Limitations and possibilities of animal models for human allergenic risk evaluation

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Limitations and possibilities of animal models for human allergenic risk evaluation

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There are many unanswered questions relating to food allergy sensitization in humans. We don't know under what circumstances sensitization takes place i.e. route (oral, dermal, respiratory), age, dose, frequency of exposure, infection or by-stander effect of other allergens. In addition we don't know under what circumstances oral tolerance develops.

With all these unanswered questions, it is a big challenge to design an animal model that, with relatively few animals, is able to predict if a food allergen is not only a potential allergen but also predict its potency, a prerequisite for risk evaluation.

One of the pitfalls may be the premise that an animal model needs to mimic the disease. Chemical contact sensitizers may be predicted in an animal test, the Local Lymph Node Assay (LLNA). This assay is based on detailed mechanistic knowledge of contact sensitization including knowledge on dose-response relationship. The outcome of the test is sensitization measured as cell proliferation in the regional lymph node.

Animal models in food allergy can be used to increase our understanding of food allergens and food allergy sensitization e.g. the influence of digestion or processing or to compare closely related allergens. Examples of this will be given.