

Multiplexed Platform for Immune Response Detection

DIAGNOSTICS: Immunology, Allergy & Infectious diseases

Product Type	Flow cytometry-based detection for immune response.
Use	Component-resolved diagnostics of allergy; companion diagnostics of allergen immunotherapy; monitoring of vaccine responses.
MOA	Fluorochrome-labeled tetramers consisting of recombinant antigen to detect immune cells that either express antibodies (B cells) or have surface-bound antibodies (basophils; IgE) specific to that antigen.
Brief Description & Differentiation	<ol style="list-style-type: none"> Component-resolved diagnostics of allergy Various recombinant allergen tetramers labeled with fluorochromes are used in a multiplex manner to detect IgE-bearing basophils in a single flow cytometry staining tube requiring <0.5ml blood, with same-day result reporting. This exceeds current state-of-art diagnostics with skin prick tests having high false-positive rates and where independent RAST tests are needed for testing of each unique allergen. Companion diagnostics of allergen immunotherapy Allergen-specific B cells can be detected and immunophenotyped. Early results demonstrate that successful immunotherapy is associated with a shift of allergen-specific memory B cell receptors expression. Monitoring of vaccine responses Similar to 2, vaccine antigens can be used to detect and to immunophenotype vaccine-antigen specific B cells. This can enable detection of vaccine responses in patients receiving immunoglobulin substitution therapy following solid organ transplant or as treatment for recurrent infections, in whom it is currently not possible to determine whether their immune system is capable of generating immune memory.
Research Team	Menno van Zelm (Monash University), Mark Hogarth (Burnet Institute), Robyn O'Hehir (Monash University)
Intellectual Property	Provisional patent has been filed covering detection of immune responses in allergy and vaccine settings.
Key Publications	N/A
Future	Expand panel of allergen tetramers; assay optimization.

➤ Key Data

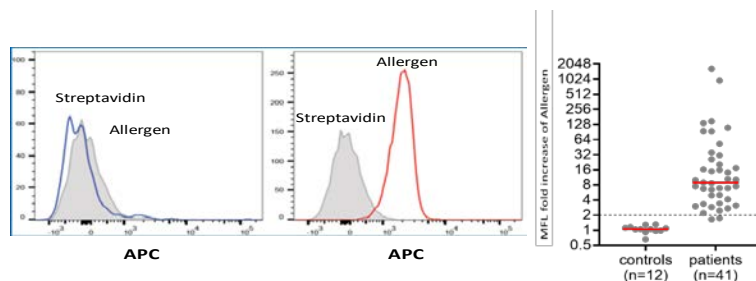


Figure 1.

Examples of flow cytometric analysis of allergen staining on blood CD123⁺ IgE⁺ basophils from healthy donor and a patient with allergy, and aggregate data from 12 controls and 41 patients with a specific common allergy.

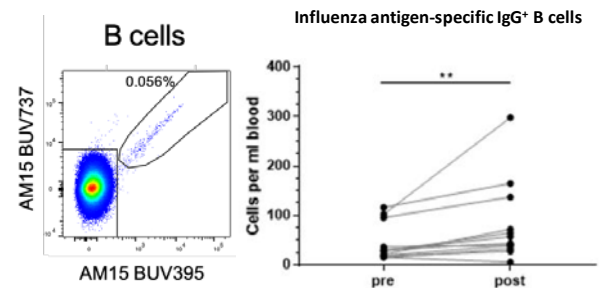


Figure 2.

Detection of influenza A/Michigan/2015 antigen-specific B cells; comparisons of numbers in healthy adults before and after influenza vaccination.