Peanut Ara h2 Detection ELISA Kit

Catalog # 6043

For Research Use Only - Not Human or Therapeutic Use

PRODUCT SPECIFICATIONS

DESCRIPTION:	ELISA kit to quantify Ara h2
FORMAT:	Precoated 96-well ELISA Plate with removeable strips
ASSAY TYPE:	Sandwich ELISA
ASSAY TIME:	4 hours
STANDARD RANGE:	100 – 1.6 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 (2.1-8.3%)/Inter-Assay (2.8-8.7%)/Spiking Test (92-97%)
NOTES:	Ara h2 in samples must be extracted before starting assays

© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

16928 Woodinville-Redmond Rd NE Suite B-101
Woodinville, WA 98072
Phone: 425.702.6365 or 888.246.6373
Fax: 425.882.3094
www.chondrex.com
support@chondrex.com

Peanut Ara h2 Detection ELISA Kit

Catalog # 6043

For Research Use Only - Not Human or Therapeutic Use

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 h1, Ara h2, Ara h3, and Ara h6 have been designated the major peanut allergens. Ara h2 and Ara h6, two highly related 2S albumins belonging to seed storage proteins, especially contribute to the development of allergic reactions (2). Ara h2 contains ten independent IgE-binding linear epitopes. Two isoforms, Ara h 2.01 and Ara h 2.02, were identified respectively as a 17 and 19-kDa doublet on SDS-PAGE. The larger isoform containing twelve extra amino acids including a duplication of a strong IgE-binding sequence, DPYSPS, can bind more IgE antibodies (3, 4). Ara h6 has a molecular weight of 14.5 kDa and is 59 % homologous to Ara h2. It also possesses heat and digestion stability, a protease-stable core, and allergenic potency similar to that of Ara h2 (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 h2 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 h2 can be detected in serum after ingestion of peanuts by healthy individuals as well (8)

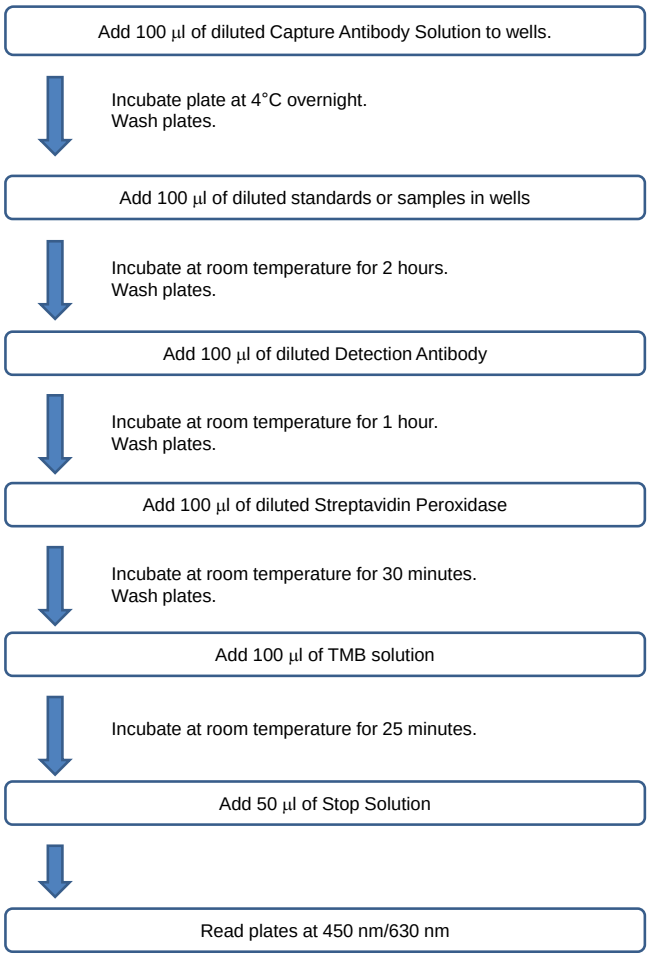
Chondrex, Inc provides an Ara h2 detection ELISA kit (Cat # 6043) as well as an Ara h6 detection ELISA kit (Cat # 6042) for evaluating food quality and for studying the distribution and dynamics of Ara allergens. Please visit www.chondrex.com or contact support@chondrex.com for more information.

KIT COMPONENTS

Item	Quantity	Amount	Storage
Standard Ara h2 (60431)	1 vial	100 pg, lyophilized	-20°C
Anti-Ara h2 Capture Antibody (60432)	1 vial	100 µl	-20°C
Anti-Ara h2 Detection Antibody (60433)	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)	2 bottles	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

© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

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.

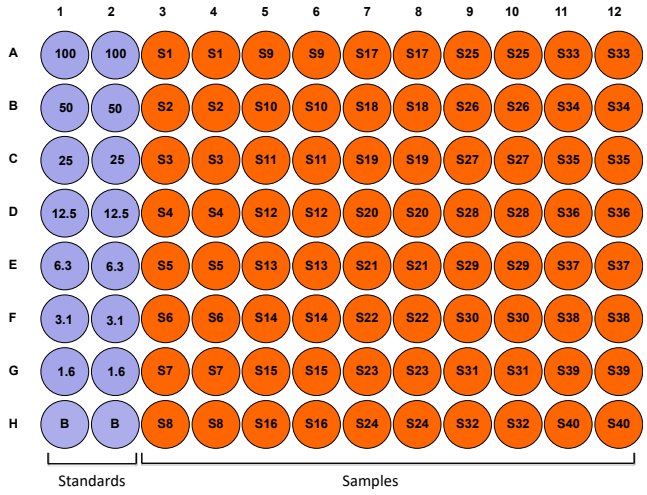
NOTE 5: Cover the plate with plastic wrap or a plate sealer after each step to prevent evaporation from the outside wells of the plate.

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 -20ºC 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.

© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

PLATE MAPPING

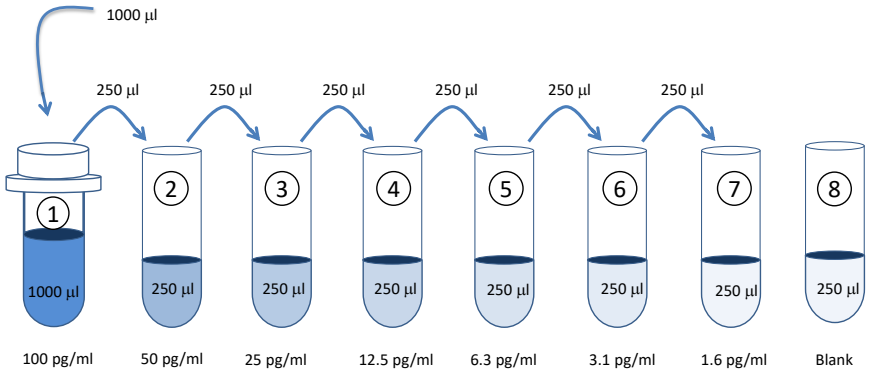


ASSAY PROCEDURE

1. **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 µl 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 (µl)	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

1. **Prepare Standard Dilutions**: The recommended standard range is 1.6 - 100 pg/ml. Dissolve one vial of Standard (100 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 µl of the 100 pg/ml solution with an equal volume of Solution B to make a 50 pg/ml solution, and then repeat it five more times for 25, 12.5, 6.3, 3.1, and 1.6 pg/ml standard solutions.



© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

16928 Woodinville-Redmond Rd NE Suite B-101
Woodinville, WA 98072
Phone: 425.702.6365 or 888.246.6373
Fax: 425.882.3094
www.chondrex.com
support@chondrex.com

2. **Prepare Sample Dilutions**: Dilute samples at least 1:1 with Solution B depending on the estimated Ara h2 level in the samples. Two or three different sample dilutions are recommended if the Ara h2 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 µl 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 Detection Antibody**: Dilute one vial of Detection Antibody in 10 ml Streptavidin Peroxidase Dilution Buffer (Solution D). Add 100 µl of detection antibody solution to each well and incubate at room temperature for 1 hour.

Strip #	Detection Antibody (µl)	Solution D (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 µl of streptavidin peroxidase solution to each well and incubate at room temperature for 30 minutes.

Strip #	Streptavidin Peroxidase (µl)	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 µl of TMB solution to each well immediately after washing the plate and incubate for 25 minutes at room temperature

© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

16928 Woodinville-Redmond Rd NE Suite B-101
Woodinville, WA 98072
Phone: 425.702.6365 or 888.246.6373
Fax: 425.882.3094
www.chondrex.com
support@chondrex.com

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

11. **Stop**: Stop the reaction with 50 µl of 2N Sulfuric Acid (Stop Solution) to each well.

12. **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

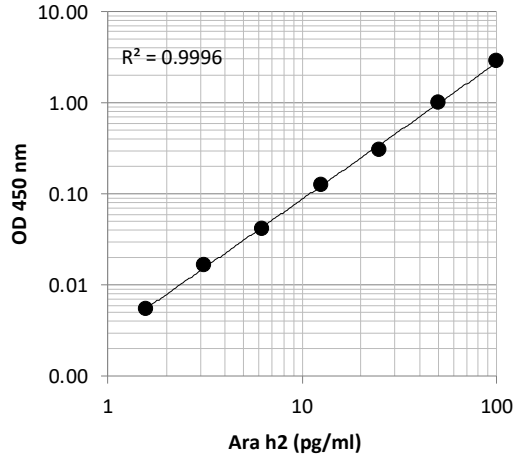
1. Average the duplicate OD values for the standards, blanks (B), and test samples.

2. Subtract the averaged blank OD values from the averaged OD values of the standards and test samples.

3. 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 1.6 to 100 pg/ml.

4. The pg/ml of Ara h2 in test samples can be calculated using regression analysis. Multiply it by the sample dilution factor to obtain the Ara h2 concentration (pg/ml) in the original test samples.

Figure 1 - A Typical Standard Curve for the Ara h2 Detection ELISA Kit



© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

16928 Woodinville-Redmond Rd NE Suite B-101
Woodinville, WA 98072
Phone: 425.702.6365 or 888.246.6373
Fax: 425.882.3094
www.chondrex.com
support@chondrex.com

VALIDATION DATA

Table 1 - Reproducibility Data for the Ara h2 Detection ELISA Kit

Test	3.1 pg/ml	12.5 pg/ml	50 pg/ml
Intra-Assay CV (%)	8.3	3.9	2.1
Inter-Assay CV (%)	8.7	2.8	6.0
Spike Test* (%)	92%	95%	97%

*Known amounts of Ara h2 were added to samples and then diluted with Sample/Standard/Secondary Antibody Dilution Buffer to assay Ara h2 by ELISA.

TROUBLESHOOTING

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

REFERENCES

1. A. W. Burks, Peanut allergy. *Lancet*. **371**, 1538–1546 (2008).
2. Y. Zhuang, S. C. Dreskin, Redefining the major peanut allergens. *Immunol. Res*. **55**, 125–134 (2013).
3. B. J. Hales, A. Bosco, K. L. Mills, L. A. Hazell, R. Loh, P. G. Holt, W. R. Thomas, Isoforms of the major peanut allergen Ara h 2: IgE binding in children with peanut allergy. Int. Arch. Allergy Immunol. 135, 101–107 (2004).
4. J. M. Chatel, H. Bernard, F. M. Orson, Isolation and characterization of two complete Ara h 2 isoforms cDNA. Int. Arch. Allergy Immunol. 131, 14–18 (2003).
5. X. Chen, Q. Wang, R. El-Mezayen, Y. Zhuang, S. C. Dreskin, Ara h 2 and Ara h 6 Have Similar Allergenic Activity and Are Substantially Redundant. Int. Arch. Allergy Immunol. 160, 251–258 (2013).
6. M. Suhr, D. Wicklein, U. Lepp, W.-M. Becker, Isolation and characterization of natural Ara h 6: evidence for a further peanut allergen with putative clinical relevance based on resistance to pepsin digestion and heat. Mol. Nutr. Food Res. 48, 390–399 (2004).
7. U.S. Food and Drug Administration (FDA) "Food Allergies" (FDA, 2022; https://www.fda.gov/food/food-labeling-nutrition/food-allergies).
8. K. Baumann, P. S. Skov, E. Eller, B. Kristensen, C. Bindslev-Jensen, Detection of Circulating Peanut Components in Serum after Ingestion. Int. Arch. Allergy Immunol. 183, 706–713 (2022).

© 2022 Chondrex, Inc. All Rights Reserved, 6043 1.0

16928 Woodinville-Redmond Rd NE Suite B-101
Woodinville, WA 98072
Phone: 425.702.6365 or 888.246.6373
Fax: 425.882.3094
www.chondrex.com
support@chondrex.com