

Product Focus - Proteins and Biomarkers: Technologies Integrated: Proteomics Enabled

Recent new product round ups have concentrated on the mass spectrometry hardware developed for proteomics and biomarker applications. There is a marked difference in the new products that are now coming onto the market. These focus on accessories to make analyses quicker and easier, enabling technologies that combine to create an integrated solution and software that enables label-free quantitation and microarrays. These innovations have been designed to create easier and more effective analyses using existing mass spectrometers. Chris Hebel, vice president of business development at LC Sciences comments: "A broad range of biomarkers based on disease-based pathways, transcriptome regulation/modifications and known genomes of infectious viruses and pathogens requires integrated technology platforms that can transform information into clinical tests, biosensors, bedside medical devices and many other advanced medical products."

Platforms

As the field of modern proteomics develops it is essential to have a platform that facilitates effective analyses. **Sage-N Research** has combined industry-leading proteomics technologies into the Sorcerer Platform. Comprising the SEQUEST 3G search engine and a range of additional proprietary post-processing tools, these technologies enable the most accurate and sensitive identification and characterization of low abundance phospho-proteins and post-translational modifications (PTMs) important to cancer and stem cell research.

New England Peptide has launched the NEPTune platform of custom proteomics reagents and related services. This product line is designed to serve as the enabling platform for biomarker assay development and the global initiative to map all proteomes. **Nanogea** is commercializing a sensitive single molecular detection platform for protein and nucleic acids based on its innovative NanoCone chemistry and NanoCone Enabled Atomic Force Microscopy (NE-AFM) technology. The platform allows for a high level of sensitivity and specificity in the detection of protein molecules and biomarkers for early disease diagnosis and patient monitoring. The company is currently developing diagnostic applications in the areas of CNS disorders, infectious disease, and prenatal testing.

Accessories

Advion has introduced a new capability to its TriVersa NanoMate system, liquid extraction surface analysis (LESA). Combined with the system's existing capabilities of chip-based infusion, fraction collection and LC-MS, LESA allows researchers to sample directly from surfaces with extractable analytes for more information from complex samples than with LC-MS alone.

Also making strides in accessories for proteomics

and biomarker applications is **ESI Source**

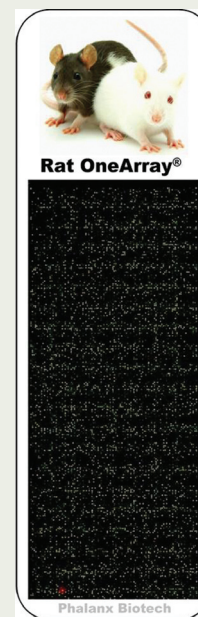
Solutions. Its Active Background Ion Reduction Device (ABIRD) for nanospray ESI/LC-MS/MSMS isolates a mass spectrometer from interferences due to variable laboratory air composition. The key feature of the product is the enhancement of signal to noise ratios in the full mass range of a mass spectrometer, allowing the instrument to observe extremely low level signals which could potentially go undetected. This is an inexpensive and reliable way of enhancing the sensitivity of a mass spectrometry method.

Norton Scientific Inc. has recently launched a Protein Aggregation Monitor – the PAM. This is an accessory for those involved in proteomics or crystallography, allowing researchers to rapidly pre-screen samples at the lab bench by using laser-based light scattering technology. Bryan C Webb, Norton Scientific Inc. president, comments: "Using existing technology that has been reduced in size and cost but with improved performance will drive down lab operating costs and shorten turn around time. It's now about how you can save budgets and get new drugs to market faster."

Software

Nonlinear Dynamics' Progenesis LC-MS software helps researchers find and quantify the proteins that show interesting behaviour in their label-free samples. It can be used in applications for both differential protein expression and protein characterization. Progenesis LC-MS quantifies peptides and proteins independently of identification, ensuring researchers are able to capture all interesting protein data within their experiments. The software is platform independent and can support all major hardware vendors.

Thermo Fisher Scientific SIEVE software is an automated solution for the label-free, semi-quantitative differential expression analysis of proteins, peptides and metabolites. SIEVE software performs differential analysis of sample populations, comparing LC-MSⁿ spectra to find



Phalanx Biotech - the Rat Whole Genome OneArray

differentially expressed features. Using SIEVE software to pre-filter data greatly reduces the number of compounds that need to be identified, significantly increasing the throughput of complex biomarker discovery experiments. Combining SIEVE software with the unique analytical power of Thermo Scientific LC-MS systems creates complete solutions for biomarker discovery.

Material compiled by The Scott Partnership



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Thermo Fisher Scientific – Kinase Enrichment Kit

Tools and Reagents

ProFACT Proteomics and its partner in research consumables **Biotech Support Group LLC** have introduced a new reagent kit called KinaSorb for the enrichment and isolation of kinases. The protocol used by this product is fast, scalable and compatible with common analytical methods like electrophoresis, enzyme assays and mass spectrometry. **Thermo Fisher Scientific** has also brought out Thermo Scientific Pierce Kinase Enrichment Kits that use novel ATP and ADP based probes developed by **ActivX Biosciences** to covalently modify active sites of ATPases, such as kinases, chaperones and metabolic enzymes. In addition to this, the Thermo Scientific Pierce GTPase Enrichment Kit for profiling small GTPase and large G-protein subunits has been introduced. The kit provides the reagents for the broad enrichment of GTP-



Norton Scientific Inc. - Protein Aggregation Monitor (The PAM)

binding proteins form tissues, cells and sub cellular proteomes.

Standards and Microarrays

Sigma Aldrich has launched the MS PhosphoMix (MS PhosphoMix 1, 2, and 3) phosphopeptide standards. These products facilitate development, evaluation and optimization of mass spectrometry based workflows during routine phosphopeptide analysis. The set of 25 phosphopeptide sequences, derived from human proteins, contain nearly 50 phosphorylation sites and are available in both natural (light) and isotopically labeled (heavy) versions. **Phalanx Biotech** launched the Rat Whole Genome Expression OneArray - featuring superb performance with high qPCR correlation and array data consistency (CV < 4%). Curated from the latest gene annotations, this microarray offers excellent interrogation power

into ADMET/DMPK pathways. **LC Sciences** has established a higher density version of its microfluidic proteomics microarray. The PepArray platform technology offers in situ synthesis of peptides and peptidomimetics using conventional peptide chemistry in an addressable format. **Nanolnk** provides nanoarray-based instrument systems, assay kits and contract services. Nanolnk assays consume much smaller sample and reagent volumes than traditional ELISA and bead-based assays, producing more proteomic data with less starting material and lowering assay costs. Nanolnk assays are also compatible with commercial lab automation systems. Bruce Dudzik, vice president of Nano BioDiscovery at Nanolnk, comments: "Life science researchers who have difficulty extracting usable protein biomarker data from limited sample volumes find that Nanolnk's newest assay format enables them to successfully analyze more samples, faster." In order to address the need for bringing reliable clinical information in protein biomarker discovery to the earliest stages of drug development, **Promigen Life Sciences** has introduced ProteoSep Microarrays. This new approach takes well defined reference disease cell line lysates and 2D fractionates them to produce thousands of well-defined subsets of intact antigens "spotted" onto microarray slides for serological assays.

Services

Promega, in collaboration with **MS Bioworks**, has launched a protein mass spectrometry service that caters for each phase of the process: sample handling, digestion, chromatography, ionization, instrument tuning and data processing. Each step of the process has been optimized to produce superior data quality. **PharmaNet Development Group** provides high quality, mass-spectrometry based and immunochemical analyses for the development, validation, and measurement of biomarkers to improve the effectiveness of drug development. These methods provide precise, accurate measurement of biomarkers for infectious and autoimmune diseases, cardiovascular risk and blood components such as hormones.

Companies featured in this product focus include:

ActivX Biosciences
Advion
Biotech-Support Group LLC
ESI Source Solutions
LC Sciences
MS Bioworks
Nanogea
Nanolnk
New England Peptide
Nonlinear Dynamics
Norton Scientific Inc.
Phalanx Biotech
Pharmanet Development Group
ProFACT Proteomics
Promega
Promigen Life Sciences
Sage-N Research
Sigma Aldrich
Thermo Fisher Scientific

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