

## Peanut Ara h 3 Detection ELISA Kit

Catalog # 6047

*For Research Use Only - Not Human or Therapeutic Use*

### PRODUCT SPECIFICATIONS

DESCRIPTION:	ELISA kit to quantify Ara h 3
FORMAT:	96-well ELISA Plate with removeable strips
ASSAY TYPE:	Sandwich ELISA
ASSAY TIME:	4 hours
STANDARD RANGE:	1000 – 16 pg/ml
NUMBER OF SAMPLES:	Up to 40 (duplicate) samples/plate
SAMPLE TYPES:	Liquid samples and biological fluids (pre-treatment acceptable)
RECOMMENDED SAMPLE DILUTIONS:	1:1 (at least)
CHROMOGEN:	TMB (read at 450 nm)
STORAGE:	-20°C for 12 months
VALIDATION DATA:	Intra-Assay (0.8-5.2%)/Inter-Assay (7.7-9.7%)/Spiking Test (95-103%)
NOTES:	Ara h 3 in samples must be extracted before starting assays

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### INTRODUCTION

Immediate hypersensitivity reactions to peanuts, an IgE-mediated food allergy, have been a major public health concern for many years, particularly in westernized countries where peanut allergies can persist into adulthood. For allergic patients, avoidance currently remains the only viable option (1).

Eleven potentially important peanut allergens have been identified. Ara h 1, Ara h 2, Ara h 3, and Ara h 6 have been designated the major peanut allergens. Ara h 3 is an 11S globulin seed storage protein consisting of 538 amino acid residues that has a calculated molecular mass of 61.7 kDa (2,3). Ara h 3 is post translationally cleaved into a 43 kDa acidic and a 28 kDa basic subunit that are covalently linked by a disulfide bond. Several fragments of Ara h 3 (14, 25, 42 and 45 kDa) can be observed, even under extraction conditions that inhibit proteases (4). Ara h3 has a high affinity for IgE in allergic individuals and can trigger allergic reactions (5,6).

The methods used to analyze allergens in foods are often divided into either DNA-based methods or protein-based methods. Immunoassays are one example of a protein-based method, and they are used in many industries for detecting allergens in foods. Enzyme-linked immunosorbent assays (ELISA) are commonly used for validating contamination of allergens in food products because of their high-precision, easy handling, and good potential for standardization (7).

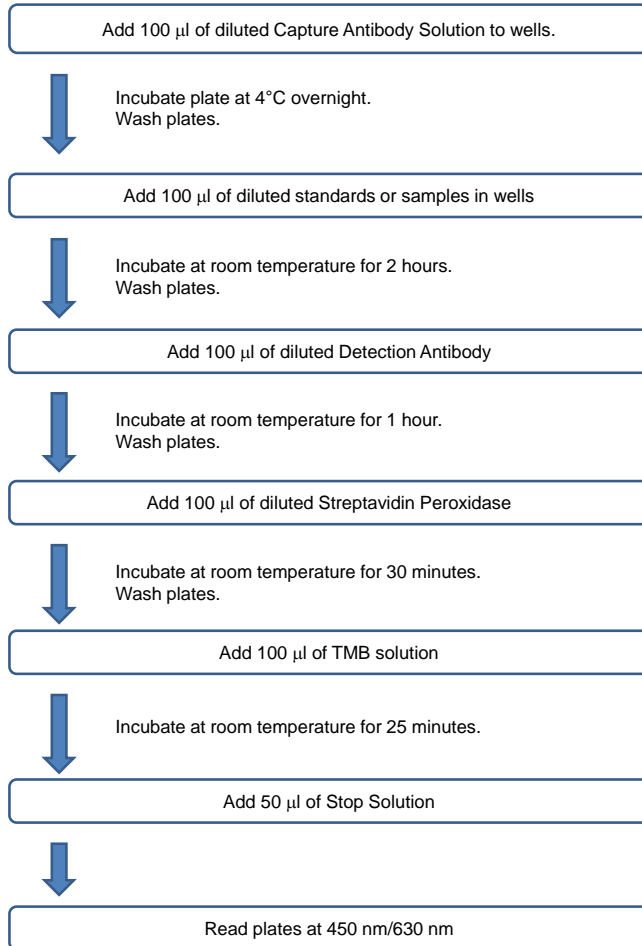
As a peanut allergen, Ara h 3 can be a useful analytical target for validating peanut-free foods and this application is not limited to only food testing either. As seen in clinical studies, Ara h 3 can be detected in serum after ingestion of peanuts by healthy individuals as well (8).

Chondrex, Inc provides an Ara h 3 Detection ELISA kit for evaluating food quality and for studying the distribution and dynamics of Ara allergens. In addition, Chondrex, Inc provides Ara h 1 (Cat # 6045), Ara h 2 (Cat # 6043), and Ara h 6 (Cat # 6042) Detection kits. Please visit [www.chondrex.com](http://www.chondrex.com) or contact [support@chondrex.com](mailto:support@chondrex.com) for more information.

### KIT COMPONENTS

Item	Quantity	Amount	Storage
Standard Ara h 3 (60471)	1 vial	1000 pg, lyophilized	-20°C
Anti-Ara h 3 Capture Antibody (60472)	1 vial	100 µl	-20°C
Anti-Ara h 3 Detection Antibody (60473)	1 vial	100 µl	-20°C
Solution A - Coating Buffer (9052)	1 bottle	10 ml	-20°C
Solution B - Sample/Standard/Detection Antibody Dilution Buffer (67015)	1 bottle	50 ml	-20°C
Solution D - Streptavidin Peroxidase Dilution Buffer (9055)	1 bottle	20 ml	-20°C
Streptavidin Peroxidase (9029)	2 vials	50 µl	-20°C
TMB Solution (90023)	2 vials	0.2 ml	-20°C
Chromogen Dilution Buffer (90022)	1 bottle	20 ml	-20°C
Stop Solution - 2N Sulfuric Acid (9016)	1 bottle	10 ml	-20°C
Wash Buffer, 20X (9005)	1 bottle	50 ml	-20°C
ELISA Plate	1 each	96-well (8-well strips x 12)	-20°C

## ASSAY OUTLINE



## NOTES BEFORE USING ASSAY

NOTE 1: It is recommended that the standard and samples be run in duplicate.

NOTE 2: Warm up all buffers to room temperature before use.

NOTE 3: Crystals may form in Wash Buffer, 20X when stored at cold temperatures. If crystals have formed, warm the wash buffer by placing the bottle in warm water until crystals are completely dissolved.

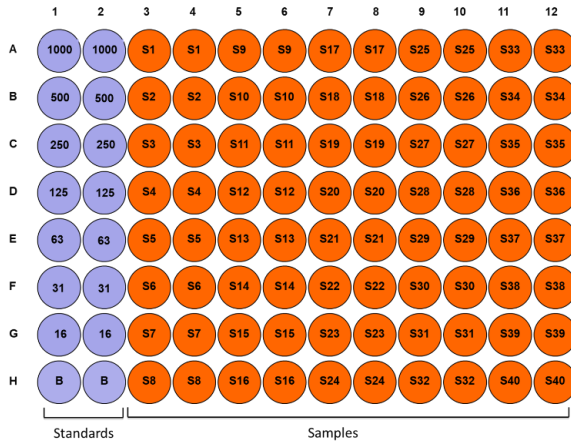
NOTE 4: Measure exact volume of buffers using a serological pipet, as extra buffer is provided.

NOTE 5: Cover the plate with plastic wrap or a plate sealer after each step to prevent evaporation from the outside wells of the plate.

NOTE 6: For partial reagent use, please see the assay protocol's corresponding step for the appropriate dilution ratio. For example, if the protocol dilutes 50 µl of a stock solution in 10 ml of buffer for 12 strips, then for 6 strips, dilute 25 µl of the stock solution in 5 ml of buffer. Partially used stock reagents may be kept in their original vials and stored at -20°C for use in a future assay.

NOTE 7: This kit contains animal components from non-infectious animals and should be treated as potential biohazards in use and for disposal.

## PLATE MAPPING

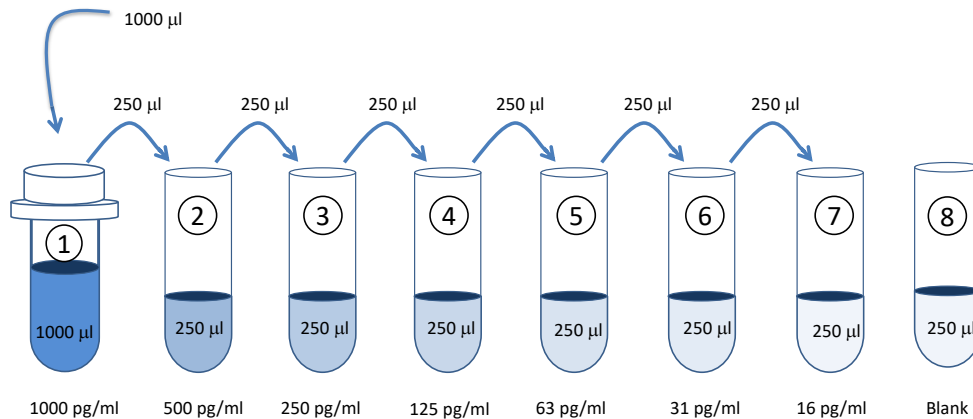


## ASSAY PROCEDURE

- Add Capture Antibody:** Dilute one vial of Capture Antibody with 10 ml of Coating Buffer (Solution A). Alternatively, dilute according to the table below. Add 100  $\mu$ l of capture antibody solution to each well and incubate at 4°C overnight. Any remaining Capture Antibody Stock Solution can be stored at -20°C for future use.

Strip #	Capture Antibody ( $\mu$ l)	Solution A (ml)
2	17	1.7
4	33	3.3
6	50	5.0
8	66	6.6
10	82	8.2
12	100	10.0

- Prepare Standard Dilutions:** The recommended standard range is 16 - 1000 pg/ml. Dissolve one vial of Standard (1000 pg/vial) in 1 ml of Sample/Standard/Detection Antibody Dilution Buffer (Solution B) and keep it as a standard stock. Then serially dilute it with Solution B. For example, mix 250  $\mu$ l of the 1000 pg/ml solution with an equal volume of Solution B to make a 500 pg/ml solution, and then repeat it five more times for 250, 125, 63, 31, and 16 pg/ml standard solutions.



2. **Prepare Sample Dilutions:** Dilute samples at least 1:1 with Solution B depending on the estimated Ara h 3 level in the samples. Two or three different sample dilutions are recommended if the Ara h 3 levels in the samples are unknown.
3. **Wash:** Dilute 50 ml of 20X wash buffer in 950 ml of distilled water (1X wash buffer). Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. *Do not allow the plate to dry out.*
4. **Add Standards and Samples:** Add 100  $\mu$ l of standards, Solution B (blank), and samples to wells in duplicate. Incubate at room temperature for 2 hours.
5. **Wash:** Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. *Do not allow the plate to dry out.*
6. **Add Ara h 3 Detection Antibody:** Dilute one vial of Detection Antibody in 10 ml Sample/Standard/Detection Antibody Dilution Buffer (Solution B). Add 100  $\mu$ l of detection antibody solution to each well and incubate at room temperature for 1 hour.

Strip #	Detection Antibody ( $\mu$ l)	Solution B (ml)
2	17	1.7
4	33	3.3
6	50	5.0
8	66	6.6
10	82	8.2
12	100	10.0

7. **Wash:** Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. *Do not allow the plate to dry out.*
8. **Add Streptavidin Peroxidase Solution:** Prepare streptavidin peroxidase solution with Streptavidin Peroxidase Dilution Buffer (Solution D) as shown in the following table. Add 100  $\mu$ l of streptavidin peroxidase solution to each well and incubate at room temperature for 30 minutes.

Strip #	Streptavidin Peroxidase ( $\mu$ l)	Solution D (ml)
2	8	1.7
4	17	3.3
6	25	5.0
8	33	6.6
10	42	8.2
12	50	10.0

9. **Wash:** Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. *Do not allow the plate to dry out.*
10. **Add TMB Solution:** Use new tubes when preparing TMB solution. Just prior to use, prepare TMB solution with Chromogen Dilution Buffer as shown in the following table. Add 100  $\mu$ l of TMB solution to each well immediately after washing the plate and incubate for 25 minutes at room temperature

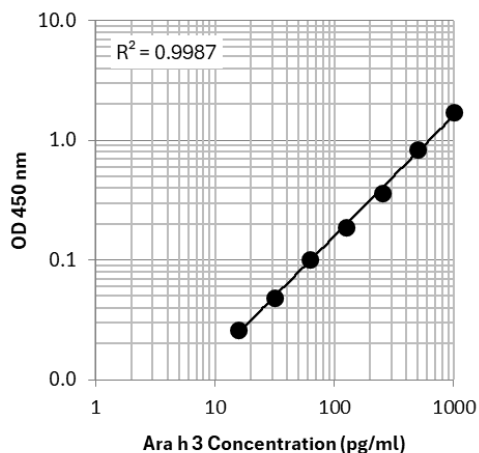
Strip #	TMB (μl)	Chromogen Dilution Buffer (ml)
2	34	1.7
4	66	3.3
6	100	5.0
8	132	6.6
10	164	8.2
12	200	10.0

- Stop:** Stop the reaction with 50 μl of 2N Sulfuric Acid (Stop Solution) to each well.
- Read Plate:** Read the OD values at 450 nm. If the OD values of samples are greater than the OD values of the highest standard, re-assay the samples at a higher dilution. A 630 nm filter can be used as a reference.

## CALCULATING RESULTS

- Average the duplicate OD values for the standards, blanks (B), and test samples.
- Subtract the averaged blank OD values from the averaged OD values of the standards and test samples.
- Plot the OD values of the standards against the pg/ml of standard. Using a log/log plot will linearize the data. Figure 1 shows an example of a standard curve where the standard range is 16 to 1000 pg/ml.
- The pg/ml of Ara h 3 in test samples can be calculated using regression analysis. Multiply it by the sample dilution factor to obtain the Ara h 3 concentration (pg/ml) in the original test samples.

Figure 1 - A Typical Standard Curve for the Ara h 3 Detection ELISA Kit



## VALIDATION DATA

Table 1 - Reproducibility Data for the Ara h 3 Detection ELISA Kit

Test	31 pg/ml	125 pg/ml	500 pg/ml
Intra-Assay CV (%)	2.3	5.2	0.8
Inter-Assay CV (%)	9.1	7.7	9.7
Spike Test* (%)	95%	100%	103%

\*Known amounts of Ara h 3 were added to samples and then diluted with Sample/Standard/Secondary Antibody Dilution Buffer to assay Ara h 3 by ELISA.

## TROUBLESHOOTING

For frequently asked questions about assays and ELISAs, please see Chondrex, Inc.'s [ELISA FAQ](#) for more information.

## REFERENCES

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4. S. J. Koppelman, E. F. Knol, R. A. A. Vlooswijk, M. Wensing, A. C. Knulst, S. L. Hefle, H. Gruppen, S. Piersma. Peanut allergen Ara h3: Isolation from peanuts and biochemical characterization. *Allergy*. **11**, 1144-51 (2003).
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7. U.S. Food and Drug Administration (FDA) “Food Allergies” (FDA, 2022; <https://www.fda.gov/food/food-labeling-nutrition/food-allergies>).
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