Powering Proteomics

The proteomics field is enabling researchers to find disease biomarkers for both diagnostics and therapeutic targets — and is growing fast. SomaLogic is helping the field reach its potential with a unique platform for measuring protein levels: the SomaScan® Assay, based on Slow Off-Rate Modified Aptamers (SOMAmer® reagents). The SomaScan Assay provides 7,000 highly reproducible measurements of circulating proteins from a single sample of plasma, serum, urine, or a variety of other sample types. Read on to find out how SomaLogic intends to revolutionize precision medicine.

Click the circles to navigate

EXPLORING THE HUMAN PROTEOME

Founded in 2000, SomaLogic – powered by an industry-leading technology platform and one of the largest clinical proteomic databases in the world – is a global leader in proteomics.

The SomaScan Assay uses proprietary aptamer-based technology to offer a number of benefits, including the following.

- High throughput protein profiling through a scalable system of robotics. Today, we can assay over 1,000 clinical samples per day.
- Sensitivity. The tiered approach used for SomaScan Assay measurements enables the detection of very rare proteins consistently without sample pre-treatment.
- Largest high throughput menu on the market.
- Reproducibility. Because the SomaScan Assay has coefficients of variation under 5 percent, many fewer samples need to be run than using other technologies, saving time and money.
- Specificity. While most protein assays rely on polyclonal antibodies, which are highly variable, the SomaScan assay is powered by SOMAmers, which are individually selected for exquisite specificity to target proteins.
- Dynamic range. The SomaScan Assay is not subject to bias for high abundance proteins, and faithfully measures throughout a 10-log concentration range.

Our technology platform profiles proteins for disease specific research and biological discovery, providing the flexibility researchers require – to either cover a broad range or simplified panels to focus on disease-specific proteins. In other words, it's proteomics your way.

We boast industry-leading reliability metrics that include higher sensitivity, specificity, and reproducibility, with coefficients of variation less than five percent. Our assays utilize small sample volumes and deliver high-quality data to accelerate your research.
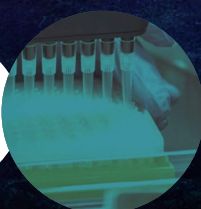
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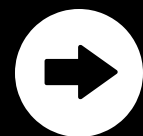Harnessing the power of proteomics

INTRODUCING THE SOMASCAN ASSAY

The SomaScan Assay from SomaLogic is the only proteomic technology capable of measuring rapidly (high throughput), broadly (thousands of proteins simultaneously), and deeply (high-and low-abundance proteins), and with a dynamic range of 10 logs, which can be measured from just 55 µl of plasma or serum. Our platform is a highly multiplexed, sensitive, and reproducible proteomic tool for discovering previously unidentified biomarkers for drug discovery, pre-clinical and clinical drug development, and clinical diagnostics across a wide range of important diseases and conditions.

The current version of the SomaScan Assay measures approximately 7,000 unique human protein analytes in small volumes of biological samples. The assay was developed for performance in human serum and plasma and offers exceptional dynamic range, quantifying the relative levels of proteins in plasma that span 10 logs in abundance with excellent reproducibility.

Enabling the technology are protein-capture reagents called SOMAmer (Slow Off-rate Modified Aptamer) reagents. SOMAmer reagents consist of short single-stranded DNA sequences that incorporate hydrophobic modifications, greatly expanding the physicochemical diversity of the large randomized nucleic acid libraries from which the SOMAmer reagents are selected.

The SomaScan Assay has been applied successfully to biomarker discovery and validation in many pharmaceutical research and development projects, diagnostics discovery and development projects and academic research projects.
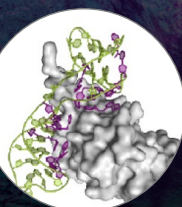
THE SOMASCAN ASSAY'S CUSTOM AND DISEASE-SPECIFIC PANELS

The SomaScan Assay is available for full analysis of 7,000 proteins or in both custom and disease-specific panels. SomaScan custom panels allow you to curate a subset of proteins to study while preserving the ability to get data on the full menu at a later date and cover 1-1,500 analytes. But there's also the option to unlock all 7,000 analytes by reserving the opportunity to request the additional data from samples that have already been analyzed. The SomaScan custom panels are fully automated, so the assay is ready to run as soon as you select your targets.

SomaLogic offers panels focusing on a specific area of disease, or a key biological process. They cover:

- Respiratory (627 analytes)
- Neuroscience (1,316 analytes)
- Cytokines (168 analytes)
- Inflammation and immune response (938 analytes)
- Cardiovascular disease (953 analytes)
- Metabolic diseases (890 analytes)
- Oncology (863 analytes)
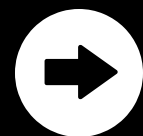
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Take advantage of a pioneering platform
that opens new doors to discovery

WHAT ARE SOMASIGNAL TESTS?

The SomaSignal tests are developed by analyzing thousands of proteins in thousands of patients using the SomaScan Assay. Machine learning is used to interrogate these protein signatures alongside standard clinical measurements from the same patients in order to identify patterns of protein changes that correlate with current and future health status. Each comprehensive dataset is developed into a model that becomes the basis for a specific SomaSignal test, which provides output data in the same measurement units in which the test was trained, for example resting energy rate in calories/day. Because each SomaSignal test is generated using a subset of the 7,000 proteins measured by the SomaScan Assay, results for all of the SomaSignal tests can be derived from a single 55-µl serum/plasma sample.

The SomaSignal tests are clinically meaningful metrics derived from just a 55-µL sample for simple, straightforward clinical insights.
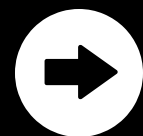
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CLICK TO LEARN MORE about the tests and what disease areas are represented

WEBINAR: Liquid health check – plasma protein patterns as comprehensive indicators of health

WEBINAR: The liquid liver biopsy – characterizing NASH and NAFLD with serum protein biomarkers

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THE SOMASCAN ASSAY IN ACTION: CARDIOVASCULAR DISEASE

As the leading cause of death in the United States and worldwide, cardiovascular disease (CVD) includes a family of diseases that affect the heart and blood vessels.

Since its initiation in 1948, the Framingham Heart Study has identified measurable elements or characteristics that are associated with the occurrence or prediction of CVD, collectively termed risk factors. Classic risk factors associated with CVD include conditions like hypertension, hyperlipidemia, and diabetes, yet many individuals with CVD do not present with any of the classic risk factors. There is thus a substantial need to identify biomarkers that complement existing clinically relevant indicators.

Circulating proteins offer a promising source for CVD biomarkers as proteins associated with atherosclerosis and myocardial fibrosis are released in blood. To this end, multi-protein biomarker panels have been employed to study whether prediction of risk for CVD can be improved using discovery and known target-based proteomic assays with mass spectrometry. However, mass spectrometry-based approaches suffer from bias towards more abundant proteins. This is a particularly important obstacle considering that the human blood proteome is estimated to consist of thousands of protein molecules, many of which are pathologically relevant to CVD but are present in very low abundance (nanomolar range or less). Similarly, multiplexing of antibody-based assays for capture and detection of targets is limited by cross-reactivity.

The SomaScan Assay overcomes the limitations of poor detection resolution and non-specificity by using SOMAmer reagents, short oligonucleotides that can bind to proteins with high sensitivity and specificity over a 10-log dynamic range. The SomaScan Assay is thus an unbiased multiplex approach for detecting novel blood biomarkers that can shed light on causal disease pathways and help stratify individuals for prognostic and predictive purposes. There are more than 25 publications in which the SomaScan Assay was used to probe cardiovascular disease to date.

LINKS

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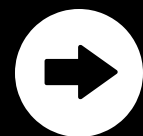Detection of low-abundance serum proteins associated with cardiovascular diseases for prognostic purposes

THE SOMASCAN ASSAY IN ACTION: PQTL ANALYSIS

Genomes pack in quite a bit information. The understanding about how biological pathways work in concert and contribute to our health or health trajectory can be broadened by extracting useful information from it.

With advances in proteomics, we are now learning more information than could ever be gleaned from genomics alone. We have evolved beyond traditional methods for measuring a limited number of proteins to new technologies with greater capabilities for protein profiling and biomarker discovery in disease research and development. Coupled with high content data analysis researchers are now efficiently generating both genomic and proteomic data to analyze large data sets and discovering new correlations and insights between the genome and proteome at a molecular level in health and disease.

For example, it is now feasible to search for genetic variants in a population that influence how much of a particular protein is made. If a dose response is seen with a set of genetic variants, then that location on the chromosome is considered a protein quantitative trait locus (pQTL). Finding these pQTLs, which can include protein single nucleotide polymorphisms (pSNPs), may be the best approach for translating the deluge of genetic information into meaningful biological insights.

Yet, the quality of pQTLs is hugely dependent on the quality of proteomic technology used to find them. The SomaScan Assay offers the quality and ability to deliver the data needed to find pQTLs that decrypt the genome.

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pQTL Analysis: the latest tool in disease research
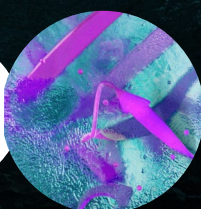
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THE SOMASCAN ASSAY IN ACTION: NEURODEGENERATIVE DISEASES

Alzheimer's disease (AD) and related dementias affect more than five million Americans, with roughly 13.9 million older Americans predicted to be diagnosed with dementia by the year 2060. While genomics research has provided some understanding of disease risk, translational research using a multiomics approach is needed to determine biomarkers and therapeutic targets.

Proteomics – the largescale study of protein expression and dynamics in healthy individuals and those in different stages of neurologic disease – can improve the understanding of disease pathology and guide the development of predictive models, diagnostics, and future treatments. In recent years, blood plasma proteins have emerged as promising biomarkers of early disease and disease progression and may help identify pathways of therapeutic interest.

The SomaScan Assay offers a highly sensitive method of quantifying proteins in different biologic fluids such as serum, plasma, urine, and CSF. It is uniquely poised to help researchers measure 7,000 proteins (or a relevant customized subset) over a 10-log dynamic range in small volumes of different sample types.
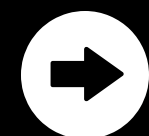
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The SomaScan Assay enables discovery of blood-based biomarkers in neurodegenerative diseases
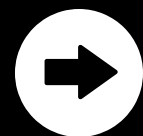
ASSESSING PRE-ANALYTICAL VARIATION FOR MORE ACCURATE ANALYSIS

What is pre-analytical variation? Differences in collection, handling, and storage can lead to sample variation, which can affect many analyses in proteomics. Identifying these variations is essential to help identify skewed data and avoid misleading analyses. That's why SomaLogic developed SomaSignal Tests for Pre-Analytical Variation.

SomaSignal Tests for Pre-Analytical Variation provide an assessment of sample variation, enabling identification of impacted measurements and allowing you to account for these variations where necessary. These tests may help minimize the impact of pre-analytical variation when preparing samples for protein assays by identifying, characterizing, and helping manage the impact pre-analytical variation can have on research data.

LINKS

FIND OUT MORE ONLINE
Assessing pre-analytical variation for more accurate proteomic analysis

WHAT YOU CAN EXPECT

SomaLogic prides itself on being flexible and customizable for each client's needs. We offer options to access our full menu of 7,000 protein analytes as well as pre-set disease-focused panels to study proteins most relevant to a particular disease space. Or, design your own panels with just the proteins you are interested in.

"We are using all major proteomics approaches including antibody-based and MS-based methods in addition to SomaScan because of their complementarity. SomaScan stands out, however, with the largest coverage of plasma proteome, no sensitivity limitation, excellent reproducibility/precision, and impressive throughput" – Customer Response to Tech Validate Survey

Through our Life Sciences Customer Portal, we now offer the ability to perform exploratory statistical analysis, and create customizable graphs by combining your SomaScan Assay results and clinical data. We also provide data files so you can use your tool of choice for analysis and visualization, the ability to track status and details about all your studies in one place, and quick links to additional resources and customer support – any time you need it.
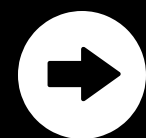
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