



***In Vitro* & Alternative Toxicity Tests**

Eye Safety

- *In Vitro* Eye Irritation Test (EIT)
- Hen's Egg Test Chorioallantoic Membrane (HET - CAM)
- Chorioallantoic Membrane Vascular Assay (CAMVA)
- Bovine Corneal Opacity & Permeability (BCOP) Test
- Porcine Corneal Opacity Reversibility Assay (PorCORA)
- EpiOcular™
- Ocular Irritection®

Skin Safety

- Corrositex®
- *In Vitro* Skin Irritation Test (SIT)
- *In Vitro* Skin Corrosivity Test (SCT)
- Dermal Irritection®

Cytotoxicity

- Agar Overlay
- MEM Elution
- Cell Proliferation
- Neutral Red Uptake Assay

Skin Sensitization

- *In Vitro* Sensitization Assay (IVSA)
- Human Cell Line Activation Test (h-CLAT)
- Direct Peptide Reactivity Assay (DPRA)
- KeratinoSens™ (ARE-Nrf2)
- GARD®skin, GARD®potency
- Mouse Ear Swelling Test (MEST)

Regulatory Toxicity Tests

EPA, OECD, DOT, FHSA, FDA, CPSC

- Oral Toxicity
- Dermal Toxicity
- Inhalation Toxicity
- Eye Irritation / Corrosion
- Dermal Irritation / Corrosion
- Local Lymph Node Assay (LLNA)
Optional Immunophenotyping
- Guinea Pig Maximization Test (GPMT)
- Guinea Pig Buehler Method

ISO / USP

- Dermal Irritation
- Implantation
- Intracutaneous Irritation
- Acute Systemic Toxicity
- GP Maximization Test (GPMT)
- GP Buehler Method
- Comedogenicity Assay
- Mucosal Irritation
- Pyrogenicity
- Cytotoxicity via MEM Elution
- Cytotoxicity via Agar Overlay
- Wound Healing Studies

Genotoxicity Assays

- Ames Test
- Unscheduled DNA Synthesis via Flow Cytometry (FLUDS) Assay

Phototoxicity Assays

- 3T3 Neutral Red Uptake Phototoxicity Test (3T3 NRU PT)
- Photo-Local Lymph Node Assay (Photo LLNA)
- EpiDerm™ Phototoxicity Assay (EPARS)
- Photo-Mouse Ear Swelling Test (Photo-MEST)
- *In Vivo* Photo-Irritation/Toxicity

Mechanistic Assays

- Inflammatory Cytokine release / Oxidative Stress / Anti-Angiogenesis Assay
- Nitric Oxide Synthase Activity
- *In Vitro* Testing with Cytokine Endpoints
- Other ELISA and Mechanistic Assays
- Peroxide Production (Lipid Peroxidation)
- Tyrosinase Activity/ Inhibition Assays
- GARD®air—respiratory sensitization

Other

- Pharmacokinetic/Toxicokinetic
- Emesis Model
- Intranasal Studies
- Maximum Tolerated Dose



OECD Test Guidelines

- 402 Acute Dermal Toxicity
- 403 Acute Inhalation Toxicity
- 404 Acute Dermal Irritation / Corrosion
- 405 Acute Eye Irritation / Corrosion
- 406 Skin Sensitization
- 420 Acute Oral Toxicity - Fixed Dose
- 423 Acute Oral Toxicity - Toxic Class
- 425 Acute Oral Toxicity - Up-and-Down
- 429 Local Lymph Node Assay (LLNA)
- 431 *In Vitro* Skin Corrosion Test (SCT)
- 432 *In Vitro* 3T3 NRU Phototoxicity Test
- 101 UV-Vis Absorption Spectra
- 433 Acute Inhalation - Fixed Concentration
- 435 Corrositex®
- 436 Acute Inhalation Toxicity - Toxic Class
- 437 BCOP Test
- 439 *In Vitro* Skin Irritation Test (SIT)
- 442B Local Lymph Node Assay (LLNA):
BrdU-ELISA or Flow Cytometry Method
- 442C *In Chemico* Skin Sensitization:
Peptide Reactivity (DPRA)
- 442D *In Vitro* Skin Sensitization:
Keratinocyte Activation (KeratinoSens™)
- 442E *In Vitro* Skin Sensitization:
Human Cell Line Activation Test (h-CLAT)
- 467 Defined Approaches for Serious Eye Damage and Eye Irritation
- 471 Bacterial Reverse Mutation Test (Ames)
- 492 *In Vitro* Eye Irritation (EIT)
- 492B *In Vitro* Eye Irritation (RhCE) Time-Course
- 496 *In Vitro* Macromolecular Eye Irritation Test - Irritection®
- 498 *In Vitro* Phototoxicity (3D RHE) Method

EPA OCSP 870

- 870.1000 Acute Toxicity Testing
- 870.1100 Acute Oral Toxicity
- 870.1200 Acute Dermal Toxicity
- 870.1300 Acute Inhalation Toxicity
- 870.2400 Acute Eye Irritation / Corrosion
- 870.2500 Acute Dermal Irritation / Corrosion
- 870.2600 Skin Sensitization
- 870.5100 Bacterial Reverse Mutation Test (Ames)

ISO / USP

- 10993-3 Tests for Genotoxicity (Ames Test)
- 10993-5 *In Vitro* Cytotoxicity
- 10993-6 Local Effects After Implantation
- 10993-10 Skin Sensitization
- 10993-11 Systemic Toxicity
- 10993-12 Sample Prep and Reference
- 10993-23 Irritation
- USP <87> Biological Reactivity Tests, *In Vitro*
- USP <151> Pyrogen