

Simplicity by design

Genera Biosystems has been testing a HydroSpeed™ plate washer with its Sirocco™ multiplexed diagnostics automation platform, allowing rapid, efficient washing of its proprietary AmpaSand™ beads for high retention rates and accurate results.



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Karl Poetter, Chief Scientific Officer at Genera Biosystems

Genera Biosystems in Melbourne, Australia, develops and manufactures molecular diagnostic testing kits based on its proprietary AmpaSand bead technology. Used for molecular diagnostics in clinical pathology laboratories throughout Australia, AmpaSand beads are based on silica microspheres of various diameters to offer multiplexed testing based on PCR and flow cytometry. The Company offers a number of diagnostic assay kits which take advantage of this technology's multiplexing capabilities, including the RTIplex™ Respiratory Pathogen Panel assay, which can distinguish between 15 common infections of the upper respiratory tract, including influenzas, parainfluenzas, respiratory syncytial virus, human adenovirus, human rhinovirus, *Bordetella pertussis*, *Chlamydomphila pneumoniae* and *Mycoplasma pneumoniae*. This broad spectrum test is designed to aid clinical decision-making by providing a fast and easy method of identifying the pathogen responsible for the patient's symptoms, improving antimicrobial stewardship and enabling appropriate infection control measures to be implemented as soon as possible.

The surface of each AmpaSand bead is chemically activated to allow covalent bonding of oligonucleotides in high concentrations, providing stable beads that can be used directly for PCR amplification and cytometric analysis. Designed for use in a 96-well microplate format, a key feature of AmpaSand beads is their high density. This ensures very fast, efficient settling during centrifugation, removing the need for magnetic separators or filtration plates. Karl Poetter, Chief Scientific Officer, explained: "Following PCR, AmpaSand plates are spun down to remove the supernatant, then washed to remove unbound reagents or PCR

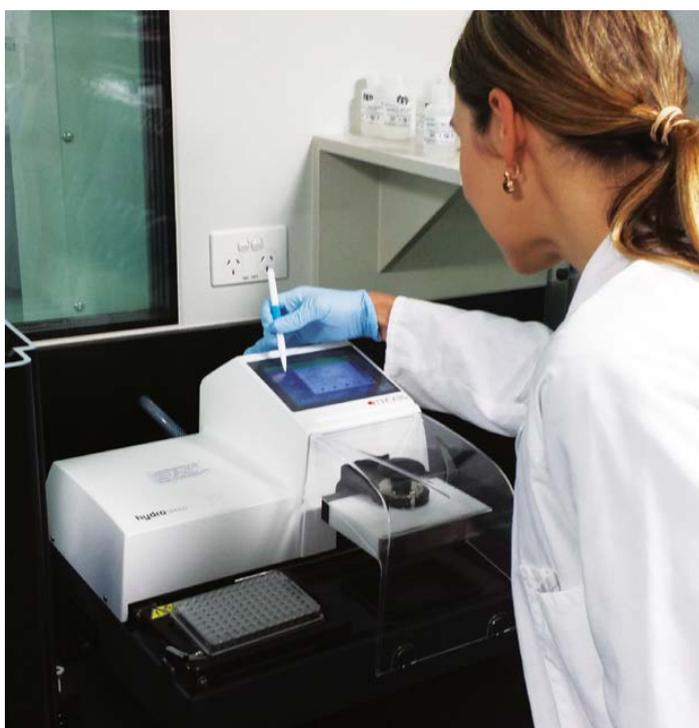
products prior to flow cytometry analysis. Manual bead washing is tedious and error-prone – much hands-on time is needed and there is a high risk of erroneous results through disturbing the pellet and losing beads – which is far from ideal in a clinical setting. We needed to automate the post-PCR washing steps to provide the accuracy and reliability necessary for diagnostic applications, and so looked for an automated 96-channel plate washer that offered us effective removal of unincorporated primers and reagents without disturbing the pellet. We looked at several plate washers on the market, and the HydroSpeed washer from Tecan was the only system that met our specifications. It offers precise control over the wash parameters and needle positioning, allowing us to obtain very high bead retention rates and ensuring effective washing."

To further simplify diagnostic testing, Genera Biosystems has evaluated the HydroSpeed washer for integration with a multiplexed diagnostics automation platform – the Sirocco Automation System. This set-up combines bead washing using the HydroSpeed with automated sampling, high throughput flow cytometry and data analysis, driven by the Company's proprietary QPlots software. This system greatly reduces the number of manual plate handling steps by providing automated post-PCR processing and analysis of AmpaSand beads, allowing efficient processing of completed PCR reaction plates from multiple PCR instruments. Karl continued: "The HydroSpeed system is designed with laboratory automation in mind, so was very straightforward to integrate into the Sirocco platform, and the engineers from Tecan Australia were very helpful during this process."

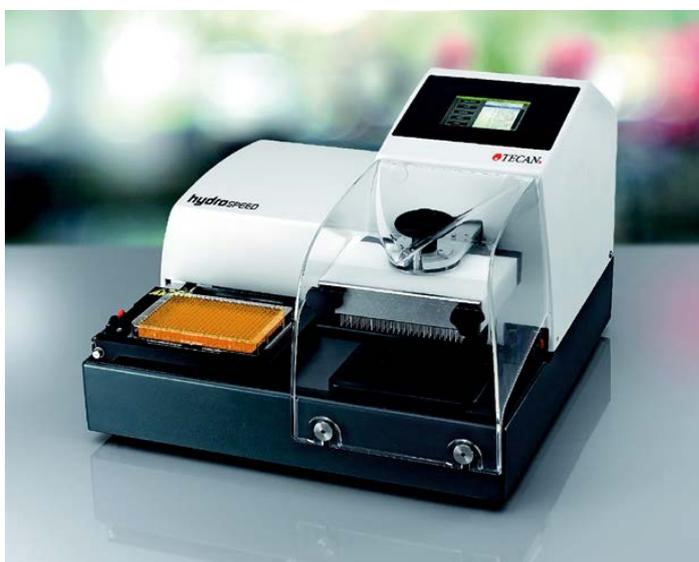
Following the successful trial integration of the HydroSpeed into the Sirocco platform, the Genera Biosystems team now plans to develop a fully automated diagnostics platform that offers complete automation of the assay. "Our aim is to create a streamlined, compact and user-friendly automated system that offers walkaway automation of the entire process, simply requiring the patient sample to be loaded onto the instrument. This will lower the risk of pathogen exposure for users, and minimize the risk of erroneous results, with potential benefits for both clinical laboratories and patients around the world. The Tecan team has always been positive and supportive of our automation efforts, and we are confident that their expertise will help us to develop this next generation of our automated system," Karl concluded.

To find out more on Tecan's HydroSpeed washer, visit www.tecan.com/hydrospeed

To read more about Genera Biosystems, go to www.generabiosystems.com



Precise control over wash parameters ensures high retention rates for AmpaSand beads



The HydroSpeed offers precise control over critical wash settings