# Molecular diagnostic testing in food allergy

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**ABSTRACT**

Molecular diagnostic testing or component-resolved diagnostic (CRD) is an IgE antibody assay using purified native and recombinant allergenic molecules to detect specific IgE (sIgE) against the individual allergenic molecules. The rationales to use CRD in clinical practice are (1) to detect missing or low abundance allergens, (2) to detect allergenic molecules that identify a risk for clinical reactions and/or predict the likelihood of anaphylaxis, (3) to document IgE cross-reactions (important in "multi-sensitized individuals"), and (4) to identify genuine (primary) sensitization. The aim of this article is to review the recent evidence on using CRD of three food allergens: cow's milk, shrimp and peanut. For cow's milk CRD, even though sIgE testing to casein and beta-lactoglobulin are commercially available, these tests neither predict clinical relevance nor prognosis of cow's milk allergy (2). The reasons are that because (1) each cow's milk component well-presents in cow's milk diagnostic extract, and (2) most patients with IgE-mediated cow's milk allergy were sensitized to several cow's milk allergen components (75% sensitized to two or more components). However, cow's milk CRD might relate to persistent clinical symptoms and can predict reaction to baked milk tolerance in some individuals. For shrimp CRD, shrimp tropomyosin (Pen a1, Pen m1) is the major shrimp allergen that is commercially available. It highly presents in shrimp allergen diagnostic extract. Previous studies and our preliminary results showed that sIgE to shrimp tropomyosin has a similar sensitivity to skin prick test and sIgE to shrimp on predicting shrimp allergy. Yet, it could improve the specificity of the tests even though the frequency of recognition is low. sIgE to shrimp tropomyosin does not predict shrimp anaphylaxis. IgE testing to additional shrimp allergens, including arginine kinase, sarcoplasmic calcium-binding protein, hemocyanin, myosin light chain, might improve the diagnostic yield of the tests. Peanut allergy from different geographic regions reacted to different peanut allergen components. This depends on dietary habits and environmental pollens. Our study from Thailand showed that Ara h2 is the most useful peanut CRD in predicting true clinical reaction. Sensitization to CCD (cross-reactive carbohydrate determinants) related to clinical tolerance, and oral food challenge (OFC) should be performed in this case to avoid unnecessary food avoidance. In conclusion, CRD can be used to optimize the decision for performing OFC, especially in patients who have (1) multiple sensitizations, (2) more than one food is suspected to cause reaction, (3) irrelevant history of food allergic reaction.