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easyBAT: Simplified BAT Offering Rapid, Accurate, Automated and Accessible Solution for Food Allergy Diagnosis at the Point-of-Care

Stanford researchers have developed easyBAT, a simplified solution integrating a microfluidic sample preparation device with a fully automated analysis pipeline for rapid, accurate and accessible solution for food allergy diagnosis at the point-of-care.

Despite the increasing prevalence of food allergies, clinical diagnosis remains insufficient due to significant hurdles faced by current diagnostic methods. Traditional techniques like skin prick tests and allergen specific IgE tests, often yield inconclusive and non-specific results. Moreover, the gold standard, Oral Food Challenge is risky and resource intensive. While the existing BAT offers better accuracy, its clinical adoption is hindered by the necessity for fresh blood samples, complex equipment, and skilled personnel. Addressing these challenges is essential for improving accessibility to food allergy diagnosis in routine clinical care.

Stanford researchers have tackled these challenges by developing easyBAT, which simplifies BAT with a user-friendly microfluidic sample preparation device and a fully automated analysis pipeline. This eliminates the need for laboratory equipment or skilled personnel, reducing processing time and expediting diagnosis. Compared to traditional BAT, easyBAT offers higher sensitivity and provides actionable insights with minimal user engagement. In summary, easyBAT delivers a rapid, simplified, and accurate solution for food allergy diagnosis, broadening the accessibility and scalability of BAT at the point-of care.

Stage of Development

Proof of concept in lab prototype. The next steps for market readiness include further validation with allergic samples, validating dried reagents to replace liquid reagents, user testing, and refining the fluidic design for improved usability.

Applications

- Lab developed tests for point-of-care or at-home food allergy diagnostics.
- Clinicians/allergists for diagnosis and treatment of food allergy.
- Researchers working on blood-based functional immune assays.
- Diagnostic companies or allergy clinics focusing on food allergy.

Advantages

- Rapid, accurate and user-friendly solution for food allergy diagnosis.
- Higher dynamic range and sensitivity compared to conventional BAT.
- Minimal user engagement and reduced processing time.
- Extended storage capability, eliminating the need for overnight sample shipping.
- Broadens access to BAT at the point-of-care.

Publications

- Nicolas Castano et al, "easyBAT: a sample preparation-to-analysis workflow for simplifying the basophil activation test", under review.

Patents

- Published Application: WO2025171408

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