KRESSER INSTITUTE
FOR FUNCTIONAL AND EVOLUTIONARY MEDICINE

Cyrex Array 10 – Part 2

Oil proteins found in seeds and nuts

Some patients may not react to proteins in nuts and seeds, but may react to oleosins

Example: if patient only reacts to peanut oleosin, but not peanut protein, they will test false negative on other assays

Oleosins are oil proteins found in nuts and seeds. Some patients may not react to the proteins in the nuts and seeds, but they're actually reacting to these compounds, the oleosins. So for example, if a patient only reacts to peanut oleosin but not peanut protein, they will test a false negative on other food intolerance assays that are only looking at proteins.

Meat glue (aka transglutaminase or thrombian) is a **powder** used in food processing to "glue" smaller pieces of meat together into one larger piece

Also used to turn flakes of white fish into imitation crab meat or form chicken scraps into nuggets, and to thicken some milks, yogurts, and egg whites

Patients may react to the meat glue in these foods, without reacting to the foods themselves

Meat glue, which is also known as transglutaminase or a thrombian, is a powder used in food processing to glue smaller pieces of meat together into one larger piece. It's also used to turn flakes of white fish into imitation crab meat or form chicken scraps into nuggets, and to thicken some milks, yogurts, and egg whites. Patients may react to the meat glue in these foods without reacting to the foods themselves.

Dual antibody detection

Both **IgG and IgA isotypes** are involved in immune response

Array 10 measures both

IgA is an indication of mucosal immune response, and IgG is indication of circulatory immune response

Measuring both gives more accurate results

Array 10 uses dual antibody detection, so both IgG and IgA isotypes are involved in the immune response; we talked about this in the context of Array 3 and Array 4. IgA is an indication of mucosal immune response and IgG is more of an indication of circulatory immune response, and for more on that, please do listen to my interview with Dr. Vojdani. We cover that in some more detail. And measuring both IgG and IgA gives better results than just measuring IgG, which is what most other food intolerance tests do.

All right, now let's look at a test result.

TEST	RESULT			
Array 10 - Food Immune Reactivity Screen **	IN RANGE (Normal)	EQUIVOCAL*	OUT OF RANGE	REFERENCE (ELISA Index)
DAIRY and EGGS, Modified				
Egg White, cooked		1.45		0.1-1.6
Egg Yolk, cooked	0.48			0.1-1.7
Goat's Milk	0.59			0.1-1.9
Soft Cheese + Hard Cheese	0.92			0.1-1.7
Yogurt	1.31			0.1-2.0
GRAINS, Raw and Modified				
Rice, white + brown, cooked	0.91			0.1-1.3
Rice Cake		1.37		0.2-1.8
Rice Protein		1.62		0.2-1.7
Rice Endochitinase		1.30		0.2-1.7
Wild Rice, cooked		1.00		0.1-1.3
Wheat + Alpha-Gliadins		1.51		0.2-1.9
BEANS and LEGUMES, Modified				
Black Bean, cooked	0.95			0.3-2.1
Bean Agglutinins	2.02			0.4-2.6
Dark Chocolate + Cocoa		1.01		0.2-1.2
Fava Bean, cooked	0.71			0.3-1.5
Garbanzo Bean, cooked			3.48	0.4-2.2
Kidney Bean, cooked	0.83			0.3-1.5
Lentil, cooked			2.33	0.3-2.0
Lentil Lectin	0.76			0.2-1.9
Lima Bean, cooked	1.16			0.3-2.2
Pinto Bean, cooked	1.05			0.4-2.4
Soybean Agglutinin	0.73			0.2-2.0
Soybean Oleosin + Aquaporin		1.70		0.2-1.8

I'm not going to go antigen by antigen here as I did with Cyrex Array 4. It would take forever with 180 antigens, and it's pretty unnecessary because the response in treatment is the same, no matter what antigen we're looking at. I just want you to see what the results look like, and then we'll talk a little bit more about interpretation and treatment, some specific considerations. Like with Array 3 and 4, most functional medicine clinicians consider equivocal results positive, especially if they're at the high end. As you can see here, the patient is reacting to egg white but not egg yolk, and we talked about that in the Array 4 presentation. Cyrex Array 4 has a combined yolk and white antigen, whereas Array 10 here separates the reaction to the white or the yolk, so this patient could actually eat egg yolks because they're only reacting to the white. Here we also see different antibody reaction to different types of rice protein, so they're not reacting to the full white plus brown rice, cooked antigen, but they're reacting to rice cake, rice protein, rice endochitinase, wild rice protein, so this patient would be better off eliminating rice altogether, at least until their gut is healed.

Food				Range
Soy Sauce, gluten-free		1.52		0.2-1.9
Tofu	0.82			0.2-1.4
NUTS and SEEDS, Raw and Modified				
Almond	1.58			0.2-2.5
Almond, roasted		1.91		0.2-2.0
Brazil Nut, raw + roasted	1.13			0.1-1.8
Cashew	0.65			0.2-1.5
Cashew, roasted	1.01			0.2-2.3
Cashew Vicilin	1.31			0.3-1.7
Chia Seed	0.80			0.2-1.7
Flax Seed	0.68			0.1-1.3
Hazelnut, raw + roasted	0.95			0.1-1.7
Macadamia Nut, raw + roasted	0.74			0.3-2.3
Mustard Seed	0.81			0.4-1.5
Pecan, raw + roasted	1.13			0.3-1.5
Peanut, roasted	0.71			0.2-1.4
Peanut Butter	0.82			0.2-1.9
Peanut Agglutinin	1.05			0.3-1.9
Peanut Oleosin	0.90			0.3-1.8
Pistachio, raw + roasted	0.98			0.4-2.0
Pumpkin Seeds, roasted	0.96			0.2-1.6
Sesame Albumin	0.95			0.2-1.3
Sesame Oleosin		1.35		0.2-1.6
Sunflower Seeds, roasted	0.98			0.2-1.5
Walnut		1.60		0.3-2.0
VEGETABLES, Raw and Modified				
Artichoke, cooked		2.02		0.1-2.7
Asparagus	1.89			0.3-3.0
Asparagus, cooked	1.15			0.1-2.2
Beet, cooked		1.26		0.1-1.5

They're also reacting to roasted almond but not raw almond, so I used that as an example before, and here you see that that is occurring in this patient. They are producing antibodies that are almost outside of the lab range to roasted almond but not raw almond, and you can also see that they're reacting to sesame oleosin, which is the oil protein, but not to the sesame albumin, which is the protein in the seed, so this is a fantastic example of some of the principles that we were talking about earlier.

Food	Green	Yellow	Pink	Range
Bell Pepper		1.80		0.1-1.8
Broccoli	1.15			0.1-1.5
Broccoli, cooked	1.17			0.1-2.0
Brussels Sprouts, cooked	1.76			0.1-3.0
Cabbage, red + green	1.79			0.1-2.5
Cabbage, red + green, cooked		2.03		0.1-2.5
Canola Oleosin	1.54			0.1-2.2
Carrot		2.08		0.1-2.7
Carrot, cooked	1.09			0.1-2.2
Cauliflower, cooked	1.63			0.1-2.2
Celery		1.76		0.1-2.3
Chili Pepper	1.15			0.1-2.4
Corn + Aquaporin, cooked		1.73		0.1-1.8
Popped Corn		1.38		0.1-1.9
Corn Oleosin		1.27		0.1-1.4
Cucumber, pickled			3.23	0.1-2.6
Eggplant, cooked			2.46	0.1-2.1
Garlic	1.09			0.1-2.5
Garlic, cooked	1.23			0.1-1.9
Green Bean, cooked	0.89			0.1-1.5
Lettuce	0.82			0.1-1.5
Mushroom, raw + cooked	0.69			0.1-1.6
Okra, cooked	1.09			0.1-1.5
Olive, green + black, pickled			1.78	0.1-1.7
Onion + Scallion	0.70			0.1-1.7
Onion + Scallion, cooked	0.77			0.1-1.5
Pea, cooked	0.73			0.1-1.5
Pea Protein	1.16			0.1-2.3
Pea Lectin	0.75			0.1-1.7
Potato, white, cooked (baked)		1.40		0.1-1.8

This patient is reacting to cooked cabbage but not raw, illustrating the importance of separating cooked and raw foods. They're reacting to baked potato but not fried potato. When the potato is fried with oil, it alters the protein structure, and in this case it's altering it in a way which is reducing the antigenicity, which is interesting.

Food				Range
Potato, white, cooked (fried)	0.68			0.1-1.6
Pumpkin + Squash, cooked			1.41	0.1-1.3
Radish	1.05			0.1-1.7
Safflower + Sunflower Oleosin		1.31		0.1-1.5
Seaweed		0.89		0.1-1.2
Spinach + Aquaporin	0.89			0.1-1.5
Tomato + Aquaporin	1.10			0.2-2.2
Tomato Paste	1.34			0.2-2.1
Yam + Sweet Potato, cooked	1.45			0.3-1.9
Zucchini, cooked	1.44			0.3-1.9
FRUIT, Raw and Modified				
Apple	0.59			0.2-1.5
Apple Cider	0.76			0.3-1.3
Apricot	2.03			0.2-2.8
Avocado	1.18			0.6-2.5
Banana	1.28			0.1-2.3
Banana, cooked	1.33			0.2-2.8
Latex Hevein	1.18			0.3-2.0
Blueberry		1.43		0.1-1.6
Cantaloupe + Honeydew Melon	0.65			0.1-1.2
Cherry	0.51			0.2-1.4
Coconut, meat + water	0.66			0.2-2.0
Cranberry	1.37			0.3-2.4
Date	0.38			0.2-1.4
Fig		1.67		0.2-2.2
Grape, red + green	0.58			0.2-1.0
Red Wine	0.98			0.1-2.3
White Wine	0.73			0.1-2.6
Grapefruit	0.82			0.2-1.9
Kiwi	0.43			0.2-1.7

They're reacting to sunflower and safflower oil proteins, the oleosins, but they're not reacting to sunflower seed protein.

Food	Green	Yellow	Pink	Range
Lemon + Lime	0.40			0.2-1.3
Mango	0.56			0.2-1.5
Orange	0.87			0.2-2.3
Orange Juice			2.10	0.2-1.8
Papaya		1.39		0.2-1.7
Peach + Nectarine	1.42			0.2-2.0
Pear	0.92			0.2-2.6
Pineapple	1.09			0.1-1.9
Pineapple Bromelain	0.97			0.2-2.6
Plum	0.89			0.3-2.2
Pomegranate	1.16			0.4-2.2
Strawberry			2.36	0.3-2.3
Watermelon	0.84			0.2-1.8
FISH and SEAFOOD, Raw and Modified				
Cod, cooked			2.15	0.2-1.8
Halibut, cooked	0.99			0.1-1.6
Mackerel, cooked	1.12			0.2-2.0
Red Snapper, cooked	0.67			0.1-1.5
Salmon	1.08			0.2-2.3
Salmon, cooked	0.99			0.2-2.4
Sardine + Anchovy, cooked	1.37			0.3-2.9
Sea Bass, cooked	1.07			0.2-2.8
Tilapia, cooked			1.98	0.1-1.8
Trout, cooked	1.61			0.1-2.4
Tuna	1.49			0.1-2.7
Tuna, cooked	0.52			0.1-1.3
Whitefish, cooked	0.68			0.1-1.4
Crab + Lobster, cooked	1.40			0.2-2.1
Imitation Crab, cooked	1.17			0.1-1.7
Clam, cooked	0.81			0.1-1.9

This patient is reacting to orange juice but not whole oranges, and I'm just going to scroll through here, you can see that there are a number of equivocal antibodies.

Oyster, cooked		1.51		0.1-1.6
Scallops, cooked	1.07			0.1-2.4
Squid (Calamari), cooked	1.32			0.1-2.0
Shrimp, cooked		2.08		0.1-2.1
Shrimp Tropomyosin	0.83			0.1-1.6
Parvalbumin	1.18			0.1-1.7
MEAT, Modified				
Beef, cooked medium	0.94			0.3-1.9
Chicken, cooked	0.59			0.2-1.5
Lamb, cooked		1.13		0.1-1.3
Pork, cooked	1.09			0.1-2.2
Turkey, cooked	0.56			0.1-1.3
Gelatin	0.47			0.1-1.3
Meat Glue	0.39			0.1-1.3
HERBS, Raw				
Basil	0.64			0.2-1.8
Cilantro	0.83			0.1-1.5
Cumin	1.04			0.2-2.3
Dill	0.99			0.3-1.7
Mint		2.08		0.3-2.1
Oregano	1.99			0.4-2.6
Parsley	0.83			0.1-1.3
Rosemary	1.32			0.3-2.2
Thyme	0.82			0.4-1.8
SPICES, Raw				
Cinnamon	0.85			0.3-1.7
Clove	0.93			0.4-1.8
Ginger	1.25			0.1-2.5
Nutmeg	1.15			0.2-1.9
Paprika	1.11			0.2-2.1

Turmeric (Curcumin)	0.70			0.1-1.7
Vanilla	0.98			0.1-2.4
GUMS				
Beta-Glucan	0.89			0.1-1.3
Carrageenan	0.61			0.2-2.6
Gum Guar	1.10			0.2-2.4
Gum Tragacanth	0.71			0.1-1.4
Locust Bean Gum	0.47			0.1-1.1
Mastic Gum + Gum Arabic	0.23			0.1-1.1
Xanthan Gum	0.92			0.1-1.7
BREWED BEVERAGES and ADDITIVES				
Coffee Bean Protein, brewed	0.95			0.2-1.8
Black Tea, brewed	0.68			0.3-1.6
Green Tea, brewed	1.19			0.3-1.8
Honey, raw +processed	0.46			0.1-1.3
Food Coloring	0.93			0.2-1.8

Positive antigen	Notes	Action
Lectins/agglutinins *(bean, peanut, soybean, lentil, pea)*	Can bind human tissue and provoke autoimmunity	Abstain from all lectins/agglutinins in legumes/beans; consider Cyrex Array 5
Aquaporins *(corn, spinach, soy, tomato)*	Similar to human aquaporin; can trigger autoimmunity to nervous system tissue	Abstain from all aquaporins; consider Cyrex Arrays 7/7x & 20
Beta-glucan	May cross-react with human tissue; associated with rheumatoid arthritis	Abstain from beta-glucan; check for pathogenic bacterial and fungal infection; consider Cyrex Array 8
Cashew vicillin	Specific cashew antigen more specific than cashew proteins	Abstain from cashews

Adapted from: Cyrex Array 10 Clinical Applications Guide (http://cyrexlabs.com)

Okay, so as I said, I'm not going to go antigen by antigen, because it's just not necessary, but I do want to give you some interpretation tips and some things to consider when you're interpreting the Array 10. So if you see a positive result for any of the lectins or agglutinins, so this is beans, peanuts, soybean, lentils, or peas, you want to have the patient abstain from all lectins or agglutinins in legumes or beans for a period of time. So for example, if they only are producing antibodies to peanut, you still would suggest that they avoid beans, lentils, and peas, and everything else in the lectin agglutinin category until you're able to resolve the issues and retest.

As I mentioned, lectins and agglutinins combine in human tissue and provoke an autoimmune response. You might consider running Cyrex Array 5, which is their multiple autoimmune reactivity panel, if the patient tests positive to lectins and agglutinins. If the patient tests positive to aquaporins, these include corn, spinach, soy, and tomato, again even if they only test positive to one, you would ask them to abstain from all of them because they have a tendency to trigger autoimmunity to nervous system tissue, you might consider Cyrex 7 or 7x and 20, which look at that in more detail. If they produce antibodies to beta-glucan, beta-glucan antibodies cross-react with human tissue and are associated with rheumatoid arthritis, so you might ask the patient to abstain from beta-glucan in foods, and then you could check for pathogenic bacterial and fungal infections, because there's also a relationship between beta-glucan antibodies and those, and you would consider Cyrex Array 8. Cashew vicilin is a specific cashew antigen that's more specific than cashew protein, so if you see a reaction there you would just have them abstain from eating cashew products.

Okay, so that's the end of Cyrex Array 10. You can find more information in the clinical applications guide at cyrexlabs.com, they have again a really extensive resource section of their website where you can get more detail on the particular antigens. They have a really good support team there as well, clinical support team, so if you have a question about a particular patient test result, you can call them up or schedule a phone conference and talk with Dr. Tom Alexander, who I'm going to be interviewing for the course as well, or any of their other clinical staff, and you can go over the results with them and they're quite helpful. All right, that's it for now, I will see you shortly.