

An alternative approach to prenatal testing



Genetic screening is used during pregnancy to look for hereditary conditions due to a chromosomal abnormality – such as Down’s syndrome – or changes in the DNA sequences, and typically involves an invasive amniocentesis procedure. Yourgene Health, an international molecular diagnostics group, has developed an automated, non-invasive alternative, for more accurate and safer prenatal screening.

Yourgene Health, headquartered in Manchester, UK, was set up in 2013 as a non-invasive prenatal testing (NIPT) company. Since then, it has grown into a global molecular diagnostics company with additional laboratories in Taiwan and offices in Singapore, Canada and the USA. It has also expanded its services and products

to include oncology, precision health and infectious diseases, as well as reproductive health tools. Today, it has a worldwide customer base that includes healthcare professionals and clinical laboratories, as well as product development projects with biotech and diagnostic companies. Joanne Cross, Director of Marketing,

explained: “We offer a range of molecular diagnostics products and services based on NGS and PCR technologies – chosen according to the level of detail that the application requires and how rapid the test needs to be – supported by an active new product development pipeline.”



The Yourgene SP150 is based on Tecan’s Freedom EVO platform

Joanne continued: “One of our flagship products is the IONA® test, which offers a more accurate and safer way to screen for trisomies 21 (Down’s syndrome), 18 (Edwards’ syndrome) and 13 (Patau’s syndrome) than amniocentesis. Healthcare providers can send samples to us for analysis, or clinical laboratories can set up the workflow in house and perform the test either manually with a three-day turnaround time, or in two days using our recently launched automated solution, the CE-IVD IONA Nx NIPT Workflow; they have the flexibility to choose whichever workflow best suits their specific needs.”

Automation Team Leader Sarah Zheng takes up the story: “The Yourgene SP150 was only launched in September, and is integral to the IONA Nx NIPT Workflow. It is based on a Freedom EVO® 150 workstation with an Air Liquid Handling Arm™ and a Robotic Manipulator Arm™, and is equipped with plate hotels, an automated thermocycler, temperature control, a shaker, a magnetic separator and a barcode scanner. The workflow begins with the extraction, amplification and library preparation of DNA from a maternal plasma sample on the SP150. Tubes are placed on the deck and the barcodes scanned to register the sample information, which is transferred to the system’s front-end Workflow Manager and the LIMS. DNA is extracted using magnetic bead-based technology, a process that can be run overnight; by the morning, a microplate containing the extracted DNA stored at 4 °C is ready for amplification and library preparation. This walkaway automation is a real advantage for the lab. Quantification and enrichment of the fetal DNA is then performed on the Yourgene QS250 instrument in a 384-well format, after which downstream NGS is carried out

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on an Illumina NextSeq™ system. At the end of the process, the data is automatically analyzed with the IONA software and a report generated. The whole process takes two days, compared to three days manually.”

When you are developing a new platform, you need a reputable supplier with global coverage who is prepared to work closely with you, and the feedback from the Yourgene team was that Tecan engaged much more enthusiastically than other providers during the technology and the supply evaluation phase. “The design phase was led by Yourgene, with valuable input from Tecan’s technical experts to customize the system for our workflow, and we developed the majority of the scripts in house. One of the advantages of the Freedom EVO is its open application programming interface, as this gives you a lot of potential to develop a fully integrated system, with complete traceability when combined with a LIMS,” said Sarah.

“Reliability is important, and Tecan has a global supply and support network. We have customers all over the world, and do our own first line technical support, including installation of the whole workflow in the customer’s lab and training the staff. We needed a

platform that was easy to integrate into the IONA Nx NIPT Workflow and intuitive to train people up on. Whereas our previous IONA workflow on the Ion Torrent™ sequencing system required two instruments for the DNA extraction, the SP150 replaces both systems, allowing everything to be done on a single platform. The smaller footprint means that the system takes up far less space in the lab and customers have just one service contract, which is a great benefit. Overall, the platform has transformed this workflow, increasing efficiency and saving time. The system can currently process up to 48 samples per sequencing run in 96-well format, but we are already looking into developing an enhanced version that will significantly increase this throughput to suit even more users’ needs,” Joanne concluded.

To find out more about Tecan’s OEM and partnering services, visit partnering.tecan.com/synergence

To learn more about Yourgene Health, go to www.yourgene-health.com