

A more powerful approach to biomarker discovery

SomaLogic is using its unique proteomics technology - the SOMAscan® assay - to help identify new biomarkers for a wide range of disease states. Capable of simultaneously measuring thousands of proteins in low volume biological samples, this technique is ideal for the detection of low abundance proteins, perfectly complementing existing technologies for basic science, biomarker discovery and pharmaceutical research.



Biomarker discovery is now at the forefront of medical, diagnostic and drug discovery research, helping to provide greater insight into many diseases and identify new therapeutic targets. The size and complexity of the human proteome makes the identification of disease-specific protein biomarkers both difficult and time consuming, requiring quantitative analysis of thousands of individual proteins in complex biological matrices such as serum, plasma and cell lysates. A wide range of proteomic methods have been developed to offer multiplexed measurement of a broad spectrum of protein analytes, with mass spectrometry emerging as a front runner. However, many of these techniques offer poor sensitivity for low abundance proteins - requiring extensive depletion steps to access any proteins in the lower end of the dynamic range - have highly limited sample throughput, and reproducibility that disallows detection of smaller signals.

Colorado-based life sciences company SomaLogic has developed a unique technology allowing the measurement of a broad range of protein concentrations in small sample volumes, complementing existing techniques and providing improved measurement of low abundance proteins. Dr Tim Bauer, Associate Director at SomaLogic, explained: "Our technology - the SOMAscan assay - converts a protein concentration into a DNA concentration,

allowing precise quantification using standard DNA measurement techniques. Using our specialized SOMAmer® reagents, this approach enables us to translate a difficult protein quantification problem into a far easier, more reproducible and widely accessible quantitative DNA analysis. Our current version of the SOMAscan assay is able to measure over 1,300 separate protein analytes, over eight logs of dynamic range, in just 65 µl of sample, and can be performed using various biological matrices - including serum, plasma, cell supernatants and cell, tissue or organ lysates."

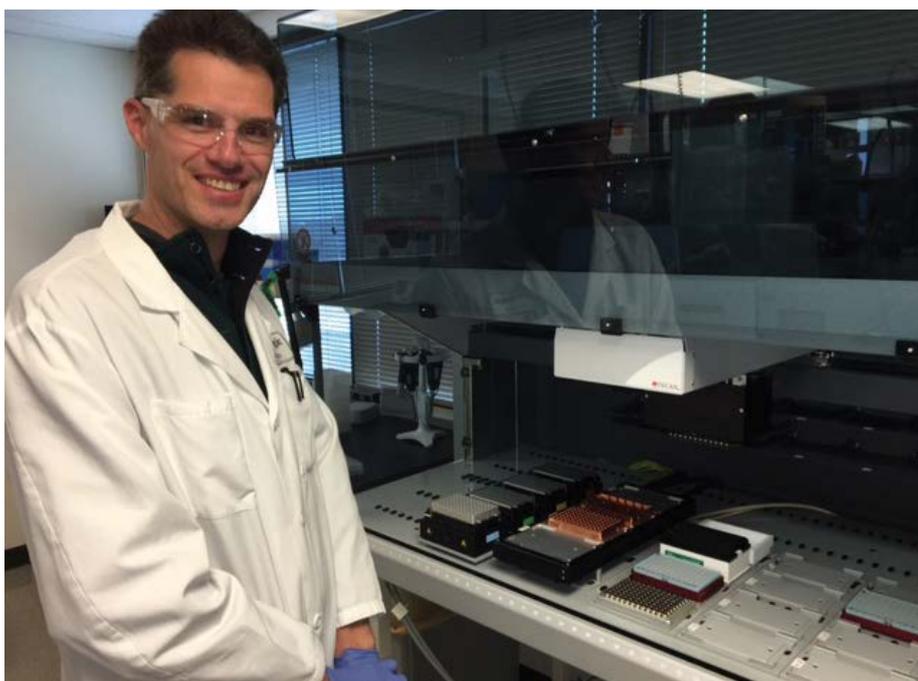
“Automation has more than tripled the throughput of the SOMAscan assay, and the team here is now working with Tecan and our field application specialists to make it even quicker and easier to run.”

Throughput is a key consideration for any biomarker discovery workflow, particularly for the pharmaceutical sector, requiring effective and reproducible liquid handling to ensure accurate results. Dr Stephan Kraemer, Director of Assay Execution, commented: "When we first developed the SOMAscan assay in a microplate format, we were running it manually. Three technicians needed to stand side-by-side, pipetting in parallel to

achieve the necessary throughput. It was clear that automation was the way forward, making it easier and more reliable to perform the assay with fewer people. We initially automated the workflow using a liquid handling system with two 96-channel pipetting arms, but this platform was incompatible with the SELEX (systematic evolution of ligands by exponential enrichment) process used to design our SOMAmer reagents, which required independent control of each pipetting channel. We wanted to be able to run both workflows on a single platform, and chose the Freedom EVO® system based on its very high

flexibility and the ease with which we could configure the instrument for different processes."

"We selected the Freedom EVO 200 because of the large number of reagents, assay plates and devices - including two Te-VacSTM modules and four shakers (Q.Instruments) - which needed to be fitted onto the workdeck," Stephan continued. "The system also has both an eight-channel Liquid Handling Arm,



Dr Stephan Kraemer with one of SomaLogic's Freedom EVO platforms

allowing independent control of individual pipetting channels, and a MultiChannel Arm™ (MCA) for simultaneous pipetting into all 96 wells of an assay plate. This gives us the flexibility to perform either the SOMAscan assay or the SELEX target identification workflow on the same instrument, or to run both together.”

Tim added: “Since introducing our first Freedom EVO platform, we have purchased three additional, almost identical systems, and we are very happy with both the precision and robustness of the instruments. Now that we have established our automated workflows in house, we are working with Tecan to optimize and place instruments using the same configuration at customer sites around the world, initially focusing on human serum and plasma samples. This will allow customers to run more samples much more quickly, without

the logistical challenges of shipping their samples to us for analysis. The use of standardized protocols should also allow direct comparisons of results between sites.”

“We have only recently placed the first instruments with customers, but the feedback we have received so far has been very positive. Automation has more than tripled the throughput of the SOMAscan assay, and the team here is now working with Tecan and our field application specialists to make it even quicker and easier to run,” Stephan concluded.

To find out more about Tecan's protein science solutions, visit www.tecan.com/proteinscience

To learn more about SomaLogic, go to www.somallogic.com