Automating advances in medical technology

Scientists at the Biodesign Institute Center for Innovations in Medicine have increased their sample throughput and improved inter-assay variation using Tecan's HS 4800™ Pro microarray hybridization station.

Researchers at the Center for Innovations in Medicine, part of the Biodesign Institute at Arizona State University, US, are focusing on the development of new technologies to help improve human health through advances in medical diagnostics and the prevention and treatment of disease. Postdoctoral researcher Bart Legutki explained: "I am primarily interested in infectious diseases and the early detection of breast cancer. We are using peptide microarray techniques to study proteomics, and have an extensive custom-synthesized peptide library consisting of random sequence peptides. This provides an even distribution across all the possible sequences available, with a very unbiased mix. These peptides have no similarities to mammalian, bacterial or viral proteins, but do show interesting mimotope-like properties. We use a commercial grade microarray printer that allows us to print hundreds of microarrays per week to screen patient samples. As we began to investigate larger patient populations we found that manual processing introduced too much inter-assay variation and was time consuming, and so we looked for a more high throughput system that would alleviate these problems."

"We needed a system capable of handling anything from 12 to 100 arrays a day. At the time, most systems could only cope with four to eight arrays per run. We evaluated the HS Pro in our laboratory for a month using well-characterized human sera, obtaining very reproducible data, and we really liked the layout and operation. We purchased our main system in November 2009. It is now in routine use, and we plan to add another module fairly soon to increase our throughput even more."

Bart concluded: "We currently perform about 24 arrays a day – but could run 36 with shorter protocols – and we aim to increase our throughput to around 100 arrays a day soon. The HS Pro has eliminated operator-to-operator variability – allowing us to have multiple users working on our samples with one person starting a run and another person finishing it – and generates better data overall. Our scientists now have more time to perform other duties, such as data analysis, which we think will be very beneficial as we perform larger studies with more samples. The HS Pro is certainly helping to increase our productivity, and we were recently able to open our Peptide Array Core. Without the HS Pro we wouldn't have nearly enough capacity to process so many samples."

The HS Pro in use at the Biodesign Institute Center for Innovations in Medicine

Photos courtesy of Joseph Caspermeyer

To find out more on Tecan's HS 4800 Pro, visit **www.tecan.com/hs4800**

To find out more about the Center for Innovations in Medicine, visit **www.biodesign.asu.edu/research/research-centers/innovations-in-medicine**