

Automation helps enhance diagnostics protocols

The Molecular Biology Department at Colombia's Laboratorio Clinico Medico Colcan is using a Freedom EVO® 150 liquid handling platform to automate its nucleic acid extraction and real-time PCR protocols, offering increased flexibility and helping to improve sample throughput.



Laboratorio Clinico Medico Colcan, a private laboratory in Bogotá, Colombia, provides a broad range of diagnostic services to clinical laboratories, hospitals, clinics and individual patients across the country. Tecan instruments feature across the laboratory, and include a Genesis FE500 for pre-analytical sample preparation, a Freedom EVOlyzer®, a Sunrise™ plate reader and a HydroFlex™ plate washer for ELISAs and, in the Molecular Biology Department, a Freedom EVO 150 for automated nucleic acid extraction and real-time PCR reactions. Scientific Advisory Specialist Mauro Rodríguez discussed the automation of the department's molecular diagnostic procedures on the Freedom EVO 150: "We perform a variety of molecular diagnostic tests for different pathogens and conditions, including HIV, hepatitis B, human leukocyte antigen (HLA) B27, mycobacteria, herpes, HPV, CMV and mutation of the coagulation factors II and V genes. Currently, many of our sample preparation protocols are run on a commercially-available platform, which is a closed system. This means that the protocols cannot be modified, and the system can only run certain kits specified by the manufacturer; other assays must be performed manually. To enable automation

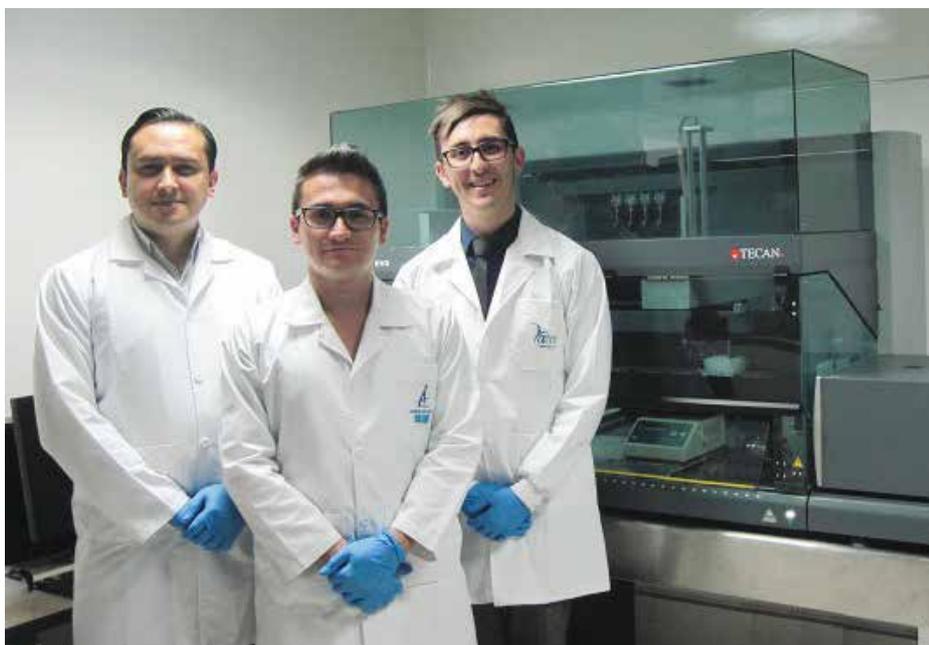
of all our molecular testing protocols, we invested in an open architecture Freedom EVO 150, giving us the flexibility to run a range of chemistries from different companies."

Ignacio Hernández, Specialist, took up the story: "We use a range of Promega kits on our existing molecular diagnostic system, and these acted as controls for the Freedom EVO validation study. Extraction protocols for the different chemistries were run on both automated systems and the purity and concentration of the extracted nucleic acids compared. The Freedom EVO was also compared to our manual assays, ensuring that the automated procedures were as effective – or better – than these processes. This enabled us to develop and standardize automated procedures for the isolation of DNA on the Freedom EVO system. We now analyze around 350

samples a week on the Freedom EVO, isolating purer, more concentrated nucleic acid samples with fewer contaminants, helping to improve the quality of downstream amplification and analysis. We have also automated our real-time PCR procedures, and plan to introduce a number of end-point PCR protocols."

Ignacio continued: "Implementation of the Freedom EVO in our laboratory was fast and straightforward; the software is easy to use and it fits perfectly into our workflow. Its open architecture provides more flexibility for our work – we can modify the volume of samples, emulsions and reagents, as well as incubation times and other parameters affecting the concentration and purity of the isolated DNA – allowing us to optimize our protocols, which we cannot do on a closed system. For example, we perform

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Mauro Rodríguez, Miguel Rios and Ignacio Hernández with the Freedom EVO platform



HLA B27 analysis using a combination of PCR amplification and gel electrophoresis, which requires high concentrations of very pure genetic material. By doubling the initial sample volume, we can generate a much higher concentration of nucleic acids without affecting the purity, maximizing the likelihood of successful PCR and electrophoresis for better quality, more reliable results.”

Mauro concluded: “We chose the Freedom EVO for its quality, and because it could meet the laboratory’s needs in terms of speed of processing, sample throughput and performance. Another benefit is that the maintenance requirements are minimal. Automation enables samples to be aliquoted, contributing to improved sample set-up times, and the overall extraction procedure is much more rapid. It also helps to prevent manual errors occurring during the pre-analytical process, decrease the risk of contamination during extraction and, with the Freedom EVO’s PosID™ Positive Identification System, sample traceability and process security are guaranteed. The system is very user friendly and easy to program, offering infinite possibilities for our assays.”

To find out more on Tecan’s genomics solutions, visit www.tecan.com/clinicaldiagnostics

To find out more about Laboratorio Clinico Medico Colcan, visit www.laboratoriocolcan.co



A Genesis FE500 provides automated pre-analytical sample preparation



The Freedom EVO offers walkaway automation of nucleic acid extraction and real-time PCR protocols