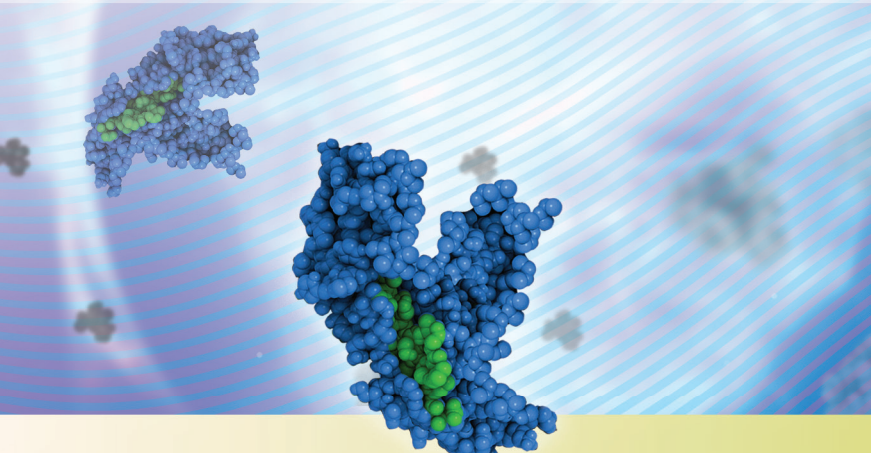


**Thermo Scientific Mass Spectrometric  
Immunoassay (MSIA)**



large molecule bioanalysis  
**workflow solutions**

**Thermo**  
SCIENTIFIC

# Thermo Scientific Mass Spectrometric Immunoassay

## innovation made easy

### Are you looking for an easy solution to innovate MS-based methods with accuracy, consistency and speed?

Presenting Thermo Scientific™ MSIA™, a comprehensive, efficient and customizable workflow that is designed to provide meaningful and definitive data from fast, reproducible, high-throughput testing.

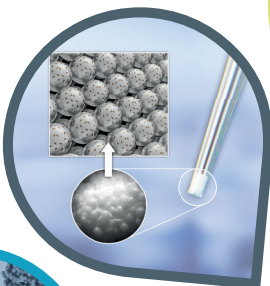
MSIA provides you with complete tools to lead the way in targeted MS-based large biomolecule analysis.

Be at the forefront of scientific advancement with improved accuracy and speed in your mass spectrometric methods.

- Biomarker discovery and analysis
- Pre-clinical and clinical trials of biotherapeutics
- Analysis of therapeutic antibodies and antibody-drug conjugates
- Analysis of protein variants and post-translational modifications
- Detection of exogenous biomolecules in sports doping and food safety applications

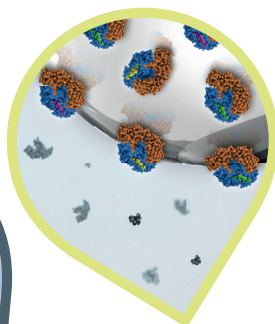
#### 1. Sample

Biological samples are complex and contain proteins that span a wide dynamic range. Purification is required to reduce the complexity of the sample to enable shorter LC gradients and ultimately maximize MS sensitivity.



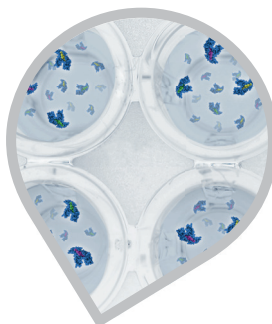
#### 2. Load Affinity Ligand

To reduce sample complexity, affinity ligands are immobilized on a proprietary microcolumn surface to purify target analytes. Biological samples are directed through microfluidic channels to expose target analytes to affinity ligands.



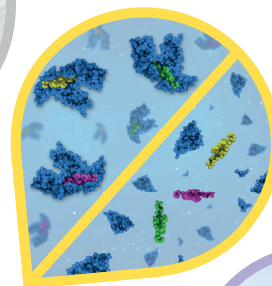
#### 3. Purify Target Analyte

Target analytes (such as protein variants, modified forms, and related analogs) are captured by the affinity ligands with high selectivity and specificity.



#### 4. Elute Target Analyte

Purified protein targets and related analogs are eluted from the microcolumn and ready for MS analysis.



#### 5. Pre-MS Sample Processing

Purified proteins and related biomolecules may be directly analyzed by mass spectrometry.

Or, broken down into peptides prior to mass spectrometric analysis.

#### 6. MS Analysis

Qualitative and quantitative MS data is generated simultaneously in a single assay.



## The MSIA Workflow

## MSIA Workflow Benefits

- Reproducible • Automated • Contaminant-free • Sensitive and precise • Low detection limits
- Wide dynamic range • Absolute quantification • Identify multiple protein variants in a single assay
- Enables novel assay development

## How does it work?

The MSIA Workflow combines highly-selective affinity purification with mass spectrometry for the simultaneous qualitative and quantitative analysis of biomolecules in a single assay. This includes proteins, peptides, antibodies, antibody-drug conjugates and their modified forms.

### Analytical Affinity Purification

Affinity purification using Thermo Scientific™ MSIA™ Disposable Automation Research Tips (D.A.R.T.'S®) is central to the MSIA Workflow. Our unique proprietary microcolumn technology is designed to enable enhanced, reproducible target purification down to picomolar levels.

This stage of the MSIA Workflow vastly reduces the complexity of the sample, enabling much shorter LC gradients and ultimately maximizing MS sensitivity.

### MSIA Microcolumn Technology

The MSIA D.A.R.T.'S embed Thermo Scientific proprietary microcolumns in a functional pipette tip. Each microcolumn contains microfluidic channels with immobilized affinity ligands. Dilute solutions containing the target analyte flow up and down the microcolumn, purified by the affinity ligand.

#### Key Features

- **Fast** – microfluidic channels force molecular interactions
- **Reproducible** – consistent amount of affinity ligand on each microcolumn surface
- **No contaminant carry-over** – enhances signal and reduces background during MS analysis
- **Sample volume independent** – repetitive pipetting captures analytes in dilute solutions
- **No matrix loss** – no particulates to impact LC-MS performance
- **High flow rate characteristics** – low back pressure supports automation

### MS Detection and Analysis

Mass spectrometric detection has molecular specificity, low detection limits, and a wide dynamic range. It can be performed in different ways, depending on the aim of the analysis:

**Top-down intact analysis** – maintains protein integrity for the detection of degradation products, sequence variants and combinations of post-translational modifications.

**Bottom-up peptide analysis** – involves the reduction, alkylation, and digestion of purified protein samples to access and analyze peptide fragments.

In the MSIA Workflow, mass spectrometric analysis provides unambiguous identification of low-abundance target analytes, even at picomolar concentrations. Absolute quantification of large biomolecules is consistently achieved by the simultaneous purification of target analytes and internal reference standards. This concurrent purification preserves the standard-to-analyte ratio from sample preparation through to MS detection, resulting in accurate, reproducible and absolute quantification.

- LC-MS/MS data provides unequivocal confirmation of target analytes.
- Identify and quantify multiple protein variants in a single assay

### Automated Liquid Handling Capabilities

The MSIA Workflow can be operated with the simple, Thermo Scientific™ Finnpipette® Novus i Multichannel Electronic Pipette for low throughput or assay development work. Alternatively, the Thermo Scientific™ Versette™ Automated Liquid Handler is available for the routine analysis of target analytes in a 96-sample format.

# Thermo Scientific Mass Spectrometric Immunoassay

## MSIA D.A.R.T.'S Product Family

MSIA D.A.R.T.'S are available in the following formats to support your individual assay development needs.

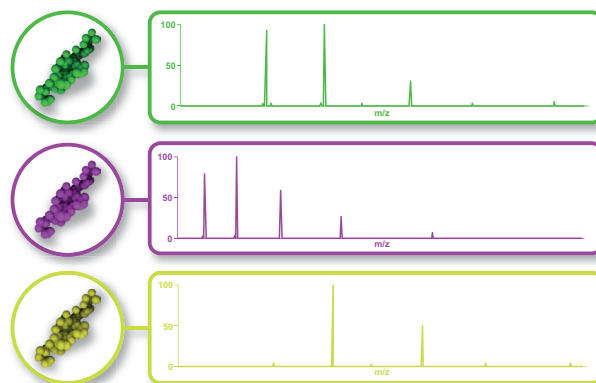
<b>Protein A, G, and A/G</b>	Versatile option to bind and orientate a wide range of antibodies for targeted MS-assay development, ideal for antibody-related applications
<b>Streptavidin</b>	Robust platform that immobilizes biotinylated affinity ligands to purify proteins and therapeutic antibodies for downstream MS analysis, ideal for biopharma applications
<b>Insulin</b>	Simultaneous quantitative and qualitative analysis of endogenous insulin and exogenous insulin analogs purified from plasma, ideal for clinical research applications
<b>Custom</b>	Optimal affinity ligands are selected and covalently immobilized to the microcolumn surface, ideal for proven routine and high-throughput MS applications

## Product Information

Part#	Description	Packaging
991001096	MSIA D.A.R.T.'S, Insulin	Racked, pack of 96
991001024	MSIA D.A.R.T.'S, Insulin	Blister Package, pack of 24
991CUS02	MSIA D.A.R.T.'S, Custom	Racked, pack of 96
991R	Reloadable Rack	
991PRT11	MSIA D.A.R.T.'S, Protein A	Racked, pack of 96
991PRT12	MSIA D.A.R.T.'S, Protein A	Blister Package, pack of 24
991PRT13	MSIA D.A.R.T.'S, Protein G	Racked, pack of 96
991PRT14	MSIA D.A.R.T.'S, Protein G	Blister Package, pack of 24
991PRT15	MSIA D.A.R.T.'S, Protein A/G	Racked, pack of 96
991PRT16	MSIA D.A.R.T.'S, Protein A/G	Blister Package, pack of 24
991STR11	MSIA D.A.R.T.'S, Streptavidin	Racked, pack of 96
991STR12	MSIA D.A.R.T.'S, Streptavidin	Blister Package, pack of 24
991SP12	Finnpipette Novus i Electronic 12-Channel Pipetter and Pipette Stand	
650-MSIA	Versette Automated Liquid Handler for MSIA applications	

## A Complete Product Offering for your Targeted MS Workflow

From affinity purification and liquid handling through mass spectrometric detection and analysis, Thermo Scientific has developed a range of efficient and customizable tools for every step of your workflow.



### What MSIA Workflows are right for you?

Visit [thermoscientific.com/msia](http://thermoscientific.com/msia) and take our Free MSIA Assessment.

For product inquiries or to request a sales quotation, please contact [msia.info@thermofisher.com](mailto:msia.info@thermofisher.com)

[thermoscientific.com/msia](http://thermoscientific.com/msia)

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Outside North America: +1 858 453 7551

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