

BD Diagnostics

Integrated Solutions

Identification and Antimicrobial
Susceptibility Testing Diagnostics

BD Phoenix™
Emerge

BD EpiCenter™

BD Phoenix™
ASSIST



The BD ID AST Integrated Solution:

Clinical responsiveness and lab efficiency at the same time

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BD offers integrated microbiology systems for clinical laboratories worldwide, including BD Lab Automation Solutions, the BD BACTEC™ blood culture system, the BD Phoenix™ automated microbiology system, and the BD EpiCenter™ data management system. These solutions can all work seamlessly as one to drive laboratory efficiency and support clinical responsiveness.

BD is committed to delivering solutions which are centered around two principal axes:

SOLUTIONS FOR **CLINICAL RESPONSIVENESS**



We provide innovative infectious disease diagnostic and information systems that dramatically reduce time-to-result, and provide clinicians with reliable, actionable, more comprehensive information sooner, resulting in improved patient outcomes.

SOLUTIONS FOR **LAB EFFICIENCY**



We provide integrated systems and lean processes for infectious disease diagnostics that drive laboratory efficiency and optimize the flow of diagnostic information.

The threat of antimicrobial resistant bacteria:

An increasingly global challenge



BD Phoenix™ Emerge:

The more we have, the safer you are

136 wells raise confidence in detecting emerging resistances.

- Accurate detection of carbapenem-resistant *Enterobacteriaceae*¹
- More drugs and wide range of serial two-fold dilutions for many key antibiotics
- Real MIC detection and rapid AST results
- The BDXpert™ system & BD EpiCenter™ for better detection, expertise and real time communication



¹ Woodford et al, JCM Aug. 2010, Vol 48, No. 8, Comparison of BD Phoenix, Vitek 2, and MicroScan Automated Systems for Detection and Inference of Mechanisms Responsible for Carbapenem Resistance in Enterobacteriaceae

Financing innovation as a key challenge:

Balancing technology advancement and return on investment



"The need to implement innovative diagnostic technologies and to maintain control of the budget is key, and yet a challenge.

My supplier must have established expertise in microbiology and a commitment to innovation so that he can provide me with integrated solutions which I can count on for future developments, and return on investment."

Daniel McAdams
(Head of Purchasing, UK)

Trends

- "This technique (identification by MALDI-TOF) developed faster in Europe than in any other geographical area in the world, including the United States. It permits, at an extremely low cost to identify all bacteria included in a rapidly evolving data bank."²



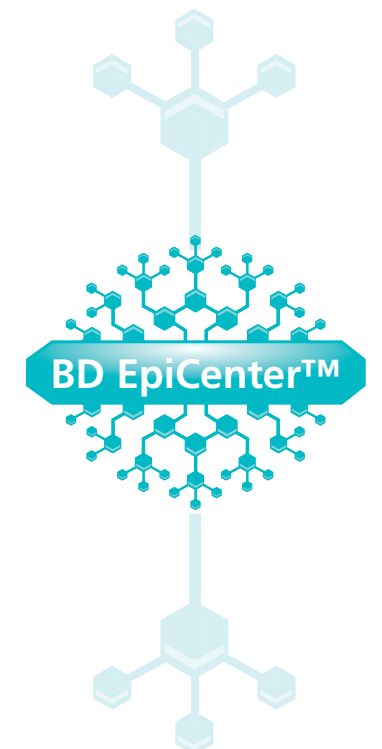
BD – Bruker distribution agreement

BD has become a global* distributor for the Bruker MALDI Biotyper™ instrument and consumables.



BD™ Bruker MALDI Biotyper™

Enhanced integration and traceability in one unique data management system – BD EpiCenter™.



The integrated connectivity with BD™ Bruker MALDI Biotyper™ is now further enhanced with a new functionality that allows paperless workflow and full traceability during MALDI-TOF plate preparation.

European harmonisation & increasing regulation:

Answering the need for standardization



"Over the past 3 years, harmonization of susceptibility testing has become a reality in Europe, and many national authorities have decided to adopt the EUCAST standard. In addition, I'm seeing laboratory accreditation becoming increasingly important. I need automated systems for susceptibility testing that facilitate the implementation of the EUCAST standard, and ease my accreditation process."

Frank Hoffmann
(Microbiology Scientific Manager, Germany)

Trends

- The European Committee on Antimicrobial Susceptibility Testing (EUCAST), has defined clinical breakpoints to allow European microbiology laboratories to use harmonized criteria for the interpretation of AST results (<http://www.eucast.org>).
- "EUCAST criteria are being adopted by a number of European Union (EU) member states and it is likely that in a short time period they will be used by all EU countries."³
- Accreditation is a new dynamic for many European countries, with a clear focus on traceability of patient specimens and all associated diagnostic testing.⁴



The BD Phoenix™ – BD EpiCenter™ system:

Proven compliance, easy to accreditate

The BD ID AST offering is the only solution which is EUCAST ready and validated.



- **BD Phoenix™ - BD EpiCenter™ is fully updated with the EUCAST standard (drugs, breakpoints and rules)**
- **EUCAST compliant panels are commonly used in the EU clinical market**
- **Our solution has been tested against the EUCAST standard and was successfully validated**

Canton et al CMI 2012:

"BD Phoenix system when using EUCAST breakpoints showed EA, CA and discrepancy rates in agreement with acceptance criteria established by the ISO standard."³

Accreditation (ISO 15189)

MAKE IT EASY!

TRACEABILITY
STANDARDIZATION
AUTOMATION

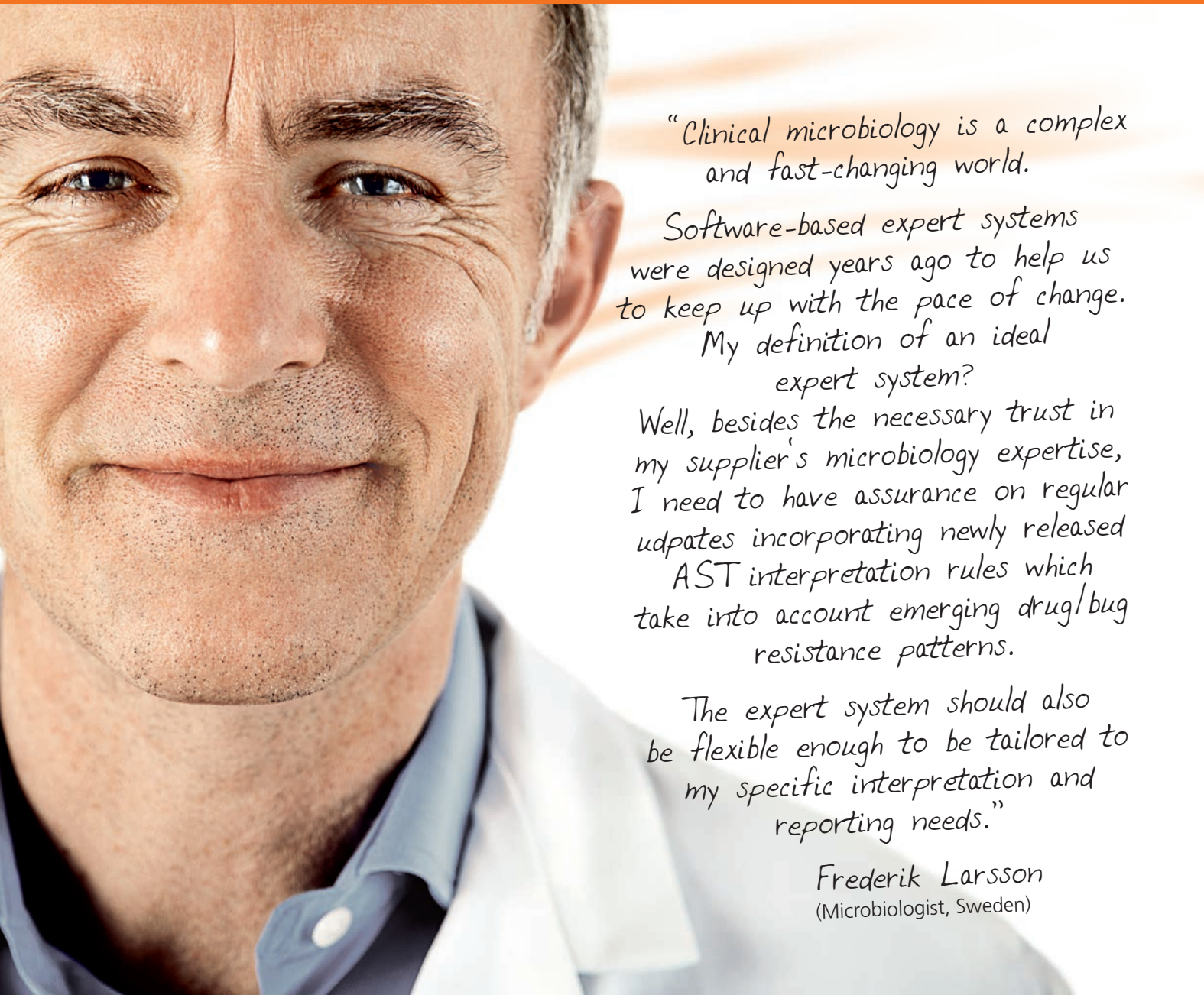
Three essential attributes of the BD Phoenix™ solution that make the ID AST methods of the laboratory **easy to accreditate**.

³ Canton et al CMI 2012; 18: E452–E458, Assessment of the Phoenix™ automated system and EUCAST breakpoints for antimicrobial susceptibility testing against isolates expressing clinically relevant resistance mechanisms.

⁴ Internal Market Survey, 2011

Clinical microbiology expert systems:

Accuracy and adaptability



"Clinical microbiology is a complex and fast-changing world.

Software-based expert systems were designed years ago to help us to keep up with the pace of change.

My definition of an ideal expert system?

Well, besides the necessary trust in my supplier's microbiology expertise, I need to have assurance on regular updates incorporating newly released AST interpretation rules which take into account emerging drug/bug resistance patterns.

The expert system should also be flexible enough to be tailored to my specific interpretation and reporting needs."

Frederik Larsson
(Microbiologist, Sweden)

Trends

- "Expert systems offer a number of advantages over conventional approaches. They provide consistent answers for repetitive decisions, processes and tasks; they can hold and maintain significant levels of information; and they can combine knowledge from many domain experts. Expert systems can also reduce training costs, centralize decision-making processes, increase efficiency, reduce time and reduce human errors and omissions."⁵

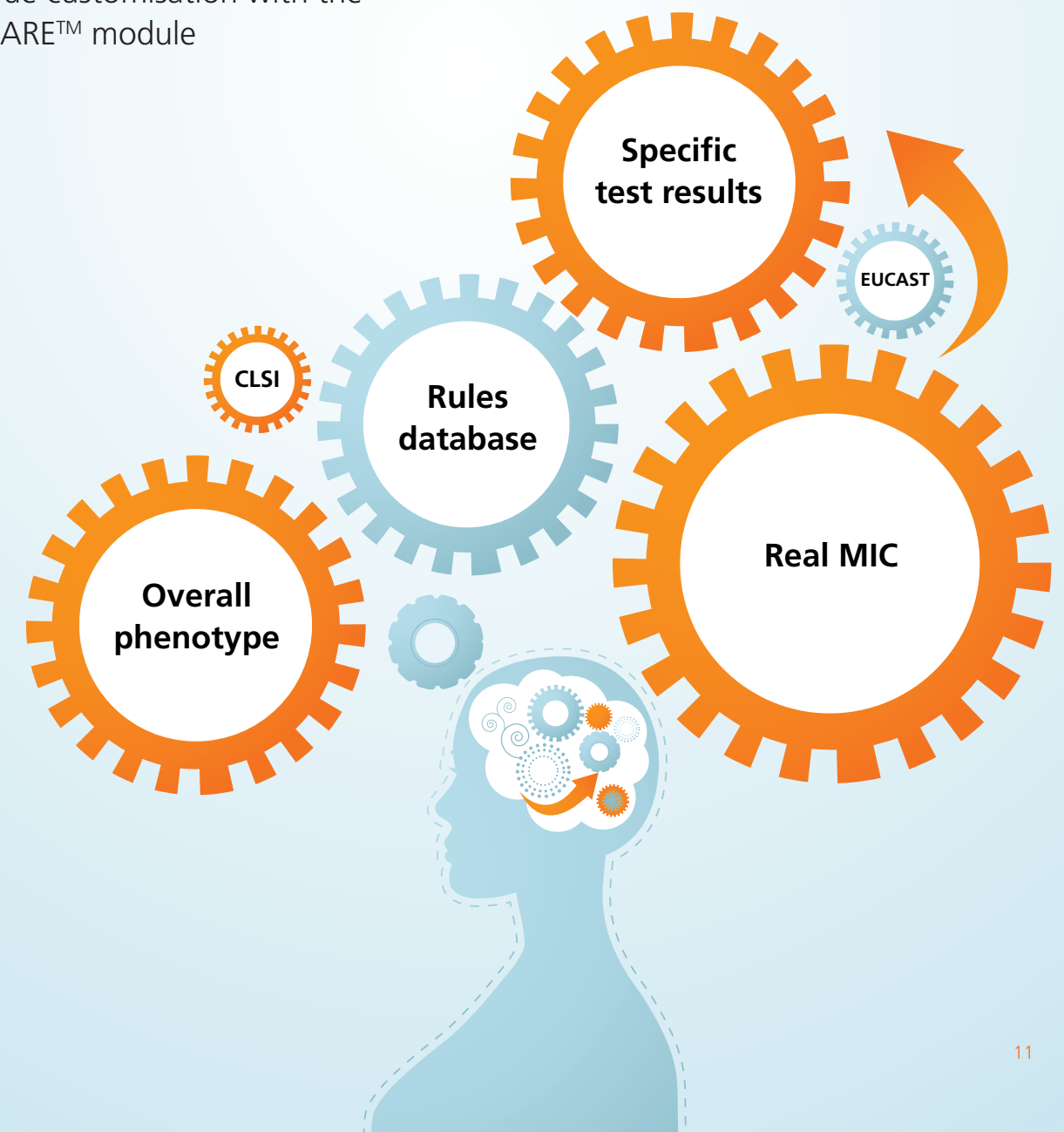


The BDXpert™ system:

Comprehensive ID AST expertise

The BDXpert™ system:

- Provides expert advice based on specific test results, MICs and overall phenotype. It uses the same "if ... then" logic that a "human expert" would for interpretive reading
- Runs EUCAST & CLSI standards and is frequently updated
- Will only change interpretations (S, I, R) according to the AST standard selected, and it will never change a MIC value to make it in line with expected phenotypes
- Offers true customisation with the BD EpiCARE™ module



Critical ICU patient management:

The importance of bloodstream infections caused by yeasts



"Bloodstream infections caused by yeasts can result in many complications with a high risk of mortality for the patients. It is especially true for critical ICU patients who are more sensitive to yeast infections. Timely etiological information will greatly help in guiding antifungal therapy."

*Caroline Brunner
(Clinician, Switzerland)*

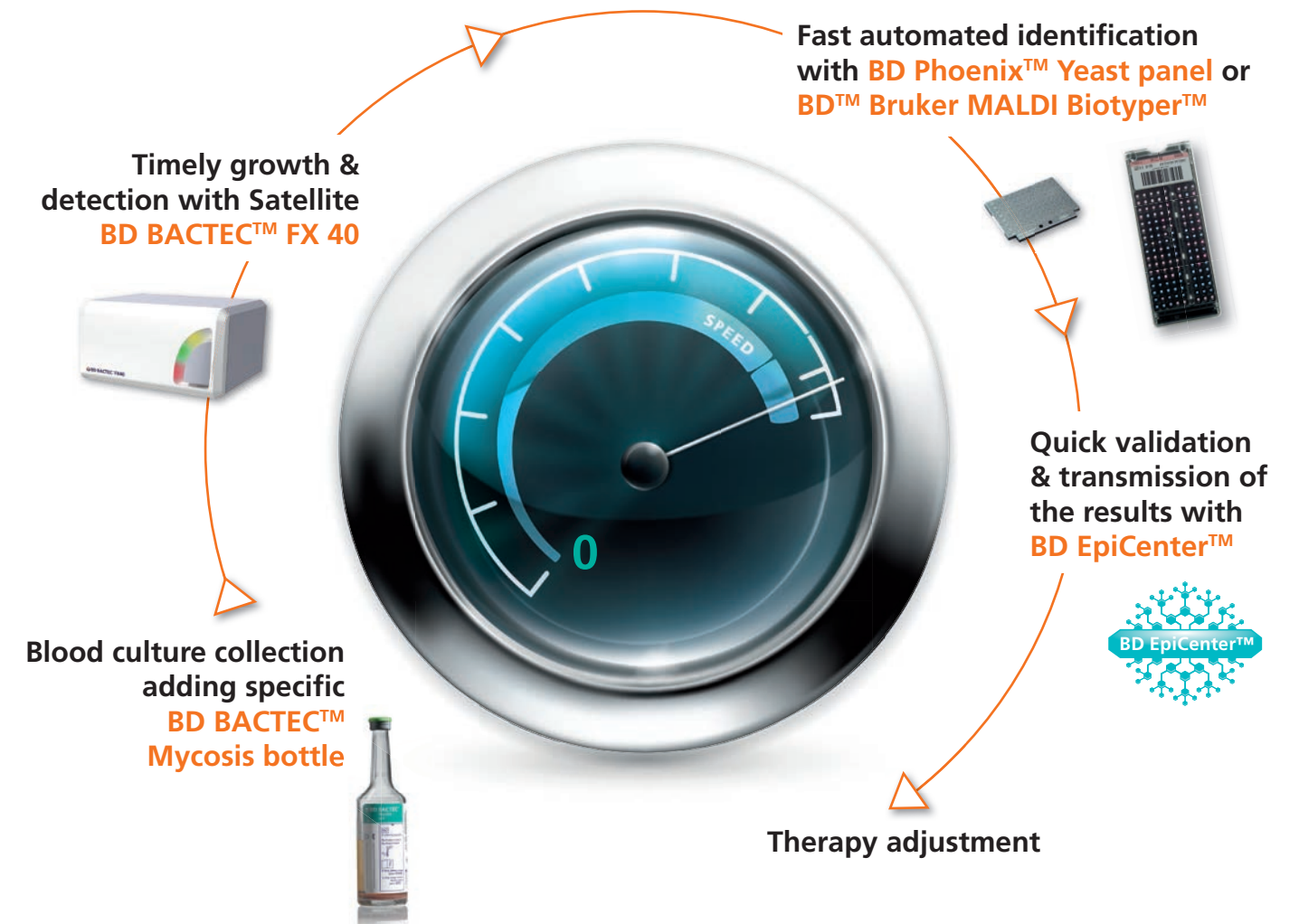
Trends

- "Candida species are the leading causes of invasive fungal infection among hospitalized patients and are responsible for major economic burdens."⁶
- "Mortality remains high, especially when effective antifungal drug therapy is not promptly administered."⁷



The BD yeast solution:

The yeast solution that dramatically reduces the overall time to result



* on average⁸ ** an indication⁷

**RAPID methods with
the BD yeast solution**

24 h**

**Conventional
methods**

72 h*

6 Arnold HM, et al. 2010. Pharmacotherapy. 30:361–368, Impact of First-Line Antifungal Agents on the Outcomes and Costs of Candidemia
7 T Spanu et al JCM, J. Clin. Microbiol. 2012, 50(1):176, Direct MALDI-TOF Mass Spectrometry Assay of Blood Culture Broths for Rapid Identification of Candida Species Causing Bloodstream Infections: an Observational Study in Two Large Microbiology Laboratories

8 Fernandez J, Erstad BL, Petty W, Nix DE. 2009. Diagn. Microbiol. Infect. Dis. 64:402–407. Time to positive culture and identification for Candida blood stream infections.

Software integration:

The search for IT solutions with data traceability and security



"Microbiology lab workflow is one of the most complex. I have evaluated several microbiology modules from different companies and have never really found a software integration system that matches our needs."

Our current workflow is often disrupted or blocked because of inter-facing failures and communication issues."

"I'm looking for a true microbiology middleware, enabling complete data traceability and security, multiple analysers interfacing, paperless workflow as well as flexible communication capabilities."

Alain Moulard
(IT Manager, France)

Trends

- "IT systems contribute to the efficiency of automation in medical laboratories. Middleware pilots and aims to optimize all or parts of laboratory processes (production, traceability, validation ...)."9



BD EpiCenter™:

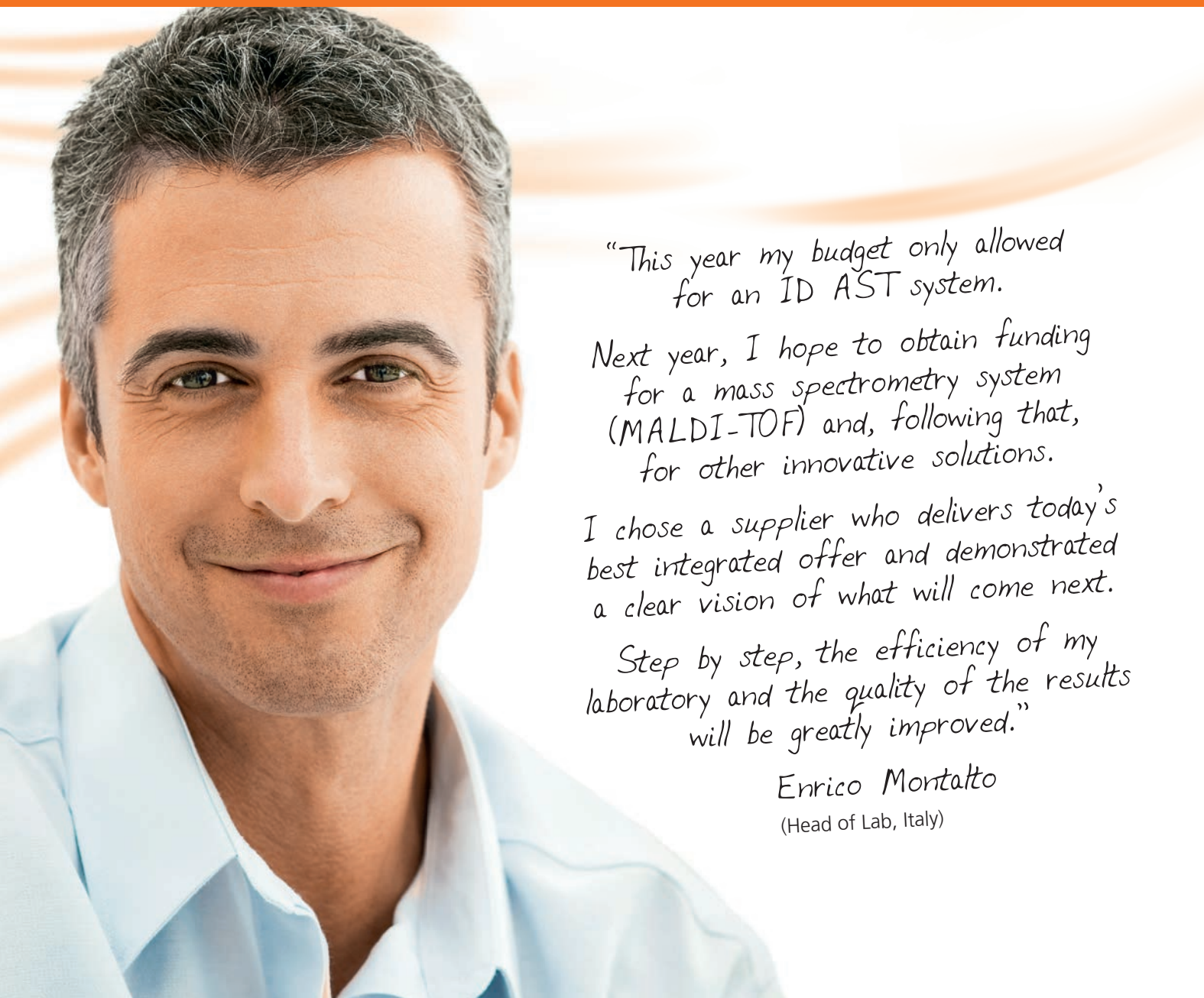
The experience of integration via one network



The connections between BD MAX™, and the BD Kiestra™ Lab Automation solution are currently under development.

Scalable automation:

Preparing for the challenges of today and tomorrow



"This year my budget only allowed for an ID AST system.

Next year, I hope to obtain funding for a mass spectrometry system (MALDI-TOF) and, following that, for other innovative solutions.

I chose a supplier who delivers today's best integrated offer and demonstrated a clear vision of what will come next.

Step by step, the efficiency of my laboratory and the quality of the results will be greatly improved."

Enrico Montalto
(Head of Lab, Italy)

Trends

- "Clinical microbiology needs to develop and master technological advances such as laboratory automation and an avalanche of new methods for rapid diagnostics. Simultaneously, the pressure for concentration, amalgamation, and out-sourcing of laboratory services is ever-increasing."¹⁰



BD Phoenix™ ASSIST:

Automated & Scalable Solution for Identification and Susceptibility Testing



Automated:

Enjoy the best experience in automation. Improve time to results and also standardization & traceability (BD Phoenix™ & BD Phoenix™ AP)

Scalable:

Enable step by step automation and connectivity with BD Kiestra™ WCA

Solution:

Bring flexibility, traceability & connectivity with the BD EpiCenter™ integrated data management system

Identification:

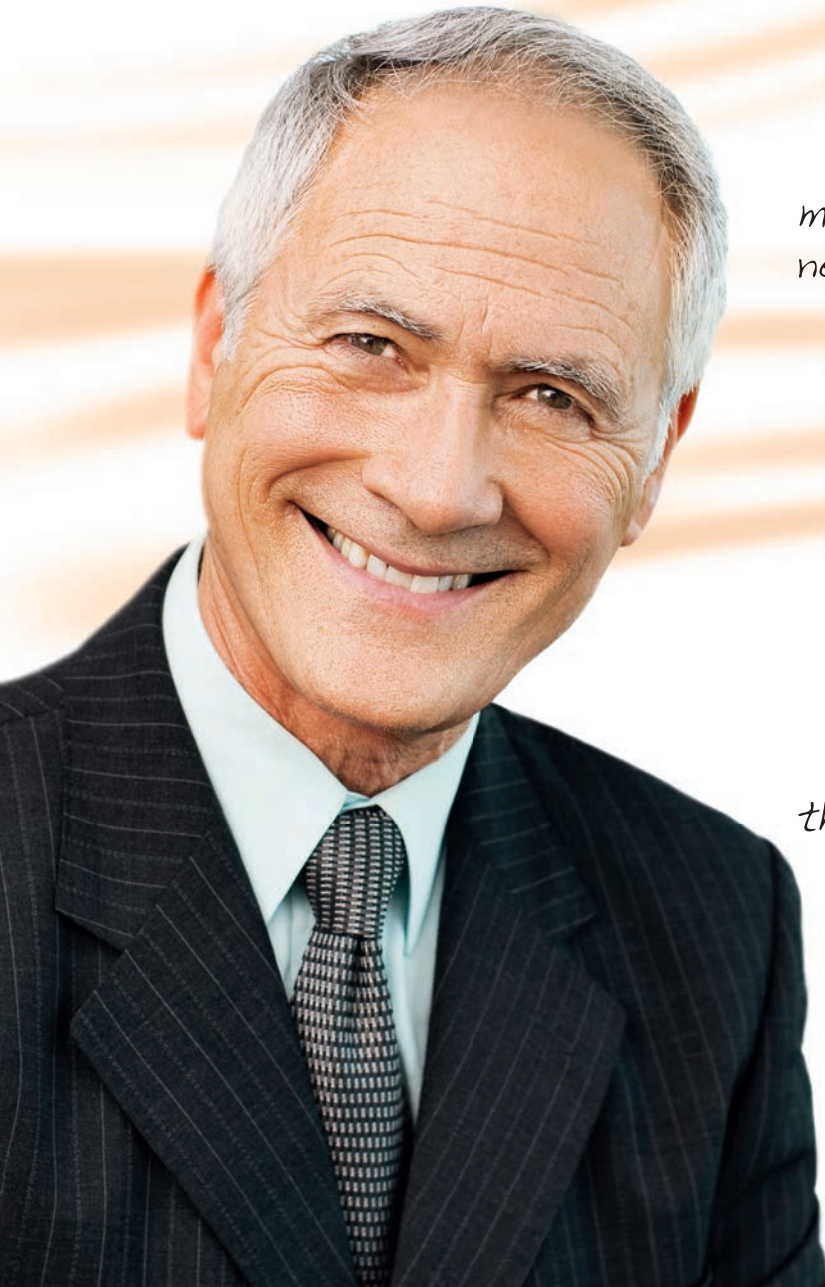
Experience the latest rapid ID technology with the BD™ Bruker MALDI Biotyper™

Susceptibility Testing:

Use state of the art automated AST testing with BD Phoenix™ and a comprehensive BBL™ Sensi-Disc™ portfolio

Looking at the future of clinical microbiology:

Anticipating the change



"During our last executive board meeting, we reviewed how upcoming new technologies and lab automation developments could further move our microbiology department to the forefront."

"Our laboratory could soon be experiencing a revolution in its working organization as well as in its ability to provide added value services to our institution."

"It is critical to understand among the different supplier's current offers and future plans, which one will support our ambition to stay at the cutting-edge of patient care."

Zoltán Horvat
(Chief Executive Officer, Hungary)

Trends

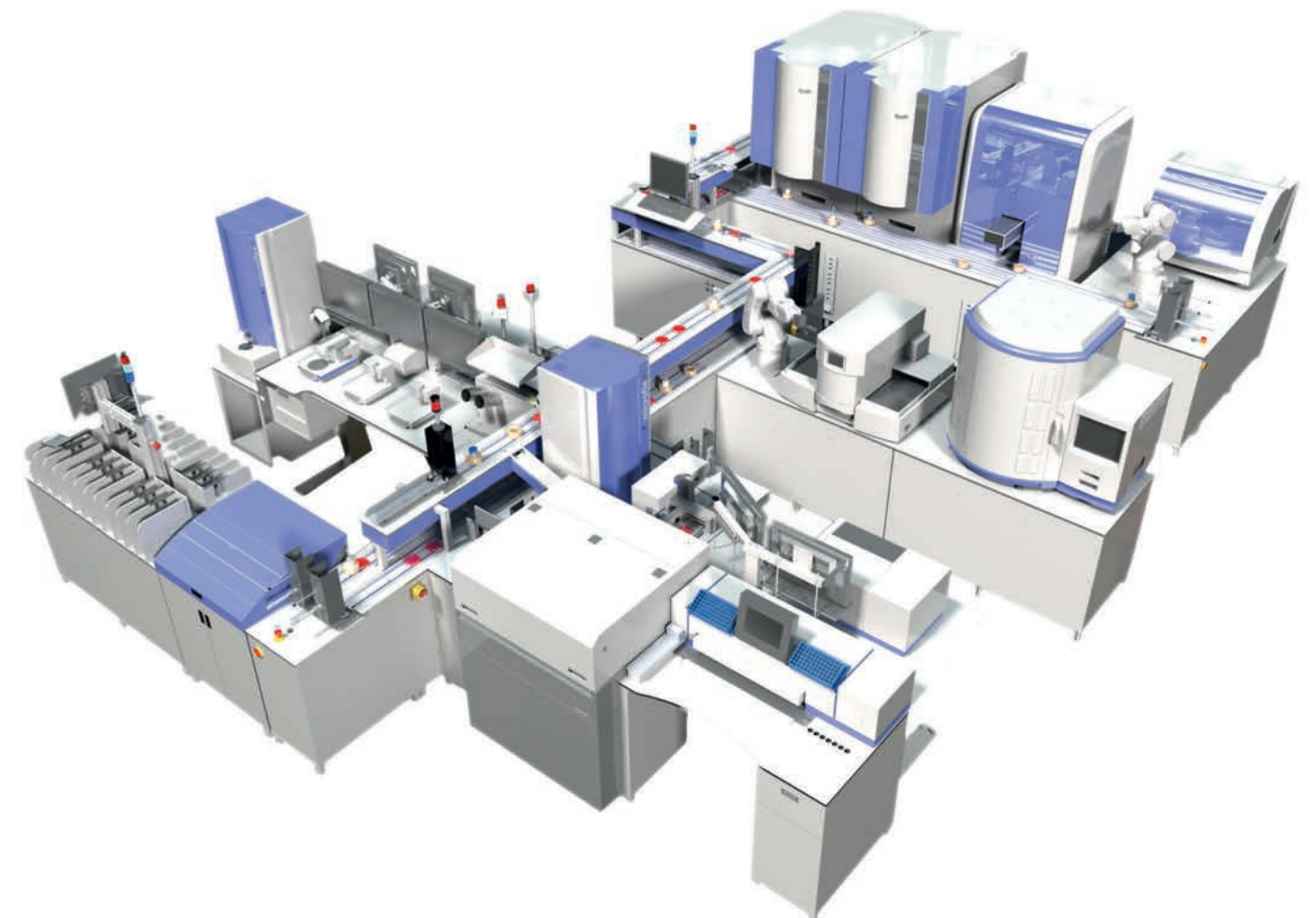
- "In the past decade, clinical microbiology laboratories have undergone important changes with the introduction of molecular biology techniques and laboratory automation. In the future, there will be a need for more rapid diagnoses, increased standardization of testing and greater adaptability to cope with new threats from infectious microorganisms, such as agents of bioterrorism and emerging pathogens."¹¹



The best clinical microbiology solution for today and beyond

Building on our legacy of expertise in the development of diagnostic products we are continually looking to bring to the microbiology laboratory new, innovative and integrated automated solutions.

Our vision of the laboratory with the BD clinical microbiology integrated solution.



BD Diagnostics:

We invite you to experience our other integrated solutions and innovations

Do you want to learn more about BD microbiology solutions?



Please visit our website for further information on our total integrated solutions: www.bd.com/ds/europe



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