

# Contact Hypersensitivity Model: DNCB

Contact hypersensitivity (CHS) is a primarily T-cell mediated form of the delayed-type hypersensitivity reaction that is often used to model Allergic Contact Dermatitis (ACD). In the DNCB induced model the inflammation is Th1 mediated (IFN- $\gamma$ , IL-12) also with a role for CD8+ T cells, and macrophage like monocytes.

ACD reportedly affects 20% of the general population, and is characterized by irritated, red inflamed skin which becomes noticeably thicker over time. In the CHS model, dermal inflammation is induced through topical application of a sensitization agent that acts as a hapten and induces a strong inflammatory response in the skin upon subsequent exposure. 2,4-Dinitrochlorobenzene (DNCB) is a commonly used sensitization agent for studying ACD. At MLM, we have developed validated mouse model of DNCB through application of the induction agent to the shaved mouse flank on Study Days 0 and 5 for sensitization. Animals are then challenged on Days 10-12 by the same sensitization agent applied to the dorsal surface of one ear, with the other ear serving as an internal control. Ear thickness is then measured on Days 10-14. Test articles can be applied either therapeutically on Day 10 or prophylactically on Day 0.

## Experimental Overview

Animal Strain:	Mouse (Balb/c) Study
Study Duration:	12 - 14 Days
Number/Group:	Variable (Dependent on Objectives)
Sensitizing Agent:	DNCB
Positive Control:	Dexamethasone

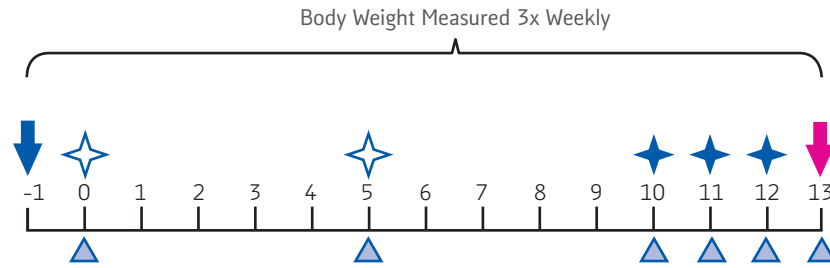
## Standard Assessments

- Body Weight
- Ear Thickness
- Cytokine Analysis (Ear Tissue)

## Add-on Assessments

- Cytokine Analysis (Serum)
- Ear Histology
- Gene Expression

### Example Experimental Schematic



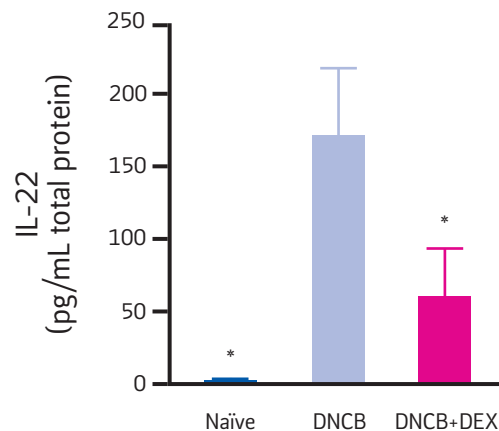
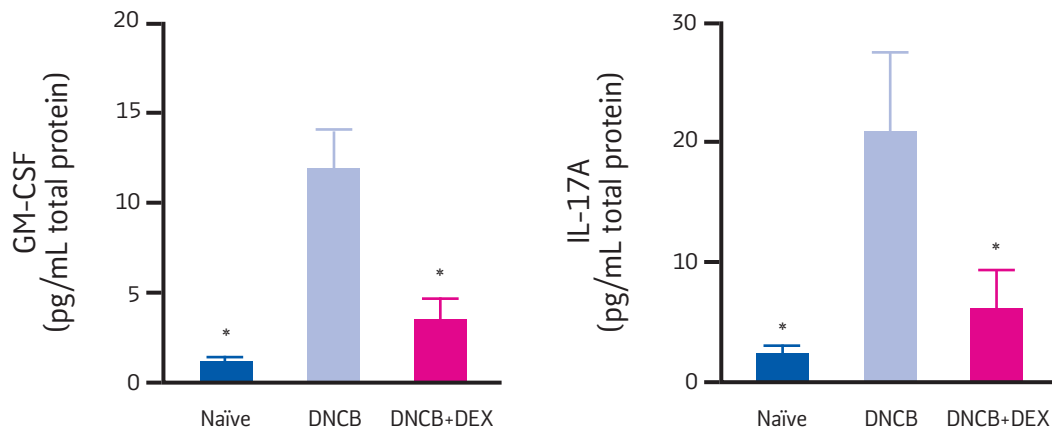
↓ Animal identification, group allocation, shaving of both flanks

↓ Termination (Day 21):  
Mice euthanized following ear thickness measurement.

▲ Ear thickness measurements  
Left and right ear thickness measured, average thickness calculated.

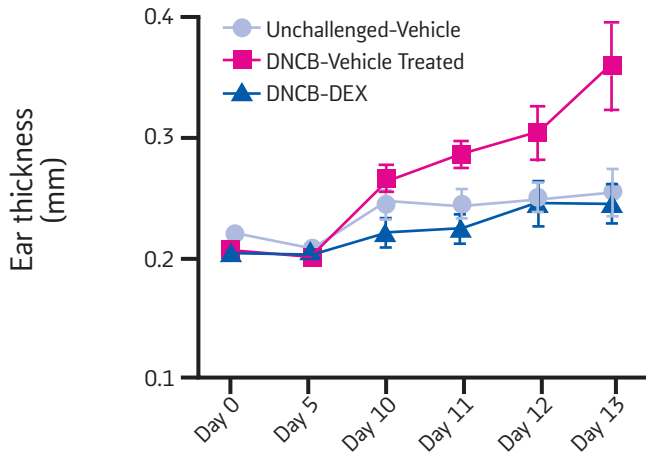
◆ DNCB Challenge  
1% DNCB in ADBP (25µl) is applied to each ear of the appropriate animals.

☆ DNCB Sensitization  
1% DNCB in ADBP (50 µl) is applied to shaved area of both hind flanks of respective animals.

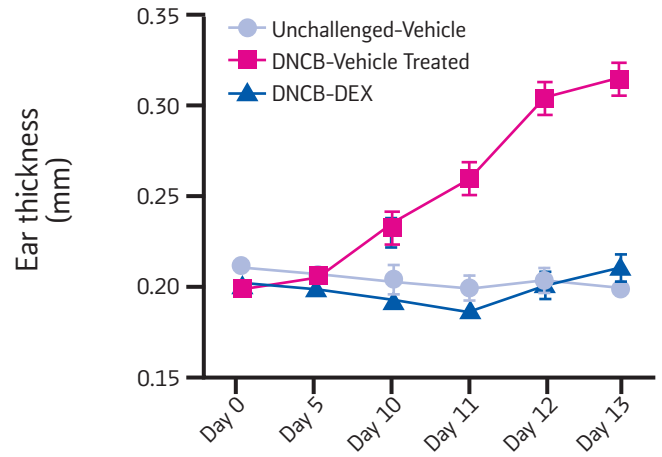


### DNCB-Induced CHS Data

Therapeutic Application On Day 10



Prophylactic Application On Day 0

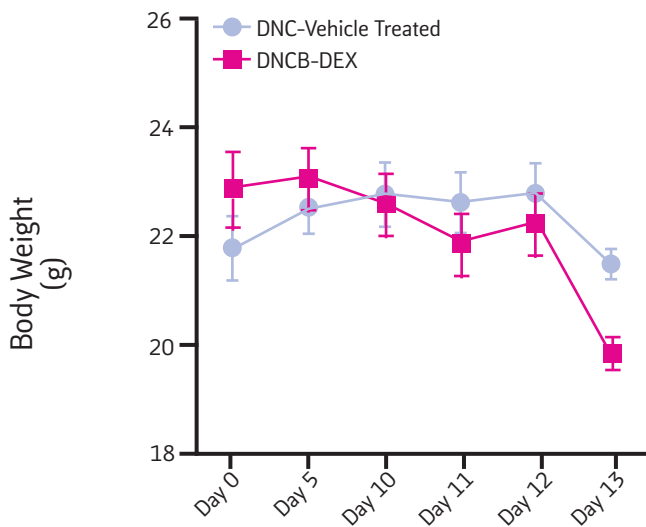


#### Ear Thickness.

Ear thickness of DNCB-induced mouse ears treated with vehicle or dexamethasone (DEX) applied therapeutically on day 10. DNCB-treated mice are both DNCB sensitized and challenged.

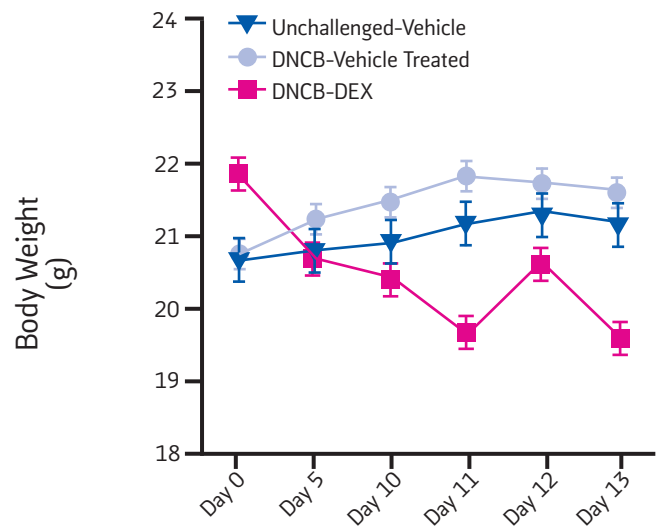
#### Ear Thickness.

Ear thickness of DNCB-induced mouse ears treated with vehicle or dexamethasone (DEX) applied prophylactically starting on day 0. DNCB-treated mice are both DNCB sensitized and challenged.



#### Body Weight.

Body Weight of DNCB-induced mouse ears treated with vehicle or dexamethasone (DEX) applied therapeutically on day 10. DNCB-treated mice are both DNCB sensitized and challenged.



#### Body Weight.

Body Weight of DNCB-induced mouse ears treated with vehicle or dexamethasone (DEX) applied prophylactically starting on day 0. DNCB-treated mice are both DNCB sensitized and challenged.

## Our Clients Say ...

"The performance of your team far exceeded our expectations. The study was performed well and we appreciate all your input into the study design. Your responsiveness and feedback during the study and following in the data interpretation was extremely helpful to guide our next steps. That's something we don't find with every CRO."

*S.G., Toxicologist, Biotech Company*

"Of all the CROs that I have used over the years... MLM Medical Labs been one of the very best in terms of scientific knowledge, data quality, timelines, flexibility and personal contacts."

*O.B., Director of Therapeutics, Pharmaceutical Company*

"Throughout our relationship, you have been attentive to our needs and have completed exploratory pilot studies and three drug studies with professionalism and an understanding of tight biotech timelines that are unmatched by other CROs."

*D.Z., Director of Therapeutics, Biotech Company*

## About MLM Medical Labs

MLM Medical Labs is a leading specialty and central laboratory with comprehensive research services and diagnostic capabilities in Europe and the United States. Offering a range of standard and fully customizable analytical services across a variety of therapeutic areas, we add value at every stage of the drug development process from non-clinical/preclinical through phase IV clinical trials that serve to augment and accelerate research programs to their next stages and milestones. Each disease area is supplemented extensively by different models and batteries of *in vitro* and *ex vivo* analyses, offering answers to your therapeutics' effect on different parameters. With our strong reputation for scientific expertise, passionate approach to customer care, and adherence to quality data, we empower clients ranging from emerging biotech to Top Ten Global Pharma companies to reach confident clinical decisions that ultimately serve to improve patient lives.

If you'd like to discuss a particular study or speak with a scientist, please reach out to us!

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