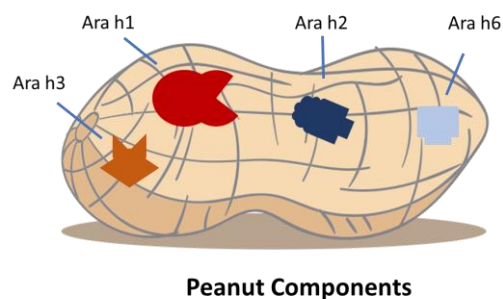




Food Allergy: Crude Peanut Extract



Immediate hypersensitivity reactions to peanuts, an IgE-mediated food allergy, has been a major public health concern for many years, particularly in westernized countries where peanut allergies can persist into adulthood. Among these allergens, peanut allergies account for most of the severe hypersensitivity acute reactions in patients. Several potentially important peanut allergens have been identified and designated the major peanut allergens: Ara h 1, Ara h 2, Ara h 3, and Ara h 6. For allergic patients, avoidance currently remains the only viable option (1).



Peanut Allergy Model

Mouse peanut allergy models can be induced by several oral administrations of crude peanut extract (CPE) and evaluated for humoral immune responses such as serum anti-CPE IgE and IgG antibodies, T-cell mediated immune response associated cytokine levels, as well as body temperature and clinical signs of anaphylaxis (2).

A. CPE Oral Challenge Model

Oral Administration of 5 mg CPE
with 0.01 mg Cholera toxin (CT)

Oral Challenge of 5 mg CPE two times, 30 minutes apart



Evaluation Methods:

- Serum anti-CPE IgE antibody levels
- Serum histamine levels

B. Anti-CPE IgE Antibody Induced Model

Intravascular (IV) injection of 0.3 mg
Anti-CPE IgE antibody

1. **Anaphylaxis Model:** IV injection of 1 mg CPE

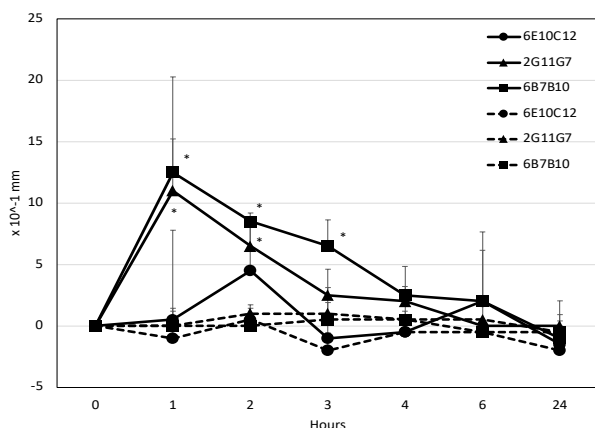
or

2. **Footpad Type I Hypersensitivity Model:** Intradermal (ID) injection of 0.1 mg CPE



Evaluation Methods:

- Body Temperature
- Thickness of footpads



Footpad Type I Hypersensitivity by anti-CPE
IgE monoclonal antibodies

The footpad thickness of mice after IV injections of 1 mg of mAbs: 6E10C12 (Circle) , 2G11G7 (Triangle), 6B7B10 (Square), followed by ID injections of 0.1 mg of CPE (Solid line) or PBS (Dashed line) at the footpad.

| Products | Catalog # |
|---|-----------|
| Crude Peanut Extract (CPE) | 3069 |
| Mouse Anti-CPE IgE Antibody, Clone 2G11G7 | 3070 |



Food Allergy: Crude Peanut Extract



IgE antibodies against allergens play an important role to induce allergic reactions in patients. Mast cells are degranulated by multivalent allergens cross-linking two IgE antibodies bound to receptors on the mast cell's surface, resulting in histamine release which activates inflammatory cascades. Alternatively, anti-allergen IgG antibodies can form multivalent immune-complexes of allergens which can bridge IgE antibodies on mast cells (3, 4).

| Products | Catalog # Anti-CPE | Catalog # Anti-Ara h 1 | Catalog # Anti-Ara h 2 | Catalog # Anti-Ara h 3 | Catalog # Total Immunoglobulin |
|----------------------|-----------------------|---------------------------|---------------------------|---------------------------|--------------------------------------|
| IgG Antibody Assay | 3056 | 3084 | 3077 | 3082 | 3023 |
| IgG1 Antibody Assay | 3057 | 3085 | Coming soon! | 3083 | 3025 |
| IgG2a Antibody Assay | 3058 | 3088 | Coming soon! | Coming soon! | 3026 |
| IgG2b Antibody Assay | 3059 | 3086 | 3078 | Coming soon! | 3027 |
| IgG3 Antibody Assay | 3060 | Coming soon! | Coming soon! | Coming soon! | 3028 |
| IgM Antibody Assay | 3062 | 3087 | 3079 | Coming soon! | 3024 |
| IgA Antibody Assay | 3061 | Coming soon! | 3080 | Coming soon! | 3019 |
| IgE Antibody Assay | 3063 | Coming soon! | Coming soon! | 3071 | 3005 |

*Individual monoclonal antibodies against allergens are also available. Please visit www.chondrex.com for more information.

Protein-based assays, especially ELISA, are capable of identifying even the most abundant peanut proteins at low levels due to the ELISA's high precision, ease of handling, and significant potential for standardization (5). The composition of peanut allergens, such as Ara h 1, h 2, and h 6, varies depending on individual food processing methods and peanut species (6). Allergens that have been treated or digested may transform into neoantigens, which possess higher allergenicity than their native counterparts. Therefore, monitoring peanut allergen levels in mixtures is crucial to prevent exposure to and consumption by allergic individuals.

| Products | Catalog # Ara h 1 | Catalog # Ara h 2 | Catalog # Ara h 6 |
|--------------------------------------|----------------------|----------------------|----------------------|
| Peanut Allergen Detection ELISA kits | 6045 | 6043 | 6042 |

References

1. A. W. Burks, Peanut allergy. *Lancet*. **371**, 1538–1546 (2008).
2. X. M. Li, D. Serebrisky, S. Y. Lee, C. K. Huang, L. Bardina, B. H. Schofield, J. S. Stanley, A. W. Burks, G. A. Bannon, H. A. Sampson, A murine model of peanut anaphylaxis: T- and B-cell responses to a major peanut allergen mimic human responses. *J. Allergy Clin. Immunol.* **106**, 150–158 (2000).
3. S. J. Galli, M. Tsai, IgE and mast cells in allergic disease. *Nat. Med.* **18**, 693–704 (2012).
4. C. Kanagaratham, Y. S. El Ansari, O. L. Lewis, H. C. Oettgen, IgE and IgG Antibodies as Regulators of Mast Cell and Basophil Functions in Food Allergy. *Front. Immunol.* **11**, 603050 (2020).
5. H.-W. Wen, W. Borejsza-Wysocki, T. R. DeCory, R. A. Durst, Peanut Allergy, Peanut Allergens, and Methods for the Detection of Peanut Contamination in Food Products. *Compr. Rev. Food Sci. Food Saf.* **6**, 47–58 (2007).
6. S. Meng, J. Li, S. Chang, S. J. Maleki, Quantitative and kinetic analyses of peanut allergens as affected by food processing. *Food Chem X* **1**, 100004 (2019).