

GARD™ skin Dose-Response

In vitro quantitative potency assessment



GARDskin Dose-Response is an *in vitro* test for quantitative skin sensitizing potency assessment of chemicals, adapted from GARDskin.

GARDskin Dose-Response provides an estimated threshold concentration for a test substance to induce skin sensitizing effects; a lower concentration equals a higher potency and vice versa.

This threshold concentration can be used for skin sensitizing potency ranking of candidate ingredients and early decision-making during product development.

Additionally, readouts can be extrapolated to correlating LLNA EC3 values traditionally used to measure skin sensitizing potency of chemicals. Furthermore, the readout can also be extrapolated to Basketter Human Potency classes and/or GHS/CLP classification, all with high statistical significance.

Non-animal test data that can be extrapolated to:

- LLNA EC3 value
- Human potency category
- GHS/CLP classification classification

Features and Benefits

Test system

- SenzaCells™: Human dendritic-like cell line.

Solvent

- Standard: DMSO and H₂O.
- Other available solvents: Acetone, DMF, Isopropanol, Ethanol, Glycerol, Olive oil, Sesame oil.

What it measures

- GARDskin response values in a titrated range of multiple concentrations.

Readout

- Hazard: skin sensitizer or non-sensitizer.
- Quantitative potency: cDV₀.*
- cDV₀ can be further extrapolated to:
 - LLNA EC3 value.
 - Human potency category 1 to 6.
 - GHS/CLP classification 1A or 1B.

High performance

- The performance of GARDskin Dose-Response is associated with GARDskin, which demonstrated a 94% accuracy for skin sensitizing hazard prediction.**
- GARDskin Dose-Response readouts have shown significant correlation with the LLNA EC3 values and human potency classification.

Short turnaround time

- Test time: 2 weeks.
- Final report: Additional 2-4 weeks.***

Low sample requirement

- Only 0.5g (solid) or 1ml (liquid).

* cDV₀ is the threshold concentration for the test substance to induce a positive response in GARDskin.

** Validation study, OECD Test Guideline Program (TGP no. 4.106). Johansson H. et al. Toxicological Sciences 2019.

*** For non-GLP studies.

How it works

The GARDskin Dose-Response investigates the GARDskin response values in a titrated range of multiple concentrations in a dose-response manner to find the threshold concentration required to induce a positive decision value.

This threshold concentration, cDV_0 , is used to estimate the inherent sensitizing potency of a chemical. A low value indicates a high inherent skin sensitizing potency and a high value indicates a low inherent skin sensitizing potency.

cDV_0 can also be extrapolated to the traditional EC3 value from Local Lymph Node Assay, the human skin sensitizing potency category 1 to 6, and/or GHS/CLP classification 1A or 1B depending on the need.

All the GARD assays are based on the same technology platform. Read more about the GARD technology platform and assay development principles on www.senzagen.com/science.

In-house validation study

Method

- 29 well-known chemicals were selected as test substances for the study.
- For each test substance, GARDskin was performed in a titrated range of multiple concentrations.
- Decision Values (DVs) were generated for the selected concentrations.
- The dose-response curve of each test substance was plotted based on DVs. The cDV_0 was estimated using linear interpolation (Figure 1 shows an example).
- The above procedures were repeated so that the cDV_0 for each test substances was estimated respectively.
- Correlation analysis between cDV_0 and LLNA EC3 values was performed afterwards (Figure 2). The correlation with human potency categories was also analyzed in the end (Figure 3).

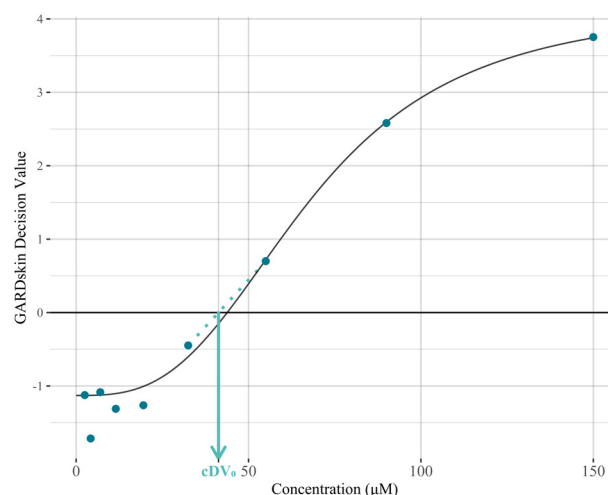


Figure 1. The dose-response curve for one of the test substances (inherent skin sensitizing potency).

Results

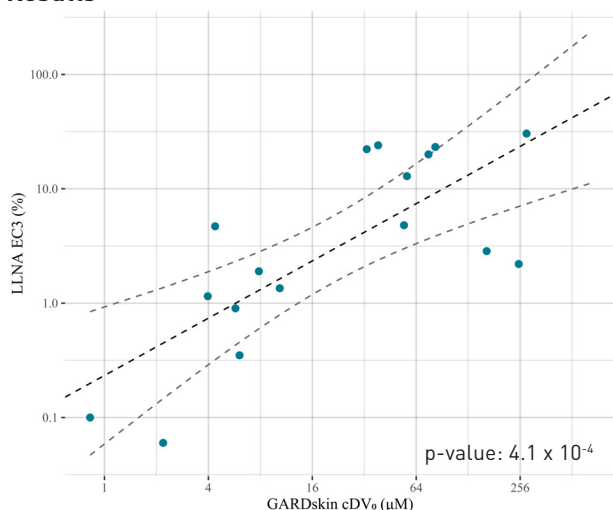


Figure 2. Significant correlation between cDV_0 and EC3 values.

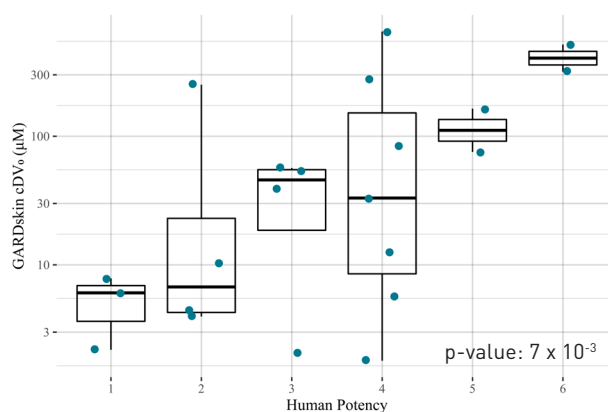


Figure 3. Significant correlation between the cDV_0 values and Human potency categories.