

## Precision Testing Technologies

### Overview

At Vibrant Wellness, our commitment to precision and innovation in advanced testing is unmatched. We utilize a range of advanced laboratory methodologies to provide comprehensive and accurate results. Below, we delve into each of these methodologies, highlighting their importance, accuracy, and the unique advantages they offer. This guide serves as an invaluable resource for healthcare providers to better understand the technologies we employ and the benefits they deliver.



### Benefits of Our Multi-Platform Approach



#### Versatility in Sample Types

Our methodologies accommodate a wide range of sample types, including blood, saliva, urine, and stool. This flexibility ensures that we can provide accurate results regardless of the sample type available, enhancing convenience for both patients and providers.



#### Wide Range of Tests

Our extensive test menu covers numerous health aspects, facilitating personalized and precise healthcare. By employing various advanced technologies, we can offer tests for genetic markers, environmental toxins, nutritional deficiencies, infectious diseases, and more.



#### Rapid Turnaround Time

Advanced technologies such as the ImmunoChip assay enable high-throughput testing, significantly reducing the time required to obtain results. This is particularly beneficial in clinical settings where timely diagnosis is critical for effective patient management.



#### Cost-Effectiveness

By integrating high-throughput and multiplexing capabilities, we can perform comprehensive testing at a lower cost per analyte. This makes advanced testing more accessible and affordable for patients.



#### Enhanced Confidence

The use of multiple advanced technologies provides a more complete and accurate picture of a patient's health status. This comprehensive approach enhances confidence in the accuracy of assessments, leading to better-informed clinical decisions and improved patient outcomes.



# ImmunoChip Assay (Vibrant Proprietary Microarray + Chemiluminescence)

**Blood**   **DBS**

The ImmunoChip assay is a high-density microarray platform that uses silicon wafers to create microchips, each representing a different antigen. This platform allows for the simultaneous detection of multiple antibodies in a single run, enhancing accuracy and efficiency in the assessment of patient health.

Microchips are made from silicon wafers, each containing immobilized antigens. When a sample is applied, antibodies in the sample bind to their corresponding antigens on the microchips. The bound antibodies are then detected using chemiluminescence, providing a semiquantitative measure of antibody levels.



*Tech: Vibrant Proprietary Microarray, solid phase binding*

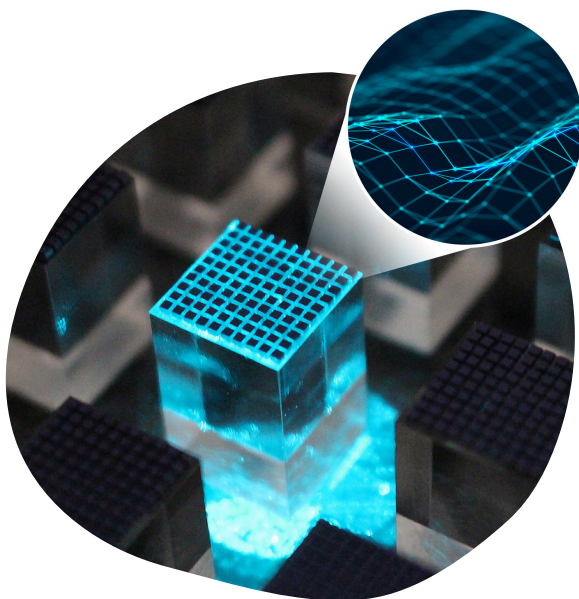
## Application

**High Throughput and Flexibility:** The ImmunoChip assay can test for multiple infections simultaneously, reducing the time and cost associated with traditional diagnostic methods. It is particularly useful for detecting antibodies associated with complex conditions like Lyme disease and its co-infections.

**Enhanced Sensitivity and Specificity:** The platform's high-density array surface and chemiluminescent detection provide high sensitivity and specificity, facilitating high accuracy for detecting a wide range of infectious agents.

## Accuracy

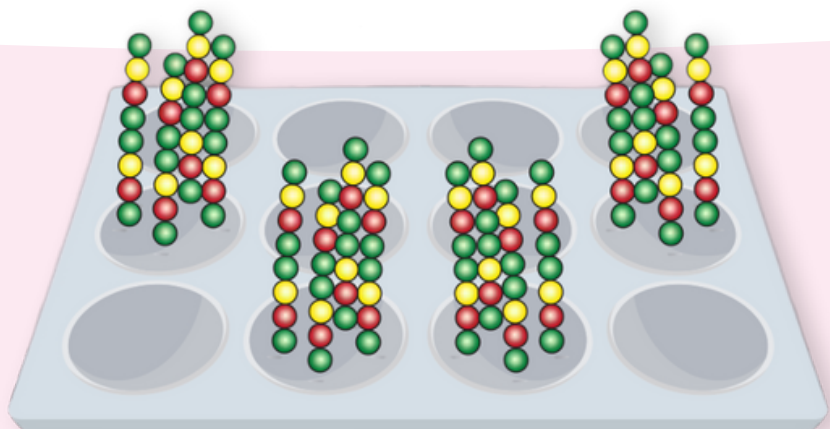
The ImmunoChip assay offers enhanced sensitivity and specificity for IgM, IgA, IgG, IgE, C3D, and IgG4 antibodies, significantly improving performance compared to traditional diagnostic methods. The use of chemiluminescence ensures high signal-to-noise ratios, enhancing detection accuracy.



## Vibrant Tests That Use This Methodology

Comprehensive panels including Lyme disease and co-infections, Neural Zoomer Plus, Food Zoomers, and Food Sensitivity testing.

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# ImmunoChip Assay (continued)

## The Vibrant Advantage

The **ImmunoChip assay** represents the pinnacle of multiplex antibody detection, utilizing high-density microarrays and chemiluminescent detection for unmatched sensitivity and specificity.

Founded by pioneering scientists in 2010, Vibrant Wellness has revolutionized advanced testing with automated, scalable technologies. Our proprietary process ensures rapid and accurate detection of antibodies against multiple infectious agents simultaneously.

This unique capability, combined with our high-resolution imaging and advanced software analysis, delivers precise results with fast turnaround times, making us leaders in infectious disease and autoimmune disorder testing.



## Key Benefits



### High Throughput and Flexibility

Simultaneously detects multiple antibodies.



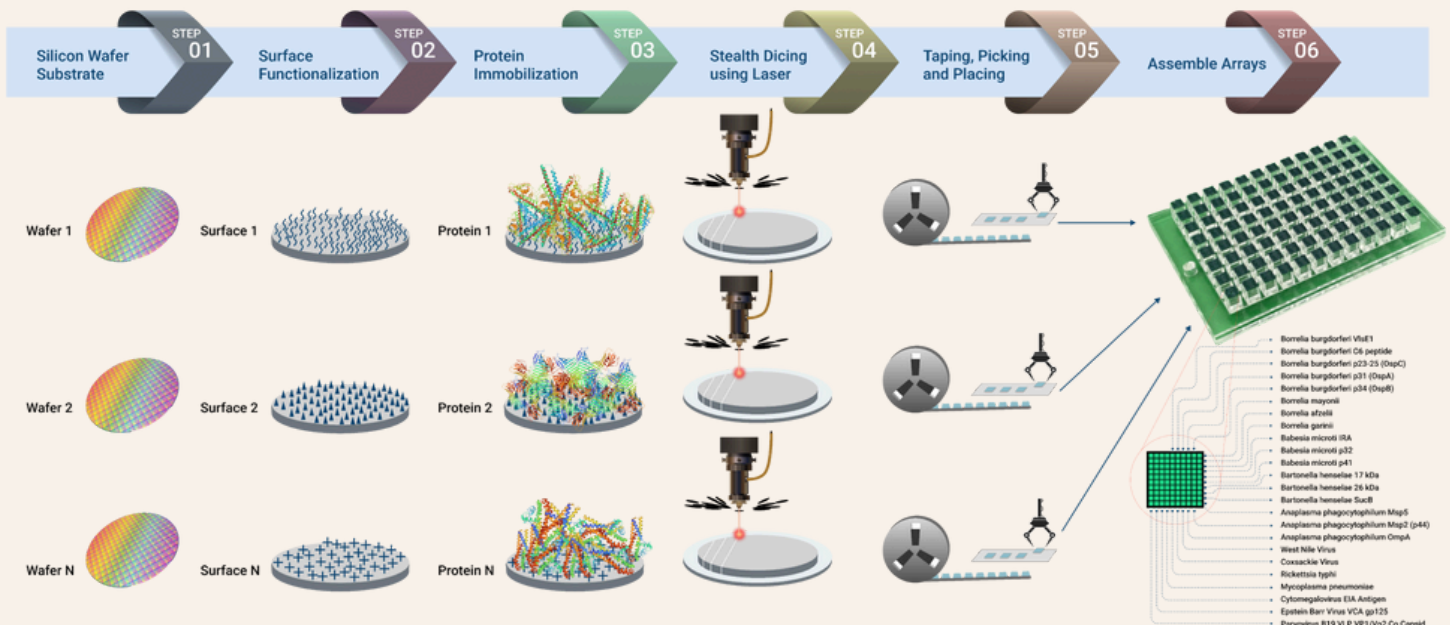
### Enhanced Sensitivity and Specificity

Provides accurate results for complex conditions.



### Rapid Turnaround Times

Ensures timely and reliable results for healthcare providers.







**Tech:** Quantstudio 5

## Real Time Polymerase Chain Reaction (RT-PCR)

**Blood** **Stool** **Saliva**

PCR is a laboratory technique that enables the amplification of a specific segment of DNA, producing millions to billions of copies of the DNA segment in a short period. This amplification process involves the use of primers (short DNA fragments) that are complementary to the target DNA sequence, DNA polymerase enzyme, nucleotides, and thermal cycling.

The process involves denaturation (heating the DNA to separate its two strands), annealing (cooling to allow primers to bind to the target DNA sequence), and extension (DNA polymerase extends the primers to form a new DNA strand). These steps are repeated through multiple cycles to exponentially amplify the target DNA.

### Application

**Human Genetics:** PCR is indispensable for identifying genetic variations (e.g., single nucleotide polymorphisms or SNPs) among individuals, which can influence susceptibility to diseases and response to treatments.

**Pathogen Detection:** It is used to detect the presence of pathogens (e.g., bacteria, viruses) by amplifying their DNA/RNA, supporting early and accurate diagnosis of infections. This is crucial in detecting tick-borne pathogens in blood samples and food-borne pathogens in stool samples.

### Accuracy

The Quantstudio 5 PCR system offers high sensitivity and specificity, essential for detecting low-abundance genetic material and supporting precise diagnostics. The system's advanced thermal cycling and optical detection capabilities minimize errors and maximize reproducibility.



### Vibrant Tests That Use This Methodology

- ApoE
- CardiaX
- MTHFR
- Factor II-V
- Celiac Genetics
- NutriPro (Genetics)
- Methylation (Genetics)
- Toxin Genetics
- Oxidative Stress (Antioxidant Genetics)
- Gut Zoomer (Pathogens & Commensals)
- Tickborne (Microbe Identification)

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## RT-PCR (continued)

### The Vibrant Advantage

PCR is a cornerstone of genetic testing and pathogen detection, renowned for its ability to amplify specific DNA segments rapidly and accurately.

Our use of the Quantstudio 5 system ensures that healthcare providers receive highly sensitive and specific results, even from samples with low DNA concentrations.

By leveraging bead beating, advanced thermal cycling, and optical detection capabilities, we minimize errors and maximize reproducibility. This precision is critical for identifying genetic variations and detecting pathogens, making PCR an invaluable tool in personalized medicine, infectious disease diagnostics, and genetic counseling.



### Key Benefits



#### High Sensitivity and Specificity

Ensures accurate detection of low-abundance genetic material.



#### Versatile Sample Types

Capable of processing blood, saliva, and stool samples.



#### Comprehensive Test Menu

Includes genetic markers, pathogen identification, and more.



# Liquid Chromatography with Tandem Mass Spectrometry (LC-MS/MS)

**Blood** **Urine**

LC-MS/MS combines liquid chromatography (LC) with tandem mass spectrometry (MS/MS) to identify and quantify compounds in complex mixtures. LC separates the components of the sample, which are then introduced into the mass spectrometer for further analysis.

In LC, the sample is passed through a column packed with a stationary phase. Different components of the sample interact with the stationary phase to varying degrees, resulting in separation. The separated components are then ionized and analyzed by the mass spectrometer, where they are fragmented and the resulting ions are detected and quantified.



*Tech: Waters, NexION 2000 Mass Spectrometer*

## Application

**Broad Application Range:** LC-MS/MS is ideal for detecting and quantifying a wide range of chemical substances, including environmental toxins, pharmaceuticals, and metabolites. Its high sensitivity makes it suitable for detecting low-abundance compounds.

**Metabolic and Hormonal Studies:** It is extensively used for metabolic profiling, neurotransmitter analysis, and hormonal studies, providing insights into various physiological and pathological states.

## Accuracy

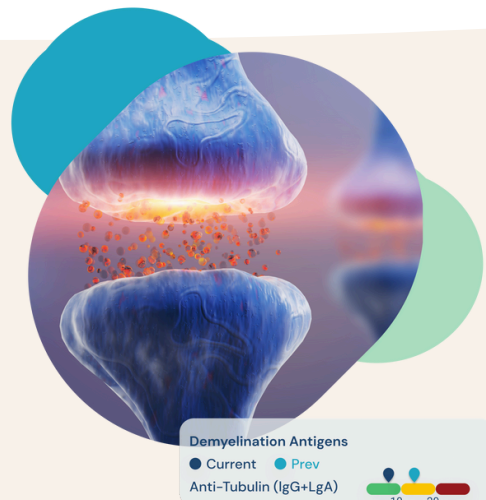
LC-MS/MS offers high specificity and sensitivity, enabling precise quantification of a wide range of analytes down to **picogram** level detection. The tandem mass spectrometry setup allows for multiple stages of fragmentation, enhancing the identification and quantification accuracy of the compounds.



## Vibrant Tests That Use This Methodology

- Environmental Toxins
- Mycotoxins
- PFAS
- Total Tox Burden
- Micronutrients
- NutriPro
- Neurotransmitters
- Neural Health
- Urinary Hormones (Non-acids)
- Salivary Hormones
- Serum Hormones
- Gut Zoomer (Gut Metabolites)
- Oxidative Stress (Damage Markers)

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## LC-MS/MS (continued)

### The Vibrant Advantage

LC-MS/MS is celebrated for its ability to identify and quantify a vast array of chemical substances with high specificity and sensitivity.

Our advanced LC-MS/MS platforms, combined with proprietary methods for sample preparation and ionization enhancement, enable us to detect low-abundance compounds with precision.

This technology is critical for metabolic profiling, neurotransmitter analysis, and hormonal studies. Our commitment to maintaining and optimizing these complex instruments ensures reliable and reproducible results, positioning us as leaders in comprehensive chemical analysis.



### Key Benefits



#### High Specificity and Sensitivity

Essential for detecting low-abundance analytes.



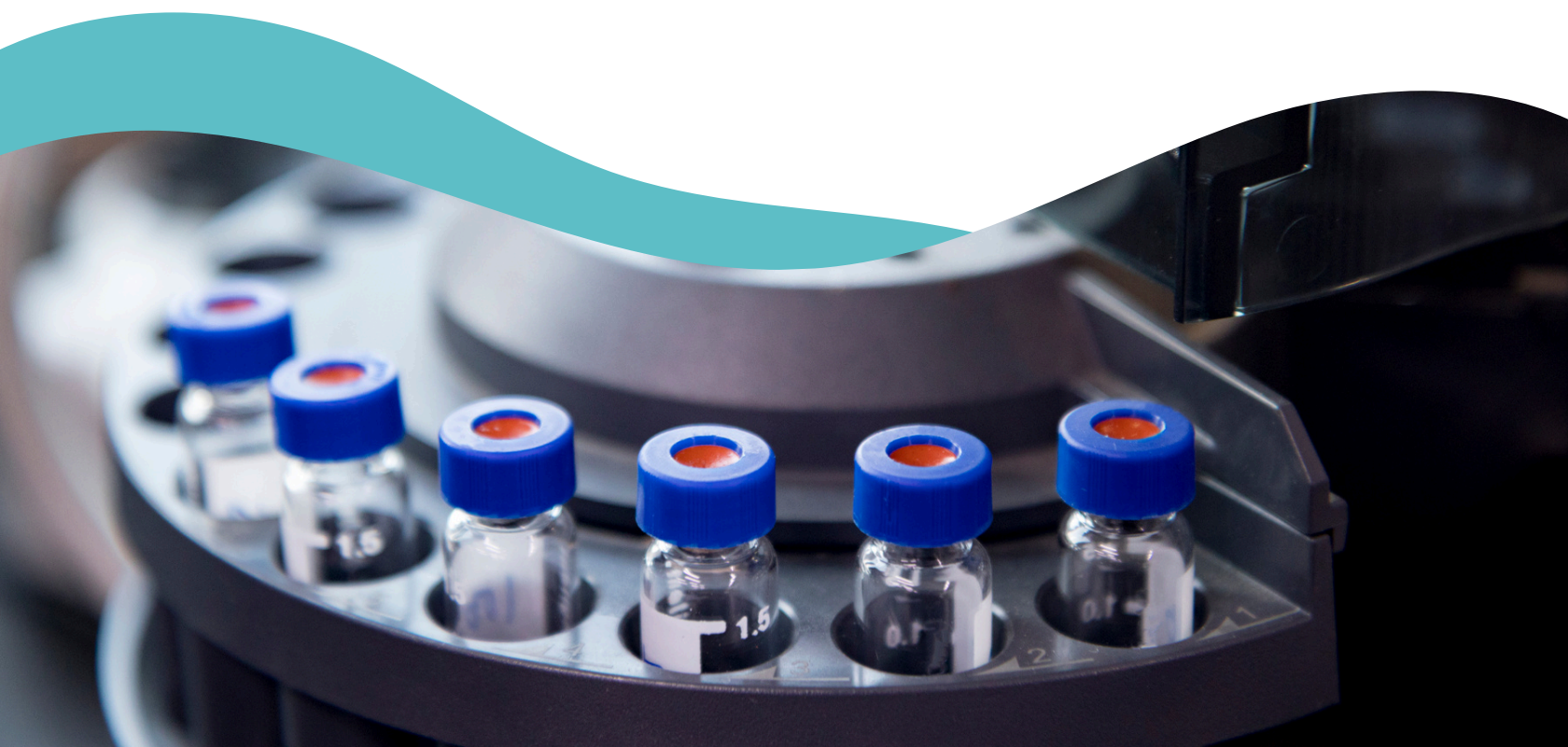
#### Broad Application Range

Suitable for environmental toxins, pharmaceuticals, and metabolites.



#### Comprehensive Test Offerings

Includes metabolic, hormonal, and neurotransmitter analyses.







**Tech:** Agilent, NexION 2000 Mass Spectrometer

## Gas Chromatography with Tandem Mass Spectrometry (GC-MS/MS)

Blood

Urine

GC-MS/MS combines gas chromatography (GC) with tandem mass spectrometry (MS/MS) to identify and quantify volatile compounds. GC separates the components of the sample, which are then introduced into the mass spectrometer for further analysis.

In GC, the sample is vaporized and carried by an inert gas through a column coated with a stationary phase. Different components of the sample interact with the stationary phase to varying degrees, resulting in separation. The separated components are then ionized and analyzed by the mass spectrometer, where they are fragmented and the resulting ions are detected and quantified.

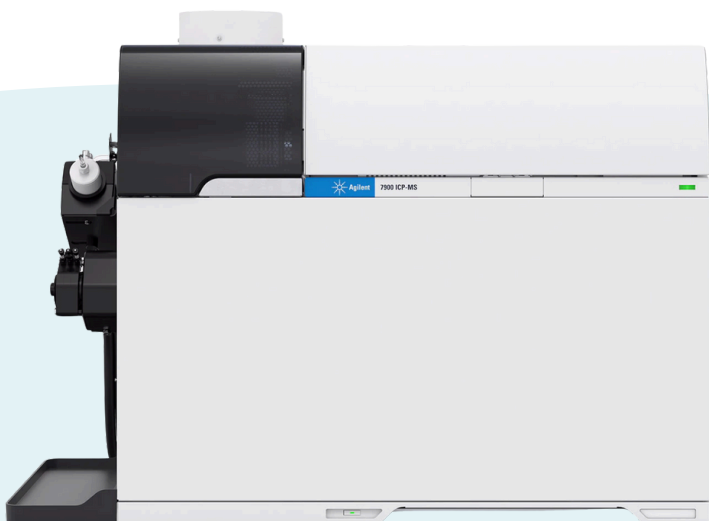
### Application

**Volatile Compound Analysis:** GC-MS/MS is particularly adept at analyzing volatile organic compounds, making it ideal for applications in environmental testing, food and beverage analysis, and clinical diagnostics.

**Metabolic Profiling:** It is used for analyzing organic acids and other small molecules in biological samples, providing valuable insights into metabolic disorders and biochemical pathways.

### Accuracy

GC-MS/MS provides high resolution and accuracy in detecting volatile compounds, essential for accurate metabolic profiling and environmental analysis, down to **femtogram** level detection. The mass spectrometer's ability to perform multiple stages of fragmentation enhances the identification and quantification of the compounds.



### Vibrant Tests That Use This Methodology

- Organic Acids
- Urinary Hormones (Acids)

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## GC-MS/MS (continued)

### The Vibrant Advantage

GC-MS/MS is the preferred method for analyzing volatile organic compounds, offering high resolution and accuracy.

At Vibrant Wellness, we leverage the capabilities of the Agilent and NexION 2000 Mass Spectrometers to provide detailed metabolic profiles and environmental analyses. Our proprietary sample preparation techniques and rigorous maintenance protocols ensure consistent and reliable performance.

This technology is vital for understanding metabolic disorders and assessing exposure to environmental pollutants, making our lab a trusted partner for comprehensive GC-MS/MS analysis.



### Key Benefits



**High Resolution and Accuracy**  
Ideal for volatile compound analysis.



**Robust Analytical Performance**  
Ensures reliable metabolic and environmental assessments.



**Advanced Sample Preparation**  
Enhances detection and quantification accuracy.



# Inductively Coupled Plasma with Mass Spectrometry (ICP-MS)

Blood Urine

ICP-MS is an analytical technique used for elemental determinations. It involves ionizing the sample with inductively coupled plasma and then analyzing the ions produced using mass spectrometry.

The sample is introduced into the plasma as an aerosol, where it is atomized and ionized. The resulting ions are then extracted and passed into a mass spectrometer, which separates them based on their mass-to-charge ratio. The detector measures the abundance of each ion, providing quantitative data on the elemental composition of the sample.



Tech: Perkin Elmer and Agilent, NexION 2000 Mass Spectrometer

## Application

**Metal Analysis:** ICP-MS is particularly effective for detecting and quantifying metals and metalloids in biological samples. This includes essential trace elements, toxic heavy metals, and mineral deficiencies or excesses.

**Environmental and Nutritional Assessments:** It is widely used for assessing environmental exposure to toxic metals and for monitoring nutritional status through micronutrient analysis.

## Accuracy

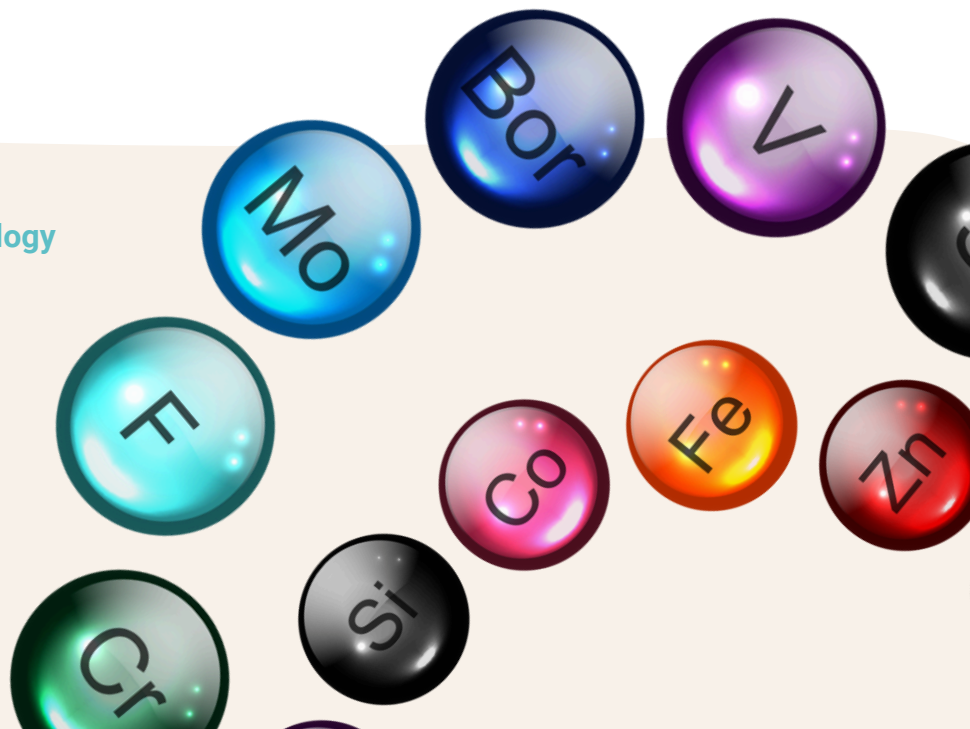
The NexION 2000 Mass Spectrometer can detect elements down to the **parts-per-quadrillion** level, offering unparalleled sensitivity and accuracy. This precision is crucial for monitoring micronutrient levels and detecting heavy metal toxicity.



## Vibrant Tests That Use This Methodology

- Heavy Metals
- Micronutrients (Metal/Minerals)
- NutriPro (Metal/Minerals)

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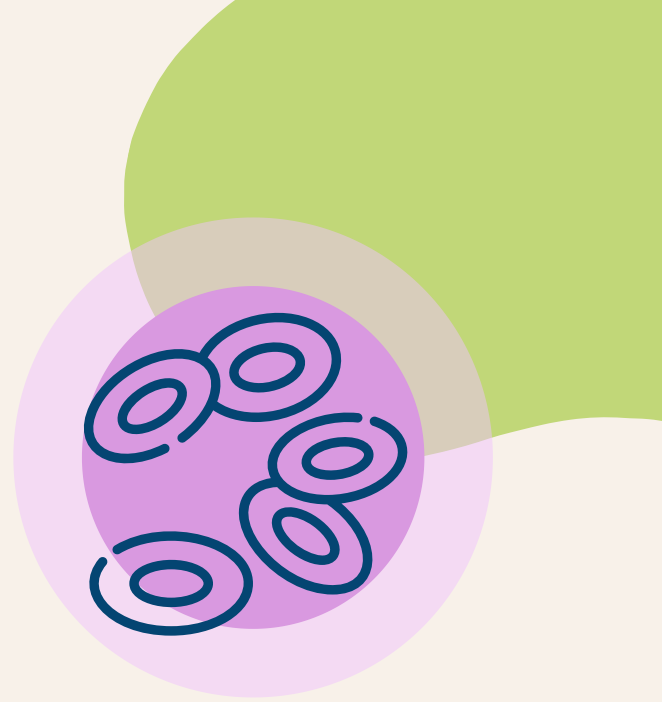
# ICP-MS (continued)

## The Vibrant Advantage

ICP-MS is the gold standard for elemental analysis, offering unparalleled sensitivity and accuracy in detecting and quantifying metals and metalloids.

At Vibrant Wellness, we utilize the NexION 2000 Mass Spectrometer to deliver precise measurements down to the parts-per-quadrillion level. Our systematic decontamination protocol and expertise in managing complex instruments ensure optimal performance and reliable results.

This makes our lab a preferred choice for monitoring micronutrient levels, detecting heavy metal toxicity, and assessing environmental exposure to toxic metals.



## Key Benefits



### Unmatched Sensitivity

Detects elements at ultra-trace levels.



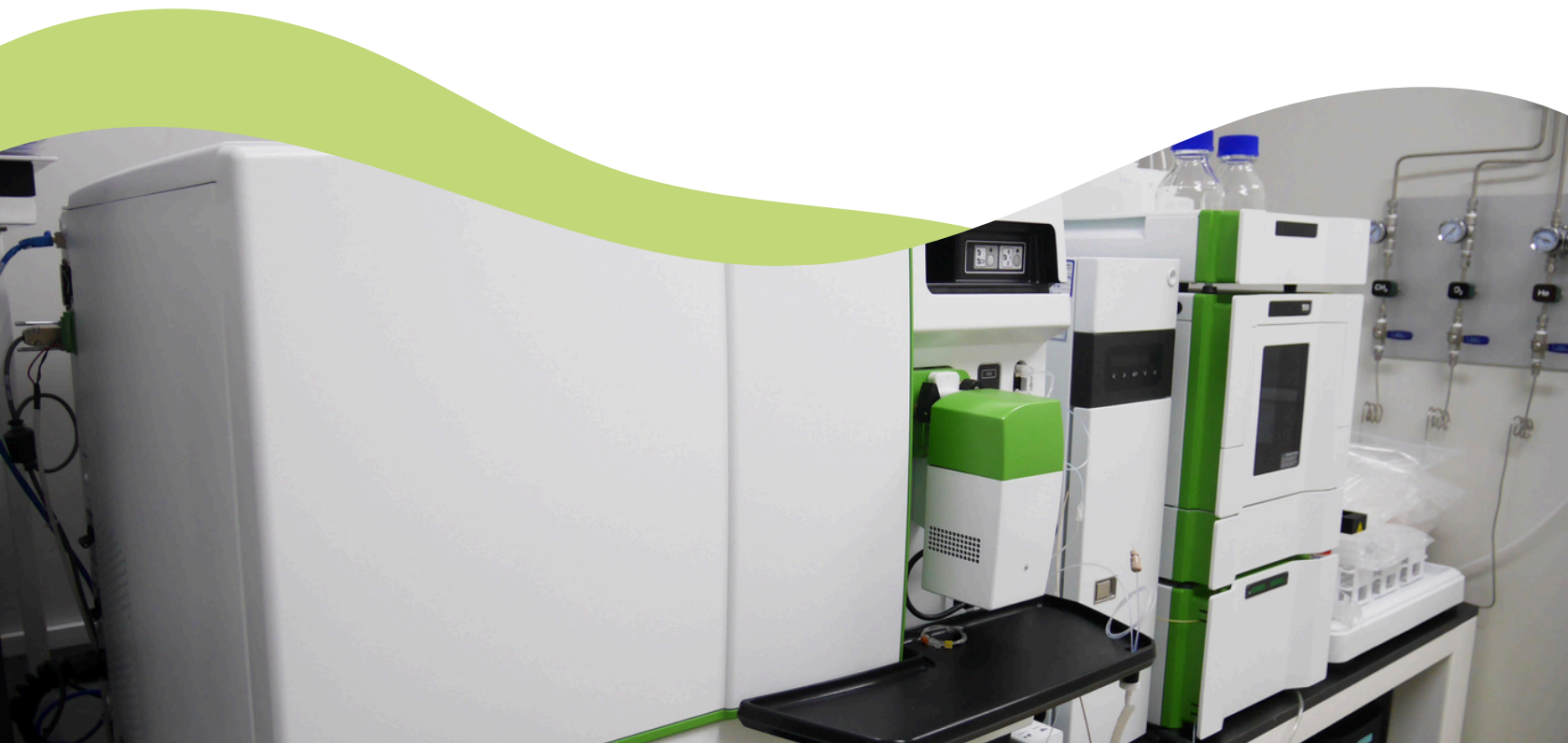
### Accurate Metal Analysis

Essential for nutritional and toxicological assessments.



### Robust Sample Handling

Handles urine and blood samples efficiently.



## Importance of Accuracy in Diagnostics



### Early Detection and Intervention

Accurate diagnostics enable early detection of diseases, facilitating timely and effective interventions. Early diagnosis can significantly improve prognosis and reduce the burden of disease.



### Tailored Treatments

Precision in diagnostics allows for treatments to be tailored to individual conditions and genetic profiles. Personalized treatment plans improve the efficacy of interventions and reduce the risk of adverse effects.



### Patient Safety

Accurate diagnostics reduce the risk of misdiagnosis and unnecessary treatments, safeguarding patient health. Ensuring that patients receive the correct diagnosis is essential for their safety and well-being.



### Cost-Effectiveness

Minimizes the need for repeated testing and unnecessary procedures, optimizing healthcare resources. Accurate initial diagnoses prevent the costs associated with misdiagnosis, including additional testing and inappropriate treatments.

## The Gold Standard of Accuracy in the Lab Industry

Vibrant Wellness stands at the forefront of precision testing technology, offering a comprehensive suite of advanced testing methodologies. Our commitment to precision, reliability, and innovation ensures that healthcare providers receive the most accurate and timely information available. By integrating cutting-edge technologies with expert management and proprietary methods, we deliver unparalleled value in the field of medical diagnostics.

For more information on how our advanced diagnostic solutions can benefit your practice, please contact us or visit our website.

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