or serious eye damage according to the GHS. This is according OECD TG 437. Currently efforts are made to replace the OP-KIT with LLBO, validation is ongoing for incorporation in OECD 437

Lab equipment

OP-KIT or LLBO (laser light based opacitometer) and spectrophotometer

Method status

Validated by an external party (e.g. OECD, EURL ECVAM,...)

PROS, CONS & FUTURE POTENTIAL

Advantages

+ in vitro method, fast results,

Challenges

- access required of bovine eyes , testing facility need to close to the slaughterhouse, hands-on assay

Future & Other applications

Yes the current equipment to measure opacity is the OP-KIT, but is not anymore available since approx 10 years. We hope to add the LLBO as equipment.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

- OECD 437, 9 October 2017

Associated documents

[verstraelen_et_al._2013.pdf](#)

PARTNERS AND COLLABORATIONS

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