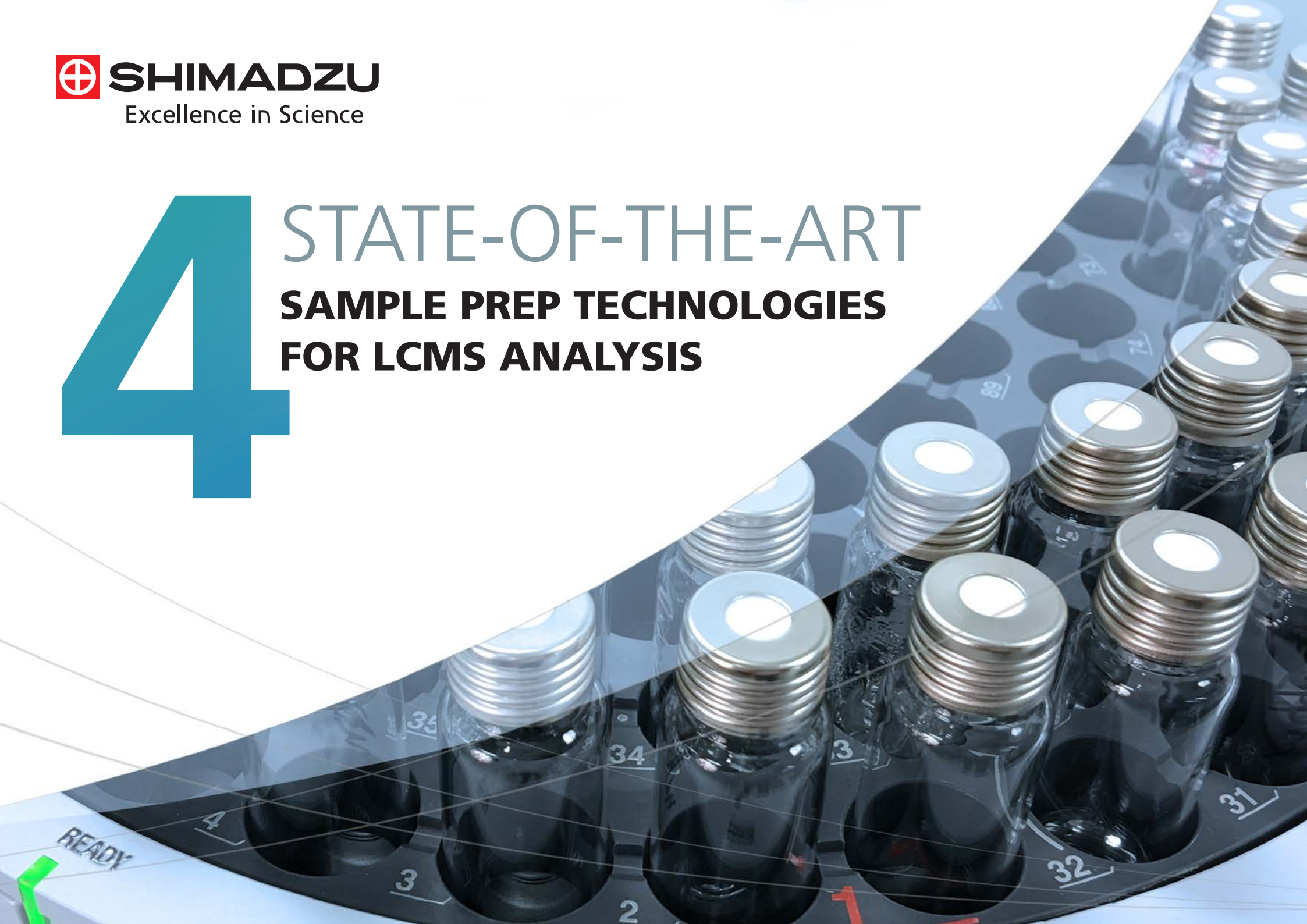
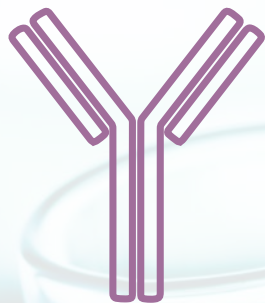


4 STATE-OF-THE-ART SAMPLE PREP TECHNOLOGIES FOR LCMS ANALYSIS



Shimadzu is well known around the world for the accuracy and precision of our analytical and testing instrumentation. In fact, no other company can deliver the same breadth of solutions. But we offer so much more than instruments. In fact, Shimadzu was a pioneer in the field of high-quality laboratory supplies. Today, we deliver a broad range of superior analytical chemistry consumables for applications across key industries, including forensic toxicology, biopharmaceuticals, food testing, and environmental analysis.

**nSMOL Antibody
Bioanalysis Kit**



**Micro Volume
QuEChERS Kit**



**Noviplex™ Plasma
Prep Card**



**MSW2™
Microsampling**





Consumables for All Your Analytical Needs

Every lab manager knows that a consistent, steady supply of lab consumables is **key to maintaining an efficient, productive organization**. It helps ensure that your instruments are in top working order and provides the everyday supplies your team needs to keep up with workloads in a fast-paced lab environment. Shimadzu Scientific Instruments delivers that extra level of support to help keep your lab running smoothly. From vials to filters and reagents to solvents, Shimadzu has everything your lab needs.

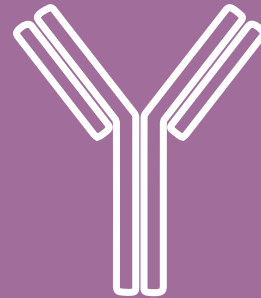
State-of-the-Art

Sample Prep Innovations

Perhaps the greatest benefit that Shimadzu delivers to your lab is in the area of advanced sample preparation. As part of our solutions-based approach, the analytical scientists at Shimadzu develop unique products that — when used with our instruments and columns — help you solve some of your toughest sample prep challenges.

- **nSMOL™ Antibody Kit** — a better and more efficient way to perform antibody quantitation
- **Micro Volume QuEChERS Kit** — fast, simple sample prep for forensic toxicology
- **Noviplex™ Card** — the next generation of dried blood spot (DBS) sampling
- **MSW2™** — fast, easy microsampling for enhanced productivity





nSMOL Technology

Improving the Speed and Accuracy of mAb Bioanalysis

To fight disease-causing viruses and other pathogens, the immune system produces large amounts of proteins called antibodies. Due to recent advancements in pharmaceutical research, **scientists are now able to create antibodies that target specific biomarkers, such as those found on cancer cells.** Researchers then develop monoclonal antibodies (mAbs) that bind specifically to those biomarkers. mAbs play a key role in treating debilitating and life-threatening diseases as well as various types of cancer.

[Visit our website to learn more.](#)



nSMOL - Bioanalysis Using Nanotechnology and LCMS

Many laboratories have been looking for better and more efficient ways to perform antibody quantitation in clinical studies. That's why Shimadzu developed the nSMOL Antibody BA kit. nSMOL stands for nano-Surface and Molecular Orientation Limited proteolysis. It is a proprietary, groundbreaking process that combines nanotechnology and LCMS analysis to dramatically improve response and quantitative repeatability.

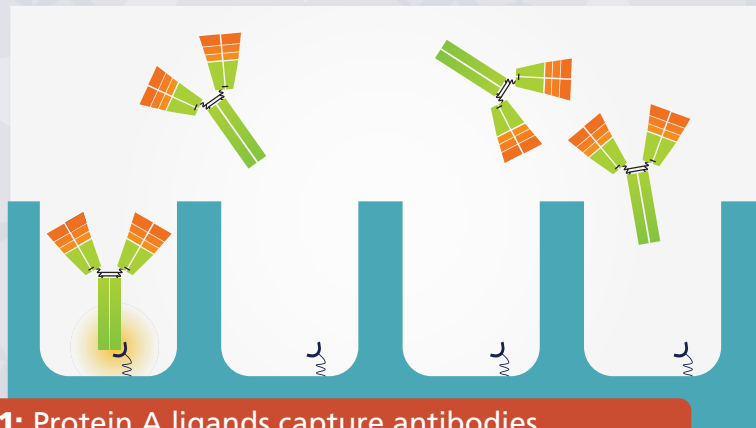
“nSMOL is optimized to capture antibodies from blood or other biological samples.”

nSMOL is ready-to-use and captures antibodies from blood or other biological samples using an immunoglobulin collection resin. It then performs selective proteolysis of the Fab region of these antibodies using trypsin-immobilized nanoparticles. A high-performance triple quadrupole liquid chromatography mass spectrometer, such as the Shimadzu LCMS-8060, can then be used for fast, reliable quantitation of Fab-derived peptides through MRM measurement.

What makes nSMOL so unique is that it enables the highly selective collection of Fab peptides.

This selective collection decreases complexity and limits contamination from excess peptides or trypsin. No capture antibodies or ligands are required, and there is no need for solid-phase extraction after the reaction. Once the sample is centrifuged, the Fab peptides can simply be extracted and injected directly into the LCMS. Analysis takes only five minutes.

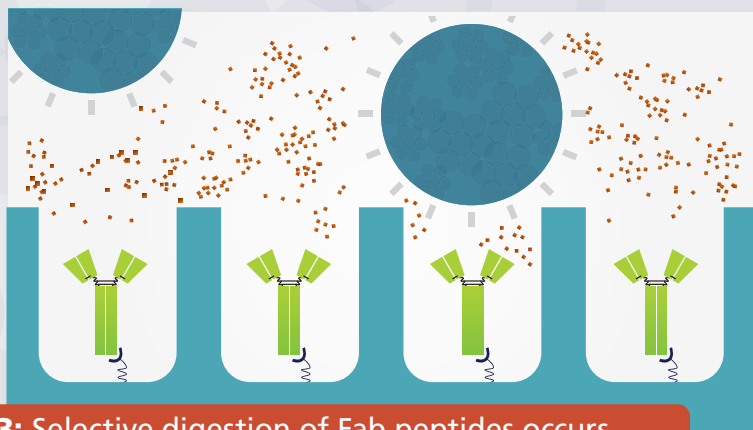




1: Protein A ligands capture antibodies



2: Trypsin-immobilized nanoparticles are added



3: Selective digestion of Fab peptides occurs

This graphic shows how the nSMOL process works.

For more information, [download our eBook](#) *nSMOL Improves the Speed and Accuracy of mAb Bioanalysis*.



Micro Volume QuEChERS Kit

Fast, Simple Sample Prep for Forensic Toxicology

In crimes involving drugs and poisons, forensic toxicologists need to be able to perform fast, reliable screening and quantitation of compounds. **One popular method for the pretreatment of blood and other biological samples is the simplified QuEChERS method.** QuEChERS, which stands for Quick Easy Cheap Effective Rugged Safe, is a versatile solid-phase extraction technique that enables the stable recovery of a wide variety of compounds, from acids to bases. However, this pretreatment method can be time consuming and presents certain challenges. Sufficient sample volumes cannot always be collected, and 500 mg of extraction salts must be weighed out for each analysis sample.

Ready-to-Use

Pretreatment Kit

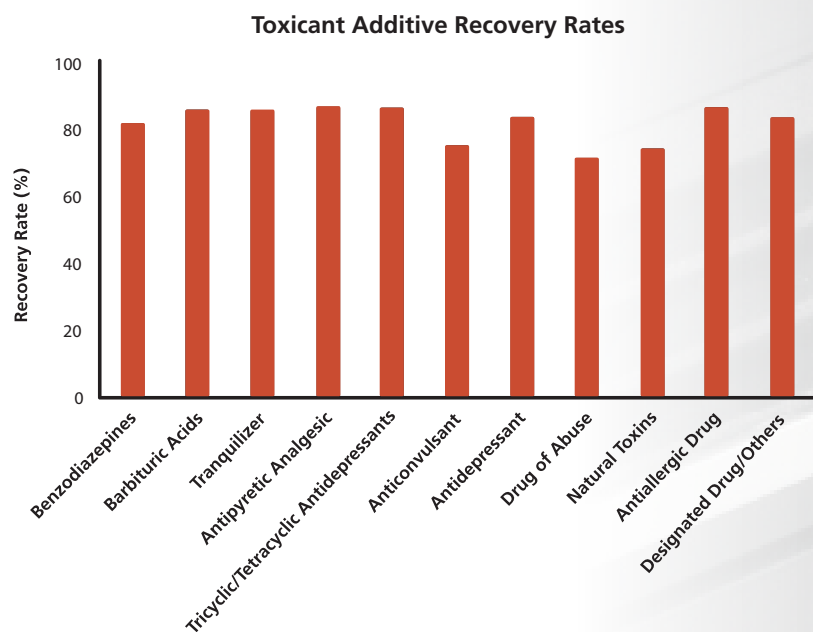
To address these challenges, Shimadzu offers the Micro Volume QuEChERS Kit. The Micro Volume QuEChERS kit consists of a 2.0 mL tube preloaded with extraction salts (100 mg). This eliminates the need to weigh out the extraction salts, speeding up the pretreatment process. If an urgent analysis is required, samples can be pretreated quickly.

With the QuEChERS kit, the sample volume has been scaled down to one-fifth the amount of sample required for the previous method (100 mg). As a result, biological samples can be pretreated even if an ample sample volume cannot be collected. Samples can then be measured with high sensitivity using a Shimadzu LCMS.



Application Example: Toxicant Additive Recovery Test

Using the Micro Volume QuEChERS kit, an additive recovery test was performed for the main toxicants in human blood. The test was performed by LC/MS/MS using the HPLC and MS conditions registered in the LC/MS/MS Rapid Toxicology Screening System Ver. 2. The results were favorable, with recovery rates for all compounds ranging from 71% to 86%. With the Micro Volume QuEChERS Kit, impurities can easily be removed, enabling the efficient recovery of a wide range of compounds without loss.





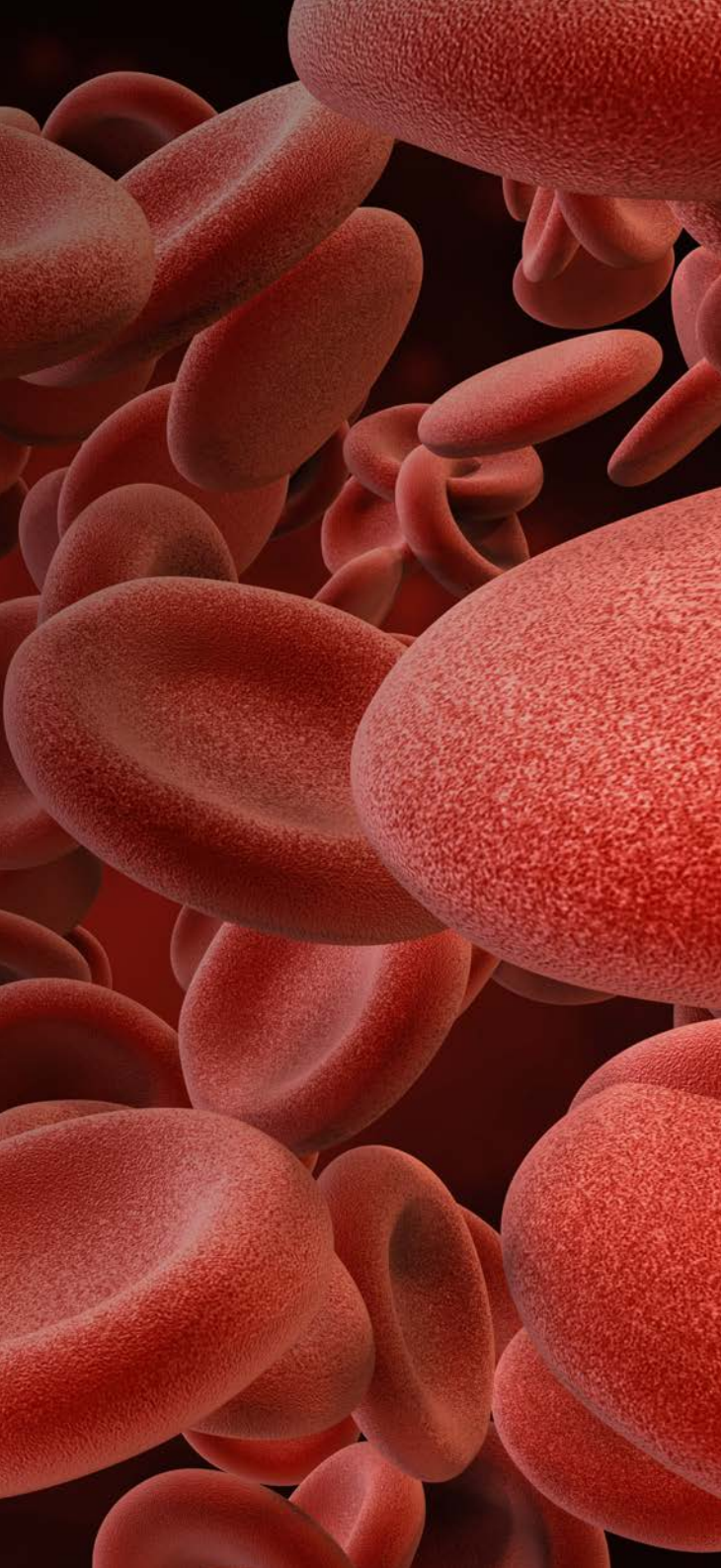
Noviplex™ Plasma Separator Technology

The Next Generation of Dried Blood Spot Sampling

For years, dried blood spot (DBS) sampling has been used for certain tests when drawing and shipping whole blood is not feasible. DBS specimens are collected by applying a few drops of blood onto specially manufactured filter paper. The dried blood samples can then be easily shipped to laboratories for analysis using industry-approved methods.

Despite significant advantages, DBS collection methods can be cumbersome. The spotted blood has to be air-dried for several hours before shipment. Additionally, laboratory personnel must receive training in application methods before using this technology. Poor application methods, such as uneven sample coverage or touching the paper, can make the sample unsuitable for analysis.

Recognizing the need for a faster, simpler, and more reliable method of plasma collection, Shimadzu developed the Noviplex™ Plasma Prep Cards in partnership with Novilytic Laboratories.



Simple, Rapid, Reproducible

Collection of Plasma

Noviplex Plasma Prep Cards offer a simple, powerful microsampling tool for plasma collection and sample preparation. Noviplex cards can be easily prepared and shipped anywhere without having to use dry ice or a power source. Blood collection takes only three minutes and eliminates the need for phlebotomists, centrifugation, evaporation, or extraction steps. After collection, Noviplex cards can be stabilized and ready for shipment after only 15 minutes of drying.

Noviplex technology is ideal for analyzing a wide variety of analytes, ranging from small molecules (including vitamins, metabolites, and drugs of abuse) to peptides and proteins.

Benefits of Using Noviplex Card Technology

- Rapid sample preparation for MS-based analysis while maintaining assay reproducibility and selectivity
- Volumetric plasma sample collection using a single drop of whole blood
- Sample volumes as low as 25 μl
- Plasma separator kits simplify sample prep and eliminate the need for solvent extraction, centrifugation, and evaporation

Noviplex Plasma Prep Cards are available in two formats — original Noviplex Plasma Cards and Noviplex Duo Plasma Prep Cards. The original Noviplex Card collects a single 2.5 μl plasma sample from a variable amount of blood (25 μl – 75 μl), while the Noviplex Duo Card prepares two plasma samples from a single application of blood (60 μl – 100 μl).



MSW2™ Microsampling Device
Easy Microsampling for Enhanced Productivity

Conventional methods for blood sampling are not always practical.

For example, access to sampling facilities may be limited in remote areas. In these cases, microsampling has become a popular alternative as it requires capturing and analyzing only a small amount of blood. In fact, microsampling can be often performed at home by the patient.

A New and Improved Microsampling Method

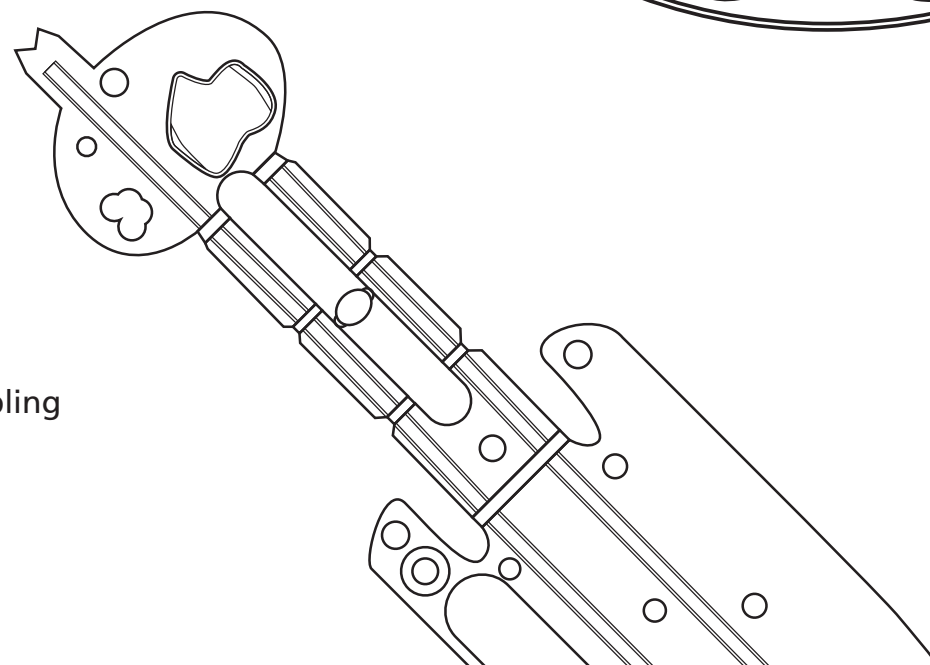
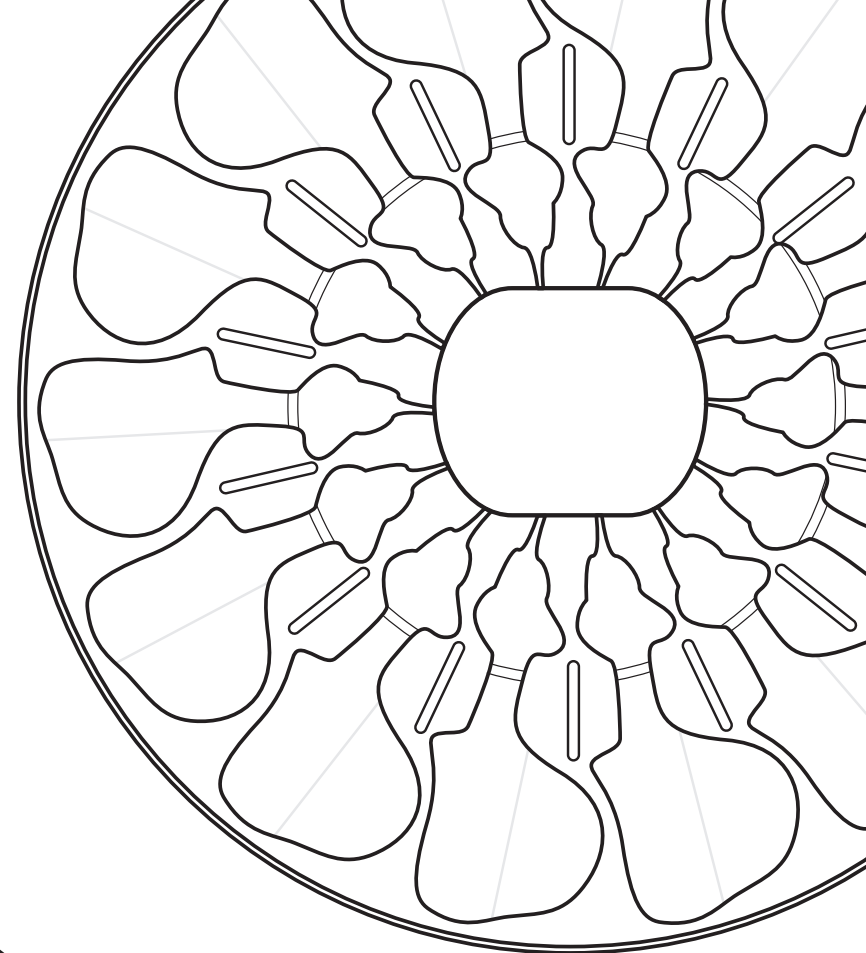
Recent innovations in blood microsampling mean that laboratory personnel spend less time preparing samples and more time focusing on results. Shimadzu's MSW2™ is a microcapillary-based microsampling device designed to help laboratories improve reduction, replacement, and refinement.

All sampling procedures are possible without high-level training. The entire sampling process, from sampling to the fractionation of a predetermined amount of plasma, can be performed with devices only, reducing the potential for human error.

MSW2 microsampling devices deliver:

- Simplified workflows
- Improved recovery
- Better reproducibility
- Accurate sampling volumes
- Safer glass-free protocol

The MSW2 series consists of the Microsampling Wing™ blood sampling device and the Microsampling Windmill™ sample holder.




Wings

Unlike glass capillaries, MSW2 offers a simple and safe microsampling tool with no glass or wax included. First, a 23 μ l blood sample is drawn into the Microsampling Wing by capillary force. Then up to 14 wings can be placed into Microsampling Windmills for centrifugation. The blood samples are contained in chip(s) located in the wings. Once the plasma is separated from the blood, the chip can be snapped off for analytical testing. Because the wing has a high solvent resistance, remeasurement is not required before deproteination and other processes.

Windmills

The Microsampling Windmill is a specialized holder for the Microsampling Wings that can hold up to 14 wings at a time. Windmills can then be stacked in the centrifuge, enabling the processing of many samples simultaneously. A specialized centrifuge rotor is required when using the windmill. No seal is necessary during centrifugation.



When it comes to critical lab consumables, you need the right partner who will deliver what you need, when you need it, and in the exact quantity you're looking for. **Shimadzu provides superior analytical chemistry consumables — as well as exceptional customer support and training — to meet the needs of your laboratory.** We make sure your facility has everything it needs to generate accurate and precise results in a timely manner.



To learn more about how Shimadzu can help improve your laboratory's efficiency, visit www.ssi.shimadzu.com/products/consumables/sample-prep.html

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