

€ 15.-

Your guide to laboratory and pathology equipment in Europe

# LAB BOOK

- Automation
- Chemistry & Immunochemistry
- Hematology
- Pathology
- DNA
- Microbiology
- POCT
- IT
- Non-Diagnostic

# 2016



Shimadzu has released the world's first system for fully automated sample preparation connected online for LCMS. The CLAM-2000 (Clinical Laboratory Automated sample preparation Module) automates the pretreatment of blood or other biological samples before LCMS analysis. It is designed for customers handling blood samples in pharmaceutical departments, medical departments or biological analysis laboratories dealing with issues of variability in analytical results or infection risk.

# Imprint

*Published by:*

**EUROPEAN HOSPITAL Verlags GmbH**

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Subscription rate: € 15,- plus postage

**Printed by**

Weiss-Druck GmbH & Co. KG, Monschau, Germany

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## Dear reader,

All good things come in threes – and the Labbook is no exception. With the present third edition in as many years we have established something like a tradition: an annual purchasing guide for laboratory medicine that offers a comprehensive overview of commercially available products and services.

We aim to provide up-to-the information for you – our readers – quickly and efficiently: each manufacturer has a quarter of a page to showcase his flagship products and present the crucial performance data. Clear categories, a color system to guide you through the wealth of products, and a manufacturer index at the end of the Labbook make sure that you've got everything you are looking for right at your fingertips. You can find further information in the product data base at [www.labbook.eu](http://www.labbook.eu) or in the e-paper [www.healthcare-in-europe.com](http://www.healthcare-in-europe.com), where each product entry will take you straight to the manufacturer's website. Even more: we compiled an easily accessible knowledge bank for you containing all the scientific papers that were published in the Labbook, contributions from industry experts as well as news from the national and international lab medicine community.

Volume and content of the Labbook reflect the progress and the growth the laboratory medicine market has witnessed over the past few years: more manufacturers, more products, more product categories are a measurement of success. Moreover, we were once again able to convince renowned professionals to offer us a glimpse of their field of expertise and share their views on the future direction of the discipline. The article on the status and the particularities of pediatric laboratory medicine and the outlook on hemostaseology reflect the state of the art of laboratory diagnostics as well as the current thinking within the community.

Pathology – and not only digital pathology – is once again one of the core issues of the Labbook. In a special section in the center of the Labbook we are looking at the entire diagnostic process from receiving the tissue samples through the pathologist's report on the findings, including sub-disciplines such as histopathology, cytopathology and molecular pathology.

And last but not the least we are looking beyond diagnostics: IT and automation play an increasingly important role in our publication. Consequently, you will find plenty of information on manufacturers and products, inter alia software to manage reagents, scanning solutions and an e-commerce platform.

Politically, the idea of "Europe" may be experiencing stormy weather, the active interest and involvement of our partners in this publication and your – the readers – ongoing interest however illustrate that Europe is "alive 'n' kicking". We should like to thank our colleagues from research and industry as well as our European team for their support with the production of this edition of the Labbook.

And just like all the manufacturers of products and providers of information we, the editorial team, look forward to your feedback.

If you have any questions, suggestions or criticism, please contact us at [healthcare-in-europe.com](http://healthcare-in-europe.com)

Enjoy reading and browsing!

**Your Labbook team**

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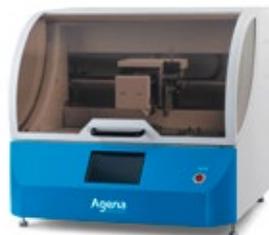
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# Automation & Sample Processing

Sample Processing  
Automation  
Robotics  
Research Use Only

**mindray**

**HOLOGIC**<sup>®</sup>  
CLARITY OF VISION

 **SHIMADZU**

 **SARSTEDT**

 **BECKMAN  
COULTER**<sup>®</sup>

**ASP**  **Lab Automation**  
Automated Sample Processing

**SIEMENS**  
**Healthineers** 

# Sample Processing

## SAMPLE PROCESSING

### ASP Lab Automation – Bench-top Decapper Pluggo RH



**Dimensions:** 360 x 560 x 610 mm (h x w x d)  
**Sample throughput:** Over 2,000 tubes per hour

**Highlights:** Pluggo RH decapper is a compact bench-top device that safely and efficiently removes original caps from blood specimen tubes.

- Avoids potential health risks from Carpel Tunnel Syndrome and aerosol contamination
- Tubes are loaded and decapped in analyzer racks
- Handles up to 15 racks each for input and output
- Available for many analyzer rack types
- Robust and simple design guarantees high reliability and uptime
- Smaller models available that handle single racks

### ASP Lab Automation – Tube Sorter SortPro



**Dimensions:** 1,130 x 1,100 x 600 mm for 6 sorting bins; +200 mm for each 2 extra sorting bins (h x w x d)  
**Sample throughput:** Up to 2,000 tubes per hour

**Highlights:** The SortPro tube sorter is an economical automation device for the pre-analytics of small and high-volume labs.

- Early specimen identification and registration
- Fast presorting of specimens
- Separates problematic specimens (missing requests, bad barcode, etc.) from routine work
- Small and fast instrument, robust and reliable
- Bulk input and bulk output of specimens
- Freely configurable number of sort bins
- Processes all standard blood and urine tube types

### Beckman Coulter – AutoMate 1250/2550



**Aliquoter (1+1 aliquot):** 700 primaries with 10% aliquoted to a daughter tube (AutoMate 1250)  
 900 primaries with 10% aliquoted to a daughter tube (AutoMate 2550)  
**Weight:** 720 kg (1250/2550)  
**Dimensions:** 1625 x 2560 x 1115 mm (without recapper)  
 1625 x 2560 x 1415 mm (with recapper)

**Highlights:** The AutoMate 1250/2550 family of pre- and post-analytical sample processors and sorting systems boosts the possibilities of the laboratory automation system by providing a fully integrated sample bank solution for long-term archiving. The AutoMate 1250/2550's archiving, retrieval for re-run, sample re-introduction and sample disposal allows for an easy workflow and sample management.

### Hologic – Tomcat Instrument



**Dimensions:** 762 x 1092 x 711 mm (h x w x d)  
**Weight:** 136 kg  
**Sample throughput:** 300 samples per 8 h shift  
**Power supply:** 100-240 V, 50-60 Hz, 600 W

**Highlights:**

- Fully automated general purpose instrument
- Automated, walkaway pre-analytical sample processing
- Improved lab workflow by freeing skilled labour for other tasks
- Increased confidence with positive sample ID and chain of custody
- Reduced risk of cross-contamination
- Standardized aliquoting process
- Lower risk of repetitive motion injuries
- Multiple sample types

## SARSTEDT – Bulk Loader BL 1200 ID



**Sample throughput:** up to 1,200 tubes

- Highlights:**
- Ideal in combination with any analytical platform
  - No sorting or handling required
  - Process any tube type of 80 to 110 mm length (with cap) and 11 to 16 mm diameter, including false bottom options
  - Suited for any sample type (serum / plasma, serum gel / plasma gel, EDTA, citrate, blood sugar, urine)
  - Integral ID module
  - Automatic sample accessioning
  - Customised sort rules to a variety of carrier types or bins
  - Safe, rapid and continuous operation without error

System range:

- BL 1200 ID - Bulk to Rack
- BL 2000 - Bulk to Bulk

## SARSTEDT – Sorter DC/RC 900 Flex



**Sample throughput:** up to 900 tubes/h

- Highlights:** Pre- and post-analytics in one system:
- Processes any tube diameter from 11 to 16 mm
  - Compatible with most racks or carrier types
  - Online or offline operation
  - Opens tubes with push caps, stoppers and screw caps
  - Enables tube identification by barcode reader and colour sensor
  - Can be customised to sort by tube type, material (colour) or test request
  - Closes tubes with archiving caps
  - Retrofitting of decapping or recapping module is possible
  - Recapping with screw caps for SARSTEDT tubes with 13 or 15 mm diameter

## SARSTEDT – Decapper DC 1200 / Recapper RC 1200



- Highlights:**
- Decapper DC 1200:**
- Automatic decapping of all tube diameters from 11 to 16 mm
  - Processes a variety of tube types in mixed operation
  - Sample pre-sorting for the decapping process is avoided
- Recapper RC 1200:**
- Automatic recapping of all tube diameters from 13 to 16 mm
  - Minimises the risk of exposure
  - Eliminates sample contamination
  - Archiving cap fits all tubes from 13 to 16 mm diameter
  - Automated decapping enabled

## SARSTEDT – Sample Distribution System PVS 1625



- Highlights:** The PVS 1625 is a tailor made automation system for pre- and post-analytical processing of samples. It is capable to handle any kind of rack and tray type. As an open system, it is complementary to any analytical platform or can be used independently. Loading of unracked or racked sample tubes is via the Bulk Loader or in racks via the loading platform, which is suitable for closed and open tubes.

Full function pre- and post-analytical system

- Ideal in combination with any analytical platform
- Modular configuration according to customer needs with: Loading platform and / or Bulk Loader
- ID Module - Decapper - Recapper
- Aliquoter - Sorter
- For all common tube types: 13 – 16 mm diameter, 65 – 100 mm length
- Compatible with most racks or carrier types

## AUTOMATION

### Beckman Coulter – Power Express

<b>Dynamic inlet:</b>	1200 tubes/h
<b>Centrifuges:</b>	300 tubes/h (1), 600 tubes/h (2), 900 tubes/h (3), 1200/h (4)
<b>Decapper:</b>	1200 tubes/h
<b>Aliquoter (1:1):</b>	600 tubes/h



**Highlights:** Power Express is a high-throughput automated sample handling system that can process chemistry, immunochemistry, hematology and coagulation tubes. A four-lane track and intelligent sample handling helps reduce turnaround time (TAT), reduce errors and improve lab productivity. Power Express performs industry leading centrifugation, with the option for up to four centrifuges to match the capacity of the automation line at 1,200 tubes per hour, decapping/recapping, aliquoting, with refrigerated as well as ambient storage, finished with a specimen automated disposal unit, giving labs the ability to deliver rapid and dependable TATs to clinicians, thereby reducing errors and improving overall laboratory efficiency and productivity.

### Beckman Coulter – AU680i

**Highlights:**

The AU680i offers laboratories the ability to combine an AU680 chemistry analyzer with a DxI immunoassay analyzer to form an entry-level automated workcell, streamlining laboratory workflow. The AU680i delivers high-capacity specimen processing power and flexibility to meet clinical laboratory workload challenges. Designed to help enhance efficiency, reduce costs and speed the delivery of test results, the AU680i features:



- Parallel processing of shared chemistry and immunoassay specimens
- Single point of loading and unloading for shared chemistry and immunoassay samples for rapid processing
- Integrated decapper to minimize biohazard exposure risk and repetitive motion injuries

### Mindray – CAL-8000 Cellular Analysis Modular System



- Highlights:**
- Smarter workstation, simpler workflow: Fully automatic flow line system
  - Flexibly consist of up to 4 units of BC-6800 Hematology Analyzers & 2 units of SC-120 Auto Slide Makers & Stainers
  - Sample loading up to 200 primary tubes at one time
  - Total throughput up to: 500 tests/hour, 240 slides/hour
  - One touch screen & one powerful operation software for whole system
  - One button "START" for whole running system
  - Specific STAT channel for priority analysis



## Good News: You're automating your lab. Best News: We've done it more than 1400 times.

At Siemens Healthineers, we have the most experience turning complexity into efficiency, helping you drive better outcomes.

[siemens.com/automation-leader](https://www.siemens.com/automation-leader)

The challenges of automating a laboratory, whether for the first time or the third, can be formidable. So having a partner with extensive experience is key to achieving your goals. Perhaps that's why more laboratories around the world rely on Siemens Healthineers for total laboratory automation than any other company.

How does Siemens Healthineers do something so complex so well? We bring expertise to every phase of your project. For example, our Lean Healthcare-accredited workflow consultants apply best practices and leverage our proprietary database of sample-processing rules to streamline operations. Our teams are equipped with established analytical tools to set achievable benchmarks for throughput, TAT, staffing, and resource utilization.

We perform periodic, data-driven evaluations that help you continually improve productivity throughout our years of partnership.

And by being the only single-source provider able to connect all four key laboratory disciplines—chemistry, immunoassay, hematology, and hemostasis—to the automation track, we can help reduce interoperability issues, ensuring a more integrated and efficient overall solution.

Laboratory automation can be complex, but having completed more than 1400 track-based automation projects, we can put your mind at ease and help you achieve your goals. And that is very good news indeed.

Get more good news at [siemens.com/automation-leader](https://www.siemens.com/automation-leader).



## Pursuing Excellence

### Proven Practices for Lab Automation Success

*By Franz Walt*

Cost constraints, higher workloads, and a shortage of qualified staff are three distinct market trends driving demand for greater efficiency in the laboratory. The goals of automation are to make workflow more efficient, improve the turnaround time and predictability, and reduce errors – all while accommodating future growth. Automation also frees up staff for other activities.

With the right infrastructure, and software behind it, automation gives a lab more control over its operations, simplifies lab processes, and improves business and clinical outcomes.

As the global leader\* in total laboratory automation, Siemens Healthineers has helped laboratories worldwide to implement intelligent solutions approximately 1,500\*\* times. What does it take to optimize a laboratory for automation excellence? Here are proven practices that have contributed to our customers' automation success:

**1. Align your laboratory with a reliable provider.** The decision to automate creates a long-term relationship with the products and the people who support the equipment. Therefore, having a strategic relationship with a company that has extensive experience with the process is essential for achieving your long-term laboratory automation goals.

**2. The planning phase.** Our Healthcare Consulting Solutions (HCS) consultants' expertise in Lean and Six Sigma process improvements enables us to work with the customer to design the optimal workflow for the unique needs of each laboratory. Before the installation begins, our Lean consultants establish key performance indicators (KPI). These KPIs will demonstrate that the process has been successful. Then, our consultants manage the installation and implementation process according to the project plan.

**3. Initial health check.** Health checks, performed by Siemens Healthineers, assess newly installed and existing automation processes to determine how the entire automation system is working – from the time the sample enters the laboratory until the result is generated and the tube is disposed. An initial health check on an automation installation should be done within three months of the go-live. The goal of the first health check is to understand how the system is performing as a whole, and to ensure that it is meeting the KPIs. The results of the initial health check help to set the performance benchmark for the laboratory moving forward. If performance is below target, an action plan is devised.



**4. Making adjustments.** As the installation progresses, adjustments are made which may involve dissecting and rebuilding the current workflow processes and removing non-value-added-steps.

**5. Follow through with "health checks".** Once the automation system is up and running, health checks should be performed annually.

Automation is meant to improve workflow efficiency, to improve turnaround time and to reduce errors. Health checks ensure these goals are met. When labs get it right, it can pay off with measurable improvements in workflow and clinical excellence and a true multidisciplinary solution.

One case study to illustrate the power of automation is the Hospital Clinic de Barcelona in Spain. In 2001 it was among the first healthcare providers in the world to create an automated core laboratory to help address the challenges of growing workloads and shrinking budgets.

The lab incorporated chemistry, immunoassay, hematology and hemostasis testing, as well as a broad portfolio of pre- and post-analytical tasks onto a single sample track.

As time went on and the facility's needs changed and grew, so too did their automation solution. Their track was upgraded to a next-generation solution that supported individual tube routing and STAT prioritization as well as high-volume hematology and coagulation analyzers.

Over the course of its journey with Siemens Healthineers, the core laboratory has been able to consolidate instruments, integrate and automate STAT testing, reallocate staff to higher-value responsibilities, and save upwards of €600,000 in tube costs – all while increasing clinicians' trust in the laboratory to support excellence in patient care. Today, in conjunction with the automated core lab, the Biomedical Diagnostic Center, which comprises all laboratories at the hospital, processes approximately 500,000 orders from hospital patients annually, and 135,000 orders from outside hospital centers and private laboratories.

While there is no single factor for successful implementation, Siemens Healthineers strives to make your journey to automation as seamless as possible by serving as a trusted partner. ■



**Franz Walt** is a seasoned executive with more than 26 years of experience in leadership roles at two of the world's largest and most influential healthcare companies, Siemens Healthcare and Roche. He has served in positions of increasing responsibility, with roles in both country and headquarters organizations in Asia Pacific, Iberia and Latin America, Europe,

and the USA, in the pharmaceutical, medical device, and in vitro diagnostics industries. Currently Mr. Walt is president of Laboratory Diagnostics at Siemens Healthcare, with responsibility for global P&L and portfolio. Prior to his current role, Mr. Walt held a succession of senior positions at Siemens Healthcare, including CEO of the Chemistry, Immunoassay, Automation and Informatics Business Unit. During his 22 years with Roche, his executive positions included Gesch. ftsf. hrer (CEO) of Roche in Mannheim, Germany, and 8 years as a board member of the Global Roche Executive Committee (DiaEC). Mr. Walt has a Master of Business Administration degree from City University in Bellevue, Washington, and completed post-graduate studies in executive education programs at renowned institutions including Columbia University, the International Institute for Management Development in Lausanne, Switzerland, the London Business School, and INSEAD Business School in Fontainebleau, France.

\* Source: Worldwide in vitro diagnostic laboratory automation market review (excluding Japan) 2013 estimate. Report generated by independent research company in May 2014.

\*\*Source: Siemens Healthcare Diagnostics shipment and orders reports, March 2016.

On account of certain regional limitations of sales rights and service availability, we cannot guarantee that the services described in this article are available worldwide. Please contact your local Siemens organization to get more information.

## AUTOMATION

### Siemens Healthineers – Aptio Automation



#### Highlights:

Aptio Automation combines intelligent technologies with Siemens workflow expertise in adaptable, multidisciplinary track designs with intelligent routing, single-sample flow and point-in-space sampling. Choose from a selection of pre- and post-analytical processing modules and automation-ready chemistry, immunoassay, hematology, hemostasis and specialty testing analyzers. Our experts perform data-driven simulations, optimization modeling and more to design and monitor your solution for ongoing productivity.

## ROBOTICS

### Siemens Healthineers – VersaCell X3 Solution



**Dimensions:** 1520 x 1780 x 1040 mm (h x w x d)  
**Weight:**  
**Sample throughput:** Up to 200 samples tubes/h  
**Power consumption:** 800W  
**Assays:** Menu varies based on analyzers connected

**Highlights:** Advance workflow capabilities, streamline processes, and meet changing needs with agility – at a cost labs can justify. VersaCell X3 Solutions use robotics with dynamic STAT management to provide the optimal mix of chemistry and/or immunoassay analytics with one-touch sample management. Connect up to three Siemens' instruments including ADVIA 1800 Chemistry System, ADVIA Centaur XPT and/or IMMULITE Immunoassay Systems, and Dimension EXL and RxL Max Integrated Systems.  
 \*Product availability varies by country.

## RESEARCH USE ONLY (RUO)

### Shimadzu – CLAM-2000



**Dimensions:** 1,250 x 900 x 700 mm (LCD touch panel and computer are not included.)  
**Weight:** 185 kg  
**Power:** 100 V/120 V/220 V/230 V AC, 50/60 Hz, 700 VA

**Highlights:** In order to automatize the pretreatment of blood or other biological samples before LCMS analysis, SHIMADZU has developed a fully automated Sample Preparation Module named CLAM-2000 (RUO). Available pretreatment processes include: dispensing samples, dispensing reagents, stirring, suction filtration, incubation, automatic transfer of sample vials to a SIL-30AC autosampler after pretreatment. It is compatible with the LCMS-8040/8050/8060 models. This product is intended for RUO only.

# Chemistry & Immunochemistry

Clinical Chemistry  
Immunochemistry  
Integrated Systems  
Mass Spectrometry  
Electrophoresis/  
Chromatography  
Urine Screening  
Rapid Testing  
Plasma Protein Testing  
Infection Disease Testing  
Drug Testing  
Research Use Only

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SARSTEDT

Snibe  
Diagnostic

## CLINICAL CHEMISTRY

### ADALTIS SRL – Pchem Family Analysers & Dedicated Reagents



**Sample throughput:** Range of 60-600 test per hour

- Highlights:**
- PCHEM are three fully automated and complete clinical chemistry benchtop analysers operating in 60-600 tph range (incl. ISE), next to a semi-automated Pchem Micro.
  - PCHEM provides maximum efficiency in routine work and are completed with a complete CE-marked reagent panel, ready for use based on IFCC and DGKC formulations.
  - PCHEM is versatile and can operate effortlessly in routine laboratories, POL, for dedicated analysis, as back up instrument as well as in R&D.

### Beckman Coulter – AU5800 Series



**Dimensions:** 1260 x 2600 x 1580 mm (h x w x d)

**Weight:** 1070 kg

**Sample throughput:** 2000 - 9800/h

**Power consumption:** 200 - 240 W

- Highlights:** The AU5800 series represents the highest throughput and fastest chemistry analyzers in the AU family. With true random-access capabilities and a throughput ranging from approximately 2,000 tests up to 9,800 tests per hour, the AU5800 is available in four different scalable models, positioned for the high-volume core hospital laboratory to the ultra-high volume commercial laboratory market segments.

### DiaSys Diagnostic Systems – BioMajesty JCA-BM6010/C



**No of channels:** 43

**Assays:** 55

**Sample throughput:** 1200

**Dimensions:** 1220 x 1108 x 850 mm (h x w x d)

**Weight:** 450 kg

- Highlights:** BioMajesty JCA-BM6010/C is designed to increase the performance of medium-sized laboratories. Throughput of up to 1,200 tests/hour, 43 reagent and 84 sample positions guarantee flexibility in everyday use. It handles a full menu of clinical chemistry assays as well as Na, K, Cl determination by indirect ISE. The possibility to connect the device to a sample conveyor system offers a complete automation solution and the consolidation of clinical chemistry with immunology and coagulation testing.

### DiaSys Diagnostic Systems – respons910



**No of channels:** 30

**Assays:** 62

**Sample throughput:** 135

**Dimensions:** 600 x 600 x 670 mm (h x w x d)

**Weight:** 60 kg

- Highlights:** respons910 is a fully-automated bench top analyzer for maximum efficiency. High on-board capacity of 30 methods and 30 sample positions combined with a throughput of 135 tests/h offers the flexibility for everyday use. A STAT port allows loading of emergency samples at any time. High-quality clinical chemistry and immunoturbidimetric tests from DiaSys round off the respons910 system. On-board hemolysis and whole blood sample type introduction make respons910 dedicated for HbA1c testing.

## Mindray – BS-480 Clinical Chemistry Analyzer



### Highlights:

- Discrete, random access, fully automated
- Constant throughput with 400 photometric tests per hour, up to 240 tests per hour for ISE
- 24-hour on board refrigerated reagent compartment at 2~10 °C
- Reusable cuvettes with auto-washing station
- Two independent mixing stirrers
- Clot detection, automatic probe cleaning, liquid level detection & collision protection (vertical & horizontal)
- Reversed grating system with 12 wavelengths (340~800nm)
- Pre-dilution and post-dilution for sample
- Built-in bar code scanner
- Bi-directional LIS interface

## Randox Laboratories – New Liquid PTH Control



### Highlights:

Providing a true third party solution for the measurement of Intact PTH, our new liquid frozen PTH control will deliver an unbiased independent assessment of analytical performance. This notoriously unstable analyte comes with an impressive 30 day open vial stability helping to reduce waste & keep costs low. This brand new control is designed to complement our range of immunoassay controls with several options available to suit all your laboratory requirements.

## Randox Laboratories – Automated HDL3 Assay



### Highlights:

Randox are proud to introduce a new automated assay for the quantitative measurement of HDL3. HDL3 can be measured for improved patient cardiac risk profile. For RUO-coming soon for diagnostic use.

#### Features:

- Sample type-Serum & Plasma
- Format-Liquid ready-to-use
- On-board stability-28 days at approx. +2 to +8 C
- Allows quantification of HDL2-C via subtraction of HDL3-C from total HDL-C
- Dedicated controls and calibrators available
- Applications for a wide range of biochemistry analysers

## Randox Laboratories – Automated Adiponectin Assay



### Highlights:

Randox Adiponectin offers an automated biochemistry test for the measurement of adiponectin in serum or plasma. Low adiponectin levels have been linked with several pathologies including metabolic syndrome, cancer and cardiovascular disease.

#### Features:

- Methodology-Immuno-turbidimetric
- Sample type-Serum & plasma
- Format-Liquid ready-to-use
- On-board stability-28 days at approx. +10 C
- Complementary controls and calibrators available
- Applications for a wide range of automated biochemistry



## The benefits of IT integration in the clinical laboratory

The era of information systems operating in silos has passed, and this is particularly true in healthcare IT. At SCC Soft Computer, integration is one of our core values.

**W**e are the leading and most widely recognized provider of integrated information systems for the healthcare industry. We offer suites of fully integrated laboratory and genetics information management system solutions that provide clients the flexibility and scalability to be competitive. SCC's solutions include information management tools for laboratory; microbiology; diagnostic anatomic pathology, cytology, and autopsy; transfusion service management; outreach; cytogenetics; molecular diagnostics; flow cytometry; HLA/immunogenetics; biochemistry; positive patient identification; billing; reporting; quality control, and more.

SCC excels in delivering complex interfaces and integration projects. All SCC systems are designed and developed by SCC architects and programmers; all modules are integrated – and run on a single database instance producing consolidated reports. Our systems share a platform of architectural 'commons' that provides the basis of this

integration. Increased consistency between systems, timely delivery of test results, flexible order entry with real-time results reporting, automatic workflow, safety features that are second to none, long-term cost savings, and interoperability – coupled with the ability to exchange information between systems – are just a few of the many powerful features built into SCC's robust information systems.

Our world-class laboratory customers participate in the design of our systems. SCC's subject matter experts – allied healthcare and healthcare IT professionals themselves – work directly with our clients to gather user requirements. Common words and terminology used in the clinical laboratory environment by knowledgeable, trained, and experienced personnel create a familiar, friendly environment. This development practice, experience, and expertise have placed SCC at the forefront of laboratory, genetics, blood services, and outreach information systems software development.



The SCC Soft Computer headquarters in Clearwater, Florida.

Considered a leader in the LIS field, SCC's innovative, integrated, and complete solutions have been setting the standard for healthcare IT for nearly four decades.

Leveraging our nearly forty years of experience designing, developing, delivering, and supporting information management solutions for the clinical laboratory environment, SCC helps clients analyze their workflows to perform unbiased assessments of their current usage of their LIS functionality and makes recommendations on how they can optimize their systems. Implementing workflow changes in a clinical environment can be as challenging as the software implementation itself – and can have just as big an impact on the business. As varied as the reasons are for purchasing a new clinical system, the reasons for implementing change are quite simple: to automate the processes necessary to meet all business goals. SCC's streamlined workflows help clients do more in less time, thus decreasing costs and maximizing "tech time".

Integration of laboratory systems is a key quality for successful lab management, and interoperability between clinical applications is critical for success. With our history of accomplishing complex LIS implementations in large, multisite environments, we outperform the competition with our approach to integration projects. SCC offers a greater depth and breadth of laboratory modules than any other vendor. We produce the most robust – and most automated – LIS in the world. With our SoftLab LIS, the clinical laboratory can process added volumes without increasing staff. And as a functionality richer solution, SCC's laboratory and genetics information systems are rules-based and provide specialized efficiency tools within each laboratory discipline without the need for additional third-party systems.

SCC is committed to providing integrated products to our clients to ensure seamless and efficient management of their diverse labora-



tories. In keeping with our core value of integration, we have several ongoing integration initiatives between our laboratory and genetics information system applications. For example, SCC's Genetics Information Systems Suite is a fully integrated set of genetics information management systems covering a wide range of specialized testing. Although these systems were designed, built, and function as a single integrated solution, the individual modules can function as standalones or in any combination that clients can purchase to best suit their test offerings.

SCC's integrated solutions enable clients to adapt – allowing them to provide better services to their patients and decrease their operational and IT footprints while increasing opportunities for expansion and revenue-building. The flexibility to evolve with these changes and respond in a timely manner is one of the key differentiators that sets SCC Soft Computer apart. ■

**SoftLab** is a registered trademark of SCC Soft Computer in the United States and Canada.

**SCC's Genetics Information Systems Suite** is a registered trademark of SCC Soft Computer in the United States.

## CLINICAL CHEMISTRY

### Randox Laboratories – RX daytona+



**Sample throughput:** 270 photometric tests/hour and up to 450 including ISE  
**No of channels:** 50 photometric channels, 3 direct ISE  
**Power supply:** 650 VA  
**Dimensions:** 870 x 625 x 670 mm (h x w x d)  
**Weight:** 120 kg

**Highlights:** The RX daytona+ offers a high performance, fully automated solution to mid-volume clinical chemistry testing.

With a throughput of 450 tests per hour including ISE, and the most comprehensive dedicated test menu on the market, the RX daytona+ offers unrivalled flexibility and versatility. This bench-top clinical chemistry analyser is capable of performing routine and specialised testing in addition to running emergency samples, ensuring optimum efficiency and rapid turnaround of STAT samples.

### Randox Laboratories – RIQAS



**Highlights:** RIQAS is the largest international EQA scheme with more than 35,000 lab participants in over 123 countries. Comprising over 360 routine parameters in 32 comprehensive & flexible programmes, it is designed to cover most areas of clinical testing removing the need for multiple EQA suppliers & helping reduce the number of programmes required. Each programme benefits from clinically significant concentrations, frequent analysis & user-friendly reports allowing at-a-glance performance assessment.

### Randox Laboratories – RX imola



**Sample throughput:** 400 photometric tests per hour, 240 ISE tests per hour  
**No of channels:** 60 photometric channels, 3 direct ISE tests - sodium, potassium and chloride  
**Power supply:** <900 VA  
**Dimensions:** 970 x 690 x 582 mm (h x w x d)  
**Weight:** 150 kg

**Highlights:** The RX imola is a cost effective system that delivers consistent high quality results. Capable of handling the workload of a medium to high throughput laboratory the RX imola provides rapid, comprehensive testing on a small footprint analyser.

The RX imola is a fully automated system with random access and STAT sampling functionality, combining with intuitive Windows-based software, boosting productivity and saving time when it matters most.

### Sentinel CH. SpA – SENTiFIT270 (Sysmex)



**Sample throughput:** 220 samples/hour  
**Dimensions:** 625 x 870 x 670 mm (h x w x d)  
**Weight:** 120 kg  
**Assays:** FIT (Fecal Immunochemical Test)

**Highlights:**

- SENTIFIT 270 is an automated analyser dedicated to Colorectal
- Cancer Screening. It uses a piercing probe system for the SENTIFIT Pierce TUBE. The SENTIFIT pierceTube device includes a collection of stool samples that uses a quantitative immunochemical analytical method to measure human haemoglobin
- Side opening (collection side)
- Single step: insert the SENTIFIT pierceTube into the sample tray
- Sample barcode available

## Siemens Healthineers – ADVIA Chemistry Systems



**Sample throughput:** Up to 2400 tests/h with ADVIA Chemistry XPT System  
Up to 1800 tests/h with ADVIA 1800 Clinical Chemistry System

**Highlights:** The ADVIA Chemistry XPT System is engineered for simple, continuous operation and provides fast, accurate results and predictable TAT through VeriSmart Technology and onboard aliquoting. Microvolume technology enables a high onboard test capacity of over 100,000 photometric tests for long walkaway times, especially valuable when running on Siemens Aptio Automation.  
\*Product availability varies by country.

## IMMUNOCHEMISTRY

### ADALTIS SRL – Eclectica TiCA



**Weight:** 60 kg  
**Dimensions:** 59 x 70 x 66 mm (h x w x d)  
**Power consumption:** 115-230 VAC (50-60 Hz)

**Highlights:**

- Eclectica TiCA compact immunoassay analyser, addressing needs for reliable fully automated platform with up to 48 test/hr speed.
- On board 20 reagent positions and 28 positions for controls/calibrators including positive identification of reagents, calibrators/controls.
- Validated master curves for each assay available will save you valuable time and costly calibration testing.
- No peripheral cooling, or liquid/buffer containers – just connect the Eclectica TiCA to a pc and you can start working!

### ADALTIS SRL – Robust and cost efficient microELISA assays



**Highlights:**

- Complete range on microELISA assays based on very reliable and cost efficient colorimetric test principle. Additional range on microELISA assays based on the very sensitive chemiluminescence test principle.
- Large menu with excellent performance, affordable price, minimum 12-18 months stability.
- The very sensitive CLIAgen chemiluminescence assays with significant shorter incubation time, less reagent consumption, no additional sample dilutions.
- All our microELISA assay's are validated on our microELISA analysers Personal LAB, GEN4, NEXgen 7-plate.

### Beckman Coulter – Anti-Mullerian Hormone (AMH)



**Highlights:** The measurement of circulating anti-Mullerian hormone (AMH) has been applied to a wide range of clinical applications. The Access AMH assay features convenient transition to automated testing through consistent and standardized results with Beckman Coulter's AMH Gen II assay improve support of fertility assessment through increased sensitivity and precision at the low end of the analytical measuring range. Today, its use is mainly based on its ability to reflect the number of antral and pre-antral follicles present in the ovaries (the ovarian reserve).

## Pediatric Laboratory Medicine

# The Orphan

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Pediatric laboratory medicine plays a minor role in the large field of laboratory medicine. This may be due to the low incidence of rare diseases, which are a major task of pediatric medicine, but also to the small number of pediatric samples in routine laboratory medicine overall. Since most diagnostic laboratories do receive pediatric samples now and then, it is essential that there are primary sources of information and networks to answer questions arising around pediatric laboratory medicine.

*By Martin Hersberger*

**P**ediatric laboratory medicine plays a minor role in the large field of laboratory medicine. This may be due to the low incidence of rare diseases, which are a major task of pediatric medicine, but also to the small number of pediatric samples in routine laboratory medicine overall. Since most diagnostic laboratories do receive pediatric samples now and then, it is essential that there are primary sources of information and networks to answer questions arising around pediatric laboratory medicine.

The challenge in pediatric laboratory medicine starts in pre-analytically: the small blood collection tubes with capillary blood samples are not compatible with automated tube handling of pre-analytical solutions in high-throughput core laboratories. In view of the fact that pre-term neonates can have a total blood volume of less than 80 ml, it is understandable that neonatologists are reluctant to draw more blood than absolutely necessary. Thus, the pediatric laboratory has to collect manually even the last drop of plasma for diagnostic purposes to prevent a transfusion of erythrocytes.

The main challenge in pediatric laboratory medicine are inborn diseases which individually are rare but in their multitude lead to a large number of pediatric patients. The wide field of inborn errors of metabolism, inborn endocrine disorders, and inborn immunolo-

gical defects mainly pertains to the pediatric population. For these diseases pediatric laboratory medicine offers many analyses to support diagnosis and follow-up. For example, pediatric laboratories offer several targeted metabolomic profile analyses which may lead to the investigation of a specific enzyme defect followed by genetic confirmation of the rare monogenic disease. While most pediatric laboratories offer targeted metabolomic profile analysis, enzymatic and genetic analysis are available only in specialized centers for inborn errors of metabolism that have the necessary diagnostic experience for a limited number of diseases. Communication between the pediatric laboratories and the specialized centers enables the diagnosis of many rare or orphan diseases. Networking support is provided by orphanet ([www.orpha.net](http://www.orpha.net)), an initiative that allows searching for orphan diseases and directly lists the specialized pediatric laboratories offering the appropriate diagnostic procedures. However, the current list of orphan diseases is incomplete and novel orphan diseases are discovered every week. Thus, pediatric laboratories need to adapt their metabolomic profile analyses constantly in order to cover all newly discovered diseases. It is reasonable to assume that these metabolomic profile analyses will become crucial also for adult patients since life expectancy of pediatric patients with inborn errors of metabolism is increasing and more of these patients will reach adulthood due to new drugs and better treatment in general.



Even routine pediatric laboratory medicine can be challenging because children are not just small adults but have a distinct physiology that moreover changes during development from neonate to young adult. This is particularly obvious in analytes such as alkaline phosphatase during growth and in sex hormones during puberty, which require interpretation and reference intervals. Due to the rapid changes of reference intervals during development, pediatric laboratories would prefer implementing continuous reference intervals rather than displaying the categorical age groups that most laboratory information systems support today.

In order to be able to develop continuous reference intervals, we need solid reference data over the entire developmental period from the neonate to the young adult. While these data were not available in the past, several working groups within the IFCC in Northern Europe and in Canada have contributed recently to the establishment of solid reference intervals in the pediatric and adolescent age range. For example, the large children and adolescent health study (Kinder- und Jugend-Gesundheitsstudie [www.kiggs.de](http://www.kiggs.de)) in Germany established reference intervals for routine clinical chemistry and hematology; in addition, the Canadian CALIPER study ([www.caliperdatabase.com](http://www.caliperdatabase.com)) provided reference intervals for endocrinology. These studies now allow the diagnosis of orphan diseases detected with routine diagnostics such as hypophosphata-

sia or hypoalphalipoproteinemia, which both need lower reference levels for alkaline phosphatase and HDL cholesterol, respectively. These initiatives for the establishment of solid reference intervals are supported and coordinated by the Task Force for Pediatric Laboratory Medicine of the IFCC. This Task Force also organizes the triannual "International Congress on Pediatric Laboratory Medicine" (ICPLM) as a satellite meeting of the IFCC WorldLab. The next ICPLM will take place on 20 to 22 October 2017 in Durban, South Africa.

Congresses such as ICPLM allow networking between professionals in pediatric laboratories and provide clinical and scientific further education for these professionals. In addition, these events offer laboratory professionals who handle pediatric samples now and then insights into pediatric laboratory medicine and serve as a communication forum with professionals in pediatric laboratory medicine. ■



**Prof. Dr. Martin Hersberger**

*University Children's Hospital Zurich,  
Steinwiesstrasse 75, 8032 Zurich  
Switzerland*

## IMMUNOCHEMISTRY

### Beckman Coulter – Access AccuTnI+3 Troponin I Assay



**Highlights:** The Access AccuTnI+3 troponin I assay delivers the precision, clinical sensitivity and clinical specificity necessary to assist physicians with the diagnosis of myocardial infarction (MI). Access AccuTnI+3 troponin I in the core lab gets physicians the critical results they need and can cut triage time in half. The assay can use two serial samples collected within a 3-hour period, rather than waiting for a six-hour period, to provide a more accurate diagnoses. A large multicenter prospective clinical trial on the AccuTnI+3 assay confirmed that the assay provides the clinical performance needed for proper patient management.

### Beckman Coulter – UniCel Dxl 800 Access Immunoassay System



**Dimensions:** 1700 x 1710 x 970 mm (h x w x d)  
**Weight:** 630 kg  
**Sample throughput:** Up to 400 tests/h  
**Assays:** >50 preprogrammed, bar-coded immunoassay methods

**Highlights:** The UniCel Dxl 800 has exceptional throughput, proven chemiluminescent technology and assay protocols similar to other analyzers in the Beckman Coulter family – so you can simplify and automate your immunoassay testing. The UniCel Dxl 800 immunoassay system allows laboratories to decrease process steps and improve turnaround time – with ease of use.

### Beckman Coulter – phi (Prostate Health Index)



**Highlights:** phi (Prostate Health Index) is an index of three tests and combines the power of those tests into one answer or phi score. The Prostate Health Index is an aid in distinguishing prostate cancer from benign prostatic conditions, for prostate cancer detection in men aged 50 years and older with total PSA  $\geq 4.0$  to  $\leq 10.0$  ng/mL, and with digital rectal examination findings that are not suspicious for cancer. Prostatic biopsy is required for diagnosis of cancer.

### Beckman Coulter – Vitamin D Assay



**Highlights:** Access 25(OH) Vitamin D Total is a new assay that will expand the Access Bone Metabolism portfolio on the UniCel Dxl and Access 2 systems. The assay is standardized to the NIST-Ghent ID-LC-MS/MS Reference Method Procedure (RMP) and provides excellent stability and reproducibility. Features include a unique, opaque reagent pack designed to prevent light-induced reagent degradation; convenient assessment of deficient populations through a broad dynamic range; and speed and flexibility through instrumentation options (available on Beckman Coulter's Access 2 and Dxl immunoassay platforms).

## DRG Instruments – DRG:HYBRiD-XL



<b>Sample throughput:</b>	40 tests per run
<b>No of parallel samples:</b>	40
<b>Assays:</b>	Immunoassay and Clinical Chemistry
<b>Dimensions:</b>	586 x 608 x 635 mm (h x w x d)
<b>Weight:</b>	52 kg

**Highlights:** This unique technology allows the simultaneous measurement of immunoassays and clinical chemistry parameters in one sample: Free Testosterone, Calprotectin, 17-OH Prog., Androstenedione, Renin, Aldosterone, 25-OH Vitamin D, Hepcidin-25, HbA1c, Cystatin C and others.

## Fujirebio – TENDIGO



<b>Test capacity:</b>	1 to 10 strips
<b>Parallel assays:</b>	11
<b>Available assays:</b>	25
<b>Instrument control:</b>	stand alone, no PC required
<b>Dimensions:</b>	460 x 695 x 370 mm (h x w x d)

**Highlights:** TENDIGO was built for the automated processing of the widely used and classic INNO-LIA and INNO-LiPA strip-based assays from Fujirebio. It is maintenance free, has validated assay protocols on board, allows for open protocol programming and offers a cost effective solution for automation, even when the daily throughput is only 1 test.

## Fujirebio – LUMIPULSE G1200



<b>Sample throughput:</b>	120 tests/h
<b>Time to first result:</b>	30 min
<b>Sample capacity:</b>	up to 100 samples
<b>Reagent capacity:</b>	504 tests on board
<b>Dimensions:</b>	1450 x 1200 x 800 mm (h x w x d)

**Highlights:** A compact, robust and reliable fully automated chemiluminescent enzyme immunoassay analyzer. The LUMIPULSE G1200 offers optimized reagent and consumables handling, true random access, and a constant throughput regardless of the assay format or combination. The unique mono test cartridge eliminates open reagent bottle stability concerns. It comes with the broad menu of routine and unique Lumipulse G biomarkers and is fully compatible with laboratory automation systems (LIS).

## Fujirebio – LUMIPULSE G600II

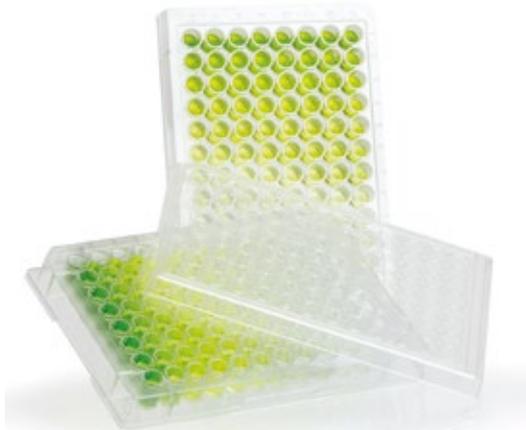


<b>Sample throughput:</b>	60 tests/h
<b>Time to first result:</b>	35 min
<b>Sample capacity:</b>	up to 36 samples (incl. 3 priority specimens)
<b>Reagent capacity:</b>	112 tests on board
<b>Dimensions:</b>	642 x 890 x 725 mm (h x w x d)

**Highlights:** A fully automated benchtop chemiluminescent enzyme immunoassay analyzer. The LUMIPULSE G600II offers optimized reagent and consumables handling, true random access, and a constant throughput regardless of the assay format or combination. The unique mono test cartridge eliminates open reagent bottle stability concerns. It comes with the broad menu of routine and unique Lumipulse G biomarkers.

## IMMUNOCHEMISTRY

### SARSTEDT – ELISA Plates - Micro test plates for immunoanalytics



**Highlights:** One of the analyses most commonly used is the Enzyme-Linked Immunosorbent Assay (ELISA). With this method, even the smallest concentrations of a range of substances (proteins, peptides, antibodies, hormones etc.) can be detected and quantified from complex solutions.

### Siemens Healthineers – ADVIA Centaur XPT & CP Systems



**Sample throughput:** Up to 240 tests/h (XPT)  
Up to 180 tests/h (CP)

**Highlights:** The ADVIA Centaur XPT Immunoassay System is engineered to provide timely, reliable results with continuous operation to meet the workloads of the most demanding laboratories. It is among the highest-throughput immunoassay systems available. The ADVIA Centaur CP Immunoassay System is a mid-volume, high-throughput bench top system. Both systems use advanced Acridinium Ester technology that can be tailored to meet different diagnostic needs.  
\*Product availability varies by country.

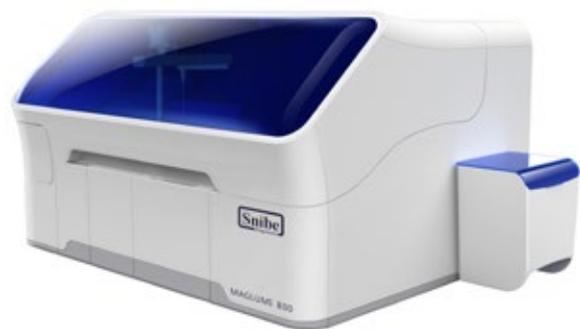
### Siemens Healthineers – IMMULITE 2000 XPi System



**Sample throughput:** Up to 200 tests/h

**Highlights:** The IMMULITE 2000 XPi Immunoassay System combines allergy and specialty testing with routine immunoassay testing. It features a wide-ranging menu, 90-day onboard reagent stability, and advanced software and hardware to handle the many testing challenges that labs face. The IMMULITE 2000 XPi system is a continuous, random access analyzer with proven reliability and easy-to-use software that allows laboratories to improve their testing capacity.  
\*Product availability varies by country.

### Snibe – Maglumi 800



**Sample throughput:** 180 tests/h  
**Dimensions:** 1200 x 720 x 560 mm (h x w x d)

**Highlights:**

- On board capability: up to 40 samples
- Reagent position: 9
- Refrigerated sample and reagent area
- Clot detection
- Liquid level detection
- Auto dilution for high concentration sample
- Color touch screen
- Bi-communication with LIS via ASTM protocol

The RANDOX logo is positioned in the top right corner. It features the word "RANDOX" in a bold, dark green, sans-serif font. The letter "O" is stylized with a white circle inside, and the letter "X" has a red dot on its top right stroke. The background of the entire page is a complex network of interconnected nodes and lines in various colors including purple, green, orange, and red, creating a molecular or network-like structure.

**RANDOX**

Providing you with  
true third party  
**Quality Controls**  
& biochemistry  
**Reagents,**  
the **RX series**  
of chemistry analysers  
and **Biochip**  
multiplex testing.

shaping the future of  
clinical diagnostics

#FutureDiagnostics  
[randox.com/future-diagnostics](https://randox.com/future-diagnostics)



## INTEGRATED SYSTEMS

### SCC Soft Computer – Laboratory & Genetics Information Systems

# SCC

Soft Computer  
[www.softcomputer.com](http://www.softcomputer.com)

**Highlights:** SCC's integrated laboratory and genetics information management system solutions support streamlined operations that focus personnel on only those functions that require direct attention. Our robust suites of fully integrated systems eliminate the need for costly add-ons providing a seamless interface that links all clinical laboratory departments. Tremendous flexibility is provided to allow the distribution of data and results from the laboratory to the entire care provider network.

### SCC Soft Computer – SoftLab



**Highlights:** SCC's flagship SoftLab LIS enables technologists to look at the results of multiple instruments simultaneously so one technologist can manage multiple instruments and easily compare a patient's results on all the instruments at the same time. This improves patient care, increases speed of resulting, and enables clients to address staffing shortages so they can do more in less time with fewer FTEs. Autoverification functionality helps improve turnaround time and uses tech-time more efficiently.

### Siemens Healthineers – Dimension Vista Intelligent Lab Systems



**Sample throughput:** Up to 2000 tests/h (Dimension Vista 1500)  
Up to 1000 tests/h (Dimension Vista 500)

**Highlights:** Dimension Vista Systems integrate photometry, nephelometry, V-LYTE electrolyte detection, and LOCI homogenous chemiluminescence technologies in one smart workstation. Labs can simultaneously process tests for multiple disease states on a single platform from a single tube. The sample-centric design found on the Dimension Vista System incorporates lean principles for simplified and consolidated sample processing. \*Product availability varies by country.

### Siemens Healthineers – Dimension EXL Chemistry Systems



**Sample throughput:** Up to 440 photometric chemistry tests/h and 187 electrolyte tests/h  
Up to 167 heterogeneous immunoassay tests/h

**Highlights:** Siemens Healthineers was the first company to integrate chemistry and immunoassay testing in one instrument, simultaneously processing tests from one sample tube to improve workflow efficiency. The Dimension EXL integrated system includes our patented LOCI homogeneous chemiluminescent technology, offering fast immunoassay reactions with high sensitivity and low sample volumes. \*Product availability varies by country.

## Mindray – SAL-8000 Modular System



### Highlights:

- Flexible scalability connection:  
Consist of clinical chemistry analyzer BS-800M & BS-2000M, chemiluminescence immunoassay analyzer CL-2000i
- Large capacity:  
Rack system with Sample Delivery Module (SDM), up to 300 onboard samples with 30 racks, continuous loading support
- Easy operation:  
Intuitive interface for ONE integrated system operation software, real-time indication of cuvettes, real-time QC status monitoring, waste and wash buffer status, reflex and re-run function, step-by-step maintenance guide, etc.

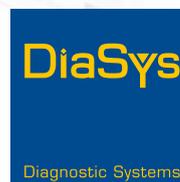


## DiaSys Diagnostic Systems



- Clinical chemistry
- Immunoturbidimetric tests
- Automated analyzers for every need
- Point-of-care products

**Quality Diagnostics. Made in Germany.**  
[www.diasys-diagnostics.com](http://www.diasys-diagnostics.com)



CHOOSING QUALITY.

Discover  
the future of LC-MS/MS...

## CLAM-2000

Fully Automated Sample  
Preparation Module for LCMS  
*(RUO - for research use only)*

Since several years, LC-MS/MS technology is making an important breakthrough in the field of clinical research. The progress of tandem MS or MS/MS in that field is mainly due to its ability for high sensitivity detection, high selectivity, as well as possibilities of multiplexing compounds in one analysis without the risk of cross reactions inherent to immuno-assay tests.

While IA (Immuno-Assay) remains the most used technic, the shift to LC-MS/MS is constantly increasing for several type of analysis like immunosuppressant, vitamin D or steroids panel, and could be even faster if not slow down by some limiting factors. The most important one is the sample preparation. It is nowadays the bottleneck in the complete process for LC-MS/MS analysis.

Thanks to Shimadzu's UFMS (Ultra-Fast Mass Spectrometry) technologies including ultra-fast polarity switching (5ms), short pause time (1 ms), multi MRM (555/s), and fast scanning



Fully Automated Sample Preparation Module for LCMS

CLAM-2000

possibilities (30000 uma/s), combined to the well-known robustness of Shimadzu systems, LC-MS/MS has proven to be a powerful tool in clinical research and the cost per analysis was decreased significantly.

As mentioned before, the bottleneck remains sample preparation which is often tedious, is subject to risk of errors, and is also increasing the risk of contamination for people dealing with sample preparation.

In order to fill the gap and building on the experience of Shimadzu to produce clinical analyzers, a system to automatize the pretreatment of blood or other biological samples before LCMS analysis has been developed by Shimadzu. It is a fully automated Sample Preparation Module named CLAM-2000 (Clinical Laboratory Automated sample preparation Module). The CLAM-2000 (RUO) is an automatic pretreatment system designed for customers that handle blood samples in pharmaceutical departments, medical departments, or biological analysis laboratories that are dealing with issues of variability in analytical results or infection risk.

Shimadzu has released this new and unique fully automated sample preparation module (RUO, for research use only), connected online to LC-MS, to the four major clinical research markets in Europe (ie Germany, France, Italy, and Spain) as a first step.



Ultra Fast Liquid Chromatograph Mass Spectrometer

## LCMS-8050 CL

The system is open and allowing the use of homebrew methods or commercial kits as long as the manual preparation steps can be adapted on the system.

### Available pretreatment processes include:

- › dispensing samples,
- › dispensing reagents,
- › stirring,
- › suction filtration,
- › incubation,
- › automatic transfer of sample vials to an SIL-30AC auto-sampler after pretreatment.

The direct detection of disease related to biological compounds in blood, urine, or other biological samples, the measurement of trace concentration levels of drugs, and other applications are possible thanks to Mass Spectrometry, but, by using the CLAM-2000 unit in front of your LC-MS:MS system, you will improve your quality of data. By simply placing blood collection tubes in the system, the CLAM-2000 performs all other processes through to LCMS analysis automatically. Unlike standard dispensing systems/robots, that are based on batch processing 96-well plates, the CLAM-2000 is completely automatic from pretreatment to analysis and processes individual samples successively in parallel. Consequently, it results in uniform pretreatment times between samples, without slowing processing speed, and improves data reproducibility and accuracy.

In addition, to keep a maximum degree of flexibility and to adapt to future needs, the CLAM-2000 is compatible with the full range of Shimadzu's LC-MS/MS:

- › LCMS-8040
- › LCMS-8050
- › LCMS-8060

The system offers a simple Graphic User Interface (GUI) via a touch panel to simplify the monitoring of the unit (full LCMS system) as well as tables to follow the work load of the system and tools to organize the maintenance.

Consequently, the new CLAM-2000 is the first system in the world able to perform all steps fully automated from pretreatment of the sample to LC-MS/MS analysis, requiring only the simple task of placing the blood, or biological fluids collection tubes, reagents, internal standards and specialized pretreatment vials in the system.

It also features excellent management functions that can provide a dramatically improved workflow with better safety for clinical research and higher reproducibility. ■



This product is intended for research use only (RUO). Not for use in diagnostic, therapeutic, and medication procedure.

## MASS SPECTROMETRY

### Bruker Daltonics – Toxtyper



**Highlights:** Simplicity, Speed and confidence: First Time, Every Time

- Rapid Forensic Screening
- High-confidence drug identifications
- Comprehensive coverage
- Toxicology research
- Unprecedented easy-to use

For research use only.  
Not for use in diagnostic procedures.

### SCIEX – 4500MD series: Triple Quad or QTRAP LC-MS/MS



<b>Dimensions:</b>	790 x 590 x 790 mm (w x h x d)
<b>Weight:</b>	130 kg
<b>Sample throughput:</b>	up to 60 samples/hour
<b>Power consumption:</b>	2.2 kW
<b>No of channels:</b>	1
<b>Assays:</b>	Vitamin D and Immonosuppressant drugs
<b>No of parallel samples:</b>	0

- Highlights:**
- Enable your clinical laboratory to develop tests for the most demanding clinical applications
  - Keep assays in-house and increase lab capabilities with an affordable benchtop platform with unique performance and application versatility
  - Minimize downtime, improve lab productivity with robust performance and excellent ROI
  - Quantitate multiple low level compounds in a single analysis with high accuracy and sensitivity
  - Minimize training time and increase efficiency with powerful workflow-driven software

### SCIEX – IVD-MS Immunosuppressants kit



**Assays:** 1200 test included

- Highlights:**
- A new standard for routine therapeutic drug monitoring in transplant patients using LC-MS/MS
  - Ensure optimized, individual patient dosage prescriptions even in low concentrations
  - Simultaneously quantitate levels of sirolimus, everolimus, tacrolimus and cyclosporine
  - Eliminate hidden cost associated with re-runs and dilutions which may result from interferences in the sample- found in traditional immunoassays
  - Complete single-vendor solution
  - Only available in Europe at this time, but not in every EU country

### SCIEX – IVD-MS Kit for 25-OH-Vitamin D3/D2 in Serum/Plasma



**Assays:** 1000 test included

- Highlights:**
- Designed to accurately identify 25-OH-Vitamin D2 and D3 and their concentrations
  - Quantitate both 25-OH-Vitamin D2 and 25-OH-Vitamin D3 simultaneously in a single run
  - Exceptional accuracy and sensitivity even at low levels considered as deficient
  - Eliminate hidden costs associated with re-runs and dilutions which may result from interferences in the sample- found in traditional immunoassay testing
  - Complete single-vendor solution
  - Only available in Europe at this time, but not in every EU country

## Shimadzu – iMScope TRIO



**Highlights:** Imaging mass spectrometry is a revolutionary new technology. The instrument is a combination of an optical microscope which allows the observation of high resolution morphological images, with a mass spectrometer which identifies and visualizes the distribution of specific molecules. Superimposing the two images obtained based on these very different principles, has created a significant new research tool, the imaging mass microscope. The accurate and high resolution mass images from the iMScope will drive your research to the next level. At long last, we have entered the age of imaging mass spectrometry

## Shimadzu – LCMS-8040



**Sensitivity:** 1 pg reserpine, S/N > 10,000:1 (RMS)  
**No of channels:** MRM (max. 1,000 events x 32 channels)  
**Scan speed:** max. 15,000 u/s  
 (0.1 u step: 150,000 data points/s)  
**Polarity switching time:** 15 msec  
**MRM transition speed:** max. 555 channels/s

**Highlights:** The LCMS-8040, first mass spectrometer on the market with a fast scanning speed (15000 u/s) and a fast polarity switching is well suited for immunosuppressants and NBS analysis.

## Shimadzu – LCMS-8050



**Sensitivity:** 1 pg reserpine, S/N > 60,000:1 (RMS)  
**No of channels:** MRM (max. 1,000 events x 32 channels)  
**Scan speed:** max. 30,000 u/s  
 (0.1 u step: 300,000 data points/s)  
**Polarity switching time:** 5 msec  
**MRM transition speed:** max. 555 channels/s

**Highlights:** With a heated ESI and a polarity switching 3 times higher than 8040, the LCMS-8050 is the right tool for analysis of a broad range of molecules including vitamin D and steroids.

## Shimadzu – LCMS-8060



**Sensitivity:** 1 pg reserpine, S/N > 180,000:1 (RMS)  
**No of channels:** MRM (Max. 1,000 events x 32 channels)  
**Scan speed:** Max 30,000 u/sec (in all modes of scanning)  
 (0.1 u step: 300,000 data points/sec)  
**Polarity switching time:** 5 msec  
**MRM transition speed:** 555 MRM/s

**Highlights:** Built on the proven platform of the LCMS-8050, the new patented ion guides developed for the LCMS-8060 greatly improves sensitivity. It brings a meaningful impact to quantitative detection while maintaining high robustness.



# CHANGES **EVERYTHING**

**Shimadzu's new LCMS-8060 makes a real difference to working better and faster. The LCMS-triple-quadrupole combines all UF technologies and pushes the limits of LC-MS/MS quantitation for applications requiring highest sensitivity and robustness.**

**World's highest sensitivity**  
based on the new UF Qarray technology, delivering new limits of MRM sensitivity and impacting full-scan sensitivity

**Unmatched speed**  
due to data acquisition with scan speed of 30,000 u/sec and polarity switching time of 5 msec

**Outstanding durability**  
achieving peak area response RSD of 3.5 %,\* thus showing high robustness

**UFMS**  
ULTRA FAST MASS SPECTROMETRY

[www.shimadzu.eu](http://www.shimadzu.eu)

\*2,400 samples of femtogram levels of alprazolam spiked into protein-precipitated human plasma extracts over a 6 day period (over 400 samples were injected each day).



## ELECTROPHORESIS/CHROMATOGRAPHY

### biostep – Chemiluminescence/Fluorescence Imager Celvin S



**Dimensions:** 420 x 240 x 360 mm (h x w x d)  
**Weight:** 10 kg

- Highlights:**
- Smallest chemiluminescence imaging system, imaging area up to 14 x 14cm
  - Cooled CCD-camera
  - Binning up to 6 x 6
  - Four camera options from high resolution to high sensitivity
  - Electromagnetic safety lock
  - Acquisition of colorimetrically-stained markers possible
  - GxP-compliant in Master and Serial Mode
  - Image export as raw data for analysis or as optimized image for publication
  - NEW: Fluorescence module incl. four excitation and emission wavelength settings each

### Shimadzu – i-series



**Max. operating pressure:** 66 MPa  
**Detectors:** UV, MWD, DAD/PDA, Fluorescence, RID  
**Sample capacity:** 336 (1ml vials) or 216 (1.5 ml vials) or 112 (4ml vials) or 4 x 384-well MTP or DWP  
**Injection speed:** 14 seconds  
**Dimensions:** 605 x 410 x 500 mm (h x w x d)  
**Weight:** 63 kg  
**Applicable LC flow rate:** 0.0001-3.0 ml/min (66 MPa); 3.0001-5.0 ml/min (44 MPa); 5.0001-10.0 ml/min (22 MPa)

- Highlights:** High speed and outstanding performance, maintainability and efficiency – the new i-series with the compact Prominence-i (HPLC) and Nexera-i (UHPLC) versions meets the needs of large as well as small laboratories.

### Shimadzu – Nexera X2



**Max. operating pressure:** 130 MPa  
**Detectors:** UV, MWD, DAD/PDA, Fluorescence, RID, ELSD, CDD, SQ MS, TQ MS, IT-TOF MS  
**Sample capacity:** 115 (1.5 ml sample vials), optional rack changer with capacity up to 658 (1.5 ml sample vials) or 12 x 384-well MTP or DWP  
**Injection speed:** 14 seconds  
**Flow rate range:** 0.0001-3.0 ml/min (to 130 MPa); 3.0001-5.0 ml/min (to 80 MPa); 5.0001-10.0 ml/min (to 22 MPa)  
**Dimensions:** flexible, standard configuration 630 x 520 x 500 mm (h x w x d)  
**Weight:** flexible, standard configuration 80 kg  
**Power Supply:** AC 110 V, 230 V, 150 VA, 50/60 Hz

- Highlights:** The Nexera X2 is a modular UHPLC system with the advantage of high flexibility and extended functionality including sample pre-treatment and overlapping injection.

### Shimadzu – Nexera UC



**Detectors:** UV, MWD, DAD/PDA, ELSD, SQ MS, TQ MS  
**Sample capacity:** SFC / HPLC: 115 (1.5 ml vials), SFE: 4 (48 with optional rack changer)  
**Injection speed:** 14 seconds  
**Flow rate range:** 0.0001 to 5.000 ml/min (CO2 pump)  
**Dimensions:** flexible, standard configuration: 630 x 1040 x 500 (h x w x d)  
**Weight:** flexible, standard configuration: 160 kg  
**Power supply:** AC 110 V, 230 V, 150 VA, 50/60 Hz

- Highlights:** Unified and fully automated system that combines supercritical fluidic extraction (SFE) with supercritical fluid chromatography (SFC). An optional rack-changer for the supercritical fluid extraction unit, enables up to 48 samples to be continuously and automatically processed. The low volume backpressure regulator allows for splitless injection into every detector for ultra-high sensitivity.

## URINE SCREENING

### Beckman Coulter – Iris iRICELL Series



**Sample throughput:** Up to 70 samples/h (microscopy),  
Up to 210 samples/h (chemistry)

**Highlights:** The Iris iRICELL2000, available from Beckman Coulter, integrates urine chemistry and microscopy into a fully automated walk-away solution to help increase efficiency and improve lab productivity. By focusing on one particle at a time, IRIS products isolate, identify and characterize particles, nearly eliminating the need for manual microscopic review. This leads to improved workflow, lower review rates and reduced urine cultures.

### Sysmex – UN-Series



**Dimensions:** 2574 x 1910 x 2510 mm (h x w x d)  
**Weight:** 269 kg

**Highlights:**

- Combines digital imaging, particle and chemistry analysis (UD-10 / UF-5000 / UC-3500)
- Fully automated urinalysis workflow solution
- User-friendly and easy handling
- Multiply your throughput by connecting more than one UF together with one or more UD-10
- Extend your possibilities by adding a UC-3500
- Intelligent data management by U-WAM (Urinalysis Work Area Information Management System)

### Sysmex – UC-3500



**Sample throughput:** max. 276 samples/hour  
**Dimensions:** 829 x 638 x 709 mm (h x w x d)  
**Weight:** 75 kg

**Highlights:**

- User friendly and easy handling
- Fully automated urine chemistry analysis
- Fast total turnaround time (TAT)
- Combination with the UF-5000 and the UD-10 for an optimal, fully automated urinalysis workflow
- 11 test strip parameters including microalbumin and creatinine, and five system parameters
- Able to distinguish between RBC and haemoglobin thanks to the new CMOS sensor
- High accuracy for specific gravity (refractometry measurement method) and cloudiness

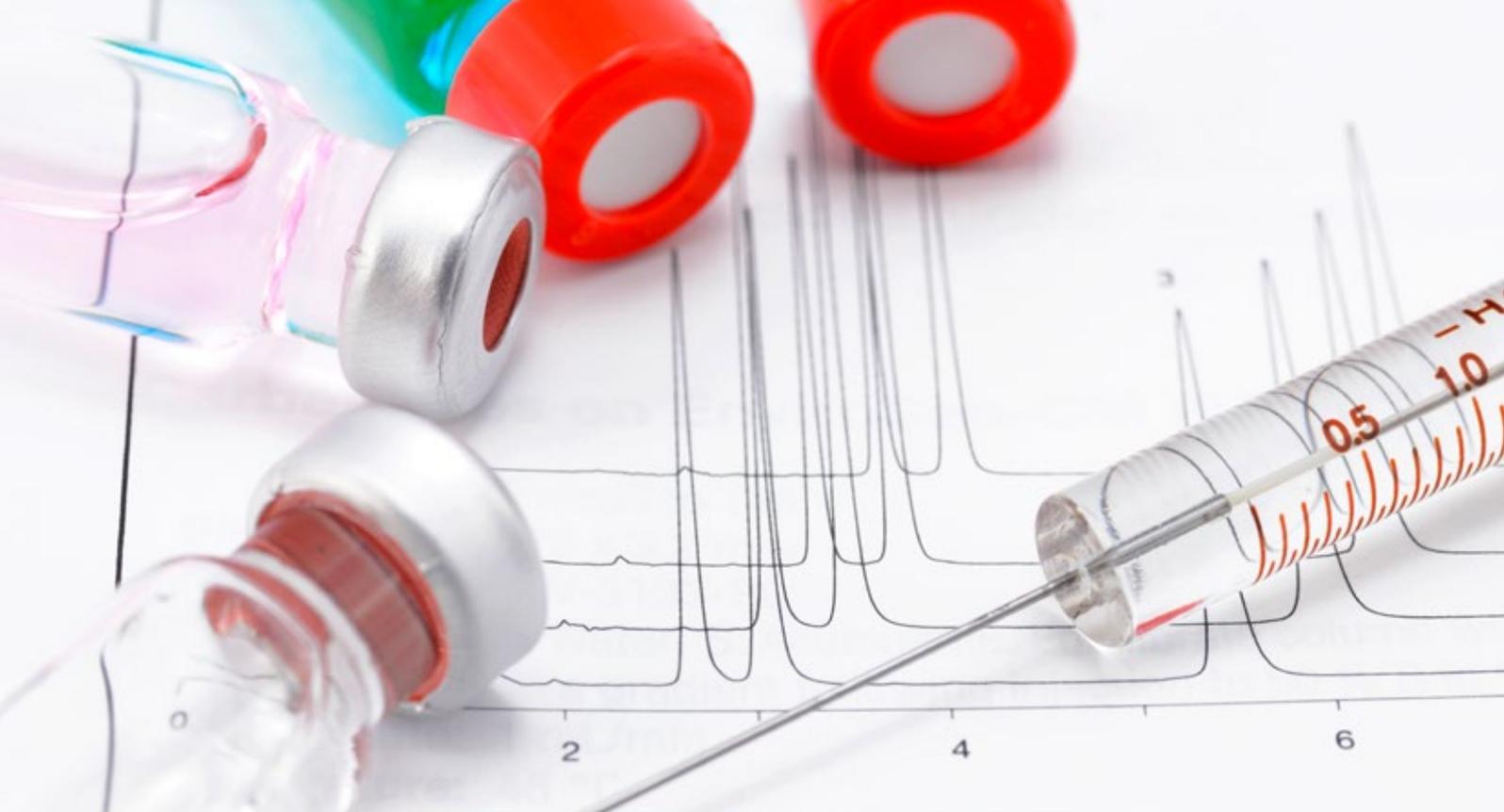
### Sysmex – UF-5000



**Sample throughput:** 105 (Urine), 20 (Body fluids) samples/hour  
**Dimensions:** 855 x 760 x 754 mm (h x w x d)  
**Weight:** 90 kg

**Highlights:**

- Fully automated urine particle analysis
- Modular concept: easy to combine with other members of the UN-Series for a fully automated urinalysis workflow
- Integrated body fluid mode
- Small sample volume needed
- Exclude negative UTI samples in less than a minute
- Blue laser for better detection of bacteria
- New depolarised side scatter light to differentiate RBC and crystals
- Differentiation of epithelial cells & casts
- Reliable QC management by our SCNS network



# The Calibration Laboratories of the Reference Institute of Bioanalytics (RfB)

*By Christina Ritter-Sket*

The calibration laboratories Bonn and Hannover are scientific institutions of the Reference Institute for Bioanalytics (RfB). Using traceable reference measurement procedures of the highest metrological order the laboratories determine laboratory medical target values, so-called reference method values, in human or human-like materials such as serum, plasma or urine. 30 years ago, the first reference procedures for the determination of hormones were developed in Bonn. Since then, the number of measurands has been expanded steadily. Currently, the offering of the calibration laboratories Bonn and Hannover includes 30 measurands in the areas metabolites and substrates, enzymes, hormones, electrolytes, and pharmaceuticals. In addition to determining reference method values for external quality assessment the calibration laboratories certify calibrators, control materials and panels of human sera, urines, etc., thus enabling traceability of measuring results to the highest metrological level. As independent laboratories with extensive analytical experience the calibration laboratories Bonn and Hannover provide their services to diagnostics manufacturers to support the development of routine measurement procedures. This enables the manufacturers to ensure optimal traceability of their routine measurement procedures. Moreover, the RfB calibration laboratories focus on research and development with regard to new reference methods.

For many years the calibration laboratories have been maintaining close contacts to various prestigious diagnostic manufacturers,

national and international research institutions as well as metrology institutes. The scientists of the calibration laboratories support the development of quality assurance in laboratory medicine with their participation in relevant working groups of national and international standard-setting bodies (DIN, ISO) as well as in committees of international scientific societies.

The work and commitment of the calibration laboratories is an important core competence of the Reference Institute of Bioanalytics. The new website [www.rfb-calibration-labs.org](http://www.rfb-calibration-labs.org) introduces the calibration laboratories Bonn and Hannover to the general public. With this internet presence the calibration laboratories invite all interested parties to engage in a dialogue with the calibration laboratories, and they offer diagnostics manufacturers and EQA providers the opportunity to use the labs' services and to improve the traceability of routine measurement procedures. ■

**Dr. Christina Ritter-Sket**  
Director,  
Calibration Laboratory Bonn  
Stiftung für Pathobiochemie  
und molekulare Diagnostic



## URINE SCREENING

### SARSTEDT – Urine V-Monovette, Monovette, tubes & containers



- Highlights:**
- The diverse, user-friendly products for urine collection offer pre-analytical and post-analytical solutions thanks to their simple, hygienic use. Our range of conical urine tubes is ideally suited for sediment recovery and subsequent microscopic analysis.
  - Urine-Monovette: For hygienic urine collection, transport and analysis.
  - V-Monovette Urine: For enclosed urine transfer. Optimal hygienic and convenient handling.

## RAPID TESTING

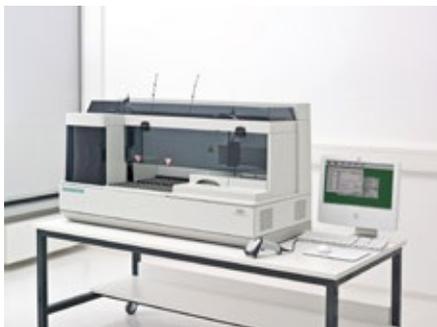
### SARSTEDT – Blood gas capillary tubes



- Highlights:**
- Blood gas collection systems for arterial, venous and capillary sampling with the smallest sample volumes and Ca<sup>2+</sup> balanced heparin.
  - The liquid Ca<sup>2+</sup> balanced heparin enables rapid and optimal mixing of blood and anticoagulants. The Blood Gas Monovette is available in 1 and 2 ml options and has been designed for venous and arterial blood collection. The blood gas capillaries offer a nominal volume range of 100–175 µl.

## PLASMA PROTEIN TESTING

### Siemens Healthineers – BN II System



- Weight:** Analyzer: 150 kg (330 lbs.)
- Sample throughput:** Effective: Approx. 130 tests/h depending on the assay mix; Nominal: 225 tests/h
- Assays:** More than 60 programmed assay protocols for specialty plasma protein testing
- Highlights:** The BN II System is a fully automated protein analyzer that features high flexibility, continuous loading, and excellent instrument reliability.
- Optimal alignment of reagents and systems for more efficient determination of proteins
  - Bar code identification of primary sample tubes, standards, controls, and reagents
  - Comprehensive menu of over 64 assays for routine and specialty testing, including innovative assays such as CDT, FLC and BTP
  - Average effective throughput of 130 tests/h

### Siemens Healthineers – BN ProSpec System



- Weight:** Analyzer: 115,2 kg (254 lbs.)
- Sample throughput:** Effective: Approx. 65 tests/h depending on the assay mix; Nominal: 100 tests/h
- Assays:** More than 60 programmed assay protocols for specialty plasma protein testing
- Highlights:** The BN ProSpec System is a dedicated, compact platform that offers a consolidated menu of specialty and routine reagents for reliable plasma protein testing.
- Proven nephelometric technology and minimized sample preparation for increased confidence in results
  - Broad menu of over 64 assay protocols, including innovative markers such as CDT, FLC, and BTP
  - Average effective throughput of 65 tests/hour

## INFECTIOUS DISEASE TESTING

### Siemens Healthineers – Quadriga BeFree System



**Weight:** 3 configurations: ~730 kg ~970 kg ~1210 kg  
**Sample throughput:** 3 configurations: 1:1 Up to 700 results per run in <4 hours; 1:2 Up to 2,464 results per run in ~7.5 hours; 1:3 Up to 3,000 results per run in ~8 hours

**Highlights:** The Quadriga BeFree System delivers the next generation in ELISA automation in a dedicated, fully automated blood screening analyzer.

- Full blood screening menu, including Enzygnost Anti-HCV 4.0 and Enzygnost HIV Integral 4 Assays
- Primary tubes, sample processor, and robotic transport system for operator safety
- Ability to connect up to three BEP III Systems for different volume needs
- Up to 3000 results in an 8-hour shift for maximized walkaway operation

## DRUG TESTING

### Siemens Healthineers – Viva-ProE System



**Weight:** Approx. 93 kg/205 lbs (excl. monitor arm and panel PC)  
**Sample throughput:** Up to 133 EMIT tests per hour with two reagents; Up to 65 EMIT tests per hour with three reagents

**Highlights:** A flexible, new approach to dedicated drug-testing analysis, the Viva-ProE System provides greater ease of use, workstation efficiency, and a full drug-testing menu, all in one powerful benchtop system that is supported by unrivaled Syva experts.

The system offers peltier cooling for efficient reagent use, can run up to 133 Emit tests per hour and 12 Emit assays simultaneously; 120 tests can be programmed with 10 open test channels. Results available within 10 minutes of processing.

## RESEARCH USE ONLY (RUO)

### Shimadzu – CLAM-2000



**Dimensions:** 1,250 x 900 x 700 mm (LCD touch panel and computer are not included.)  
**Weight:** 185 kg  
**Power:** 100 V/120 V/220 V/230 V AC, 50/60 Hz, 700 VA

**Highlights:** In order to automatize the pretreatment of blood or other biological samples before LCMS analysis, SHIMADZU has developed a fully automated Sample Preparation Module named CLAM-2000 (RUO). Available pretreatment processes include: dispensing samples, dispensing reagents, stirring, suction filtration, incubation, automatic transfer of sample vials to a SIL-30AC autosampler after pretreatment. It is compatible with the LCMS-8040/8050/8060 models. This product is intended for RUO only.

### IBA – FABian - Cell Selection reINVENTED



**Dimensions:** 230 x 190 x 310 mm (h x w x d)  
**Weight:** 3.8 kg

**Highlights:** The FABian cell selection device is a fully automatic bench top instrument for quantitatively selecting cells of interest in high purity from a suspension such as whole blood or buffy coat.

- Mild Fab-based immune affinity chromatography
- Very high yields and purity >90%
- Minimally manipulated target cells, minimal cell stress
- Embedded system, no external PC needed
- Magnetic beads free
- No density gradient centrifugation required
- Various markers (Fab-fragments) available

# Hematology

**mindray**



Blood Cell Counter  
Integrated Hematology  
Histology Equipment  
Flow Cytometry  
Coagulation  
Research Use Only



# SCC Soft Computer

## The World's Largest Laboratory and Genetics Information Systems Vendor

Founded in 1979 by Gilbert Hakim, SCC Soft Computer is the world's largest LIS programming house—with a global workforce of more than 1,800 information technology, medical technology, communications, and business professionals dedicated to LIS development. Mr. Hakim's passion for healthcare IT and the dedication of his diverse global team have made SCC Soft Computer the leader in laboratory and genetics information management system software development.

With nearly four decades' experience, SCC Soft Computer designs, develops, delivers, and supports one of the most complete solution sets of LIS software available today. These tools enable healthcare clients to develop integrated laboratory environments across multiple departments that allow their technical environments to grow as their laboratory needs expand.

SCC is a pioneer in genetics informatics, and is among the first to produce production environment ready genetics information systems. SCC's Genetics Information Systems Suite<sup>®</sup> provides a full range of genetics IT solutions designed to automate workflow in the diagnostic genetics laboratory.

SCC's integrated laboratory and genetics information management system solutions are helping the largest and most sophisticated hospitals, IDNs (integrated delivery networks), and laboratories—including many of the world's renowned academic medical institutions—reach peak productivity.

### **SCC Soft Computer: the global leader in healthcare IT**

To learn more, visit us at [www.softcomputer.com](http://www.softcomputer.com). To schedule a demonstration with one of our experts, please contact Ellie Vahman, Vice President of Sales & Marketing, [ellie@softcomputer.com](mailto:ellie@softcomputer.com)

## BLOOD CELL COUNTER

### Beckman Coulter – UniCel DxH Connected Workcell Solution



**Dimensions:** 1905 x 3225 x 787 mm (h x w x d)  
**Weight:** 1016.6 kg  
**Sample throughput:** 300 samples and 140 slides/h

**Highlights:** With the new UniCel DxH Series of connected hematology workcells, your lab can streamline workflow through smart workload balancing advanced analytics – providing relevant and thoughtful workflow efficiency while delivering accurate patient results. The UniCel DxH eliminates the need for pre-sort and offers workflow enhancements with bi-directional transport.

### Mindray – BC-5800 Auto Hematology Analyzer



**Sample throughput:** 90/h  
**No of parallel samples:** 100  
**Assays:** 25 basic parameters + 4 Research parameters (LIC%, LIC#, ALY%, ALY#), 2 Histograms for RBC and PLT, 2 Scatter grams: 4-differential scatter gram, Basophil scatter gram  
 Cyanide free hemoglobin measurement

**Highlights:**

- Sample volume: Prediluted 40 µL, manual mode (open vial) 120 µL, auto loader/manual mode (closed tube) 180 µL
- LIS Communication: LAN port supports HL7 and 15ID protocol, support uni- or bi-directional LIS

### Mindray – BC-6800 Auto Hematology Analyzer



**Sample throughput:** 125 (CBC+DIFF), 90 (CBC+DIFF+RET), 40/h (body fluid)  
**No of parallel samples:** 100

**Highlights:**

- SF cube cell analysis technology (3D scattergram) for WBC, 5-Part DIFF, NRBC, RET and PLT-Optical
- Cyanide free hemoglobin measurement
- Reportable parameters: 37 (whole blood), 7 (body fluid), research parameters: 17 (whole blood), 7 (body fluid)
- 2 histograms for RBC & PLT; 3 scattergrams (3D) for DIFF, NRBC, RET; 6 scattergrams (2D) for DIFF, BASO, NRBC, RET, RET-EXT, PLT-Optical
- Data storage capacity: up to 100,000 patient results including all numeric and graphical information

### Mindray – BC-5150 Auto Hematology Analyzer



**Dimensions:** 410 x 320 x 400 mm (h x w x d)  
**Weight:** 24 kg  
**Sample throughput:** 60/h  
**Assays:** 25 basic parameters + 4 research parameters, 3 histograms for WBC, RBC and PLT + 3 scattergrams for WBC differential

**Highlights:**

- Impedance method for RBC and PLT counting
- Cyanide free reagent for hemoglobin test
- Flow Cytometry (FCM) + Tri-angle laser scatter + chemical dye method for WBC 5-part differential analysis and WBC counting
- Sample volumes are prediluted modes 20 µL, whole blood mode 15 µL, capillary whole blood mode 15 µL
- Data Storage if possible up to 40,000 results including numeric and graphical information

## Siemens Healthineers – ADVIA 360, 560, and 560 AL Systems



**Dimensions:** 360 x 316 x 492 mm  
(h x w x d)  
520 x 410 x 490 mm

**Sample throughput:** Approx. 60 tests/h

**Parameters:** 22-26 parameters;\* 3- or 5-part white cell differential

**Highlights:** The ADVIA 360, 560, and 560 AL Systems provide laboratories with intuitive, easy-to-use, and scalable hematology solutions designed to offer the right fit for every lab. Each system delivers fast, reliable, and accurate CBC and white cell differential testing with the performance and adaptability that low- and mid-volume labs need. The optional autoloader on the ADVIA 560 AL streamlines automatic sampling for even greater workflow efficiency.

\*Not all parameters are available in the U.S.

## Siemens Healthineers – ADVIA 2120i System



**Dimensions:** 860 x 1410 x 680 mm (h x w x d)

**Sample throughput:** Up to 120 samples/h

**Parameters:** CBC incl. NRBC, 6-part white cell differential, reticulocytes, body fluids, and comprehensive morphology results

**Highlights:** Siemens' high-volume hematology analyzer, the ADVIA 2120i System with Autoslide streamlines workflow by eliminating the majority of manual steps commonly performed to maximize productivity. Its unique testing methodology optimizes results while offering the simplicity and flexibility you need for easy integration into your lab. With connectivity to Aptio Automation and Centralink Data Management System, it supports accurate, fast, sample processing with fully customizable, user-defined features.

## Sysmex – XN-L Series



**Sample throughput:** CBC + DIFF up to 70/h with the optional Speed-up licence

**Dimensions:** 440-510 x 450 x 460-660 mm (h x w x d) (depending on model)

**Weight:** 35 (XN-350, XN-450); 53 (XN-550 incl. sampler); 3 (XN-550 monitor)

**Highlights:**

- XN-350: Single sample analysis in open mode
- XN-450: Single sample analysis in closed or open mode
- XN-550: Automated sampler analysis for increased workflow productivity: Rerun & Reflex and continuous loading
- Add reticulocyte and body fluid analysis as you need them
- XN quality. Cost-effective. Plus full support.
- Delivering specialist solutions for labs that need to offer niche diagnostics.
- A perfect secondary analyser
- Upgrade from 3-part diff to 5-part diff at a price you can afford

## Sysmex – XP-300



**Sample throughput:** approx. 60/h

**Dimensions:** 480 x 420 x 355 mm (h x w x d)

**Weight:** 30 kg

**Highlights:**

- Robust and reliable 3-part differential analyser
- Neutrophil count for greater diagnostic value
- 20 parameters at the push of a button
- Unique barcode and reagent management simplifies laboratory work
- Easy connectivity and user support through SNCS Online QC



## Sysmex

# Shaping the Advancement of Healthcare

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**O**ur mission at the Sysmex Corporation is defined very clearly in our corporate policy: in all that we do, our focus must be on Shaping the Advancement of Healthcare. Of course, there are a million mission statements out there, with all underlying companies claiming that they will change the world in which they operate. Words can come cheap. But not at Sysmex. By the simple fact that we are the global leaders in haematology, by the diversity of products we offer as shown throughout this book, and by our ongoing focus on knowledge and its dissemination through our global support network, we are proud in knowing that we are true to our word. We know that we demonstrate that Shaping the Advancement of Healthcare really is our daily bread and butter. And that, in the end, patients around the world benefit.

### **Strength through focus**

Sysmex Europe has affiliates and distributors in some 25 countries around the European continent, in the Middle East and in Africa. We are by no means the largest company in the healthcare sector – yet as mentioned above, we have already achieved so much. Our formula is as simple as it is effective: ensuring we have a clear focus. As the saying goes, one should only fight the battles one can win, and this is exactly what we do. Where we can make our mission come true, and where we can therefore ensure improvements occur in our areas of expertise, we hone our focus to address issues at hand, solve them, and make them available. It's effective and efficient, and does not demand an overly large and unwieldy backbone in terms of the administrative organisation. It has and is proving a strong recipe for success.

## Knowledge is the key

Advancing healthcare means solving issues, and our backbone lies in our fundamental knowledge of the problems at hand in health-care. From our headquarters in Kobe, Japan, and from our regional headquarters just north of Hamburg, we drive our knowledge development and research to address the issues we identify and subsequently distribute what we have learned and how this can be implemented through our sales channels, and to our best-in-class support network. To ensure our sales staff and product specialists are up-to-date, we have private Academies at strategic locations that train both our staff and in some cases our clients. The result is that our clients – you – always benefit from insights and support that will truly make your job easier and more effective.

## Core business and new areas of expertise

As mentioned, the formula above has taken us to a place where we can proudly call ourselves the global leaders in haematology. In 2011, we introduced our XN-Series, which has since expanded to become a true XN Family. The XN consolidated our position as market leaders, and with the said expansion of the XN Family, we are now delivering the sum of our knowledge in haematology across all market segments for all labs that want only the best.



applications of our core technology and so to address the issues found in a wider range of related disciplines. Please check our website if you are interested in staying abreast of developments.

You will find further demonstrations of our devotion to solving problems in this book with our 3DHitech entries, also related to cancer and population screening as a whole. For more information about our full portfolio, you need just to visit our website on [www.sysmex-europe.com](http://www.sysmex-europe.com).



*The Sysmex XN-9000*

As this book demonstrates, however, we are far more than 'just' a haematology company. In recent months we introduced a brand new series of solutions for urinalysis known as the U-Next Series. The new products provide a fully automated workflow from sample entry to morphology. In haemostasis, another of our historical strengths, we continue to demonstrate our Power of Three, where we combine best-in-class reagents and analysers.

## An overflow of knowledge

Newer areas of expertise are found in what can loosely be defined as cancer management, or oncology. Our drive to drive change was reflected by the acquisition of flow cytometry pioneers Partec in 2013. The tight overlap between our haematology expertise and flow cytometry is allowing our knowledge to bleed over into wider

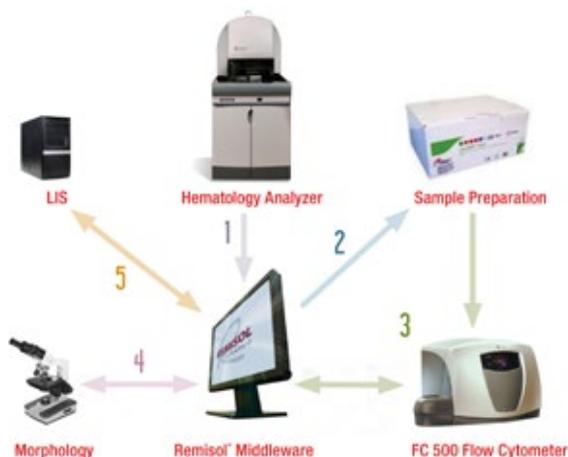
## We're not ordinary

Sysmex is no ordinary company. Thanks to our drive to shape the advancement of healthcare, the subsequent application of our knowledge and teamwork throughout our stakeholders and network, and the production of products that truly address issues at hand, we are making a genuinely significant impact in the way in which laboratories do business. Helping you solve problems that were previously unaddressed, and so in turn helping you to better serve your clients. Not just in haematology, but in all business areas we touch.

Of course, when all is said and done, it's about the patients. And that is the ultimate motivator to keep us on track. Sysmex is about one thing and one thing only. Shaping the Advancement of Healthcare. ■

## INTEGRATED HEMATOLOGY

### Beckman Coulter – HematoFlow



**Highlights:** HematoFlow is a unique cellular analysis solution which brings automated flow cytometry testing into the routine, mid to large haematology laboratory. When used in the HematoFlow solution with automated gating software, CytoDiff, a 5 colour, 6 monoclonal antibody reagent cocktail, yields more extensive results with a 16-part flow differential. With the HematoFlow, labs save time by reducing manual slide reviews.

### Sysmex – XN-3000 DI



**Sample throughput:** CBC+DIFF 200; with RET approx. 170; Body fluid analysis 50; SP-10 80 smears/h; DI-60 30 analyses/h  
**Dimensions:** 1150 x 3000 x 1630 mm (h x w x d)  
**Weight:** 970 kg

**Highlights:**

- Fully integrated slide maker & stainer
- For labs with a steady, medium workload and relatively high smear rate
- Choose Clinical Value APPs as needed
- Integrated backup concept
- Short turnaround times
- Digital Imaging (DI) module:
  - Seamless integrated morphology analysis of slides
  - Efficient, detailed review and validation for greater accuracy
  - Faster, improved workflow
  - Long-term storage and archiving of cell images
  - Consistency in analysis quality

### Sysmex – XN-9000 Sorting & Archiving



**Sample throughput:** CBC + DIFF max 900/h  
**Dimensions:** depending on configuration  
**Weight:** depending on configuration

**Highlights:**

- Haematology automation line, best suited to labs with a high routine workload with relatively standardised sample profiles, and with archiving needs
- Flexible configuration of XN analysis modules
- Discrete rack management
- Built-in auto reflex
- Flexible rack entry and exit positions, also possible as single point of entry/exit
- Comprises XN analysis modules, barcode terminal, SP-10 for smear-making/staining, DI-60 for digital image slide analysis (optional), tube sorter TS-10 or TS-10 Up, *Extended* IPU

## HISTOLOGY EQUIPMENT

### Mindray – SC-120 Auto Slide Maker & Stainer



**Sample throughput:** up to 120 stained slides per hour  
**Sample volume:** 200 µl (autoloader and on track mode), 40 µl (micro-sample mode)

**Highlights:**

- Autoloader capacity is up to 50 sample tubes at once with random access
- Loads up to 10 cassettes at once, each cassettes can hold up to 10 slides
- Automated slide making and staining by single instrument, automated detection of blood consistency and automated adjustment of blood volume, angle and speed of spreader (or pusher) to optimize quality of smear (or blood film)
- Wright stain, Wright-Giemsa stain, May-Grunwald-Giemsa stain with the possibility to recycle stains up to 20 times

## FLOW CYTOMETRY

### SCC Soft Computer – SoftFlowCytometry



**Highlights:** SCC's SoftFlowCytometry integrates testing and resulting with SCC systems for a total view of all patient data from one location. Reliable data capture optimizes workflows in clinical and research settings, enabling laboratory personnel and clinicians to effectively analyze raw data, population percentages, parameter calculations, and scattergrams derived from standard or user-defined custom panels resulting in better design configurations in protocol workflows, task management, and reporting.

### SCC Soft Computer – SoftBank



**Highlights:** SCC Soft Computer's SoftBank – voted the Number 1 Laboratory Blood Bank application since 2009 – provides critical safety functions that enable users to focus on providing safe blood components, tissue, and derivative products to their patients. SoftBank provides a controlled and documented process for blood bank testing and issue of products as well as a wide range of exceptional features that streamline many of the routine, manual, and time-consuming tasks associated with blood bank protocols.

## COAGULATION

### SARSTEDT – S-Monovette ThromboExact



**Highlights:** The blood collection tube S-Monovette Thrombo-Exact has been developed especially for anticoagulant-induced pseudothrombocytopenia. Generally, pseudothrombocytopenia is caused by thrombocyte aggregation. Early detection avoids the consequences of a thrombocytopenia misdiagnosis.

This blood collection tube is validated internally by Sarstedt and externally at the University Hospital Rostock, Germany.

### SARSTEDT – S-Monovette Hirudin - Thrombocyte function



**Highlights:** This blood collection tube is developed to measure thrombocyte activity on the Multiplate analyser (multiple platelet function analyser). In 2008 Sarstedt AG & Co in cooperation with Dynabyte / Verum Diagnostica (now Roche) was the first manufacturer to produce and launch a blood collection system with Hirudin as anticoagulant agent. During validation the S-Monovette Hirudin was compared to the Hirudin tube of Dynabyte. This was done internally by Sarstedt as well as externally by two independent institutions (Munich University Hospital, Westpfalz-Klinikum, Medical Clinic III).

# A new generation of hemostasis instrumentation

By Giuseppe Lippi, Chiara Bovo and Emmanuel J. Favaloro

## Abstract

Authors Giuseppe Lippi, Chiara Bovo and Emmanuel J. Favaloro offer a glimpse into a new generation of hematology analyzers and discuss the concepts of redesigning coagulation analyzers to fit the most important aspects of the preanalytical, analytical and postanalytical phases in hemostasis testing.

The aim of this opinion article is to provide some personal ideas, based on experience and inclination, on how the next generation of coagulation analyzers may evolve in the near future (Figure 1).

## Introduction

Hemostasis testing, conventionally referring to the performance of in vitro diagnostic tests for screening, diagnosis and therapeutic management of patients with either bleeding or thrombotic disorders [1], represents a notable portion of clinical laboratory activity.

A vast array of analyses are performed by the modern hemostasis laboratory in order to generate accurate and comprehensive diagnostic information.

In general, hemostasis testing can be divided into first-line (or screening) tests, aimed to reveal any general impairment of primary and secondary hemostasis, along with second-line (or specialized) tests, which enable the accurate identification of the underlying cause(s) of the hemostatic defect.

First-line tests are therefore usually high-throughput analyses available to most clinical laboratories. The accessibility to second-line tests has been traditionally limited to specialized hemostasis

centers for decades, but these analyses are now increasingly implemented in routine laboratories [2].

Both types of processes require dedicated laboratory instrumentation, which include coagulation analyzers, immunochemical platforms, aggregometers and platelet function analyzers. With progression of technology, it should be recognized that the status

quo is unlikely to remain stagnant.

## General aspects

There are several 'general' considerations around which the next generation of hemostasis instrumentation might be designed. Indeed, the first important issue is represented by the evolution of laboratory diagnostics as a whole.

Modern clinical laboratories are increasingly consolidated within networks or large facilities [3,

4]. This tangible revolution carries notable implications in the way laboratory resources are organized and tests ultimately delivered. The foremost consequence is that the layout of the future coagulation analyzers may be designed to fit small, medium and large laboratories [5].

To put it simply, rather than creating a vast array of different models of analyzers that can individually fit highly heterogeneous volumes of testing in different geographical environment, the use of modular instrumentation would enable simple connection of separate analyzers, with substantial savings in both human and economical resources.

Automation has prepotently revolutionized workflow and sample management in modern laboratories [6, 7]. Several technical

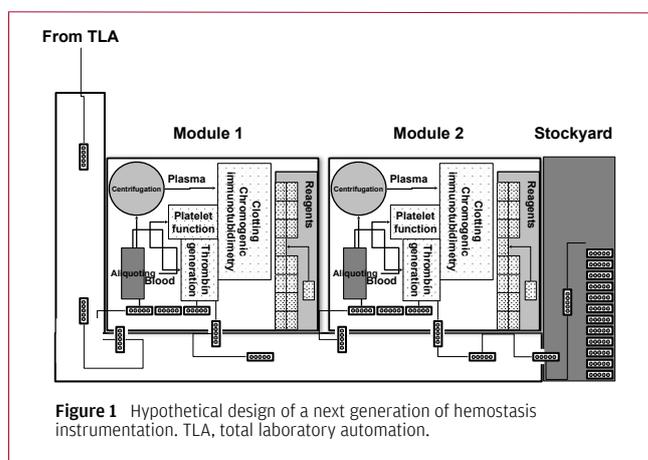


Figure 1 Hypothetical design of a next generation of hemostasis instrumentation. TLA, total laboratory automation.

solutions exist that can be customized around specific needs of organization and testing volume [8].

### Preanalytical sample management

The preanalytical phase conventionally includes all those activities related to collection, handling, transportation, preparation and quality check of diagnostic samples [9, 10].

Several lines of evidence accumulated over decades of research in this field, suggest that this phase is by far the most vulnerable to diagnostic errors [11].

It is noteworthy, however, that the preanalytical and analytical issues pertinent to platelet function testing are still matter of ongoing discussion by many national and international working groups. Regrettably, no definitive indications for automated and standardized preanalytical consideration/stabilization of platelets are available.

### Analytical testing

Since the early history of the hemostasis laboratory, coagulation analyzers have been mostly designed for running clotting tests. In recent decades, however, these instruments have become increasingly equipped with additional technical tools to perform a broader test menu for the investigation of bleeding and thrombotic disorders [12].

An important arena, that is currently inaccessible to most coagulation analyzers, is the exploration of platelet function. The current armamentarium of diagnostic tests in this field include impedance platelet aggregometry on platelet poor plasma (PPP), which is performed using traditional optical lumi-aggregometers, and innovative platelet function analyzers on whole blood, which generally simulate platelet adhesion/aggregation under high shear conditions and after stimulation with a number of platelet agonists.

In regards to technical perspectives, the integration of these techniques within a next generation hemostasis instrumentation is theoretically feasible, and has been explored in a limited manner in a newer hemostasis instrument, the Siemens CS-2100s [13].

### Post-analytical sample management

The post-analytical sample management may be seen as critical as the preanalytical and analytical management in some circumstances. This specifically refers to repeated or reflex testing.

Re-run of samples may be necessary when the analysis is to be repeated with suspicion of an analytical error or interference, or when the observation of abnormal values may trigger forward automatic testing.

Reflex tests are those that automatically result in the order of one or more secondary analyses based on predefined criteria applied to the initial test. A typical example in hemostasis is lupus anticoagulants (LAC) testing. The second-line tests are manually activated in most laboratories [14, 15].

### Conclusions

The future of the hemostasis laboratory is currently unwritten and no crystal ball can accurately predict it. The challenge of coagulation analysis in the context of the widespread use of novel anticoagulants is a paradigmatic example [16].

Table 1 How should the next generation of hemostasis instrumentation be designed?

#### General aspects

- > Modular
- > Fitted for (total) laboratory automation

#### Preanalytical sample management

- > Internal centrifugation
- > Separation and aliquoting of blood or plasma for transportation within the instrument
- > Preanalytical checks for volume, clots hemolysis, hyperbilirubinemia, turbidity

#### Analytical testing

- > Multiple analytical techniques, including
  - Clotting test
  - Chromogenic assays
  - Turbidimetric (latex-enhanced) immunoassays
  - Chemiluminescence
  - Platelet aggregation
  - Thromboelastometry/thromboelastography
- > Availability of more test as turbidimetric immunoassays
- > Ready-to-use reagents liquid reagents
- > Reagents lots with longer duration
- > Continuous loading and unloading cassette reagents
- > On-board, automatic quality controls

#### Post-analytical sample management

- > Automatic sample re-run
- > Automatic reflex testing
- > Internal aliquoting and/or sample stockyard
- > Automatic interpretative comments

According to ongoing reorganization of laboratory diagnostics around the globe, continuous technological innovations and predictable trends of disease prevalence, some basic ideas can be proposed to envisage how a next generation coagulation analyzer might be (Table 1).

Indeed, most of the concepts expressed in this article are based on personal experience and inclination, but in the authors' opinion some of these may still be regarded as a reliable basis for future discussion, with the aim to improve quality of test and laboratory work-out as a whole, and meet the demands of regulatory agencies. ■

#### This article is an excerpt from:

Giuseppe Lippi\*, Chiara Bovo and Emmanuel J. Favaloro.

Reflections on the next generation of hemostasis instrumentation. A glimpse into the future?

LaboratoriumsMedizin. Volume 40, Issue 1, Pages 1-7, ISSN (Online) 1439-0477, ISSN (Print) 0342-3026, DOI: 10.1515/labmed-2015-0087.

## COAGULATION

### Siemens Healthineers – Sysmex CS-5100 System



**Dimensions:** Approx. 1,280 x 1,576 x 1,150 mm (h x w x d)  
**Sample throughput:** Approx. 400 simultaneous PT/APTT tests/h  
**Weight:** Approx. 362 kg

**Highlights:** The Sysmex CS-5100 System – now available in the U.S. – offers high-volume and multisite labs smartly designed PSI technology and automation connectivity for streamlined workflow and high-quality test results on the first run. Simultaneous, multiwavelength PSI technology helps labs to identify and manage unsuitable test specimens prior to analysis.

The Sysmex CS-5100 System offers an expansive test menu of routine and specialty hemostasis assays (including several INNOVANCE assays).

### Siemens Healthineers – Sysmex CS-2500 System



**Dimensions:** Approx. 685 x 1,113 x 895 mm (h x w x d)  
**Sample throughput:** Approx. 180 simultaneous PT/APTT tests/h  
**Weight:** Approx. 140 kg

**Highlights:** The Sysmex CS-2500 System – now available globally including the U.S. – offers mid-volume and multisite hemostasis labs smartly designed technologies for improved efficiency, exceptional accuracy, and reliable first-run results. Equipped with next-generation PSI technologies, the system takes hemostasis testing to the next level.

The Sysmex CS-2500 System offers an expansive test menu of routine and specialty hemostasis assays (including several INNOVANCE assays), all on a single instrument.

### Siemens Healthineers – Sysmex CA-600 Systems



**Dimensions:** Approx. 490 x 566 x 490 mm (h x w x d)  
**Sample throughput:** Approx. 60 PT tests/h  
**Weight:** Approx. 43 kg

**Highlights:** The Sysmex CA-600 Systems – with the smallest footprint in their class – are built on a history of proven reliability and provide scalable options for routine and specialty\* coagulation testing.

- Features clotting, chromogenic,\* and immunologic\* measurements with true random access
- Enables critical tests to be processed at any time via STAT sample processing
- Offers the most frequently requested routine and specialty tests, including INNOVANCE D-Dimer\*

\*Sysmex CA-660 System only.

### Sysmex – CS-1600



**Sample throughput:** up to 120 tests/h (PT)  
**Dimensions:** 540 x 760 x 690 mm (h x w x d)  
**Weight:** approx. 85 kg  
**Assays:** 20 simultaneously

**Highlights:**

- Minimal need for hands-on maintenance
- Perfect solution for medium-size labs with needs for specialty testing
- Proven, reliable technical performance with advanced CS-technology
- High-quality results based on advanced multi-wavelength technology
- Traceability for operation history and results

**Sysmex – CS-2400/2500**



- Sample throughput:** up to 180 tests/h (PT)  
**Dimensions:** 685 x 775 x 895 mm (h x w x d)  
**Weight:** approx. 110 kg  
**Assays:** 60 simultaneously
- Highlights:**
- Advanced inhibitor testing with cross-mixing tests
  - CS-2400: open tube model, CS-2500: cap-piercing model
  - Rule-based rerun & reflex testing
  - Gold standard in "light transmission aggregometry"
  - Automated, high-accuracy platelet function testing by aggregometry
  - High-quality results based on advanced multi-wavelength technology
  - Pre-analytic sample checks for interferences and over-/underfilling
  - Consolidates routine and specialised testing in a single analysis system

**RESEARCH USE ONLY (RUO)**

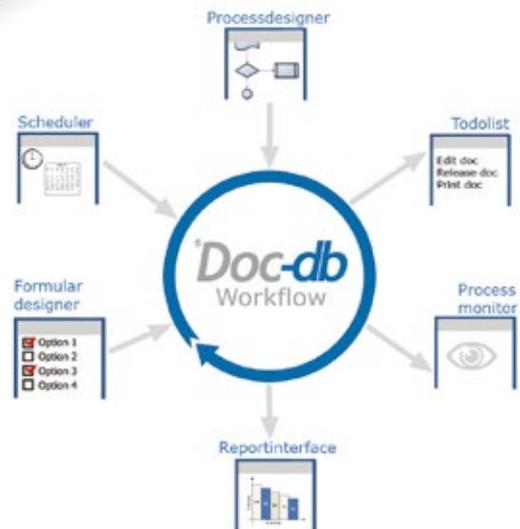
**IBA – FABian - Cell Selection reINVENTED**



- Dimensions:** 230 x 190 x 310 mm (h x w x d)  
**Weight:** 3.8 kg
- Highlights:** The FABian cell selection device is a fully automatic bench top instrument for quantitatively selecting cells of interest in high purity from a suspension such as whole blood or buffy coat.
- Mild Fab-based immune affinity chromatography
  - Very high yields and purity >90%
  - Minimally manipulated target cells, minimal cell stress
  - Embedded system, no external PC needed
  - Magnetic beads free
  - No density gradient centrifugation required
  - Various markers (Fab-fragments) available

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# Pathology



MALDI-MSI  
Virtual slide  
microscopes  
Scanner  
Microscopy  
Optical microscopy  
Slide preparation  
Printer  
Digital microscopy (RUO)

# LAB BOOK 2016

## Digital Pathology

*from idea  
to implementation*

In order for digital pathology to be able to benefit from IT advancements such as electronic image analysis, archiving, virtualization and workflow documentation, it has to master major challenges.

Firstly, there are technological challenges such as the management of huge data volumes created by gigapixel virtual slides, or hardware issues surrounding the speed of scanners and the quality of screens.

Secondly there is integration: how will digital pathology be integrated in the overall processes covering pathology, lab and information systems?

Mastering these challenges requires implementation of – and blanket compliance with – suitable standards. The race is on! *Read more ...*

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## The MALDI Tissue typer

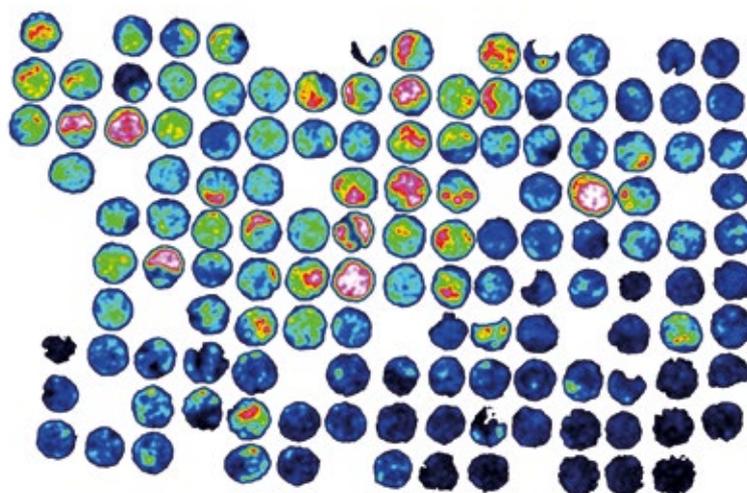
The rapifleX is now available as TOF/TOF

The MALDI Tissue typer is a system that records spatially resolved mass spectra directly from tissue. This allows the direct measurement of proteins, lipids and other molecular classes without the need for antibodies or molecular probes. This results in highly multiplexed datasets in which hundreds or thousands of compounds are measured simultaneously. The acquired data can be used in different ways. For instance, using a classical biomarker approach, it is possible to compare different tissue or disease states to look for specific mass signals. Since the mass spectra can be also seen as reflecting complex tissue-specific phenotypes, it is also possible to use these patterns to develop bioinformatic tools that can then be used to classify unknown tissue. In the analysis of tumors, there can often be molecular differences in tissues that are histologically identical. The MALDI Tissue typer can therefore be used to assist in the research of tumor heterogeneity. The system allows image co-registration; the ability to superimpose virtual microscopic slides with the MALDI data, enabling the detailed simultaneous analysis of histological and molecular information.



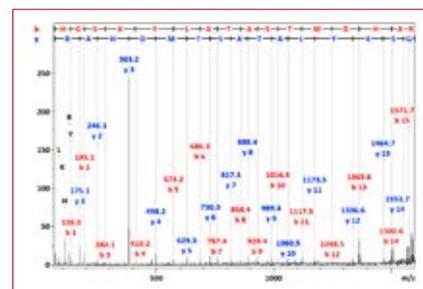
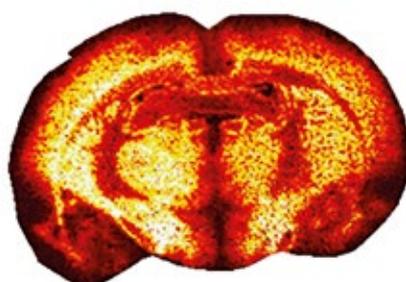
*MALDI image of a blood vessel. The microscopic image can be overlaid and seamlessly cross-faded to assign molecular signals to histological features.*





MALDI image of a tissue microarray. The MALDI Tissue typer can analyze formalin fixed tissue. Microarrays are a convenient way to carry out studies on a large number of samples.

Example of the distribution of a tryptic peptide in rat brain (left). The rapiflex TOF/TOF allowed the direct identification of the peptide by MS/MS (right).



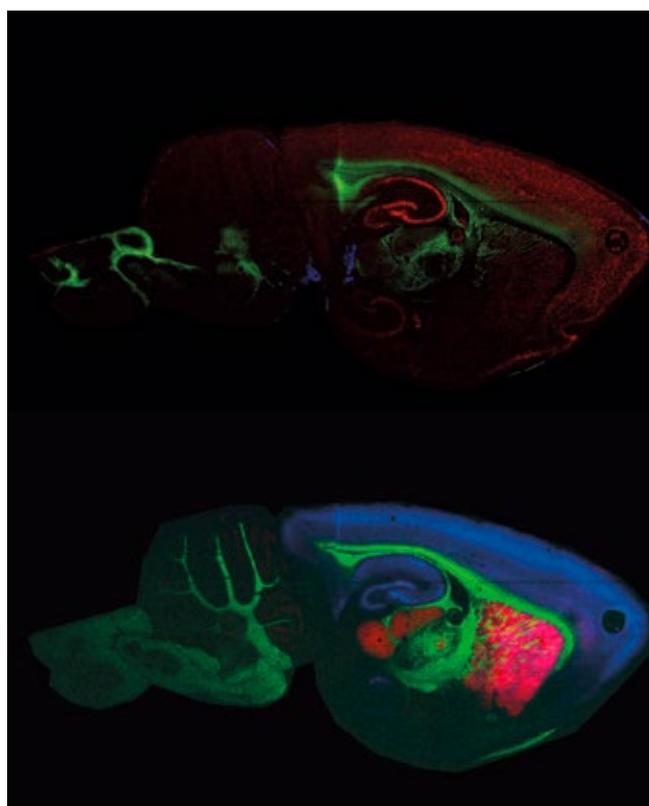
### FFPE Tissue

Most of the early development in mass spectrometry imaging has been conducted on frozen tissue, which allows for the analysis of intact proteins, lipids and endogenous metabolites. However, the interest in the analysis of formalin fixed paraffin embedded (FFPE) tissue has continuously increased due to the limited availability of frozen tissue and the wide availability of FFPE samples. Because of formalin crosslinking, intact proteins cannot be measured from FFPE tissue. Instead, spatially resolved tryptic digests are performed to measure tryptic peptides. While this adds additional sample preparation steps, it has the advantage that the mass spectrometry identification of tryptic peptides is easier than the identification of intact proteins.

### The rapiflex

The introduction of the rapiflex MALDI Tissue typer instrument last year was a milestone for mass spectrometry imaging. The system is a completely new design with the application of MALDI Tissue typing in mind. The speed of MALDI imaging measurements was increased up to 20 fold, from a few pixels per second to up to 50 pixels per second. This now allows researchers to tackle problems that could not be targeted before, including the efficient measurement of large samples or many samples in research studies. This year, the scope of the rapiflex has been considerably widened by the introduction of the new rapiflex TOF/TOF. This instrument has a second ion source which allows MS/MS measurements to fragment and identify peptides and other compounds. In the context of the MALDI tissue typer, this facilitates the identification of peptides as biomarkers or as part of classification patterns. Peptides can be identified by either direct measurement from tissue or more comprehensively by combining information from tissue imaging with information from LC-MS separations in the imageID workflow. ■

These images show the distribution of different proteins in brain tissue.



## MALDI-MSI

### Bruker Daltonics – rapiflex MALDI Tissue typer



#### Highlights:

- Mass Spectrometry Imaging based on MALDI-TOF
- Direct imaging of proteins, peptides and lipids
- Available as TOF/TOF
- Unique ion source for robust day-to-day operation
- Fast acquisition speed of up to 50 true square pixel / second
- Laser repetition rate up to 10 kHz
- Pixel size <10µm
- Comprehensive software

For research use only.  
Not for use in diagnostic procedures.

## VIRTUAL SLIDE MICROSCOPES

### Hologic – ThinPrep Imager/Imager Duo



<b>Dimensions:</b>	584 x 813 x 635 mm
(h x w x d)	558 x 635 x 825 mm (Duo)
<b>Weight:</b>	59 kg / 77 kg (Duo)
<b>Power supply:</b>	100 - 240 V, 50-60 Hz, max. 400 W
<b>Sample throughput:</b>	3 min/slide; 1.5 min/slide (Duo)
<b>Sample capacity:</b>	25 slides/cassette 250 slides/full batch

- Highlights:**
- The ThinPrep imaging system provides Dual Review that ensures that every ThinPrep Pap test gets two different reviews: one full review by the ThinPrep imager and another by an experienced cytotechnologist
  - Significant increase in ASCUS+ sensitivity of 6.4% [95% CI: 2.6-10.0]
  - Significant increase in HSIL+ specificity of 0.2% [95% CI: 0.06-0.4]
  - 42% increase in HSIL detection and a 37% increase in LSIL detection, compared to manually reviewed ThinPrep Pap test slides

## SCANNER

### Hamamatsu Photonics – NanoZoomer S210



**Highlights:** With over a decade of experience in digital pathology, Hamamatsu introduces the NanoZoomer S210.

#### Features:

- 210 slide scanning capability
- Batch scanning or continuous loading of slides
- High performance
- Cost-effective
- Simple operation
- New sleek design and small footprint

### Hamamatsu Photonics – NanoZoomer XR



- Highlights:** NanoZoomer XR Benefits :
- Real high throughput: Greatly improved scanning speed (35 s at 40 x mode for 15 x 15 mm sample sizes) and slide capacity of 320 for high workload laboratories.
  - Hassle free: Simple operation and hassle free scanning. New, powerful viewer for fast and easy slide viewing.
  - Error free: Robust and stable scanning. Automatic system calibration.
  - Blur free: Sharp focus on entire specimen. Dynamic Pre-Focusing (DPF) method and focus scoring.

## Hamamatsu Photonics – NanoZoomer S60



**Highlights:** NanoZoomer S60: The most flexible slide scanner for any histology lab: The best of Hamamatsu's know-how, combining flexibility and outstanding image quality.

**Features:**

- High-speed and sensitivity in fluorescence
- Best image quality both in brightfield and fluorescence
- Double-size slides scan
- Ideal for all research and pathology laboratories

## MICROSCOPY

### Olympus – CX41 Routine Microscope



- Highlights:**
- Ideal for different observation methods
  - Ergonomic design
  - Plan objectives for image clarity

The CX41 biological microscope sets the standard for its class in both basic and system performance. It provides high image clarity in a variety of observation methods, including bright field, phase contrast and fluorescence. This cost-efficient microscope is suitable for routine observation and has an ergonomic design for comfortable long-term use.

### Olympus – UC90 4K Microscopy



- Highlights:**
- Up to 4K UHD image capturing
  - One Camera for Multiple Applications
  - 9-megapixel CCD camera

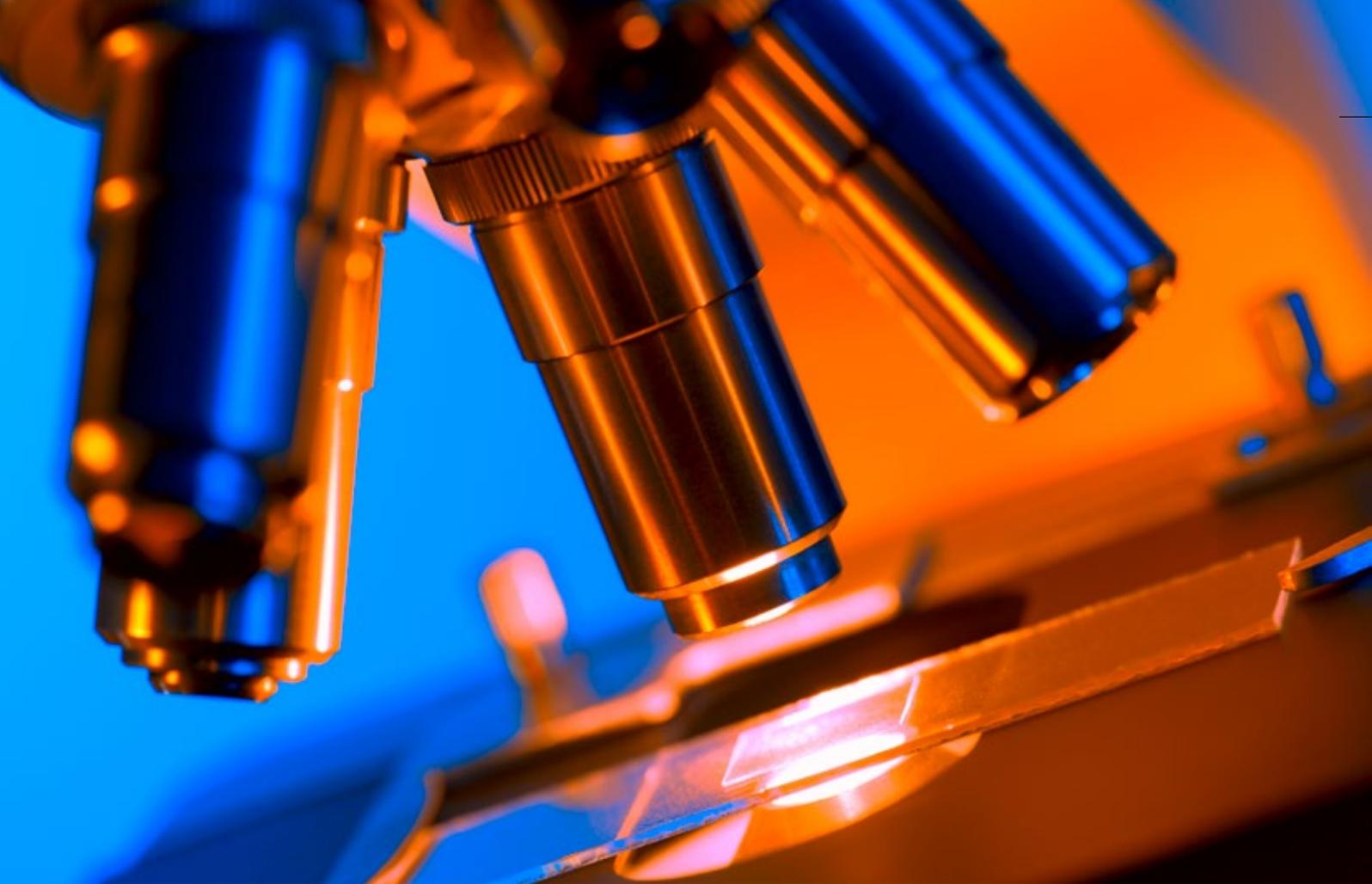
The 9-megapixel UC90 camera captures it all: bright-field images of superior quality, and up to 4K UHD imaging. Whatever your imaging needs are, expect no less than exceptional results in image quality, sensitivity, dynamic range, and color fidelity. The UC90 offers fluid sample navigation and focusing, making it effortless and convenient to locate regions of interest right on your screen. Excellent microscope imaging has never been as easy and versatile as with the UC90.

## OPTICAL MICROSCOPES

### Hologic – ThinPrep Review scope/Review Scope Manual Plus



- Dimensions:** (h x w x d)  
 533 x 304 x 584 mm (Review Scope)  
 89 x 140 x 7 mm (Console for Review Scope)  
 460 x 559 x 680 mm (Review Scope Manual Plus, Controller, Computer ...)
- Weight:**  
 17 kg (Review Scope)  
 0,4 kg (Console for Review Scope)  
 31 kg (Review Scope Manual Plus, Controller, Computer ...)
- Objectives:**  
 10X, 40X (Review Scope), 4X, 10X, 40X + additional objective position (Review Scope Manual Plus)
- Power supply:**  
 100 - 240 V, 50/60 Hz, 200 W (Review Scope), < 150 W (Review Scope Manual Plus without Computer)



# Lab information systems in pathology and the challenges of digital pathology

*By Stefan Kropf*

In order to be able to properly locate digital pathology in the current discourse on the digitalisation of healthcare, pathology has to be understood as a fundamental diagnostic discipline, above all in oncology.

Any tissue sample taken in a surgical intervention is sent to the pathology lab: The tissue, placed on a slide and processed depending on the question at hand, e.g. stained, is examined under a microscope in order to detect pathological structures and changes which then can be treated in a targeted fashion along the clinical pathway.

In digital pathology the microscope is replaced by a slide scanner linked to a reading station where the image data are assessed. Thus the pathologist no longer "reads" the physical slide under a microscope but the digital images on a monitor.

There is no doubt that over the next few years digital pathology will move from niche to mainstream – too convincing are its benefits. Nevertheless, its drawbacks need to be addressed.

The most obvious advantage of digital pathology is the fact that the location of the reader – the pathologist – is no longer linked to the location of the physical tissue sample. Without the need to mail slide and sample, second opinions can already be obtained during initial assessment of the specimen. Furthermore, routine reading can be done from the home office so to speak.

A further advantage is the possibility to view the entire slide which enhances orientation within the specimen. Images with different stains can be superimposed to create better contrast of interesting structures. Image analysis software allows precise

selection of the structures to be evaluated and notes can be added right on the image and saved.

Beyond these advantages research and teaching provide ample opportunity to use digital images.

The disadvantages of digital pathology are expensive equipment, instable technology, lack of standards and lab information systems that are not yet ready to support digitalization.

With a view towards digital pathology current lab information systems need to address certain issues – issues that go beyond digital pathology but are relevant for the digitalisation of healthcare as such:

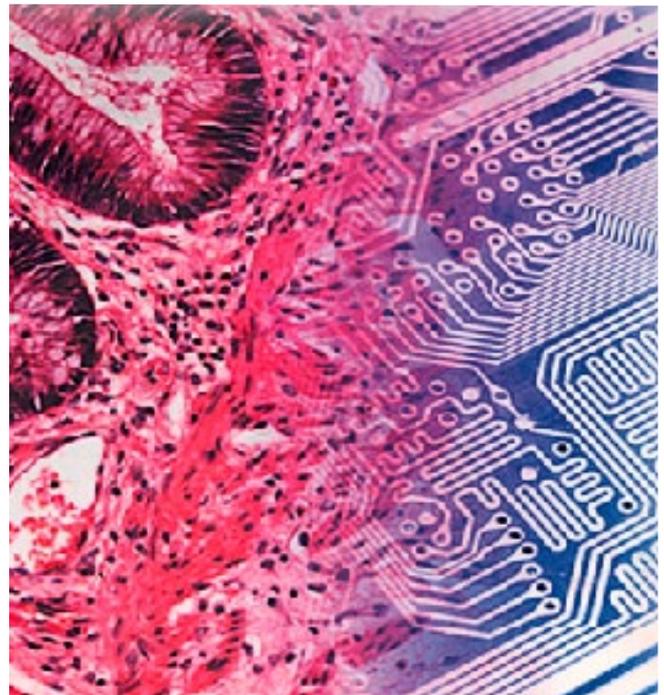
- » internal and external order entry
- » secure platforms for the exchange of image and document
- » unified formats, such as DICOM, and open hardware interfaces to integrate different devices
- » integration and processing of legacy data (reports)
- » labelling and assignment of procedures and processes
- » integration of different devices (tablet PCs, smartphones, VR headsets) to facilitate reading/reporting and communication with clinicians (e.g. tumour board)
- » creation of communication pathways between pathologists and clinicians
- » automatization of data input and transfer, e.g. ADT/GEKID
- » molecular pathology and its information and diagnostic potential

When the future requirements of an LIS are defined from the vantage point of the core task of digital pathology – to make histological specimens available in a digital format – the issues industry has to tackle become clear. And indeed industry has its work cut out to achieve stable and mature systems.

In order to be able to digitalize this core task the process of pathological assessment first has to be described analogically.

In conventional diagnostics the pathologist uses a microscope – as well as his or her experience – to assess tissue morphology, cell size, cell distribution and colour. The patterns the pathologist detects allow a diagnosis – or at least point in a diagnostic direction. These parameters can be mapped in digital pathology. Case in point: staining. The different colours illustrate the potential of assessing digitalized slides. Calibrated systems can perform these assessments and provide probability values as percentages, thus paving the way towards diagnosis. Task lists based on "regions of interest" can be created, prioritized and distributed to several pathologists. Moreover, the probability values can trigger further examinations, for example in molecular pathology, that lead to personalized healthcare.

The major challenge with regard to digital mapping of an analogue process is the correct handling and categorization / allocation of data. On the one hand there are ancillary tasks which never-



theless require a high degree of "tweaking" into digitalization, such as data capture, creation of cases, data transfer and report shipping. On the other hand there are the data to be managed in the LIS - and it is exactly these data that pose the major challenge since the LIS lacks the crucial feature of the human pathologist: diagnostic experience. Any digital system will have to close this knowledge gap. Thus, every kind of information needs to be validated by a specialist prior to integration in the system. Moreover it is not only the quantity but also the quality of information that determines the level of detail of subsequent diagnostic procedures. These developments are comparable to the digitalisation of radiology departments some years ago.

**Conclusion** Pathology, indeed healthcare in general, is facing the enormous task of mastering the challenges digitalisation will pose in the coming years. Personalized medicine and "big data" will remain nothing but buzz words if the information systems don't manage to meet the requirements of digitalisation. At the same time we should not forget that the new possibilities will also create new dependencies. They need to be addressed in order to avoid a complete breakdown of the diagnostic tasks that are performed every single day. Thus, any new pathology LIS solution needs to offer a reliable disaster recovery strategy, including the post-failure input of analogue data. Even in the digital future the pathologist has to be able to dust off and use the microscope as analogue assessment tool. In short: digitalisation supports the pathologist's assessment – it does not replace it! ■

Stefan Kropf  
Leipzig



## SLIDE PREPARATION

### Hologic – ThinPrep 5000 Autoloader



**Dimensions:** 1450 x 1370 x 710 mm (h x w x d)  
**Weight:** 368 kg  
**Power supply:** 100/130 V, 220/240 V, 47-63 Hz, max. 720 W  
**Sample throughput:** batch of 20 samples processed in 45 min.

- Highlights:**
- Fully automated processing of 160 gyn, general or UroCytex samples, up to 160 can be loaded at once, no minimum
  - Up to 4 racks with 40 vials, 3 cassettes with 100 filters, 3 cassettes with 100 slides
  - Integrated laser engraving sample ID on slides
  - Recharging consumables during run
  - Run unattended, ability to run batch of up to 160 samples unattended, including overnight
  - Robot arm in Autoloader feeds consumables into the carousel in benchtop
  - Urgent samples run at any time by pausing batch processing

## PRINTER

### Primera Technology – Signature Cassette Printer



**Highlights:** Primera's Signature Cassette Printer is designed for use in pathology and histology labs to print high-resolution text, graphics and bar codes directly onto tissue cassettes helping to reduce the risk of misidentification of specimens. It is available in both a stand-alone manual printer and a fully automated complete system.

- On-demand or batch mode printing
- Black or colour printing
- Chemical-resistant ink – ensures reliable identification of cassettes
- USB interface – ability to integrate with LIS

### Primera Technology – Signature Slide Printer



**Highlights:** Primera's Signature Slide Printer can significantly increase the efficiency of labs while helping to reduce the risk of misidentification of specimens.

- On-demand, full-colour printing – prints only the number of slides needed
- Prints directly onto slides – eliminates handwriting that is hard to read and labels that are hard to apply
- Xylene-, alcohol-, heat- and chemical-resistant ink – ensures reliable identification of slides
- PTSlide Software allows connection to LIS systems
- Compact design

## DIGITAL MICROSCOPY (RUO)

### 3DHitech – Panoramic Confocal

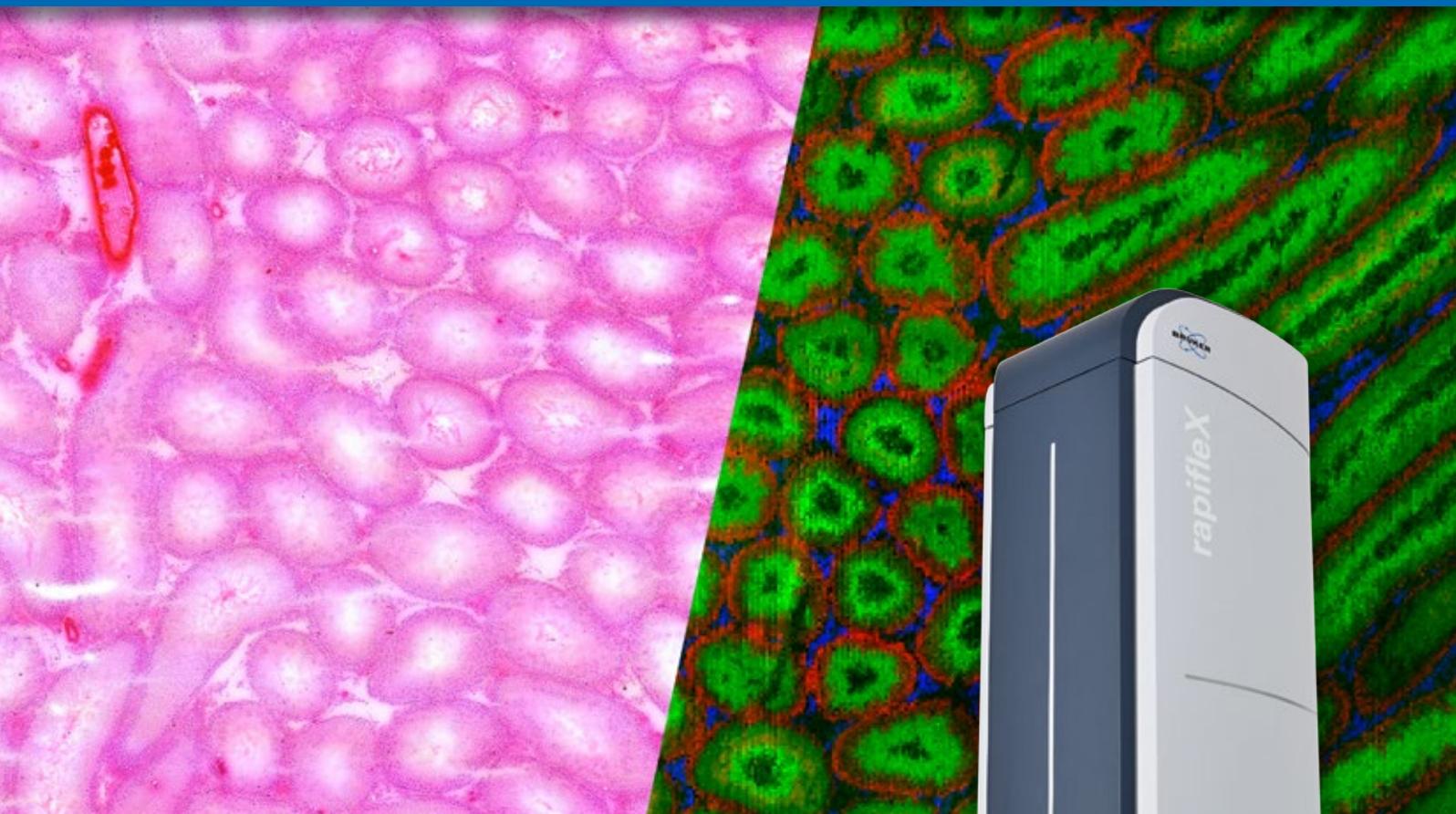


**Sample throughput:** up to 12 slides/hour @60x  
**Dimensions:** 570 x 950 x 100 mm (h x w x d)  
**Weight:** 90 kg

**Highlights:** Research pathology demands great accuracy and flexibility – both of which you'll find in the new Panoramic Confocal. By combining confocal imaging with award-winning whole slide-scanning, your immuno-fluorescent samples appear on your screen in unprecedented quality! With superb light efficiency and minimal bleaching, 3DView provides an amazing insight into the whole specimen. Now you can be flexible in your research objectives...

- 3D reconstruction/visualisation
- minimal bleaching, fast scan

# MALDI Tissue typer



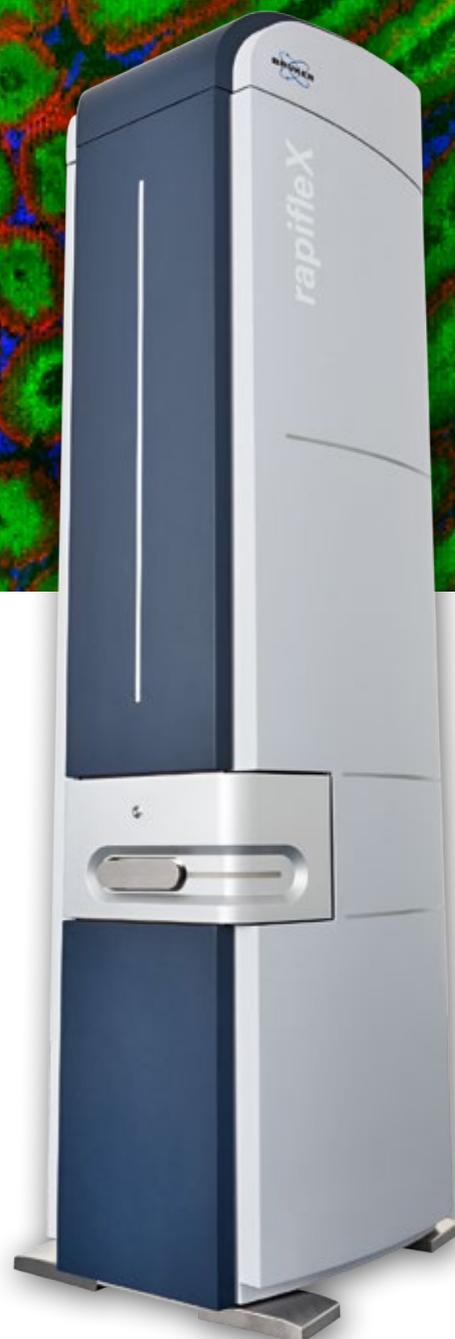
## Direct mass spectrometry imaging of proteins, lipids, drugs and metabolites

- Direct mass spectrometry imaging of proteins, peptides and other endogenous compounds from tissue.
- For biomarker discovery and tissue classification
- Adding a molecular dimension to histology

Read more about Brukers new rapifleX™ on Page 50-51

Contact us for more details: [www.bruker.com](http://www.bruker.com)

For research use only. Not for use in diagnostic procedures.



# DNA

 SHIMADZU

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**Agena**  
BIOSCIENCE

**LabTIE**  
Improving Productivity

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Detection  
Amplification/Detection  
Extraction  
PCR Setup  
Clinical chemistry  
Research Use Only  
Service

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## AMPLIFICATION

## Orion Diagnostica Oy – Orion GenRead



**Highlights:** Orion GenRead system brings fast and accurate results within reach of a wide range of laboratories. The CE marked system consists of a small, portable instrument and a C. difficile test, followed by tests for Campylobacter, Influenza A&B and RSV. This easy to use solution combines reliability with user friendliness for flexible laboratory routines. The Orion GenRead system is based on SIBA, Orion Diagnostica's proprietary isothermal nucleic acid amplification technology.

## SARSTEDT – White Multiply PCR Plates



**Highlights:**

- White wells for improved fluorescence reflection
- Thin-walled reaction tubes for quick temperature transfer
- Free from DNA, DNase, RNase and PCR inhibitors
- Barcode labeling on plates with half or full skirt is available on request

## Sysmex Corporation – RD-100i



**Sample throughput:** 8 samples/hour  
**No of parallel samples:** 4  
**Number of channels:** Single marker: Cytokeratin 19 (CK19) mRNA  
**Dimensions:** 548 x 596 x 622 mm (h x w x d)  
**Weight:** 66 kg

**Highlights:** OSNA – Molecular Detection of Metastases in Lymph Nodes

- Prompt availability of results
- Automated and standardised test procedure
- High level of sensitivity and specificity
- The entire lymph node can be analysed
- Simple test performance even without molecular biological expertise

OSNA is CE-marked and compliant with Directive 98/79/EC for in-vitro diagnostic medical devices. OSNA is approved for use in diagnostics of breast, gastric and colon cancer regional lymph nodes.

## DETECTION

## Shimadzu – MultiNA



**Highlights:**

- Fully automated microchip electrophoresis system for DNA and RNA analysis
- Low running costs due to reusable microchips
- Fluorescence detection for high-sensitive detection
- No need of harmful EtBr for staining
- Easy and reliable size determination and semi-quantification of DNA and RNA
- 4 different DNA kits (from 25 bp to 12,000 bp) and one RNA kit available
- Fast automation with up to 120 samples per schedule

## Rapid, reliable cancer diagnostics using **MassARRAY mass spectrometry**

### Introducing the Agena MassARRAY Dx platform



*The Agena MassARRAY dx Analyser 4*

Cancer patients today can benefit from much better drugs providing treatments tailor-made to specific mutations. However, broad application is still hampered by a considerable bottleneck: fast, reliable, and cost-effective diagnosis. Agena's MassARRAY platform is addressing this bottleneck with an elegant new solution.

Cancer is characterized by a broad variety of mutations that enable tumors to escape surveillance and elimination by the immune system and to achieve unrestricted growth. With hundreds of mutations identified, researchers and pharma companies are working to design a growing number of compounds able to interfere with these specific mechanisms. With the advent of the first of these targeted cancer drugs, oncology has entered into the area of personalized medicine.

However, before the best suited drug can be prescribed to the patient, it is necessary to analyze the patient's tumor to establish which of the known mutations is or are present. This analysis today is performed by sequencing and fluorescence in situ hybridization (FISH) analysis to identify amplifications, point mutations, deletions, insertions, and gene fusions. The entire process is time-consuming and requires a substantial amount of tumor material so that many patients have to be prescribed a drug before test results are available.

But now a faster and easier to perform technology is available. It is based on mass spectrometry using MALDI-TOF, which is a long established tool in clinical labs, e.g. to identify pathogens in clinical microbiology. As the technology is applicable to all sorts of biological macromolecules, it is also being used in research labs around the world for the analysis of nucleic acids. The approach is well-proven for the accurate identification of somatic mutations, SNPs, insertions, and deletions as well as DNA methylation from a variety of sample types, as illustrated by over 2,500 publications in oncology, pharmacogenetics, inherited disease, blood group genotyping, and others.

Therefore, Agena Bioscience GmbH, a pioneer of the MALDI-TOF-based MassARRAY technology for the analysis of genes and genetic variants, has introduced a CE-IVD certified mass spectrometry system for clinical cancer diagnostics to the European market. Agena's MassARRAY Dx platform identifies a broad spectrum of mutations involved in cancer. It consists of the MassARRAY Dx Colon Panel, the MassARRAY Dx Lung Panel and the MassARRAY Dx instrumentation (MassARRAY Dx Analyzer 4, MassARRAY Dx Nanodispenser RS 1000).

The MassARRAY Dx Colon Panel simultaneously analyzes over 200 mutations in the four major oncogenes involved in the pathogenesis of colorectal cancer (*KRAS*, *BRAF*, *NRAS*, *PIK3CA*).

The MassARRAY Dx Lung Panel simultaneously analyzes over 300 mutations in 10 genes implicated in the pathogenesis of lung cancer (*EGFR*, *KRAS*, *BRAF*, *PIK3CA*, *NRAS*, *ALK*, *ERBB2*, *DDR2*, *MAP2K1*, and *RET*).

Both panels can detect mutation frequencies as low as 5% and are based upon clinical practice guidelines recommended by the European Society for Medical Oncology (ESMO) for diagnosis, treatment and follow-up for metastatic colorectal cancer and metastatic non-small-cell lung cancer (NSCLC), respectively.

The panels come with the necessary reagents for Agena's proprietary iPlex chemistry to amplify specific gene regions from tumor DNA and to identify somatic mutations in up to 15 genomic positions in a single reaction. The process requires not more than 40 ng of DNA extracted from a broad variety of tumor samples as starting material, e.g. fresh, frozen, paraffin-embedded tissues (FFPE) and fine-needle-aspirate (FNA). The extension products are then dispensed onto Agena's SpectroCHIP arrays using the MassARRAY Dx Nanodispenser RS1000. Each SpectroCHIP has a capacity of up to 10 patient samples and 2 controls per plate. When loaded into the MassARRAY Dx Analyzer 4, the SpectroCHIP is analyzed in 15 minutes. An automated software report provides the calls and mutation frequencies for each sample. The entire process from extracted DNA to report can be performed in a single 8 hours work day.

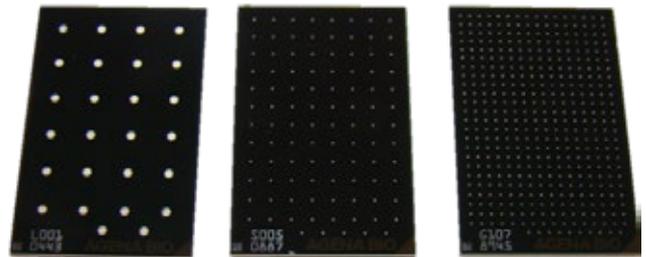
The MassARRAY Dx System can analyze two plates in parallel and multiple plates per day, providing accurate and parallel processing of multiple patient samples every day.

The variant alleles are called in real-time, eliminating the need for complex bioinformatics. The Analyzer uses Matrix-Assisted Laser Desorption Ionization – Time of Flight (MALDI-TOF) for the precise detection of DNA molecules. Using a principle similar to gel electrophoresis, the DNA molecules are distinguished by their time-of-flight, hence mass, after being ionized in a vacuum chamber. Direct analysis of the mass of the molecules eliminates the need for fluorescence or other labeling.



The Agena MassARRAY dx Nanodispenser RS 1000

The technology is quite elegant, offering molecular pathologists a unique combination of reliability, sensitivity, ease-of-use, and cost-effectiveness for targeted genetic testing. The multiplexed MassARRAY assays allow the user to concurrently analyze the relevant oncogenes and thereby reduce costs and turnaround time compared to existing methods. The two test panels support personalized treatment and improve patient care through rapid analysis of clinically actionable mutations implicated in lung and colon cancer.



3 formats of SpectroCHIP

The technology is future-proof: Agena can modify panels easily once novel mutations are identified and validated, and the company is also working to design novel panels for additional cancer indications. As the technology is based on MALDI-TOF mass spectrometry, it is also suited to identify DNA methylation, a modification that only recently have been added to the diagnostic arsenal of oncology and that cannot easily be identified with sequencing.

Moreover, clinics are free to use the instruments for other purposes, e.g. clinical microbiology as well as open-channel capabilities in a research use only (RUO) capacity for applications including pharmacogenetics, oncology, and inherited disease screening. ■

## AMPLIFICATION/DETECTION

### Agena Bioscience – MassARRAY Dx Analyzer 4

#### Technology:

Benchtop MALDI-TOF mass spectrometry to identify somatic mutations using single base extension with mass distinction of extended primers (using iPLEX chemistry and SpectroCHIP Array)

#### Time to results (from DNA):

<8 hours, incl. 1 h of hands-on-time

#### Capacity:

Two 96-well SpectroCHIP Arrays per run; up to 5 runs/day (up to 200 samples per day)

#### Automated software output:

Mass spectra, mutant and wild-type calls, report for each patient sample



**Highlights:** The MassARRAY Dx is a CE-IVD marked genetic analysis system for the reliable multiplexed analysis of up to hundreds of clinically relevant mutations in a single workflow. Powered by sensitive and accurate mass-based detection, it maximizes laboratory resources (sample-to-answer testing with minimal hands-on-time in a single eight-hour work shift) and clinically actionable mutation reports. At present, two panels for colon and lung cancer enable cost-effective and accurate mutation screening.

### Agena Bioscience – MassARRAY Colon Panel

#### Target:

>200 clinically actionable somatic mutations in four principal oncogenes (*KRAS*, *BRAF*, *NRAS*, *PIK3CA*)

#### # of multiplexed PCR reactions:

8

#### Sample amount:

40ng DNA per sample

#### Sample throughput:

Up to 10 patient samples and 2 controls per plate

#### Sensitivity:

Detection and analysis of mutation frequencies as low as 5%

MASSARRAY DX COLON PANEL\*: GENES AND MUTATIONS

GENE	COVERAGE	# OF MUTATIONS
<i>BRAF</i>	Codons 594, 600, and 601 of exon 15	27
<i>KRAS</i>	Codons 12, 13 of exon 2; Codons 59, 61 of exon 3 and Codons 117, 146 of exon 4	62
<i>NRAS</i>	Codons 12, 13, 18 of exon 2; Codons 59, 61 of exon 3; Codons 117, 146 of exon 4	55
<i>PIK3CA</i>	Codons 38, 81, 88, 93, 108 of exon 1; Codons 118 of exon 2; Codons 345 of exon 4; Codons 420 of exon 7; Codons 539, 542, 549, 545, 546 of exon 9; Codons 1021, 1025, 1043, 1047, and Codons 1049 of exon 20	67

\*MassARRAY Dx Colon Panel is based upon recommendations made by ESMO clinical practice guidelines for diagnosis, treatment and follow-up for metastatic colorectal cancer. *Annals of Oncology* 25 (Supplement 3), 2014

**Highlights:** MassARRAY Dx Colon Panel is a CE-IVD approved set of clinically validated assays for cost-effective, accurate mutation screening to help you rapidly profile actionable somatic mutations in *KRAS*, *BRAF*, *NRAS*, and *PIK3CA* genes. The kit includes the required controls (wild-type and negative). The Panel is based upon clinical practice guidelines for diagnosis, treatment and follow-up for metastatic colorectal cancer recommended by ESMO.

### Agena Bioscience – MassARRAY Dx Lung Panel

#### Target:

>300 somatic mutations in 10 principal genes (*EGFR*, *KRAS*, *BRAF*, *PIK3CA*, *NRAS*, *ALK*, *ERBB2*, *DDR2*, *MAP2K1*, and *RET*)

#### # of multiplexed PCR reactions:

8

#### Sample amount:

40ng DNA per sample

#### Throughput:

Up to 10 patient samples and 2 controls per plate

#### Sensitivity:

Detection and analysis of mutation frequencies as low as 5%

**Highlights:** The MassARRAY Dx Lung Panel is a CE-IVD approved set of clinically validated assays for cost-effective, accurate mutation screening to help you rapidly profile actionable somatic mutations in *ALK*, *BRAF*, *DDR2*, *EGFR*, *ERBB2*, *KRAS*, *MAP2K1*, *NRAS*, *PIK3CA*, and *RET* genes. The Panel kit includes the required controls (wild-type and negative). It is based upon clinical practice guidelines for diagnosis, treatment and follow-up for metastatic non-small-cell lung cancer (NSCLC) recommended by ESMO.

MASSARRAY DX LUNG PANEL\*: GENES AND MUTATIONS

GENE	COVERAGE	# OF MUTATIONS
<i>ALK</i>	Codons 1150 of exon 22; codon 1196 of exon 23; and codon 1263 of exon 25	3
<i>BRAF</i>	Codons 466, 489 of exon 11 and codons 594, 600, 601 of exon 15	24
<i>DDR2</i>	Codon 223 of exon 9; codon 638 of exon 16 and codon 238 of exon 18	4
<i>EGFR</i>	Substitutions, insertions, and deletions at 105, 188, 191, 201, 203, 207, 210, 215, 216, 217, 220, 221, 223, 225, 227, 228, 231, 232, 233, 235, 236, 238, 243, 244, 245, 247, 248, 249, 251, 252, 253, 255, 256, 257, 259, 261, 264, 265, 267, 268, 270, 271, 272, 273, 275, 276, 277, 279, 280, 281, 282, 283, 285, 286, 288, 289, 290, 291, 292, 293, 295, 296, 297, 299, 300, 301, 302, 303, 305, 306, 307, 309, 310, 311, 312, 313, 315, 316, 317, 319, 320, 321, 323, 324, 325, 327, 328, 329, 331, 332, 333, 335, 336, 337, 339, 340, 341, 343, 344, 345, 347, 348, 349, 351, 352, 353, 355, 356, 357, 359, 360, 361, 363, 364, 365, 367, 368, 369, 371, 372, 373, 375, 376, 377, 379, 380, 381, 383, 384, 385, 387, 388, 389, 391, 392, 393, 395, 396, 397, 399, 400, 401, 403, 404, 405, 407, 408, 409, 411, 412, 413, 415, 416, 417, 419, 420, 421, 423, 424, 425, 427, 428, 429, 431, 432, 433, 435, 436, 437, 439, 440, 441, 443, 444, 445, 447, 448, 449, 451, 452, 453, 455, 456, 457, 459, 460, 461, 463, 464, 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**EXTRACTION**

**LabTIE – Gel electrophoresis Combs & Trays**



**Compatibility:** Combs & Trays are compatible 'MULTIFIT' with the following brands: Bio-Rad, Biostep, Sigma-Aldrich, Scie-Plas, VWR & LabTIE

**The First 'Student Proof' Combs & Trays.** Extra strong and durable. No more broken edges or broken components.

- Highlights**
- Multichannel compatible & color coded, 0,8mm & 1,5mm
- Combs:**
- Gel Comb small: White 5, Blue 9, Yellow 15
  - Gel Comb medium: Green 14, Red 28
  - Special design that enables the user to remove the comb out of the agar gel with minimum force
- Highlights**
- No need for tape: Casting dams that seal of the hot gel
- Trays:**
- Anti-scratch feature, super transparent surface
  - Anti-gel slip feature included: Gel does not float or slip out of the tray when pipetting or moving the tray around
  - UV light transparent
  - Two Variants: Small Tray 4 slots and Medium Tray 7 slots

**LabTIE – Seed Dispenser**



**Sample throughput:** 10 seconds / Microtiter, Deepwell plate, Petri dish and Trays

**Assays:** Germination, screening or DNA extraction

- Highlights:**
- Productivity improvement: 60-150x (600 sec → 10 sec)
  - ROI (Fast Return of Investment): in less than 20 lab hours
  - Full range of models for different seed sizes and quantities
  - Easy cleaning and sterilizing
  - All devices work in 'drop' mode. No need to 'invert' device 'up-side-down'

LabTIE Seed Dispensers are already used for dispensing more than 20 sorts of seeds into:  
 Microtiter/Deepwell plates: 384-, 96-, 48-, 24-well  
 Petri dishes: Round and square  
 Blot paper: Trays and dishes

**LabTIE – Bead Dispenser**



**Sample throughput:** 8 seconds / Microtiter, Deepwell plate, Petri dish and Trays

**Assays:** DNA extraction

- Highlights:**
- Productivity improvement: 60-150x (600 sec → 8 sec)
  - ROI (Fast Return of Investment): in less than 20 lab hours
  - Full range of models for different bead sizes and quantities
  - Easy cleaning and sterilizing
  - All devices work in 'drop' mode. No need to 'invert' device 'up-side-down'
  - Optional Vibration Unit
  - Grinding plant tissue (leaf, stem, root, anthers and seeds)
  - Grinding bacteria, animal tissue & soil
  - Vitality assay by dispensing coated beads on a bacteria lawn

LabTIE Bead Dispensers are used for dispensing beads into: Microtiter/Deepwell plates: 384-, 96-, 48-, 24-well  
 Petri dishes: Round and square

**PerkinElmer – chemagic 360-D Nucleic Acid Extractor**



**Dimensions:** 900 x 900 x 820 mm (h x w x d)

**Weight:** 140 kg

**Sample throughput:** 1-96 samples/h

**No of parallel samples:** 96

**Power supply:** 1700 VA

- Highlights:**
- DNA isolation directly from human whole blood or plasma samples, no need for additional treatment on primary samples prior to extraction
  - Sample volumes from 10 µl – 10 ml
  - Ready to use DNA in high yields and purity
  - Fast processing times – 96 samples in < 60 min.
  - Long DNA fragments – up to 200 kb suitable for NGS
  - High recovery rates
  - Autonomous system regarding downstream assays
  - For in vitro diagnostic use

## EXTRACTION

### Siemens Healthineers – VERSANT kPCR Molecular System



**Dimensions:** 924 x 1254 x 1043 mm (h x w x d)  
**Channels:** Open-channel  
**Assays:** Real-time PCR assays for infectious disease testing

**Highlights:** From increased efficiency and new industry standards in extraction to assay reliability and system flexibility, the VERSANT kPCR Molecular System with the MiPLX Software Solution\* is a comprehensive molecular diagnostics solution. The open-channel concept and customizable MiPLX software set a new industry standard and further reduce the need for manual labor so that personnel can spend time on other value-added activities.  
 \*Product availability varies by country.

## PCR SET-UP

### R-Biopharm AG – Aila



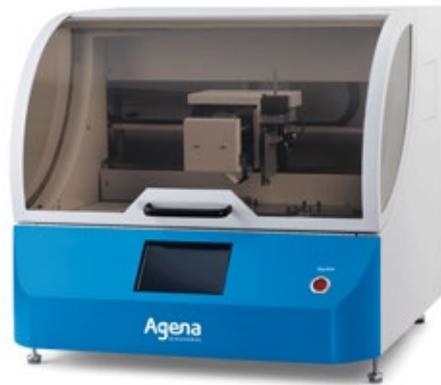
**Dimensions:** 470 x 600 x 515 mm (h x w x d)  
**Weight:** 45 kg  
**Pipetting tips:** 96 clear, non-conductive: 50 µl, 200 µl  
**Pipetting volume range:** 1 µl - 180 µl  
**Pipetting speed:** 10 µl/sec - 200 µl/sec  
**Precision:** CV < 3%, 5 - 180 µl (dry-well transfer)  
 CV < 5%, 2 - 5 µl (wet-well transfer)  
 CV < 10%, 1 - 2 µl (wet-well transfer)

**Highlights:**

- Multiple parameter testing out of one patient sample
- Up to 8 different master mixes per run
- 96 samples in 45 minutes with master mix set-up
- Different plate formats
- UV light & Liquid Level sensing
- LIS compatible

## CLINICAL CHEMISTRY

### Agena Bioscience – MassARRAY Dx Nanodispenser RS 1000

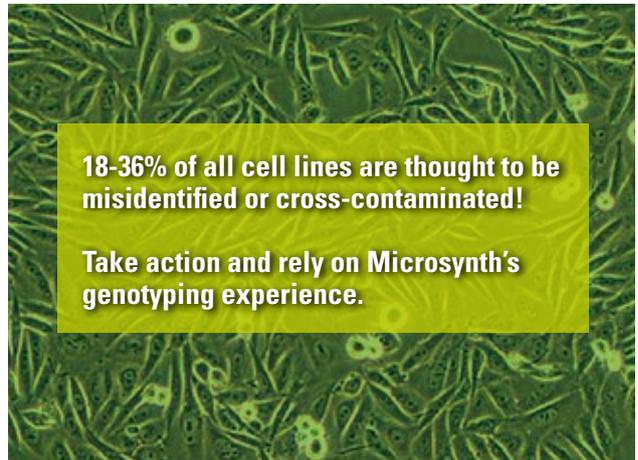


**Purpose:** Rapid sample transfer to Agena's SpectroCHIP arrays for further processing in MassARRAY Dx Analyzer 4  
**Processing time:** < 15 minutes / 96-well microtiter plate

**Highlights:** The MassARRAY Dx Nanodispenser RS 1000 is a benchtop dispensing instrument employing advanced robotics for the rapid transfer of nanoliter sample volumes onto SpectroCHIP Arrays. Standard configuration is two microtiter plates at a time (can also be done with a single plate). Samples are transferred from the microtiter plate to the SpectroCHIP in less than 15 minutes. The spotted SpectroCHIP Arrays are then loaded into the MassARRAY Dx Analyzer 4.

## SERVICE

### Microsynth – Easy-to-Use Cell Line Authentication Service



**18-36% of all cell lines are thought to be misidentified or cross-contaminated!**

**Take action and rely on Microsynth's genotyping experience.**

**Highlights:**

- Easy: sample preparation and shipment of cell lines at room temperature
- Free: daily pickup service via Microsynth collection boxes in Austria, Germany and Switzerland.
- Reliable: more than 10 years experience in genotyping
- Multiple organisms: In cooperation with ecogenics we can develop high-quality microsatellite markers for any organisms.
- Additional services: database comparison of DNA profile (e.g. ATCC), mycoplasma testing, GMP Sanger sequencing, contract research

## RESEARCH USE ONLY (RUO)

## Eppendorf – BioSpectrometer fluorescence



**Dimensions:** 150 x 295 x 400 mm (h x w x d)  
**Weight:** 5,4 kg  
**Power consumption:** 15 W (during operation),  
 5 W (dimmed display)

**Highlights:**

- Absorbance measurement for one or more wavelengths, recording of wavelength scans
- Sensitive nucleic acid and protein quantification via fluorescence intensity
- Integrated application and results memory
- Compatible with microliter measuring cells, such as the Eppendorf  $\mu$ Cuvette G1.0, and standard cuvettes

Eppendorf – Eppendorf  $\mu$ Cuvette G1.0

**Dimensions:** 48 x 12.5 x 12.5 mm (h x w x d)  
**Height of light beam:** 8.5 mm  
**Volume:**  $\geq 1.5 \mu\text{L}$  (dsDNA)

**Highlights:**

- Microvolume measuring cell for photometric measurements
- Measurement of small sample volumes (1.5 – 10  $\mu\text{L}$ )
- Measurement of high sample concentrations without prior dilution
- Exclusively available for Eppendorf BioPhotometer and Eppendorf BioSpectrometer

## Eppendorf – Mastercycler nexus X2



**Dimensions:** 321 x 250 x 412 mm (h x w x d)  
**Weight:** 11 kg  
**No of parallel samples:** 64/32 \* 0.2ml PCR tubes, up to  
 64 \* 0.5ml PCR tubes  
**Temperature range:** 4 - 99 °C

**Highlights:**

- Large block for large assays – small block for small assays
- Optional gradient for PCR optimization
- E-mail notification
- Flexlid concept allows use of all types of consumables with automatic height adjustment of the lid

## SARSTEDT – Low DNA Binding Micro Tubes



**Highlights:** As the trend towards decreasing sample volumes continues, it is increasingly important to minimize potential interaction between the analyte and tube. Our low protein and new low DNA binding micro tubes are specifically designed to meet the requirements in protein and DNA analytics while maximizing recovery rates.

# Microbiology

Mass Spectrometry  
Microscopy  
Susceptibility/  
Identification  
LIS



**OLYMPUS**

Your Vision, Our Future



**SCC**  
Soft Computer  
[www.softcomputer.com](http://www.softcomputer.com)

**BioVendor**  
Instruments



## MASS SPECTROMETRY

### Bruker Daltonics – MBT smart



**Highlights:** MBT smart is the MALDI Biotyper High-End option with increased speed, equipped with Bruker's proprietary smartbeam laser technology. It is the first MALDI Biotyper system with lifetime laser: 7 years warranty or 500 Mio shots (whatever comes first). The new high-performance vacuum system with increased pump capacity shortens Ready-to-Measure time significantly. Available as an IVD solution.

### Bruker Daltonics – Maldi Biotyper



**Highlights:**

- Leading microbial ID system
- Fast, accurate and cost effective
- Broad application range
- Available as an IVD solution

### Shimadzu – iDplus Assurance



**Highlights:** iDplus Assurance is a Linear MALDI-TOF for simple microbial identification using SARAMIS and basic analytical life sciences using launchpad. Combining speed of analysis, positive and negative ionization and wide mass range, the iDplus Assurance provides excellent quality and reliability in a general analytical setting.

### Shimadzu – iDplus Confidence



**Highlights:** iDplus Confidence is a Reflectron MALDI-TOF. The patented curve-field reflectron design in the iDplus Confidence extends analysis possibilities beyond the simple identification. Expanding on microbial ID, reflectron mode ensures high resolution and high mass accuracy required for molecular profiling and structural analysis.

## MASS SPECTROMETRY

### Shimadzu – iDplus Performance



**Highlights:** iDplus Performance is a MALDI-TOF/TOF. It delivers flexibility and ease of use in a robust and reliable research-grade instrument. Advanced MS/MS performance utilizing the highest collision energy to fragment compounds for accurate structural analysis. The most versatile iDplus platform from simple identification to in-depth proteomics, lipidomics and sequencing.

## MICROSCOPY

### Olympus – BX46 Ergonomic Upright Microscope



**Highlights:**

- Unrivalled ergonomic design
- World's first tilting, telescopic, lifting tube
- Ultra-low fixed stage

The BX46 is specifically designed to meet the demands of repetitive routine microscopy. This microscope is focused with a moveable objective nosepiece rather than by moving the stage. The stage is fixed in a very low position, allowing the user to rest their arm on the desk when moving specimens. Ideal user posture is further encouraged by the three-dimensional adjustability of the new observation tube, making the BX46 extremely comfortable for continuous daily use.

## SUSCEPTIBILITY/IDENTIFICATION

### BioVendor Instruments – MALDI Colonyst



**Dimensions:** 361 x 466 x 800 mm (h x w x d)  
**Weight:** Approx. 65 kg

**Highlights:**

- Intelligent robotic colony picking with contactless homogeneous deposition on MALDI target plate
- Supported deposition methods: Direct Dry Deposition, Semi-Extraction, and new Wet Deposition
- Complete visual control and record of all steps for full traceability of the automatic process
- Considerable reduction of consumables - no need for manual picking tools and Eppendorf tips

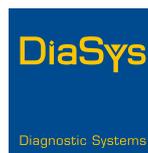
## LIS

### SCC Soft Computer – SoftMic



**Highlights:** SCC's SoftMic automates specimen processing through all stages, from order entry and workup to final reporting – offering a paperless solution with on-demand work cards, result entry, and flexible reporting capabilities that can substantially improve testing accuracy and report uniformity. Its seamless operation and automated batch resulting customizes workflow, increases productivity, improves efficiency, and minimizes errors providing real-time patient results and point-of-care quality.

Clinical Chemistry  
Cardiology  
Coagulation  
Blood Gases, Electrolytes, Oximetry  
Infectious Disease  
Urinalysis  
Information Technology  
Specialties



## CLINICAL CHEMISTRY

### DiaSys Diagnostic Systems – InnovaStar



- Highlights:** InnovaStar – POC Testing with superior results in Lab Quality. A high precision system for the determination of HbA1c, CRP, Glucose and Hemoglobine
- NGSP / IFCC certified HbA1c test
  - Determination of up to four parameters from one 10 µl whole blood sample
  - Sample individual hematocrit correction to plasma values (CRP, Glucose)
  - Pre-calibrated test
  - Fully automated measurements; no manual steps required
  - User-friendly
  - Barcoded reagents
  - Colored touch-screen

### Orion Diagnostica Oy – QuikRead go



- Dimensions:** 270 x 155 x 145 mm (h x w x d)  
**Weight:** 1.7 kg  
**Assays:** CRP, CRP+Hb, Strep A, iFOBT

- Highlights:** QuikRead go brings ease of use, reliability and speed to healthcare professionals' everyday work in point-of-care. The flexible CE marked system supports treatment decisions and increases patient comfort and satisfaction. Thousands of healthcare professionals worldwide use QuikRead go system to ease their everyday processes. QuikRead go is US FDA cleared for use in clinical laboratories, not for point-of-care.

## CARDIOLOGY

### Siemens Healthineers – Stratus CS 200 Acute Care System



- Highlights:** The Stratus CS 200 Acute Care Diagnostic System\* delivers lab-quality results at the point of care with the speed needed for cardiac patients. Its broad test menu – which includes guideline acceptable troponin I – helps physicians make faster clinical decisions for better patient care.

\*Not available for sale in the U.S. Product availability varies by country.

## COAGULATION

### Siemens Healthineers – Xprecia Stride Coagulation Analyzer



- Highlights:** Primary care, urgent care, and hospitals demand fast, reliable PT/INR testing for oral anticoagulation therapy (OAT). That's why Siemens developed the Xprecia Stride Coagulation Analyzer\*, a truly handheld device that tests PT/INR with lab accuracy. With the Xprecia Stride Analyzer, healthcare professionals can feel confident that they are getting the safety, efficiency, and accuracy they need.

\*Under FDA review. Not available for sale in the U.S. Product availability varies by country.

**BLOOD GASES, ELECTROLYTES, OXIMETRY**

**Siemens Healthineers – RAPIDPoint 500 Blood Gas System**



**Highlights:** The RAPIDPoint 500 Blood Gas System delivers fast, accurate and comprehensive test results for whole blood samples in approximately 60 seconds. It's flexible, easy to use, and can also perform pleural fluid pH testing and measure dialysate fluid\*.

\*Not available for sale in the U.S. Product availability varies by country.

**INFECTIOUS DISEASES TESTING**

**Atlas Genetics – Atlas Genetics io system**



**Dimensions:** 268 x 260 384 mm (h x w x d)  
**Weight:** 10 kg  
**Assays:** Sexually Transmitted & Hospital Acquired Infections

**Highlights:** The Atlas Genetics io system is a rapid diagnostic platform designed for use in decentralised laboratories, point-of-care and other near-patient settings, providing a laboratory-accurate test result in 30 minutes. The io system, comprising a small, low cost, easy-to-use instrument and a test-specific disposable cartridge, delivers a 'test and treat' solution for Sexually Transmitted Infections (STI) and Hospital Acquired Infections (HAI), where a rapid, actionable test result, delivered on-demand, can reduce costs and improve patient outcomes.

**URINALYSIS**

**Analyticon Biotechnologies AG – Urilyzer 100 Pro**



**Dimensions:** 77 x 190 x 260 mm (h x w x d)  
**Weight:** 1.5 kg  
**Assays:** Glucose, Blood, Ketones, Nitrite, Protein, Leucocytes, Bilirubin, Urobilinogen, pH-Value, Specific Gravity, Ascorbic Acid.

**Highlights:**

- Up to 120 test/hour in fast mode
- Memory of 3000 patient test and 1000 QC tests
- Quality control management with reminder function
- Operator management with password protection
- Convenient connectivity via serial connection or ethernet
- Touch screen, autostart function and start-up wizard

**Siemens Healthineers – CLINITEK Novus Urine Analyzer**



**Highlights:** The CLINITEK Novus Automated Urine Chemistry Analyzer combines proven dry-pad urine chemistry technology with an easy-to-use cassette test format to help ensure standardized testing and maximum productivity in busy laboratories.

## INFORMATION TECHNOLOGY

### SCC Soft Computer – Laboratory & Genetics Information Systems



**Highlights:** SCC Soft Computer has an unmatched history writing complex interfaces, working with our industry colleagues to ensure that our clients' clinical systems get the data exchange they need, and delivering integration projects in large, multisite environments. With nearly four decades' experience, we know that interoperability is critical for success – whether it's our own robust healthcare information technology solutions, instruments, foreign systems, robotics, or a module from another vendor.

### Siemens Healthineers – RAPIDComm 6.0 Data Management



**Highlights:** RAPIDComm Data Management System gives you freedom to control your environment and gives you confidence and control over all of the parts of your POC Ecosystem solution. RAPIDComm system enables centralized management of point-of-care testing through a single, customizable interface. It helps streamline workflow, reduce costs, and improve patient care.

## SPECIALTIES

### JADAK – HS-1R Handheld HF RFID Reader



**Dimensions:** 33.4 x 51.3 x 108.2 mm (h x w x d)  
**Weight:** 98 grams  
**Handheld/Stationary:** Handheld 1D & 2D barcode scanner with HF RFID reading & writing functionality

**Highlights:** The flexpoint HS-1R from JADAK integrates 1D & 2D barcode scanning with HF RFID reading & writing functionality. Sure to be an integral part of many medical and clinical applications, the HS-1R enables patient ID via wristband scanning, clinician security login via badge scanning, pharmaceutical applications incl. drug inventory tracking & digital signature capture using built in camera modes, and much more. JADAK products can be tailored to meet specific customer requirements.

### SARSTEDT – Minivette POCT - Capillary Blood Collection

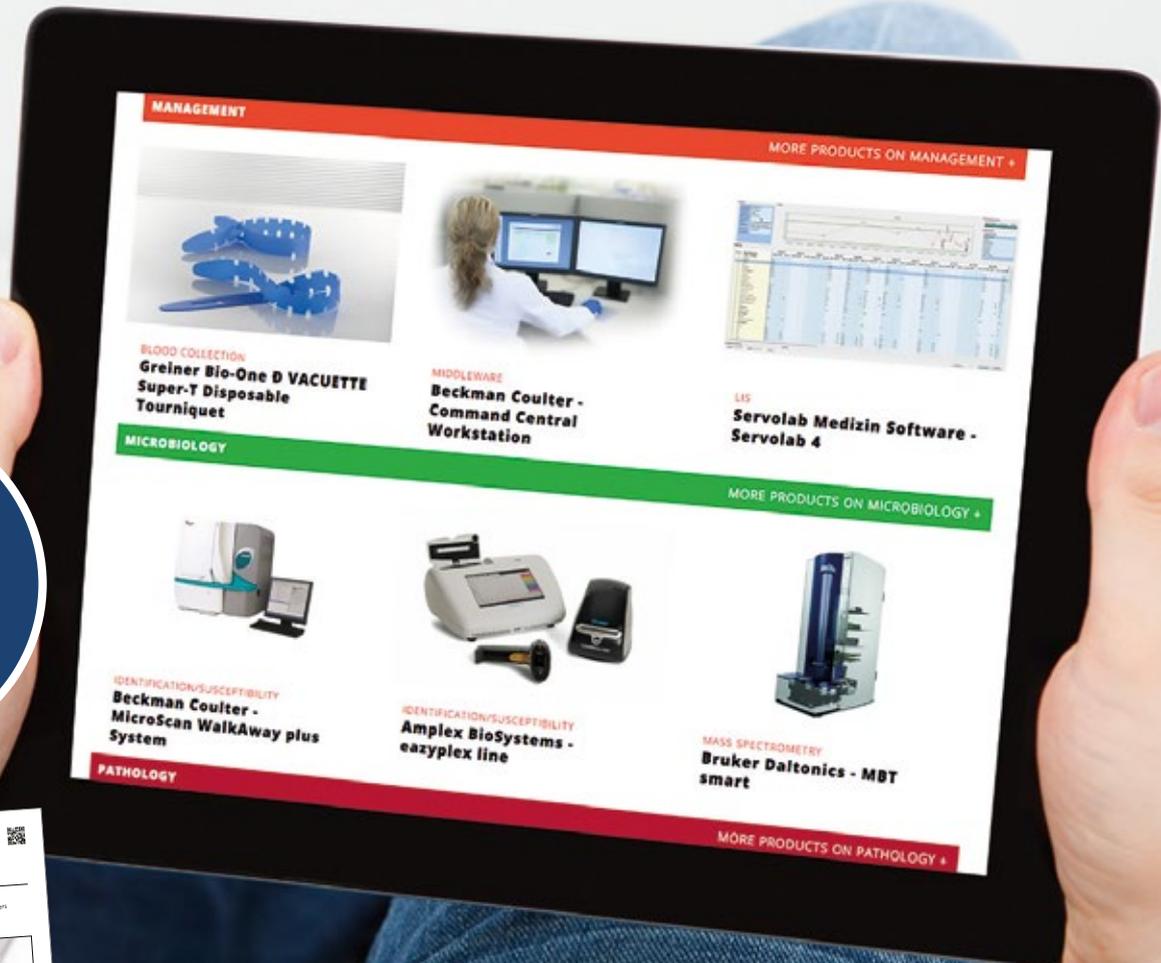


**Highlights:**

- Collection devices for Point-of-Care tests
- Easy sample recovery
- Precise and dispensing of small whole blood volumes
- Prevents spillage during transfer
- Volume range: 10µl - 200µl
- Preparations: Neutral, Heparin and EDTA

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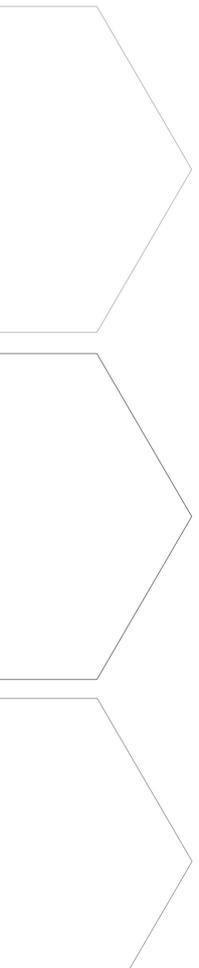
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# Information Technology



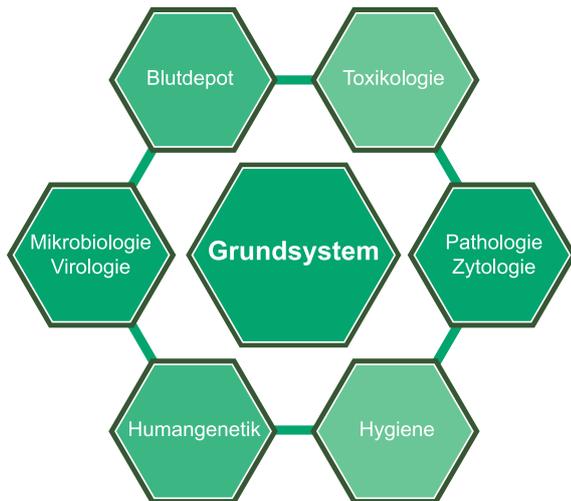
LIS, Middleware, POCT  
Specialties

# **LABCENTRE ARTIKEL**



## LIS, MIDDLEWARE, POCT

### Medat – Laboratory Information Systems



- Highlights:**
- Flexible, private company with 50 employees.
  - Complete solution from order entry to billing.
  - Tailor-made modules for microbiology, virology, environmental hygiene, cytopathology, histopathology and blood banking.
  - Single, integrated system for all divisions and sites.
  - Reliable operation in some of Europe's biggest laboratories.

### Beckman Coulter – PROService



- Highlights:**
- PROService is Beckman Coulter's secure remote management and diagnostics system that enables the transfer and analysis of performance data from connected Beckman Coulter systems in the customer laboratory to the customer support staff. This information is channeled into the PROService system's suite of features and tools, enabling the service and support teams to review, diagnose and help resolve system issues quickly and efficiently. PROService Remote Management System can help labs maximize uptime, enhance efficiency, and improve productivity.

### Beckman Coulter – REMISOL Advance



- Highlights:**
- REMISOL Advance is an enterprise data management solution that can help manage lab workflow, improve the efficiency of labs and standardize operations across multiple sites. It is a unique software product that consolidates patient test information from multiple instruments in the lab or from multiple labs in the hospital network. REMISOL Advance features virtualization capability to help reduce failure points, increase uptime, and enhance patient data security. It offers an integrated visual management system to track and trace transported samples from the draw site to the lab enabling your lab to become ISO 15189 compliant. Not available in all geographies.

### Beckman Coulter – Command Central Workstation



- Highlights:**
- Beckman Coulter's Command Central instrument management system helps manage lab workflow and improve decision-making steps. Connecting up to 18 instruments or automation systems, and up to five networked Command Central workstations within a single laboratory, this increase in flexibility allows the operator to place Command Central workstations in prime locations for optimum laboratory management. Command Central provides lab technicians with a real-time view of laboratory systems from a single point of control to maximize workflow efficiencies. Command Central works with data managers such as REMISOL Advance to achieve workflow efficiencies, or can serve as a stand-alone product for users to monitor automation and/or multiple analyzers and quickly respond to any instrument issues. In addition to serving labs that don't utilize data management software, Command Central provides an opportunity to apply other Beckman Coulter information systems and workflow solutions all while keeping an eye on what is going on in the lab.

## Hamamatsu Photonics – NDP.serve3 Image Server Software



**Highlights:** NDP.serve3 is the next generation of our established image server software. It is a power solution to share and manage whole slide images (WSI) across a network, either as a stand-alone solution or integrated with your LIS/LIMS software.

Key Benefits / Features:

- Secure database with enhanced security functionality
- Intuitive, simple to use graphical user interface
- Easy to share whole slide images
- Seamless integration with NDP.view2 - the fastest Mac and Windows WSI viewer on the market

## i-SOLUTIONS Health – LabCentre



**Highlights:** LabCentre is a market-leading laboratory and pathology information management system. It helps doctors, scientists, technologists and management staff to track samples and testing processes, communicate results to other health professionals, and monitor costs and reporting.

LabCentre supports the following disciplines:

- Blood Sciences
- Microbiology
- Transfusion Medicine
- Pathology
- Billing

## SCC Soft Computer – Laboratory & Genetics Information Systems



**Highlights:** SCC Soft Computer outperforms the competition with our best of breed approach to integrated systems. Our laboratory and genetics information systems provide robust functionality, ease of instrument interfacing-including robotics, rules-based logic, multisite capabilities, flexible order entry with real time results reporting, automatic workflow, safety features that are second to none, long-term cost savings, and interoperability coupled with the ability to exchange information between systems.

## Servolab Medizin Software – Servolab 4



**Highlights:**

- Language independent  
Supported languages: German, English, Spanish, Catalan, Portuguese, Brazilian, Turkish
- Operating big european laboratories
- Complete solution from order entry to billing
- Unit graphical interface for all modules of standard lab, microbiology, virology, blood banking, nuclear medicine
- Support of standard connections ASTM, HL7, XML
- Datawarehouse and datamining
- Flexible team using Scrum for development
- ISO certified since 2004



## Consolidating with Randox Quality Control

Quality Control is our passion and with more than 30 years' experience developing QC for the in vitro diagnostics market we believe in producing high quality material that can help streamline procedures, whilst saving money for laboratories of all sizes and budgets. These qualities have been reflected in our RIQAS External Quality Assessment (EQA) programmes which, as outlined in Case Study 1, are able to not only streamline EQA practice in the laboratory, but save on preparation time and expenditure. As a result the NHS laboratory, Laboratory A<sup>1</sup>, was able to utilise these vital resources elsewhere.

**Case Study 1** Laboratory A initially approached Randox to see if we were able to consolidate their EQA menu as they were previously employing 30 different programmes. Upon review we noted that a total of 133 sample tubes were assessed each month to meet the requirements of the existing EQA scheme. Consequently this consumed a lot of time, as each sample had to be prepared and results reported for all of the 133 tubes, meaning that some members of staff were taken away from other duties to complete this task.

After receiving a list of the parameters being tested, we were able to reduce the number of programmes required by 50%, resulting in a total of just 15 programmes. Furthermore the number of tubes required for EQA testing could be reduced by approximately 88%, to just 16 tubes per month. This meant less preparation and reporting time for laboratory staff, freeing them to carry out other duties. As well as saving time, consolidation delivered significant cost savings for the laboratory meaning vital funds could be used in other areas within the laboratory.



**IQC** EQA isn't the only area where Randox can facilitate consolidation. We have a number of success stories where laboratories have been able to dramatically reduce the number of internal quality controls required. The below case studies document such examples from two NHS Laboratories – Laboratory B and Laboratory C.

**Case Study 2** Laboratory B had been using the same controls for a number of years and although they were happy with the performance they required 9 competitor controls to cover their Chemistry, Immunoassay, Tumour Marker, Speciality, Vitamin D, Anti-TPO and Low Testosterone testing. After review of the analytes tested we found that we could consolidate the test menu to just 3 controls - Liquid Assayed Chemistry Premium Plus, Immunoassay Premium Plus and our Immunoassay Speciality 1 Control. As a result switching to Randox saved valuable laboratory time in preparing, running and storing 6 unnecessary controls, whilst creating an overall saving of £16,046.60 per year.

**Case Study 3** A second example from Laboratory C also saw the creation of significant savings by switching to Acusera to streamline their QC testing. After a test menu review it was noted that they could consolidate their existing QC controls from 16 to just 5. The competitor controls they had employed previously included Chemistry, Immunology, Bile Acids, Lipid, Troponin, Anaemia, Tumour Marker and TDM controls. We replaced these with our Liquid Chemistry Premium Plus Control, a customised RF & CRP Control and our Immunoassay Premium Plus Control therefore resulting in an annual saving of £8,971 and making available valuable time which can be directed to other vital activities.

**Conclusion** In all of the above case studies we were able to provide both cost and time savings in an environment where both are restricted due to workloads and budgeting. In the current recovering economic climate and an age where we are seeing an increase in many diseases time and money are invaluable assets that Laboratories cannot afford to overlook. As a result we have used our expertise in these 3 cases to help streamline QC practice, making such savings possible and ensuring results you can trust.

<sup>1</sup> Please note that to maintain the confidentiality of our customers we will be referring to each laboratory using assigned letters.

**There's more** There is much more to Randox Quality Control beyond consolidation and cost savings.

**Acusera** Randox is one of the largest manufacturers of true third party quality control solutions in the market. Our reliable, high quality controls will accurately assess the performance of your instruments assuring you that the results being released are accurate. By employing Acusera in your laboratory you could benefit from:

- > The analytes present in our Acusera controls have been included at clinical decision levels. It is imperative to ensure that your analyser can accurately measure to the levels required for clinical diagnosis. As such QC material with similar cut off levels should be used to ensure you are assessing the full clinical range.
- > With a shelf life of up to 2 years for liquid & 4 years for lyophilised controls, Acusera can help minimise costly lot changes. Furthermore each control has their own target values & extended open vial stability claims, which do not differ from lot to lot due to our unrivalled consistency, ultimately helping to reduce waste and save time.
- > When using controls with non-commutable components you are likely to experience shifts in QC values when changing reagent batch. Our controls are 100% commutable, reacting to the test system in the same manner as a patient sample.

**Acusera 24.7** Acusera 24.7 has been designed to be compatible for use with the Acusera range of true third party controls. The software has been created to help monitor and interpret QC data, providing access to; QC multi-rules, interactive charts, real-time peer group data and our unique dashboard interface instantly highlighting any poor performing tests for at-a-glance performance assessment. Employing Acusera 24.7 in your clinical laboratory will allow you to increase the efficiency of laboratory operations, meet regulatory requirements and ultimately improve analytical quality.

**RIQAS** With more than 35,000 participants in 123 countries, RIQAS is the world's largest international EQA scheme, with many clinical laboratories employing the scheme to ensure the quality and reliability of their results. 32 flexible programmes are currently available and our high level of participation provides a large database of results and analytical methods, therefore increasing statistical validity. RIQAS provides frequent test events with bi-weekly, monthly & quarterly options, depending on the programme, and user-friendly reports available within 72 hours of result submission to enable preventative actions to be taken prior to the analysis against subsequent samples. ■



#### CONTACT US

Visit [www.randoxqc.com](http://www.randoxqc.com) to find out more or email [Acusera@randox.com](mailto:Acusera@randox.com) to request a visit from one of our QC Consultants.

# Information Technology

## LIS, MIDDLEWARE, POCT

### Siemens Healthineers – syngo Lab Inventory Manager (sLIM)



**Highlights:** sLIM is a real-time inventory-management system that employs cloud-based technology and wireless radio frequency identification (RFID) to master laboratory inventory management. Incoming inventory is checked into your laboratory's sLIM website. sLIM automatically detects inventory usage, eliminating manual counting, and recording. Automated order proposals are generated based on your laboratory's usage. sLIM takes the burden out of managing inventory.  
\*Product availability varies by country.

### Siemens Healthineers – CentralLink Data Management System



**Highlights:** CentralLink Data Management System consolidates and standardizes decision making across lab testing, diagnostic systems, automation, and IT to improve accuracy, optimize workflows and streamline operations. Improve patient care with fast, accurate, autovalidated results based on intelligent algorithms and customizable rules that facilitate minimal human intervention. Speed and simplify operations and centralize control of your lab with real-time visibility of sample and result processing metrics.

## SPECIALTIES

### COMED – RMS /SHS/e-Commerce (B2B)



**Highlights:**

- RMS - Reagent Management System is the leading inventory management, supply chain, laboratory controlling and e-commerce solution.
- DIMS "Scan & Go" Barcode-Scanner-Solution for labs and wards.
- Universal e-Commerce B2B-order, delivery notes, lot control: COMED-customer is "KING OF DATA"

COMED was founded in 1986 and evolved to an international solution provider for material management and lab controlling. COMED's unique fusion of IT, consulting and extensive industry know-how and a broad personal network, nowadays serves >20.000 physicians, >500 hospitals and >300 laboratories in 17 countries worldwide with one goal: Enable laboratories, hospitals and rehab clinics to focus and gain their value-added chain.

### Zenon – Doc-db QM Suite



**Highlights:**

- Doc-db is a fully featured document management system. The integrated, freely configurable workflow server makes it easy to adapt to your specific governance processes.
- The creation of documents, read confirmations, reminders, paper copies and many other processes can be comfortably managed, monitored and documented through the system.
- Handling of all file formats enables easy migration of your existing documents into professional document control with Doc-db.
- This will ensure that you are fit for the requirements needed for the ISO 15189 or ISO 17025 accreditation.

## Zenon Doc-db

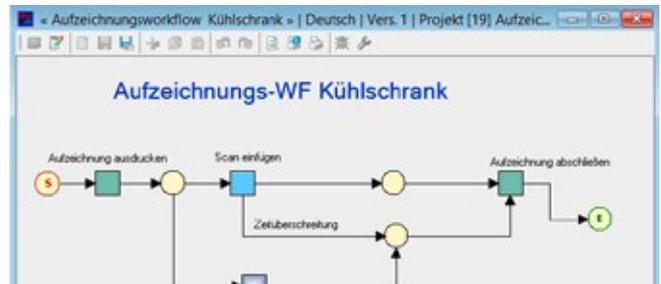
# Forms & Records

The missing link in document management for ISO 15189

In everyday life in a laboratory there is a plethora of digital and handwritten records. Records are manifold: The ISO 15189 calls for example temperature lists for refrigerators, forms for new hires, audit reports, meeting protocols and more. Some are already digitally recorded and processed, other, for example Temperature lists for refrigerators, are recognized handwritten even today and archived. Here ISO 15189 formulates the request to the laboratory to control this records. Although there is already such records in quality management software for document control, this has not yet been set for records because the workflows for records are too diverse and complex in comparison to workflows for documents (create, check, release).

The new Doc-db module for forms and records does this work for you and digitizes the creation, distribution and archiving of records. Forms that were previously already managed in DOC db are now the basis for records. The software instantiates a new record and directs them matching your requirements. For the refrigerator temperatures every month a list is created, printed, hung on the respective refrigerator, handwritten, collected at the end of the month and archived. Our software can here at the beginning of the month initiate a record for all existing laboratory refrigerators, automatically create the lists and send e-mail to the appropriate departments. At month end, the software monitors the complete return of the lists. By the applied barcode, the lists can be archived by simple batch scanning and must not be stored in paper form.

The new Doc-db module for forms and records secures electronic archiving, enhancing discovery and completeness of the records and simplifies working according to ISO 15189. ■



Name	Wegpunkt	Geometrie	Wegpunkt-URL	Angeordnet	Verfahren	Verfahren-URL	Angeordnet	Verfahren	Verfahren-URL
...	...	...	...	...	...	...	...	...	...

Datum	Temp. (°C)	Abw.	HZ	Bemerkung
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Datum	Temp. (°C)	Abw.	HZ	Bemerkung
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## SPECIALTIES

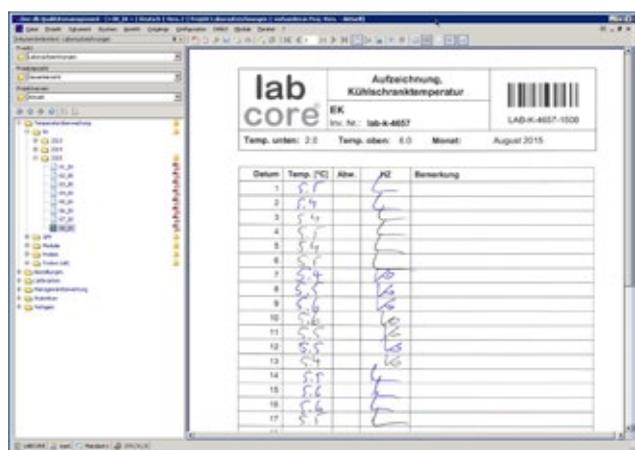
### Zenon – Doc-db external document connector (XDC)



#### Highlights:

- Doc-db XDC allows a connection to an external document repository, e.g. reagent data sheets from reagent suppliers.
- Available documents are identified, downloaded and added to the Doc-db local document repository.
- Downloaded documents can be linked to already existing local documents (e.g. SOP) and are controlled according to ISO 15189 and ISO 17025.
- Connectivity interfaces are available for numerous reagent suppliers and diagnostic companies.

### Zenon – Doc-db Forms & Records



#### Highlights:

The new Doc-db module forms and records does all the work. It makes forms that were not previously in the document management system to records that, using the software, can be created, checked, shared, and after manual editing digital archived.

- automated creation of recurring forms and records
- automatic reminder and check for completeness
- direct distribution as a print job to the employees responsible
- general and individual design of the workflows for each form / record

Mehr Qualität  
und Effizienz  
in Labor und  
Pathologie

## Auf Erfolg programmiert.

Wir bringen Sie im Bereich der Healthcare-IT auf die Gewinnerstraße. Profitieren Sie von unserer erstklassigen Software für den deutschsprachigen Gesundheitsmarkt und von ganzheitlichen Lösungen für Klinik, Labor und Radiologie aus der Hand eines Mittelständlers. **agil – intelligent – kundenorientiert – effizient**

# Non-Diagnostic



Ultrasonics.Steam.Ultraclean.



Blood Collection  
Compressors  
Pipette Tips  
Specialties

## BLOOD COLLECTION

### SARSTEDT – S-Monovette - Venous Blood Collection



- Highlights:**
- S-Monovette – The Revolution in Blood Collection. A blood collection system that combines two blood collection techniques – the aspiration technique and the vacuum technique.
  - The S-Monovette is suitable for all vein conditions and achieves an optimal sample quality, thereby producing the best results.
  - The aspiration technique is a gentle technique for routine blood collection. Using the vacuum technique, a "fresh" vacuum is always available.
  - Suitable for all ages, from young to old, the S-Monovette is as individual as your patients.

### SARSTEDT – Microvette - Capillary Blood Collection



- Highlights:**
- Flexible capillary blood collection systems such as the Microvette - tailor-made to the individual needs of each patient group.
  - Different patient groups and collection techniques require different collection systems.
  - With a nominal volume range from 100–500 µl, the capillary blood collection systems product range is one of the most extensive in the entire market.
  - Depending on the requirements, our portfolio includes Microvettes with conical or round bottom inner tubes and the option for various different collection techniques, end-to-end or with a collection rim.

### SARSTEDT – Multi-Safe Disposal boxes



- Highlights:**
- Our wide, tailor-made range of Multi-Safe disposal boxes corresponds to the current European directive on the prevention of needle stick injuries.
  - With our extensive product range of Multi-Safe boxes we are able to meet any disposal need in the field of medicine and laboratory.
  - With the various options, from the convenient 200 ml format to the autoclavable 60 l disposal box for clinical waste, we offer an optimal solution for every need.

## COMPRESSORS

### Dürr Technik – SICOLAB - compressor station

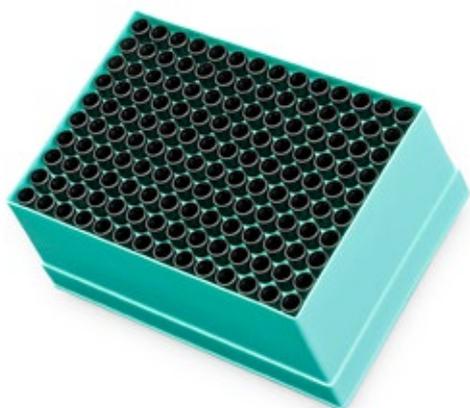


- Dimensions:** 510 x 580 x 653 mm (h x w x d)  
**Weight:** 66 - 94 kg  
**Noise level:** 48 - 54 db(A)  
**Air flow:** up to 145 l/min at 5 bar  
**Compressed air quality:** up to 1:3:1  
 (according to ISO 8573-1)

- Highlights:**
- Oilfree compressed air for many applications
  - Silent – thanks to excellent soundproofing
  - Compact – fits under the laboratory bench
  - Mobile – with wheels and handling grips
  - Wide variety of versions
  - Membrane dryer and filters as options

## PIPETTE TIPS

### Ritter – conductive tips



**Type Olympus:** conductive tips for clinical diagnostic

- Highlights:**
- Volume: 20 - 1200µl
  - 140 conductive tips per rack
  - The conductivity enables the system to recognize the filling height and offers a minimal immersion of the tips into the liquid, in order to assure a save pipetting and dispensing
  - Rigid rack for optimized tips acceptance in the OLA 2500 and Automate 1250/2550
  - For different systems, other sizes and formats are available

### Ritter – riplate 2ml RW



- Highlights:**
- Raised wells reduce the risk of cross-contamination
  - Optimized footprint according the SBS-format
  - U-shaped well bottom reduces death volume
  - High chemical resistance, ideal for sensitive diagnostic applications
  - riplate 2ml RW offers continous round wells with a wider diameter for mixing 2 samples or sample-preparation

### Ritter – robotic tips for diagnostic



- Highlights:**
- 108 tips for use with DSX, DS2 or DS4 instruments from Dynex Technologies
  - Sample tips: working volume 5 - 250µl
  - Reagent tips: working volume 20 - 1000µl
  - Robotic tips are manufactured to guarantee the highest quality specifications for your application
  - For different systems, other sizes and formats are available

### SARSTEDT – Low Retention Pipette Tips



- Highlights:**
- Minimising sample loss
  - Optimised surface for enhanced dispensing behavior
  - Improved sample recovery
  - Minimal sample loss of highly viscous liquids or samples containing detergents
  - Cost savings in valuable reagents

## SPECIALTIES

### Elma Schmidbauer – Elmasonic P



**Ultrasonic frequency:** 37 or 80 kHz  
**Mains voltage:** 230 or 115 V  
**Max. power consumption:** 370-1630 W (depending on unit size)  
**Max. filling volume:** 2.75-90 l (depending on unit size)  
**Unit ext. dimensions:** 321 x 568 x 179 mm (h x w x d) (depending on unit size)  
**Tank int. dimensions:** 200 x 505 x 300 mm (h x w x d) (depending on unit size)  
**Weight:** 3.3-11 kg (depending on unit size)

- Highlights:**
- Multi-frequency:
    - 37 kHz: for coarse cleaning tasks and for dissolving, emulsifying, dispersing and degassing
    - 80 kHz: ideal in silent workspaces and for the cleaning of inner areas of parts e.g. in capillaries
  - Degas-function for quick degassing
  - Sweep-function for sound field distribution
  - Heating safe to run-dry
  - Temperature-controlled auto-start function

### Elma Schmidbauer – Elmasonic S



**Ultrasonic frequency:** 37 kHz  
**Mains voltage:** 230 or 115 V  
**Max. power consumption:** 30-2800 W (depending on unit size)  
**Max. filling volume:** 0.8-90 l (depending on unit size)  
**Unit ext. dimensions:** 176 x 206 x 116 mm / 457 x 715 x 570 mm (h x w x d) (depending on unit size)  
**Tank int. dimensions:** 60 x 190 x 85 mm / 300 x 600 x 500 mm (h x w x d) (depending on unit size)  
**Weight:** 2.0-42 kg (depending on unit size)

- Highlights:**
- Elmasonic S units are available in 13 different sizes and have all technical features that are indispensable for modern everyday laboratory applications.
- 37kHz ultrasonic frequency for typical laboratory applications such as dissolving, emulsifying or dispersing
  - Degas-function for quick degassing
  - Sweep-function for sound field distribution
  - heating safe to run-dry
  - temperature-controlled auto-start function

### Elma Schmidbauer – Elmasonic S 50 and 350 R



**Ultrasonic frequency:** 37 kHz  
**Mains voltage:** 230 or 115 V  
**Max. power consumption:** 150 (600 for S350R) W  
**Max. filling volume:** 2.75-90 l (depending on unit size)  
**Unit ext. dimensions:** 355 x 304 mm for S50 (h x d) / 455 x 650 mm for S350R (h x d)  
**Tank int. dimensions:** 140 x 240 mm for S50 (h x d) / 245 x 600 mm for S350R (h x d)  
**Weight:** 5 (21 for S350R) kg

- Highlights:**
- Professional equipment for sample preparation and test sieve cleaning.
- Intensive cleaning of individual sieves (200 - 500 mm)
  - Simultaneous processing of up to 4 sieves.
  - Integrated special programs for sample preparation and sieve cleaning
  - Quick and efficient degassing of samples and HPLC solvents with pre-defined Degas-function
  - Filling marks for working with smaller bundles and for saving water

### ibidi – Cell Culture & Imaging Chambers



**Highlights:** Choose from the wide variety of ibidi imaging chambers.

- Innovative labware solutions for live cell imaging and cell-based assays
- Excellent cell culture conditions on the unique ibidi Polymer Coverslip
- Supreme optical-grade imaging chambers for high-end microscopy
- Available in various open formats or channel slides
- Test with a free sample!
- Buy 4 boxes of  $\mu$ -Slides,  $\mu$ -Dishes, or  $\mu$ -Plates, and receive 1 additional box for FREE.

## SARSTEDT – Cell Culture Products



**Highlights:** For over 20 years Sarstedt has produced a wide range of high quality cell culture products which are distributed worldwide. These many years of experience and knowledge of the needs of users have allowed us to optimise and continually expand the product range.

## SARSTEDT – Sediplus Sedimentation System



**Highlights:**

- Venous and capillary blood collection systems for blood sedimentation with matching accessories and devices for automatic detection are available.
- The automatic blood sedimentation system Sediplus S 200 with 10 measurement positions, and the Sediplus S 2000 with 40 positions (can optionally be extended to 160 positions) for a high sample throughput, optimise ESR measurement.
- The S-Sedivette venous blood collection system enables hygienic, easy handling in an enclosed system. The Microvette CB 200 ESR blood collection system is designed for 200  $\mu$ l of blood only and ensures minimal patient discomfort when collecting blood. Both systems are proven to perform well in comparison with the Westergren method.



## Integrated solution management for your laboratory

IT in a laboratory should never be the problem, but always the solution.

**labcore** is much more than conventional IT strategic advice. We provide highly specialized service modules for medical laboratories:

- Drawing up specifications
- Support of supplier selection processes (tenders)
- Orchestration of existing IT solutions/processes
- Implementation of QM specifications
- IT project management
- Modelling data and material flows in laboratory networks
- Use of in-house IT solutions (e.g. Doc-db for document and quality management)

dr. neumann&kindler

[www.labcore.de](http://www.labcore.de)

# Companies / Suppliers

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Mass Spectrometry

Hematology

Pathology

DNA

Microbiology

POCT

IT

Non-Diagnostic

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# Companies / Suppliers

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Automation	Sample Processing	Chem./Immunochem.	Mass Spectrometry	Hematology	Pathology	DNA	Microbiology	POCT	IT	Non-Diagnostic
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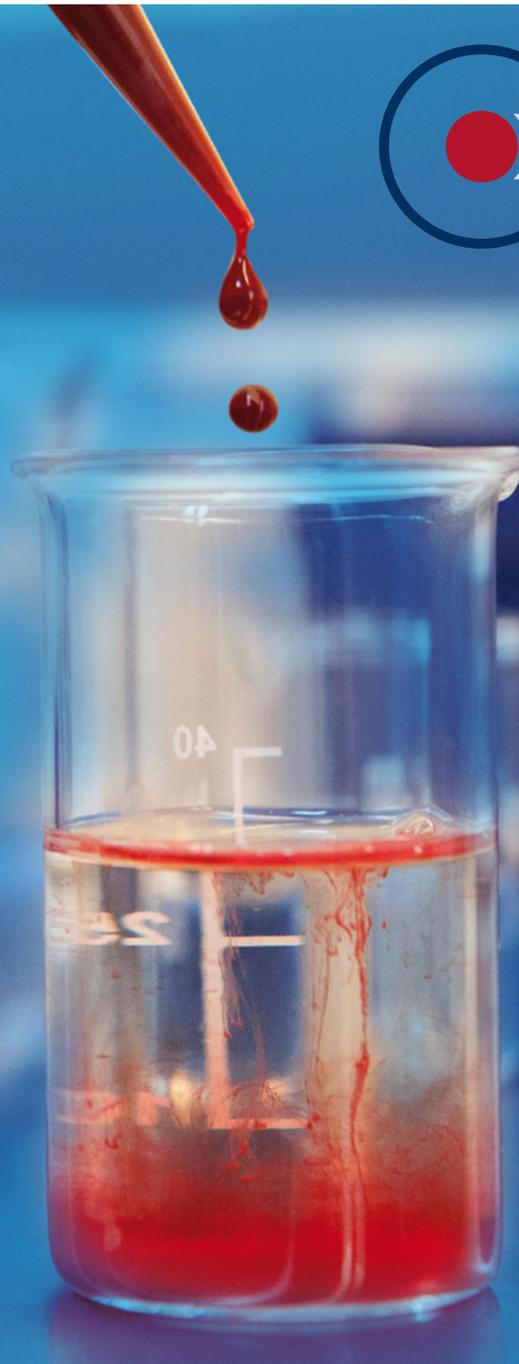




# The Reference Institute for Bioanalytics

External quality control at the highest level

[www.rfb.bio](http://www.rfb.bio)



**OUR MISSION** is the performance of proficiency tests in accordance with the guidelines of the German Medical Association for quality assurance of laboratory medical investigation

## KEY FACTS

- RfB is accredited in accordance with DIN ISO 17043 and DIN ISO 17025
- Proficiency tests for all parts of the RiliBÄK (B1-B5)
- Development of more than 30 reference methods
- 30 years experience with EQAs
- More than 110.000 participations in 2014
- Customers from 76 countries

# A bright future for Urinalysis: Sysmex modular solutions

