A novel array-based assay for the detection of IgG-mediated food intolerance.

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Abstract

IgG reactions to food have been implicated in a number of chronic diseases including arthritis, irritable bowel syndrome, bronchitis and depression. Such reactions involve the formation and deposition of antigen/antibody complexes in a variety of tissues where they cause inflammation, pain and other symptoms.

The measurement of food-specific antibodies by microplate-based immunoassays is currently used for the assessment of these reactions and several studies have shown that food elimination diets, based on food IgG determinations, often help resolve symptoms. Consequently, the demand for food IgG measurements has increased world-wide and, in acknowledgment of this, we have developed a microarray-based immunoassay to permit both greater food panel diversity and higher throughput testing.

The Genarrayt™ 200+ Foods IgG test comprises of glass slides onto which 16 microarrays of over 200 different foods have been printed. Each microarray includes standards for quantitation and positive and negative controls for quality control. Food IgGs are detected by a novel fluorescent dye labelled anti-human IgG conjugate and results are measured using a laser scanner. Fluorescence intensity is directly proportional to antibody activity in the sample. The assay has a number of advantages over conventional ELISA including increased sample throughput, small reagent volumes and much greater information.

Composition of the Food Array

Meats	16
Fruits	43
Vegetables	44
Fish	38
Grains	18
Nuts	10
Others	57

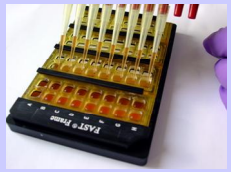
Assay method

Block ↓ Add sample ↓ Wash ↓ Add conjugate ↓ Wash ↓ Dry ↓ Scan ↓ Analysis ↓ Patient report ↓ Nutritional Advice

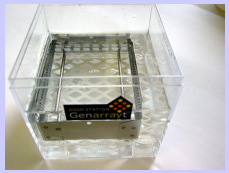
Methods

200+ foods are arrayed onto FAST® slides with the *Bio*Robotics MGII.

Slides are blocked prior to adding diluted sample. ↓



Slides are then washed before adding fluorescently labelled antibody. This is followed by a final wash. ↓

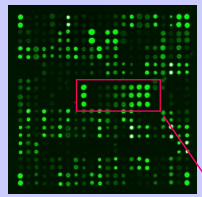


Slides are centrifuged dry ↓

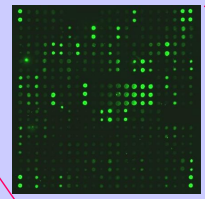
Scanned

Results are then discussed between the patient and our nutritionist who will suggest dietary changes if applicable.

Proprietary software converts raw data files into individual patient reports.



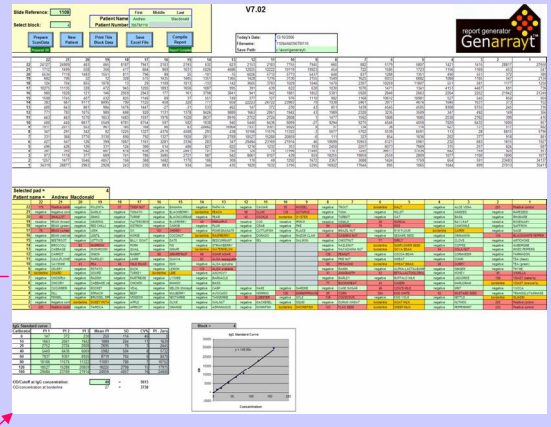
Coeliac patient

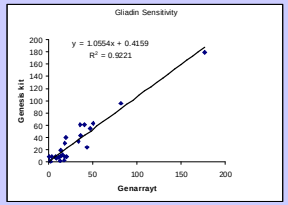


Non Coeliac Patient

Positive control
0 µg/ml IgG
10 µg/ml IgG
20 µg/ml IgG
40 µg/ml IgG
60 µg/ml IgG
80 µg/ml IgG
120 µg/ml IgG
160 µg/ml IgG

IgG Standard Curve region of the sub array





Correlation between Genarrayt and ELISA determination of Gliadin IgG

Benefits

- Works with blood, plasma or serum
- 4µl sample volume means less invasive sampling
- Highly miniaturised – 1 slide instead of 80 Microtitre plates
- 64 samples assayed in less than 2 hours
- Flexible array design allowing for dietary variation
- High throughput multiplex assay for over 200 food antigens

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