Seer Showcases Scalable Proteomic Advancements Impacting Alzheimer's, Population Health, and Xenotransplantation at HUPO 2024

October 21, 2024

Seer's Proteograph™ Product Suite reveals new insights into Alzheimer's pathways, drives population-scale plasma analysis, and captures immune dynamics in xenotransplantation—with additional breakthrough research from collaborators advancing proteomic discovery at scale

REDWOOD CITY, Calif., Oct. 21, 2024 (GLOBE NEWSWIRE) -- Seer, Inc., (Nasdaq: SEER), a leading life science innovator shaping the future of proteomics, is set to present significant advancements at the 23rd Human Proteome Organization (HUPO) World Congress in Dresden, Germany, from October 20-24, 2024. As a HUPO sponsor, Seer will showcase novel findings that are driving the adoption and expansion of proteomic science, demonstrating the unique power of its Proteograph™ Product Suite to accelerate proteomic research at scale.

Seer's foundational technologies redefine how the research community approaches proteomic analysis, making it possible to tackle complex biological questions with an unprecedented level of depth, scalability, and efficiency. By automating key processes and compressing the dynamic range of the proteome, Seer's solutions empower researchers to generate meaningful insights into human health and disease, which are essential for personalized medicine, biomarker discovery, and population health studies.

"The advanced research being presented this week is the latest in a rapidly growing body of evidence demonstrating how the Proteograph Product Suite is empowering researchers to generate deep, unbiased proteomic data at a speed and scale previously unattainable," said Omid Farokhzad, CEO and Chair at Seer. "We're at the leading edge of innovation to provide researchers with the tools they need to understand complex biology at a molecular level, driving the field toward transformative breakthroughs in precision medicine."

Highlights from Seer at HUPO 2024:

Alzheimer's Disease: Exploring Genetic Influence with Unbiased Proteogenomics to Uncover Unexpected Disease Pathways

Title: *Understanding the Impact of Genetic Variants on Alzheimer's Disease with Mass Spectrometry Proteogenomics*
Presenter: Harendra Guturu
Date & Time: October 23, 13:00 (Poster Session P-III-1031)

Leveraging Seer's Proteograph XT, this study analyzes almost 1,800 plasma samples from 1,005 participants of the Massachusetts General Hospital Alzheimer's Disease Cohort, exploring the connection between genetic variants and proteomic alterations associated with Alzheimer's Disease. By combining mass spectrometry-based proteomics and Mendelian randomization, this analysis uncovered 138 differentially abundant protein groups between healthy and Alzheimer's-affected individuals, pinpointing possible causal pathways linked to disease progression. This approach demonstrates how Seer's platform facilitates comprehensive coverage and effectively correlates genetic and proteomic data, providing an unbiased exploration of complex diseases. This research advances the understanding of systemic factors in Alzheimer's, potentially revealing new biomarkers and therapeutic targets that targeted methods might overlook.

Population Health Studies: Achieving Population-Scale Plasma Proteomics with Novel Speed and Depth to Drive New Discoveries

Title: *Empowering Robust Population-Scale MS Plasma Proteomics Studies with Nanoparticle Enrichment*
Presenter: Lee Cantrell
Date & Time: October 21, 13:15 (Poster Session P-I-0212)

Seer's Proteograph XT was applied in a population study involving 1,600 plasma samples, combining nanoparticle enrichment, plate-based automated preparation, and MS measurements to achieve significant depth at scale. With over 8,100 protein groups identified and processing throughput reaching 40 samples per day, the cloud-based DIA-NN integration accelerated data analysis up to twenty times faster compared to standard computational frameworks. By compressing the dynamic range of plasma proteins and enhancing peptide diversity, this workflow circumvents typical bottlenecks like manual fractionation and depletion, delivering higher coverage with minimized handling time. This capability is particularly valuable for discovery proteomics researchers looking to generate biological insights efficiently, offering significant gains in both depth and throughput.

Whole Blood Microsampling: Extending Accessibility of Proteomics through Novel DBS Analysis for Comprehensive Biomarker Studies

Title: *Advancement in Nanoparticle-Based Proteomic Analysis of Whole Blood Obtained from Various Dried Blood Spot Collection*

Devices
Presenter: Maik Pruess
Date & Time: October 21, 13:15 (Poster Session P-I-0165)

This study focused on proteomic analysis using dried blood spot (DBS) samples, a method enabling less invasive sampling with broader clinical applications. The integration of Seer's nanoparticle enrichment improved the number of proteins detected—from approximately 1,000 to up to 3,000 when compared to conventional direct processing methods. The approach demonstrated low variability across subjects (CV <10%) and illustrated the applicability of Proteograph XT for large-scale studies involving minimal sample volumes. By combining DBS with nanoparticle enrichment, researchers are enabled to conduct in-depth proteomic analysis from minimal samples, which is key for early biomarker discovery. This approach facilitates a more inclusive and accessible model for proteomic research compared to traditional methods, supporting innovation at both individual and population scales.

Xenotransplantation: Capturing Immune Dynamics with Ultra-Deep Longitudinal Profiling for Novel Insights in Transplant Research

Title: *Ultra-Deep Longitudinal Profiling of Plasma and Serum Proteome Provides Critical Insights into the Interaction of Human Organism and Pig Xenotransplants*
Presenter: Alexey Stukalov
Date & Time: October 22, 11:05 (Oral Presentation OP-43)

In a pioneering study of xenotransplantation performed with collaborators at multiple high-profile research institutions, Seer's Proteograph XT was used to perform ultra-deep profiling of plasma and serum proteomes from recipients of genetically modified pig organs. The integration of Proteograph XT with advanced LC-MS workflows (Thermo Scientific™ Orbitrap™ Astral™ MS) enabled comprehensive identification of both human and pig proteins over a period of 61 days, including over 100,000 peptides. This provided a detailed view of immune system responses, complement system dynamics, and physiological adaptation in real-time. For researchers focused on human health and organ transplantation, this study highlights Seer's platform's ability to support deep longitudinal sampling and comparative proteomics, facilitating the identification of biomarkers and immune responses important to advancing xenotransplantation and immunological research.

Highlights from External Collaborators and Customers Utilizing Seer's Proteograph Product Suite

Respected organizations from around the world are presenting research at HUPO 2024 that utilized Seer's Proteograph platform, demonstrating its versatility and value across different proteomic studies. These collaborations highlight Seer's role as a key enabler in bridging discovery proteomics and clinical applications. Collaborators leverage Seer's platform for a range of studies from drug discovery to preclinical models, reinforcing the Proteograph Product Suite's effectiveness in generating deep and unbiased insights across diverse contexts. These posters reflect how Seer's technology enhances sensitivity, scalability, and depth of proteomic workflows.

External Presentations:

1. **Stanford University**
    - **Keynote Lecture**: *Disrupting healthcare using deep data and remote monitoring*
    - **Presenter**: Michael Snyder
    - **Section/Session**: New technologies for large scale proteomics
    - **Date & Time**: October 23, 10:15 (Conference Room 1-2)

2. **Evotec**
    - **Title**: *Nanoparticle-based proteomics analysis of human biofluid samples from different patient cohorts*
    - **Authors**: Carleen Kluger, Giada Marino
    - **Date & Time**: October 21, 13:15 (Poster Session P-I-0363)

3. **Thermo Fisher Scientific** (Poster 1)
    - **Title**: *Unveiling Hidden Depths: A High-Throughput Plasma Proteomics Workflow on Orbitrap Astral Mass Spectrometer for Enhanced Biomarker Discovery*
    - **Author:** Amirmansoor Hakimi
    - **Date & Time**: October 21, 13:15 (Poster Session P-I-0124)

4. **Thermo Fisher Scientific** (Poster 2)
    - **Title**: *An In-Depth and High Throughput Plasma Proteomics Workflow Powered by Orbitrap Exploris 480 Mass Spectrometer Using Multi Nanoparticle-Based Workflow*
    - **Author:** Julian Saba
    - **Date & Time**: October 22, 13:00 (Poster Session P-II-0661)

5. **Inserm (French National Institute of Health and Medical Research)**
    - **Title**: *In-Depth Analysis of the Plasma Proteome: Are We Enriching Extracellular Vesicles, Platelets, or Soluble Proteins?*
    - **Author**: Ida Chiara Guerrera

- **Date & Time**: October 21, 13:15 (Poster Session P-I-0331)

6. **Seoul National University**
   - **Title**: *Discovery of Plasma Biomarkers in Dogs Afflicted with Mammary Gland Tumors through Proteograph Analysis*
   - **Author**: Jeong-Woon Lee
   - **Date & Time**: October 22, 13:00 (Poster Session P-II-0604)

7. **Ted Rogers Centre for Heart Research**
   - **Title**: *Comprehensive Plasma Proteomics in Heart Failure Patients: Findings and Future Directions*
   - **Author**: Uros Kuzmanov
   - **Date & Time**: October 23, 13:00 (Poster Session P-III-1048)

8. **Oregon Health and Science University (OHSU)**
   - **Title**: *Study of Fundamental Biological Determinants of the Plasma Proteome Using Proteograph™ Rise and Murine Models*
   - **Authors**: Mark Flory and Matthew Chang
   - **Date & Time**: October 23, 13:00 (Poster Session P-III-0938)

Seer's contributions at HUPO 2024 are reflected not only in its research but also in the adoption of its Proteograph Product Suite by leading academic and industry groups. The broad array of external studies showcases the applicability and value of Seer's technologies in advancing proteomics research, enriching understanding, and pushing the frontiers of biological analysis.

About Seer:

Seer is a life sciences company developing transformative products that open a new gateway to the proteome. Seer's Proteograph Product Suite is an integrated solution that includes proprietary engineered nanoparticles, consumables, automation instrumentation and software to perform deep, unbiased proteomic analysis at scale in a matter of hours. Seer designed the Proteograph workflow to be efficient and easy to use, leveraging widely adopted laboratory instrumentation to provide a decentralized solution that can be incorporated by nearly any lab. Seer's Proteograph Product Suite is for research use only and is not intended for diagnostic procedures. For more information, please visit www.seer.bio.

For more information, please visit Booth #20 at HUPO 2024 or contact us at pr@seer.bio.

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