

# Developing one-step allergy testing panels using the HydroFlex™ system

VBC-Genomics in Vienna uses a Tecan HydroFlex™ system for automated washing of its microarrays for allergy testing. The arrays are spotted onto VBC's proprietary surface, segmented into a 96 well format with a Whatman FAST® frame slide adapter and then processed by the HydroFlex, which halves the slide processing time and improves the signal quality and consistency of results.



The team at VBC-Genomics (left to right): Rene Ertler, Tamara Braun, Sabine Hutter, Claudia Kirisits, Marianne Brill and Christian Harwanegg

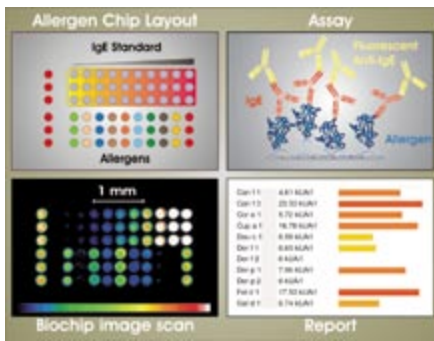


The Tecan HydroFlex system

VBC-Genomics Bioscience Research was founded in Vienna, Austria, in 1999, as a spin-off company from Vienna University, and was established for providing microarray-based genetic research and screening tools. The company currently focuses on developing microarrays to screen for large numbers of allergens, in order to identify the specific triggers of individual patients' allergic reactions. VBC-Genomics has already launched a panel of 89 different allergens that allows rapid, one-step allergy testing from a single drop of blood; the latest version of this product, which will be called ImmunoCAP® ISAC® (Immuno Solid-phase Allergen Chip), will be launched later this year in co-operation with Phadia, Sweden. Phadia is the global market leader for *in vitro* allergy diagnosis and one of VBC-Genomics' major shareholders.

"We have been keen to automate our array development procedures for some time, and we chose Tecan because it is important that the processes meet certain quality standards," said Christian Harwanegg, COO at VBC-Genomics. "The arrays are CE-marked, registered medical devices that meet IVD-D requirements, and they are spotted with highly standardized, purified or recombinant allergen molecules, rather than the extracts used by many other companies."

These arrays can be used by healthcare professionals to test patient samples against a broad range of molecules that may be responsible for their allergies. The information can be used to define more suitable, individualized treatment or avoidance regimes. ISAC® allows semi-quantitative analysis of IgE



*ImmunoCAP® ISAC® enables rapid, one-step allergy testing from a single drop of blood*

immunoglobulins from human serum and is the first biochip-based allergy test approved for allergy diagnosis according to EU regulations. The arrays contain four different segmented chambers, each of which can contain up to 400 individual allergens tested against just 20 µl of human serum. Any IgE antibodies – indicating an allergic reaction – bind specifically to their respective allergens spotted on the array, emitting fluorescent signals that are automatically identified using standard microarray scanning techniques.

“Our panels aim to cover as many relevant allergens as possible in a single assay, because even if you know that 90 % of rhinitis patients, for example, react only to specific antigens, it is important to cater for the additional 10 % so doctors can be confident that they have identified all of a patient’s allergy triggers,” Christian explained. “We chose the HydroFlex because we needed a system that is affordable, practical and easy to integrate into other laboratory automation platforms and workflows. We looked at several instruments initially but we were convinced that the HydroFlex was the only system that was able to meet all of our needs, including its compliance with the IVD directive 98/79/EC in ELISA configuration, flexibility and software, without any compromise on our part. Its flexibility is essential to us, as Tecan’s

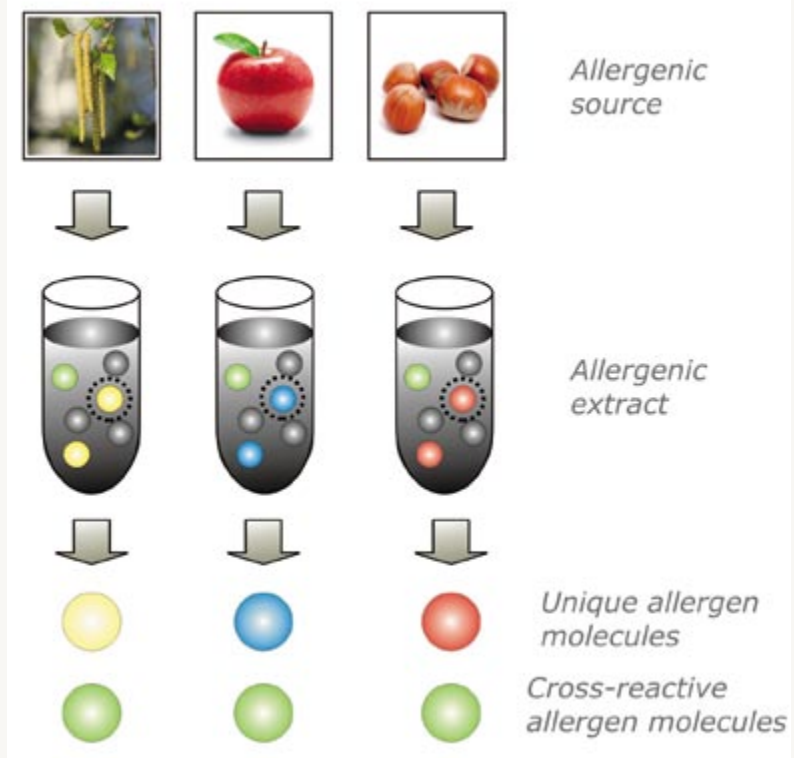
application specialist was able to create a customized plate setting for a 64-field format for the washer so that we can wash four slides simultaneously using our Whatman slide adapter.”

“We now rely on the HydroFlex for many of our internal regulatory testing and product development procedures, the automated washing, shaking and mixing steps are very important in eliminating human error so that we can truly standardize the testing processes. We are really impressed with the performance of the HydroFlex; it has already helped to speed up our assay processing time from around five hours to just two hours including all washing steps. We have significantly increased our throughput so

that one person can easily process about 200 tests (representing almost 20,000 results) in a day, requiring minimal hands-on time. Perhaps the most important benefits we have seen are the increases in both the sensitivity of the assay and in its reproducibility, each by at least 50 %. In the future we hope to integrate the HydroFlex system with an automated liquid handling platform, such as the Freedom EVO®, to fully automate our laboratory processes.”

*FAST is a trademark of companies within the Whatman Group. ISAC is a trademark of VBC-Genomics. ImmunoCAP is a trademark of Phadia AB.*

For more information on Tecan’s HydroFlex, visit [www.tecan.com/hydroflex](http://www.tecan.com/hydroflex)



*Preparation of allergen molecules*