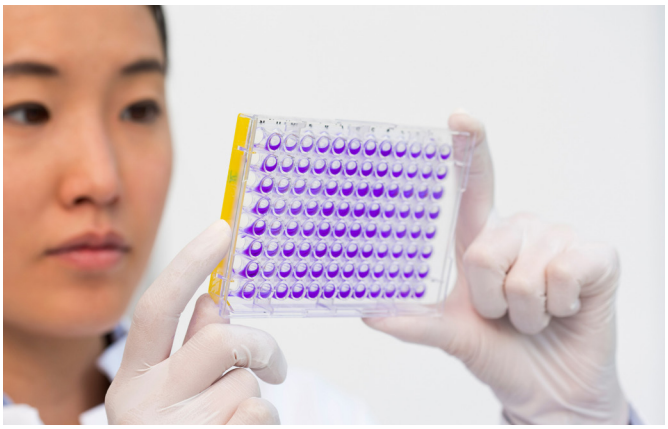
Increasing ELISA Capacity at Allermetrix

Jay Weiss, PhD, and his business partner Gary Kitos, PhD, are the founders of Allermetrix, an allergy testing company based in Franklin, Tennessee. Allermetrix performs quantitative allergy testing assays for foods, pollens, animals and insects, occupational chemicals and drugs, molds and other allergens. They also perform quantitative COVID-19 antibody testing using their own proprietary methods. We spoke with Dr. Weiss about his business, his assays, and why he chose Hudson Robotics for assay automation.

Allergy Testing

Allermetrix does tests for nearly 500 antigens, from anchovies to tetracycline, on serum samples sent in by physicians. Unlike other allergy testing companies, their assays are quantitative, so when the physician reports results back to the patient, he or she can give an idea how allergic a patient may be to something. Quantitative results can aid the doctor in choosing a starting dilution for immunotherapy, rather than simply beginning therapy at a very high dilution. By starting at more concentrated extract concentrations, the patient can become tolerant more quickly and cease immunotherapy earlier. The physician can report a strong reaction too, advising patients of which allergens may cause a life-threatening reaction. This is important given that allergic reactions can come on suddenly; there may be only one or two minutes to treat anaphylaxis. It is this quantitative aspect of allergy testing that has allowed Allermetrix to prosper, expand their menu of tests, and invest in automation.



Allermetrix uses ELISA to test serum samples for levels of IgE, IgG, and IgG4 antibodies to allergens, and, as part of their commitment to operating economically, they prepare the ELISA plates themselves. “Allergy testing is not highly reimbursed,” explained Dr. Weiss, “and the in-house approach to ELISA means we can perform our quantitative assays without cutting corners.”

Allermetrix Assays

Robots make laboratory processes more efficient because they can perform complex tasks faster and at lower cost. Allermetrix worked with Hudson Robotics to modify their protocol, based on their previous work, that could be performed by robot systems. The Hudson Robotics system adopted by Allermetrix is a “track” solution consisting of a StackLink microplate stacker at the left-hand end, a press that ensures that strip wells are seated properly, a RapidWash microplate washer, a Micro10X microplate reagent dispenser, and another

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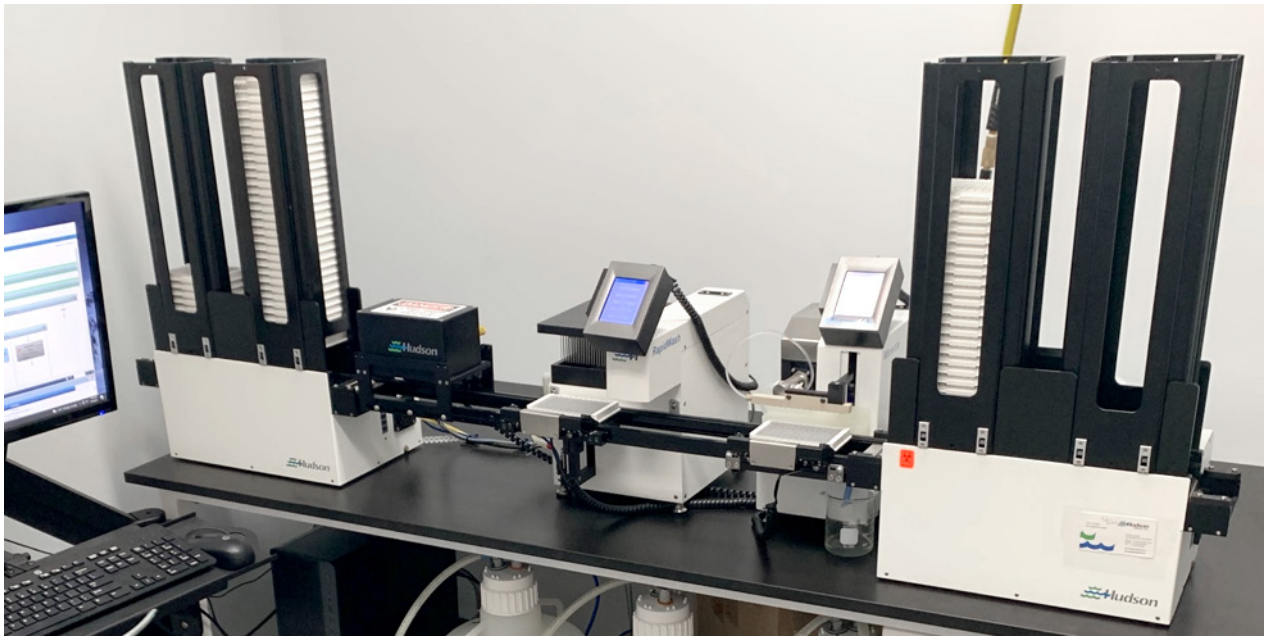
Jay Weiss, PhD
Founder, Allermetrix



The Hudson Robotics system gives Allermetrix the capacity they need to perform up to 400 quantitative ELISAs per week economically.

StackLink stacker at the right-hand end. To support the Allermetrix "sandwich" ELISA, the microplates are prepared by passing through the system three times, having several reagents added in sequence. Once the ELISA plates are processed, they are ready for the actual ELISA that is run by adding the patient samples and processing through the assay, ending up in an absorbance reader.

Choosing an Automation Solution

"The primary purpose of the Hudson Robotics system, which was purchased in 2018, was to increase the capacity of the ELISA operation at Allermetrix," said Dr. Weiss. Previously, they used another vendor's system consisting of a washer/dispenser and a stacker. Capacity was limited to about 100 plates per week. Now, with the Hudson Robotics system, they are processing 200 plates per week routinely, with the ability to go up to 400 as demand dictates. "The system is easy to use and relatively straightforward. We didn't require training, but we did work closely with the Hudson Robotics representative at first, making sure that the system was performing the plate processing effectively," he added.

Manual techniques can be lost if not carefully noted and adapted to an automated environment, and Dr. Weiss recalled some initial difficulties with the assay automation. "It was a frustrating process for us at the beginning. You can't expect a manual system to run on an automated platform. We had to think of alternative ways to do things," he explained. "After translating our protocol for use with the Hudson system, it has not only delivered the capacity we needed, but is even more sensitive and robust than the manual process."

Dr. Weiss likes the single-track simplicity of the Hudson Robotics system. "We looked at an orbital system from another manufacturer when we were evaluating automation systems," he said. "We went with the Hudson system because it seems to me like a more reliable solution."

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