MS Hub:

Precision clean-up, powered by expertise

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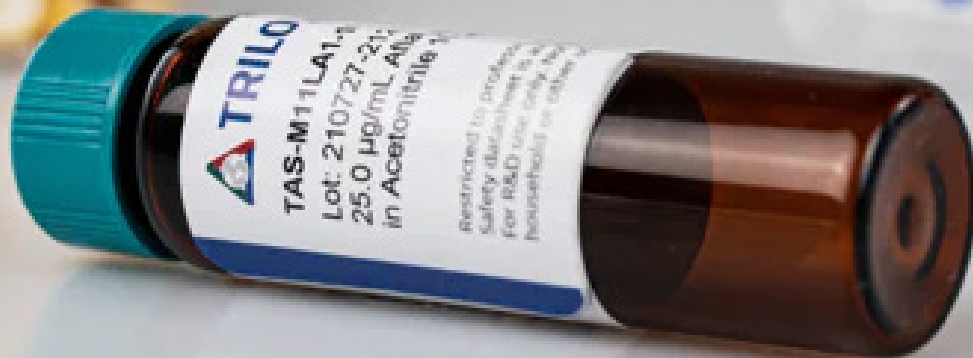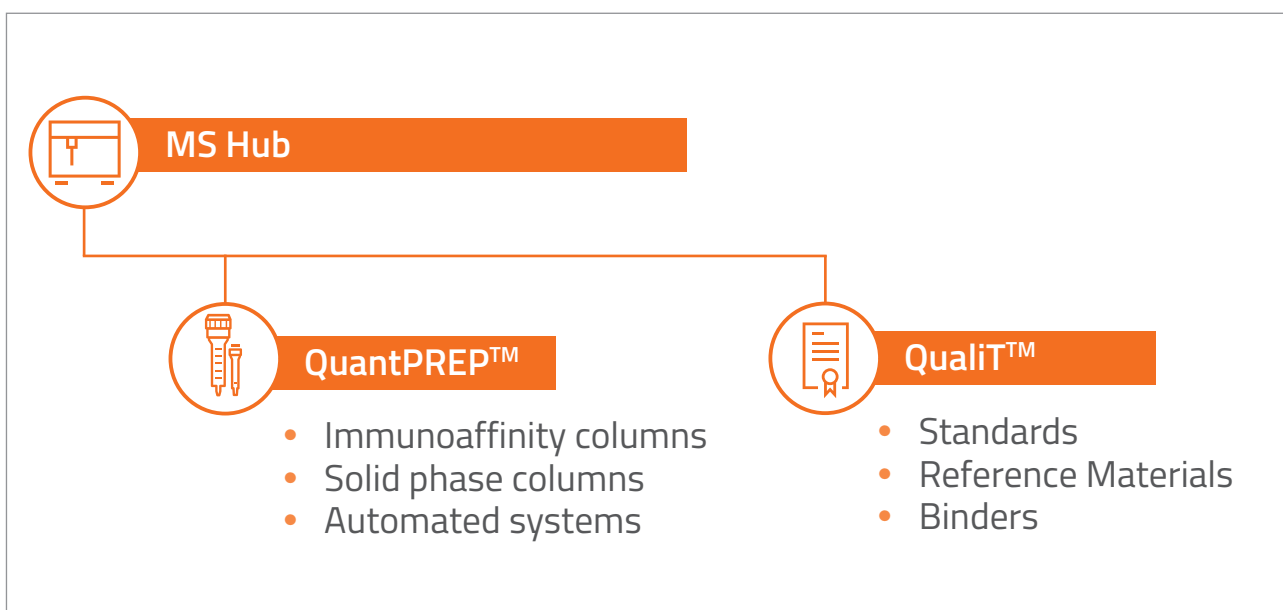
MS Hub

Introduction

R-Biopharm is a trusted leader in the provision of food safety solutions, offering comprehensive services from a single, reliable source. With a rich history in developing test kits and applications for diverse sample types, we boast a proven track record of delivering top-quality products and service.

Our Scottish subsidiary, R-Biopharm Rhône, has been at the forefront of producing immunoaffinity solutions for the mycotoxin testing market for over 35 years. In 2010, our acquisition of Trilogy Analytical Laboratory, a leading analytical laboratory for mycotoxin analysis in the US, further fortified our position. This strategic integration seamlessly combines analytical expertise with manufacturing capability, enabling us to tailor products precisely to market needs.

To further enhance our commitment to ensure simple and efficient mycotoxin sample processing, we are pleased to announce our MS Hub designed specifically for LC-MS/MS users. The Hub is comprised of two areas: one focused on the Quality Assurance and the other focused on sample clean-up.

With these offerings, we aim to provide laboratories, researchers and industry with everything they need for accurate, efficient and reliable mycotoxin analysis from a single source.

MS Hub

QuantPREP™
- Immunoaffinity columns
- Solid phase columns
- Automated systems

QualiT™
- Standards
- Reference Materials
- Binders

QuantPREP™: Detection of mycotoxins

Numerous mycotoxins are legislated by law, which means that the concentration in food and feed must not exceed a maximum level. Regulations for mycotoxins are complex, with different toxins associated with specific commodities. Additionally, different limits exist depending on whether the product is intended for direct consumption or further processing.

The number of commodities and mycotoxins that are now covered by legislation are also increasing. Some of the most commonly regulated mycotoxins are aflatoxins, ochratoxin A, deoxynivalenol, zearalenone and fumonisins. Mycotoxin legislation varies from country to country, with different nations establishing their own regulations and maximum allowable levels for mycotoxins in food and feed.

Legislation is constantly changing with more emphasis being placed on sampling, analytical method criteria and precision of results. The identification and quantitative assessment of mycotoxins in food and feed samples requires fit-for-purpose sampling, preparation, extraction and analytical techniques. Immunoaffinity and solid phase extraction columns are both techniques used in analytical chemistry for sample clean-up. Both can help to reduce or eliminate sample matrix caused by components within the food and feed samples.

	Immunoaffinity columns	SPE columns
Principle	• Contain antibodies bound to a gel support. • The target analyte/s specifically bind to the antibody while unwanted matrix components are washed away. • Column selectively isolates and concentrates the analyte/s of interest prior to injection on the LC-MS/MS system.	• Contain a solid sorbent material. • The unwanted matrix components bind to the sorbent. • The analyte/s passes through the column and collected ready to inject onto the LC-MS/MS system.
Selectivity	• Highly selective (relies on antibody-antigen interactions). • Ideal for analysis of complex matrices.	• Selectivity depends on choice of sorbent material. • Offers a broader range of selectivity compared to immunoaffinity clean-up.
Applications	• Can be used for the clean-up of any sample type (i.e. cereals, nuts, coffee, tea, cocoa, dried fruits, species, herbs, milk, baby food, wine etc).	• Most commonly used for the analysis of cereals and animal feeds.
Complexity	• Requirement to optimise methods depending on matrix analysed.	• Generally involves fewer steps.
Automation	• Often automated with dedicated instruments available for high-throughput extraction processes.	• Often automated.
Costs	• Typically, more expensive due to the use of antibodies however no requirement for matrix matched or isotopic labelled standards.	• Can be cheaper as relies on solid sorbents which are less expensive however matrix matched calibration would be required.

In summary, both immunoaffinity and SPE clean-up are valuable techniques for sample preparation offering different levels of selectivity, complexity and cost depending on the specific requirements of the analysis.

QuantPREP™: Immunoaffinity columns

Product overview

In today's fast-paced laboratory environments, maximizing efficiency is of utmost importance. Traditionally, immunoaffinity columns were used to target single mycotoxins however multi-toxin products are preferred in combination with LC-MS/MS detection. In addition, with advancements in automation technology, labs can now significantly increase throughput, streamline workflow and improve overall productivity.

Art. No.:	Product	Toxins
P89	AFLAOCHRA PREP®	Aflatoxin B1, B2, G1, G2 ochratoxin A and C
P112	AO ZON PREP®	Aflatoxin B1, B2, G1, G2 ochratoxin A and C, zearalenone
P115	AOF MS-PREP®	Aflatoxin B1, B2, G1, G2, ochratoxin A and C, fumonisin B1, B2 and B3
P73	DZT MS-PREP®	Deoxynivalenol, zearalenone, T-2 and HT-2
P128	11⁺Myco MS-PREP® AOAC-RI 112401	Aflatoxin B1, B2, G1, G2, ochratoxin A and C, fumonisin B1, B2, B3, deoxynivalenol, zearalenone, T-2 and HT-2

Features & benefits

Features	Benefits
Highly specific: The quality of the antibody is crucial in obtaining accurate and reliable results.	**Pure sample eluates:** Immunoaffinity columns provide pure eluates, minimising issues with chromatographic interferences. In addition, this removes the requirement for the use of matrix matched or isotopic labelled standards. **Sensitivity:** In addition, they enable the detection and isolation of the analyte/s at low levels enhancing sensitivity of the analysis.
High antibody capacity: Our immunoaffinity columns have high antibody loading meaning that there is sufficient antibody to ensure capture of the analyte/s even when present at levels above the legislative levels. This excess antibody ensures that the capacity of the product is not exceeded which can result in the underreporting of results.	**Reliability:** Immunoaffinity columns provide consistent and reproducible results.
Selective binding: Immunoaffinity columns offer high selectivity, enabling the isolation of the analyte/s from complex samples which contain numerous other components.	
Unique batch number etching: R-Biopharm columns are uniquely etched with the batch number on every column.	**Improved traceability:** When running several columns, the unique batch number helps to reduce human errors and improve overall traceability.
Unique multi-toxin options: R-Biopharm have a comprehensive portfolio of multi-toxin immunoaffinity columns to detect a range of mycotoxins.	**Time efficiency:** Multi-toxin columns streamline the clean-up process, reducing bench time allowing more samples to be analysed in a day.

In summary, immunoaffinity columns provide analysts with a robust and efficient method for purifying mycotoxins from a wide range of complex food and feed samples, offering high purity isolates, sensitivity and ease-of-use.

QuantPREP™:
Solid phase clean-up columns

Product overview

SPE clean-up offers laboratories a versatile and effective method for sample preparation of multi-mycotoxins.

PuriTox

PuriTox clean-up columns contain a specifically formulated sorbent which retains large molecules and contains several active sites to adsorb various interfering compounds.

These simple to use syringe format columns provide a quick clean-up solution for screening a range of cereal and animal feed products.

Art. No.:	Product	Toxins
P25	PuriTox Aflatoxin	Aflatoxin B1, B2, G1, G2
TC-M160	PruiTox AflaZON	Aflatoxin B1, B2, G1, G2 and zearalenone

QualiT Pure™

QualiT Pure™ clean-up columns contain a specifically formulated sorbent which retains large molecules and contains several active sites to adsorb various interfering compounds. The sorbent is layered between nylon, cellulose and polyethylene frits which provide additional purification and clean-up of the sample. These columns allow for multiple mycotoxins to be screened with the use of a single syringe format column.

Art. No.:	Product	Toxins
TC-QP1000	QualiT Pure™ Multi-Mycotoxin	Aflatoxin B1, B2, G1, G2, deoxynivalenol, 3-acetyl DON, 15-acetyl DON, DON 3-Glucoside, de-epoxy DON, nivalenol, T-2, HT-2, diacetoxyscirpenol, neosolaniol, fusarenon-X, zearalenone, zearalenol, sterigmatocystin and patulin
TC-QP1100	QualiT Pure™ Multi-Tox MS	Aflatoxin B1, B2, G1, G2, deoxynivalenol, 3 acetyl-DON, 15-acetyl DON, DON 3-Glucoside, de-epoxy DON, nivalenol, T-2, HT-2, diacetoxyscirpenol, neosolaniol, fusaernon-X, zearalenone, zearalenol, α - zearalenol, β-zearalenol, sterigmatocystin, patulin, fumonisin B1, B2, B3, ochratoxin A, citrinin, beauvericin, phompsin, patulin, enniatin A, A1, B and B1

Features & benefits

Features	Benefits
Matrix removal: Uniquely formulated sorbents effectively reduce matrix components such as salts, proteins, lipids and pigments reducing interference.	**Cleaner sample eluates:** SPE clean-up can reduce issues with chromatographic interferences compared to direct injection methods.
Additional frits: The QualiT PureTM columns contain nylon filter frits which provide additional purification of the sample.	
Syringe format column: Our SPE columns are all designed using simple syringe format columns.	**Ease-of-use and time saving:** • Convenient and easy to use, especially if large numbers of samples are being analysed in a day. • Can harmonise mycotoxin extraction with pesticide analysis.
Simple methods: • No requirement for conditioning or washing of the columns. • No need for centrifugation of samples. • Can be used in combination with a QuEChERS extraction.	
Reliable performance: Recoveries of greater than 70 % for all toxins. All validation conducted using matrix matched standards to correct for recovery.	**Reduced cost:** No requirement for expensive isotopic labelled standards. Matrix matched standards are easier to work with.

QuantPREP™: Automation

Overview

Whichever system you choose, investing in laboratory automation unlocks numerous benefits for your lab. At R-Biopharm, we understand the transformative power of automation. Our comprehensive range of solutions is designed to meet the diverse needs of modern laboratories, providing automation systems and unparalleled support services. From increased throughput and streamlined workflows to reduced manual intervention and improved data quality, automation revolutionises how laboratories operate.

Benefits of automation

Reduce variability: By minimising manual intervention, automation reduces the potential for variability therefore enhancing the reproducibility of results.

Increase throughput: Automation allows for the simultaneous processing of samples, significantly increasing throughput. This accelerated workflow enables analysis of more samples in a shorter timeframe, boosting productivity.

Streamlined workflow: Automation optimises workflow efficiency by eliminating time-consuming manual steps. Tasks that once required extensive manual labour are streamlined, allowing staff to focus on more complex tasks and scientific analysis.

Automation options

For immunoaffinity and solid phase extraction columns

To automate the use of our immunoaffinity columns, we have optimised methods for use with Gilson ASPEC systems. Both systems guarantee precise results through positive pressure and accurate liquid handling. The smaller system can be integrated online with LC systems, allowing unattended processing of samples. While the larger system maximises throughput by processing up to four samples in parallel, with a large bed capacity for unattended processing of up to 96 samples.

Re-usable immunoaffinity cartridges

For laboratories with a high number of samples, our online immunoaffinity cartridge system delivers efficiency and reliability. With consistent, optimised run times and a focus on high throughput, this system accelerates your workflow without compromising quality. This system is designed to maximise productivity while maintaining reliability.
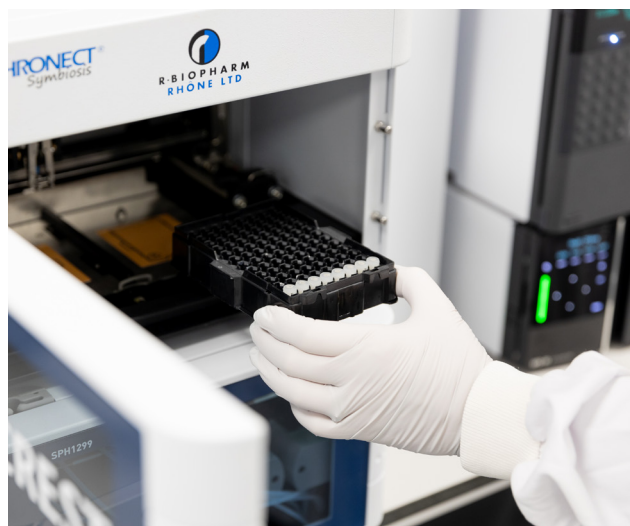
QualiT™:
Standards & reference materials

Trilogy Analytical Laboratory is a full-service ISO 17025 accredited laboratory and is one of the few producers of certified reference materials, quality control materials and mycotoxin standards manufactured according to ISO 17034.

We can provide over 30 analytical standards for a wide range of mycotoxins in solvents or in dry format. The standards can be used for spiking experiments to check laboratory performance or for the preparation of calibration standards for use with the LC-MS/MS. Both formats are easy-to-use and require minimal preparation.

Our quality control materials are naturally contaminated homogenous products that contain a specific concentration of one or more mycotoxins. Materials are available containing the major mycotoxins in various matrices and levels of contamination: aflatoxins, ochratoxin, deoxynivalenol, fumonisin and zearalenone with materials for maize and maize-based-products, wheat, barley, malted barley, oats as well as complex samples such as animal feed and pet food. The quality control materials are typically used for daily quality assurance, technician training, troubleshooting and for preparing matrix matched calibration curves.

Using matrix matched standards to correct for matrix effects

Some ion suppression or enhancement may be present when using SPE columns for sample clean-up. This can be easily overcome by using matrix matched standards. This assumes that if the background causes a 50 % suppression, then the same effect with be observed for the analyte standard. Suitable blank material should therefore be used that matches the sample matrix. The following diagram illustrates the various materials that can be used for a range of sample matrices.

For further information on our QualiT package please contact us.

contact us:

https://r-b.io/trilogylab

Summary

Multi-toxin analysis with LC-MS/MS detection offers many advantages. The ability to streamline processes, reduce resource consumption and improve data quality makes it an attractive option across various industries. As technology continues to advance, multi-toxin analysis is poised to play an increasingly critical role in achieving economic and environmental goals. We will continue to apply our expertise to extending the range of products required to make your analysis easy.

For further information please contact us: info@r-biopharmrhone.com