Ocular Irritation

Background Information

- Cyprotex’s ocular irritation test is performed using MatTek’s in vitro 3D EpiOcular™ model. Cyprotex are a MatTek-approved laboratory for performing these studies.

- The EpiOcular™ tissue model consists of normal, human-derived epidermal keratinocytes that have been cultured to form a stratified, squamous epithelium which closely mimics the human corneal epithelium.

- EpiOcular™ was developed by MatTek to create an in vitro (non-animal) alternative to the animal-based Draize Eye Irritation Test used in the cosmetics, personal care, household products, chemical, pharmaceutical, and biotech industries.

- The EpiOcular™ eye irritation test model is currently undergoing ECVAM validation. Peer-reviewed publications have shown the EpiOcular™ eye irritation model achieves greater than 80% accuracy when compared with the Draize eye irritation test.

- The EpiOcular™ model is metabolically and mitotically active and produces the same cytokines involved in irritation and inflammation in vivo.

- A range of different test articles can be assessed including liquids, solids, semi-solids, pastes, gels, creams and waxes.

- Cyprotex’s ocular irritation test is based upon assessment of the cytotoxicity following exposure to a test chemical, typically at three time points. Cytotoxicity is expressed as a decrease in mitochondrial conversion of MTT to formazan.

Protocol

Method Available
EpiOcular™ Eye Irritation Test (ET50 determination)

Model Used
MatTek EpiOcular™ 3D human tissue model (others available on request)

Number of Concentrations
Typically 1 (depending on client needs)

Number of Replicates
1 - 3 (depending on assay and client needs)

Exposure Times
3 - 5 (depending on assay and client needs)

Controls
Positive Control = between 1-10% Benzalkonium chloride
Negative control = Sterile ultrapure water
Reference control = 10% Baby shampoo (optional)

Endpoints
MTT
IL-1α release (optional)
Histology (optional)

Additional endpoints available:
- cytokine release (IL-6, IL-8, TNFα)
- oxidative stress
- glutathione levels
- mitochondrial function

Related Services

Skin corrosion
Skin irritation
Phototoxicity
Skin absorption

To find out more contact enquiries@cyprotex.com
Damage to the corneal epithelium resulting from exposure to chemicals and mixtures of chemicals may compromise tissue function, and can result in various effects ranging from mild irritation, to the loss of cornea transparency or blindness.3

Table 1
The ET50 and estimated Draize modified maximum average scores (MMAS) were determined using the cell viability data. Based on these results, the Predicted Potency was determined and compared to actual potency from various published reports.

Table 2
Proposed method for classification of ocular irritation potency.

References
1 Pfannebecker U et al., (2013) Cosmetics Europe multi-laboratory pre-validation of the EpiOcular reconstituted human tissue test method for the prediction of eye irritation. Toxicology In Vitro 27(2): 619-626