Experimental approaches to predict allergenic potential of novel food

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 bystander 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 protein is a potential allergen. An even larger challenge is to predict its potency, a prerequisite for risk evaluation. Attempts have been made to rank proteins according to their allergenic potency based on the magnitude of the IgE response in experimental animals. This ranking has not included abundance as a parameter. We may be able to predict potential allergenicity i.e. hazard but our lack of understanding of the significance of dose for the development of food allergy or its counterpart oral tolerance makes risk assessment very difficult. In addition route of exposure and digestibility are relevant variables. Examples of the use and limitations of animal models for predicting the allergenicity of food proteins will be given. Possibilities and pitfalls will be discussed.
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