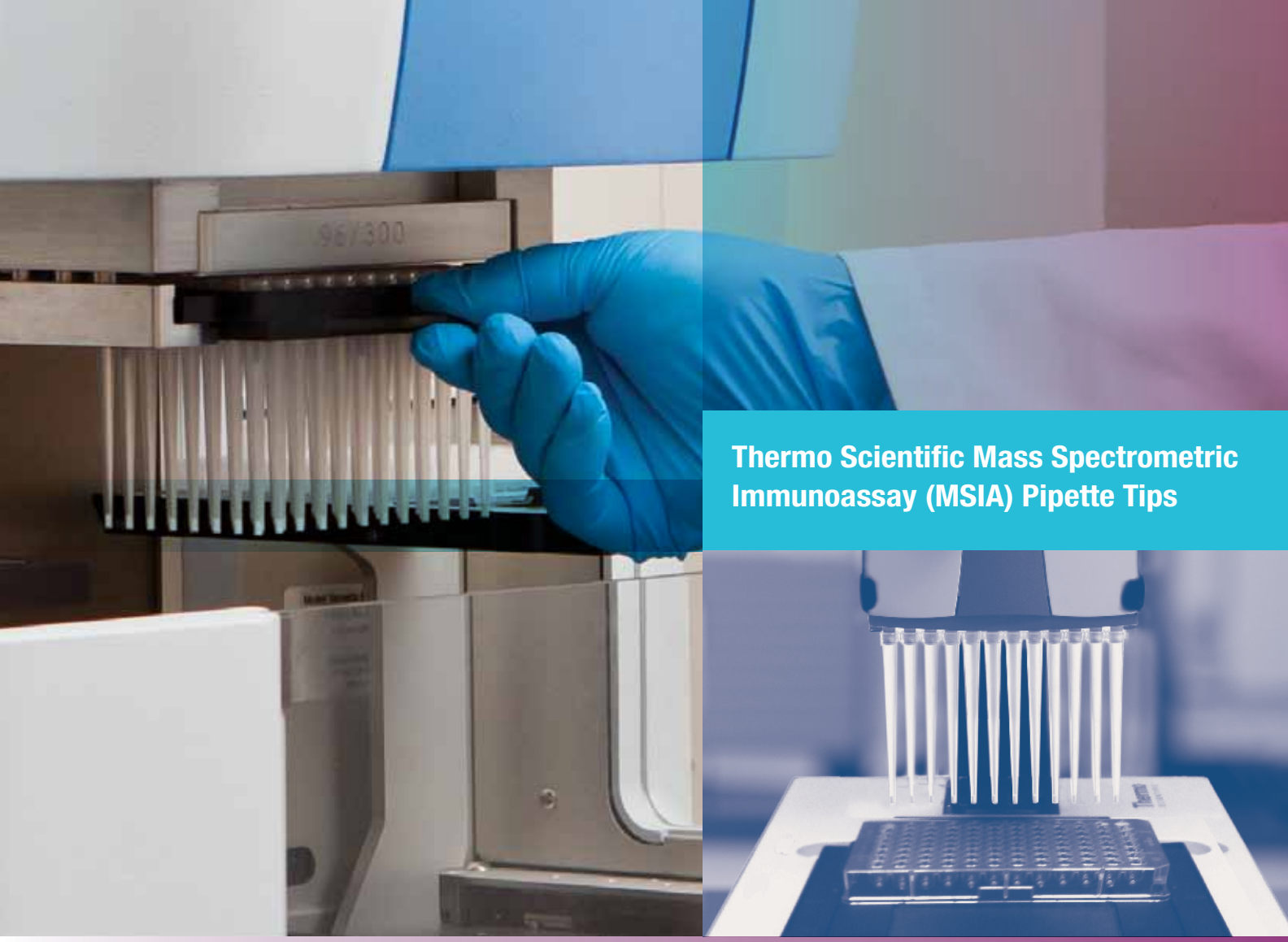


Thermo Scientific Mass Spectrometric Immunoassay (MSIA) Pipette Tips

Next generation immunoaffinity

Robust quantitative platform

Thermo SCIENTIFIC

Immunoaffinity sample preparation

Thermo Scientific Mass Spectrometric Immunoassay (MSIA) Pipette Tips

MSIA™ Disposable Automation Research Tips (D.A.R.T.'S®) are the next generation immunoaffinity approach providing a simple way to enrich and concentrate target proteins for down-stream mass spectometric analysis. The Thermo Scientific MSIA utilizes a 300 µL pipette tip embedded with a proprietary, highly porous immunoaffinity column in which the antibody is immobilized using a quick and easy protocol. The enrichment steps involve sample binding, wash and elution by cycling sample and various reagents rapidly through the micro-column in the pipette tip.

The reliable MSIA protocols can be performed manually on our new Thermo Scientific Finnpipette Novus i Multichannel Electronic Pipettes (for immuno-precipitation) or in a high-throughput format using our Thermo Scientific Versette Automated Liquid Handling Platform. Furthermore, Protein A/G and Avidin universal MSIA tips provide the flexibility to tailor the tips for specific target analyte applications by using your antibodies of choice. For more information on how to integrate your current assays into our MSIA workflow, please contact your local sales representative or complete the request form at **thermoscientific.com/msia.**

- **Highly Effective:** Proprietary micro-fluidic, immunoaffinity column enhances antibody/antigen binding kinetics
- **Proven Recovery and Reproducibility:** Superior protein recovery and reproducibility compared to conventional bead-based method
- **Increase Signal-to-Noise Ratio:** Improve specificity and reduce background
- **Increase Throughput:** Customized semi-automated manual purification or complete automated integrated 96-well processing provides choice of sample throughput
- **Save Time:** Up to 96-sample processing in parallel in less than 30 minutes
- **Less Effort:** Straight forward protocol, no additional depletion or SPE steps required
- **Increase Flexibility:** Avidin immobilized (Streptavidin, Avidin, NeutrAvidin) and Protein A/G immobilized (Protein A, Protein G, Protein A/G) MSIA tips available for easy coupling of your antibodies of choice
- **Customized to your Needs:** Custom target MSIA tips (direct covalent coupling of antibody on to the micro-column) are also available
- **Convenient Packaging:** Available in packs of 24 or 96 tips

Automated 96-well sample processing

Thermo Scientific Versette Automated Liquid Handling Platform

Streamline your biomarker research by increasing your sample throughput and productivity. MSIA capture can be automated on our Versette™ Automated Liquid Handler.

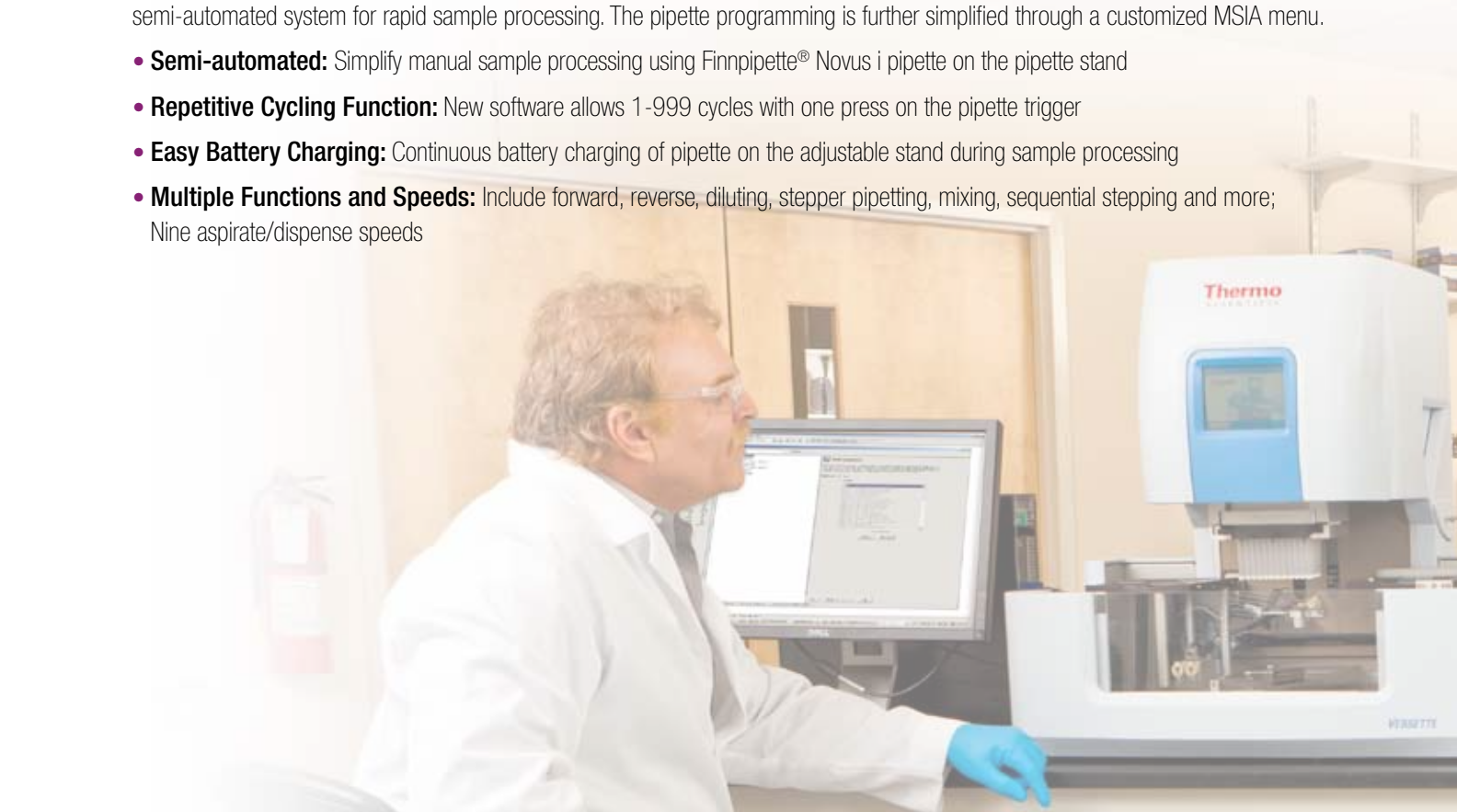
- **Complete Walk-Away:** Six-position deck allows MSIA sample preparation from sample binding to elution
- **Easy-to-Use Interface:** All functions are controlled with simple drag-and-drop intuitive Thermo Scientific Matrix ControlMate software
- **Save Space:** Small footprint, ideal for use on laboratory benches
- **Multipurpose:** Designed to perform a variety of liquid handling tasks for a wide range of applications including high-throughput MSIA immuno-enrichment

Manual 8-12-well sample processing

Thermo Scientific Finnpipette Novus i Multichannel Electronic Pipette (for immuno-precipitation)

Our new Finnpipette® Novus i Multichannel Electronic Pipettes and Adjustable Pipette Stand assist in lower throughput MSIA sample enrichment. Pipettes available in both 8-,12-channel which when combined with our adjustable pipette stand, provides an economical semi-automated system for rapid sample processing. The pipette programming is further simplified through a customized MSIA menu.

- **Semi-automated:** Simplify manual sample processing using Finnpipette® Novus i pipette on the pipette stand
- **Repetitive Cycling Function:** New software allows 1-999 cycles with one press on the pipette trigger
- **Easy Battery Charging:** Continuous battery charging of pipette on the adjustable stand during sample processing
- **Multiple Functions and Speeds:** Include forward, reverse, diluting, stepper pipetting, mixing, sequential stepping and more; Nine aspirate/dispense speeds



Protein/peptide quantification

High-performance liquid chromatography with mass spectrometry (LC-MS)

Thermo Scienific Dionex UltiMate 3000 RSLCnano Systems

Our UltiMate® 3000 RSLCnano systems have been designed to optimize low flow separations and facilitate easy coupling to mass spectrometry, providing the best resolution, sensitivity, and selectivity for nano-LC and proteomics applications.

Thermo Scientific TSQ Vantage Triple Stage Quadrupole Mass Spectrometer

Our TSQ Vantage™ triple stage quadrupole mass spectrometer delivers the highest sensitivity with the lowest noise for the quantitative analysis of small molecules, peptides, biosimilars, and biologics.

More signal and less noise provides better assay precision and accuracy. Combined with a robust new ion source, second generation (G2) ion optics and hyperbolic quadrupoles, the TSQ Vantage instrument delivers the highest sensitivity with the lowest chemical noise.

Thermo Scientific Q Exactive Hybrid Quadrupole-Orbitrap Mass Spectrometer

Identify, quantify and confirm with unmatched confidence using our Q Exactive™ mass spectrometer. This benchtop LC-MS/MS combines high-performance quadrupole precursor selection with high-resolution, accurate-mass (HR/AM) Orbitrap™ detection to deliver high performance, tremendous versatility and unsurpassed analytical confidence.

Thermo Scientific Pinpoint Software

Our Pinpoint™ software facilitates the transition from early-stage biomarker discovery to larger-scale, quantitative verification of putative biomarkers and general quantitative proteomics. Pinpoint software simplifies the creation of targeted quantitative assays. It allows researchers to leverage previously acquired data from discovery experiments. Pinpoint software largely automates the development of preliminary methods. It enables acquisition and analysis of preliminary data, which is in turn used to optimize the method.

Increase sensitivity and reproducibility

The MSIA workflow enables targeted protein/peptide quantification by improving sensitivity, reproducibility and sample throughput. Immunoaffinity capture using MSIA D.A.R.T.'S allow for reproducible target enrichment down to low femtomole levels while making quantification measurements possible over a wide, linear dynamic range as shown in Figure 1.

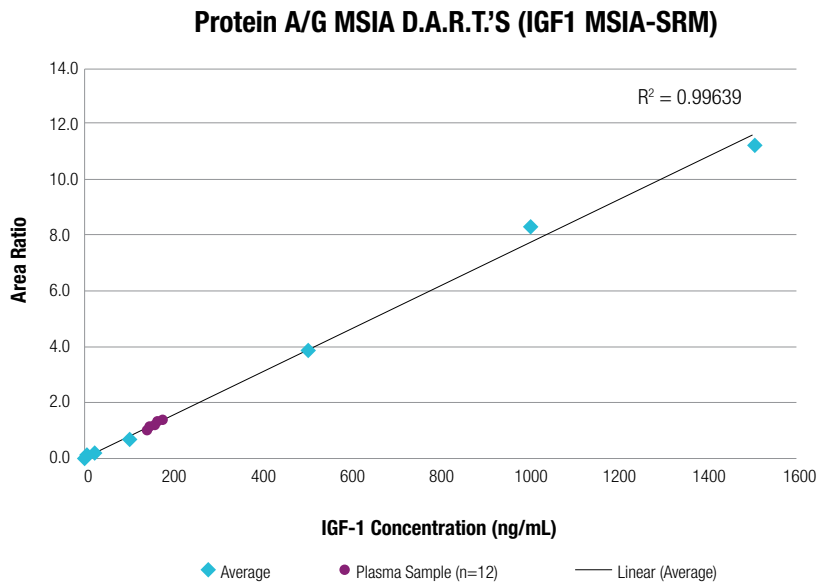


Figure 1. Calibration Curve for IGF1 SRM on TSQ-Vantage. MSIA D.A.R.T.'S, Protein A/G with IGF1 antibody provide a wide linear dynamic range 1 to 1500 ng/mL (R^2 = 0.9964). Replicate analyses of plasma samples observed %CV = 8.5% (n = 12). MSIA D.A.R.T.'S Protein A/G tips provide significant analyte recovery with reproducible results.

IGF1 Concentration (ng/ml)	Moles/Sample (femtomole)
1500	7840
1000	5230
500	2610
100	523
25	131
10	52.3
5	26.1
1	5.23

Sensitivity comparison of IGF1 mass spectrometric assays between Protein A/G MSIA D.A.R.T.'S and Protein A/G magnetic beads		
Sensitivity	**MSIA D.A.R.T.'S, Protein A/G with Versette or Novus i**	**Competitor B's Magnetic Beads, Protein A/G**
LOD	40 picogram/5.2 femtomole	400 picogram/52 femtomole
LOQ	40 picogram/5.2 femtomole	400 picogram/52 femtomole

Table A. Protein A/G MSIA D.A.R.T.'S offer flexibility for immobilizing antibodies of choice while demonstrating superior protein recovery. Sensitivity (both LOD and LOQ) were improved when it is compared to conventional magnetic bead method.

Ordering information

MSIA D.A.R.T'S Pipette Tips

Compatible with the Versette Automated Liquid Handler, Finnpipette Novus i Multichannel Electronic Pipettes (for immuno-precipitation), also with select Eppendorf®, Biohit® and Hamilton® Multichannel Pipettes.

Cat. No.	Description	Packaging
991PRT11	300 µl MSIA D.A.R.T.'S, Protein A	Pack of 96 tips
991PRT12	300 µl MSIA D.A.R.T.'S, Protein A	Pack of 24 tips
991PRT13	300 µl MSIA D.A.R.T.'S, Protein G	Pack of 96 tips
991PRT14	300 µl MSIA D.A.R.T.'S, Protein G	Pack of 24 tips
991PRT15	300 µl MSIA D.A.R.T.'S, Protein A/G	Pack of 96 tips
991PRT16	300 µl MSIA D.A.R.T.'S, Protein A/G	Pack of 24 tips
991CUS02	300 µl MSIA D.A.R.T.'S, Custom*	Pack of 96 tips
991R	300 µl MSIA D.A.R.T.'S, Reloadable Rack	1 reloadable rack, tips are not included

MSIA Pipette Tips

Compatible to Beckman® Multimek™, Type II Liquid Handling System.

Cat. No.	Description	Packaging
991AVD01	200 µl MSIA, Streptavidin	Pack of 96 tips
991AVD02	200 µl MSIA, Avidin	Pack of 96 tips
991AVD03	200 µl MSIA, NeutrAvidin	Pack of 96 tips
991PRT01	200 µl MSIA, Protein A	Pack of 96 tips
991PRT02	200 µl MSIA, Protein G	Pack of 96 tips
991PRT03	200 µl MSIA, Protein A/G	Pack of 96 tips
991CUS01	200 µl MSIA, Custom*	Pack of 96 tips

**Customized MSIA tips are also available. We immobilize your antibody of interest directly to the micro-column.*

Automated Liquid Handling Platform and Pipetting Head

Cat. No.	Description
650-01-BS	Versette Base Unit Stage, Head Housing and Pipetting Head Required for Use
650-02-NTC	96- and 384-Channel Housing Assembly. For Use with 96- and 384-Channel Pipetting Heads
650-03-SPS	6-Position Stage, Guarding Included.
650-06-96300	96-Channel Air Displacement Pipetting Head. Volume 5-300 µl
650-04-PUMP	Pump Module Optional Accessory, Used for Tip Washing/Reagent Replenishing
650-05-96TTW	96-Channel Tip Wash Station, Tall, Optional Accessory
650-08-96300SD	Serial Dilute Magazine 96/300 µl (8/12)

Multichannel Pipettes and Pipette Stand

Cat. No.	Description	Quantity
46302000	Finnpipette Novus i Electronic 8-Channel Pipette, 20-300 µl (for immuno-precipitation)	1 pipette
46302100	Finnpipette Novus i Electronic 12-Channel Pipette, 20-300 µl (for immuno-precipitation)	1 pipette
991S	Finnpipette Novus i Adjustable Pipette Stand (for immuno-precipitation)	1 pipette stand
991SP8	Finnpipette Novus i Electronic 8-Channel Pipette, 20-300 µl and Pipette Stand (for immuno-precipitation)	1 pipette and 1 pipette stand
991SP12	Finnpipette Novus i Electronic 12-Channel Pipette, 20-300 µl and Pipette Stand (for immuno-precipitation)	1 pipette and 1 pipette stand

Liquid Chromatography

Description
UltiMate 3000 RSLCnano Systems

Mass Spectrometry and Software

Description
TSQ Vantage Triple Stage Quadrupole Mass Spectrometer
Pinpoint Software
Q Exactive Hybrid Quadrupole-Orbitrap Mass Spectrometer

MSIA demo sites

Thermo Fisher Scientific, Cambridge
The Biomarkers Research Initiatives in Mass Spectrometry (BRIMS) Center
790 Memorial Dr, Suite 201, Cambridge, MA 02139, USA

Thermo Fisher Scientific, Tempe
2155 E. Conference Dr. Suite 104, Tempe, AZ 85284, USA

Thermo Fisher Scientific, UK
Stafford House, Boundary Way, Hemel Hempsted, HP2 7GE, UK

Please contact your local sales representative or visit **thermoscientific.com/msiademo** to schedule an onsite demo or visit **thermoscientific.com/msiavideo** to view the MSIA technology video.

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