Solution en Microbiologie de Autobio

Votre partenaire fiable en diagnostics

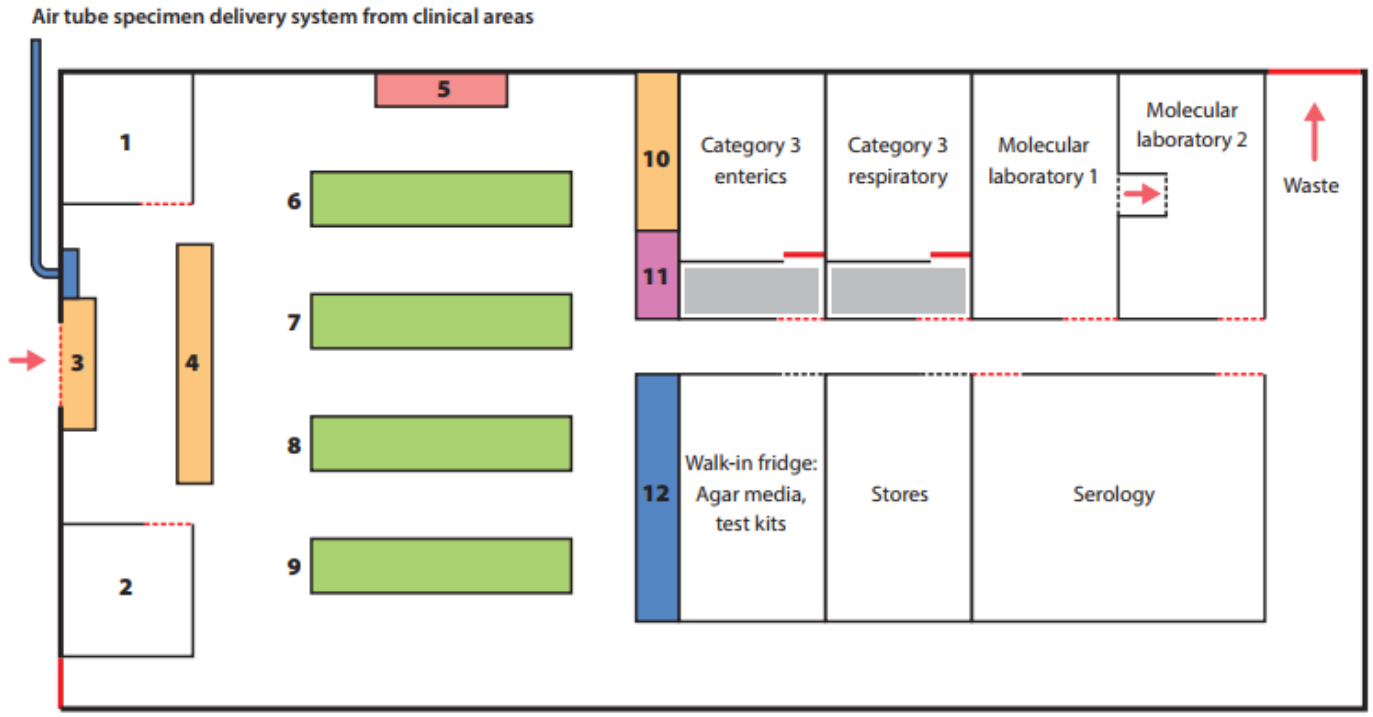
Microbio Product manager:Leia Su

Présentation du Laboratoire de Microbiologie Clinique

- Le rôle du laboratoire de microbiologie clinique

1) Apporte un service clinique et de laboratoire aux usagers de l'hôpital et de la communauté, et fait également partie intégrante de l'équipe de contrôle des infections (ECI) de l'hôpital.

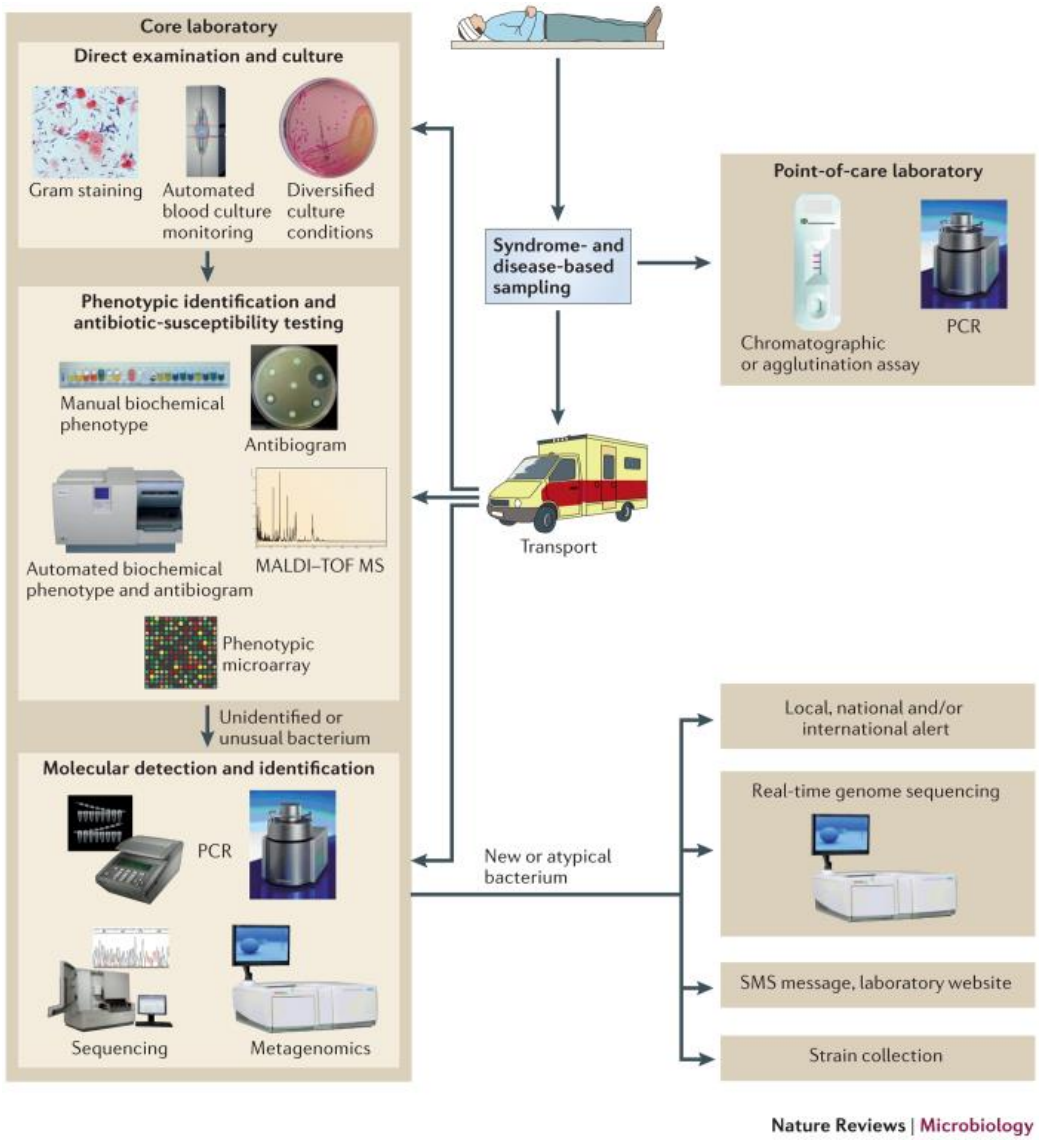
2) Portant sur le traitement en temps opportun des spécimens, l'identification des organismes par une série d'essais et la diffusion d'un rapport avec des commentaires interprétatifs destinés à être utilisés dans la prise en charge du patient.



Organisation actuelle d'un laboratoire de microbiologie clinique

Introduction du laboratoire de microbiologie clinique

Défis et besoins des laboratoires de microbiologie:



*Manque de personnel bien formé.

———Le dépistage microbiologique nécessite une formation approfondie et une expérience accumulée, et son processus est trop long et ardu. La charge croissante sur les ressources médicales rend de plus en plus difficile la formation des professionnels.

Besoin d'équipements plus intelligents, simples et hautement automatisés pour réduire la charge pesant sur le personnel hautement expérimenté.

Coût ?
Espace ?

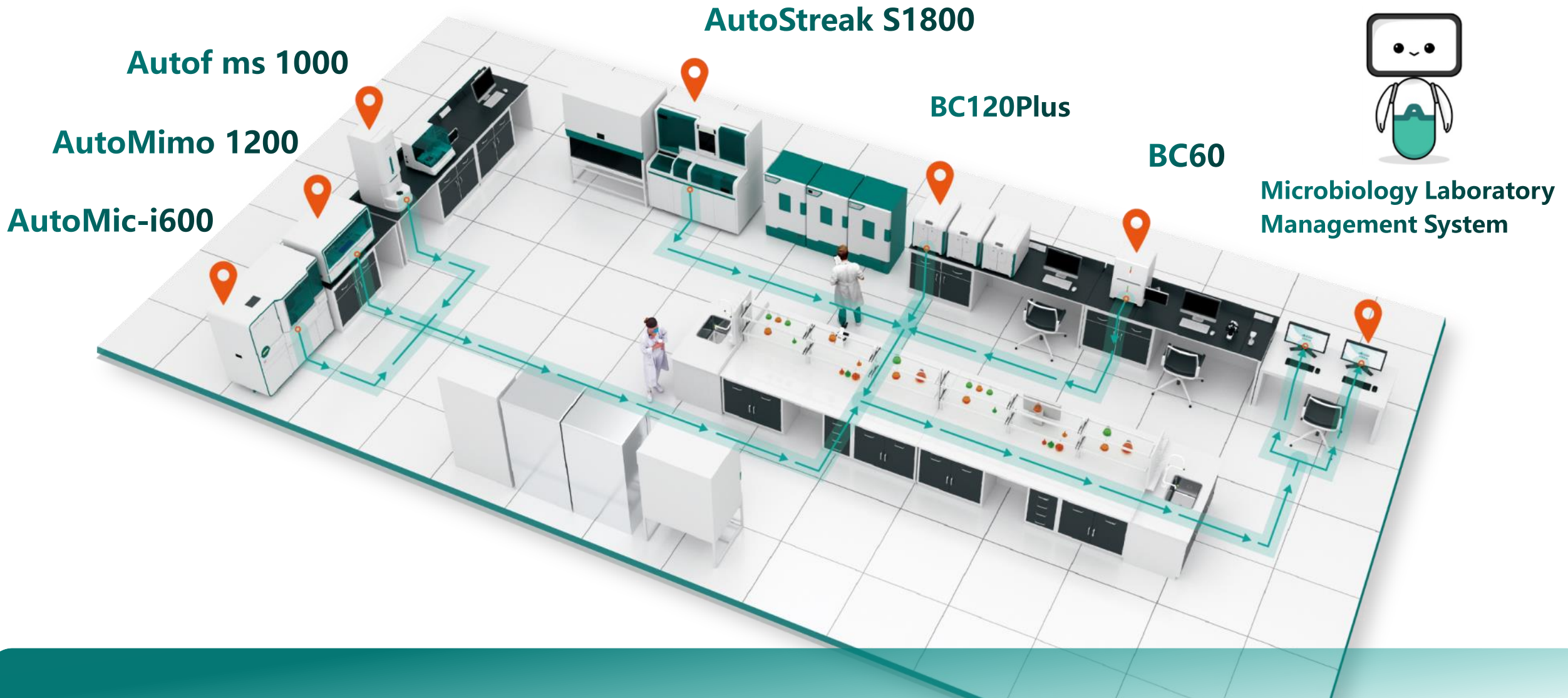
*Manque de budgets médicaux / Contraintes de taille du laboratoire

———La plupart des laboratoires de microbiologie ne disposent pas de budgets adéquats, et de nombreuses fonctions exigent différents types d'équipements, entraînant une pénurie d'espace au sein des laboratoires.

Besoin de meilleurs produits rentables et de solutions d'économie d'espace.

Fournier PE, Drancourt M, Colson P, Rolain JM, La Scola B, Raoult D. Modern clinical microbiology: new challenges and solutions. Nat Rev Microbiol. 2013 Aug;11(8):574-85. doi: 10.1038/nrmicro3068. PMID: 24020074; PMCID: PMC7097238.

Solutions en microbiologie



PART 1

Hemoculture

Solutions d’ hemoculture d'Autobio

Dans le monde > 4000+ unités (BC120/BC60)

BC120Plus
High volume
2025

BC60
More advanced,
more compact

BC120
since 2011

AutoBes X

Fully-Automated blood culture system (448 well)
2027

Une variété de débits couvrant les laboratoires de différentes tailles

BC60-Une hémoculture plus compacte

< 4500 bottles/year
L*W*H 490mm*410mm*390mm

Meilleur rapport de volume

- Une unité de 60 positions, convenable pour les laboratoires avec un volume annuel d'échantillons inférieur à 4500 bouteilles.

Plus de flexibilité

- Max 6 connexions, le volume maximal sera de 27 000 bouteilles/an.

<9000 bottles/year
L*W*H:
490mm*410mm*780mm

<18000 bottles/year
L*W*H:
980mm*410mm*780mm

<27000 bottles/year
L*W*H:
1470mm*410mm*780mm

BC60-Une hémoculture plus compacte

Paramètre de base

L*W*H: 490mm x 410mm x 390mm

Positions pour une unité : 60

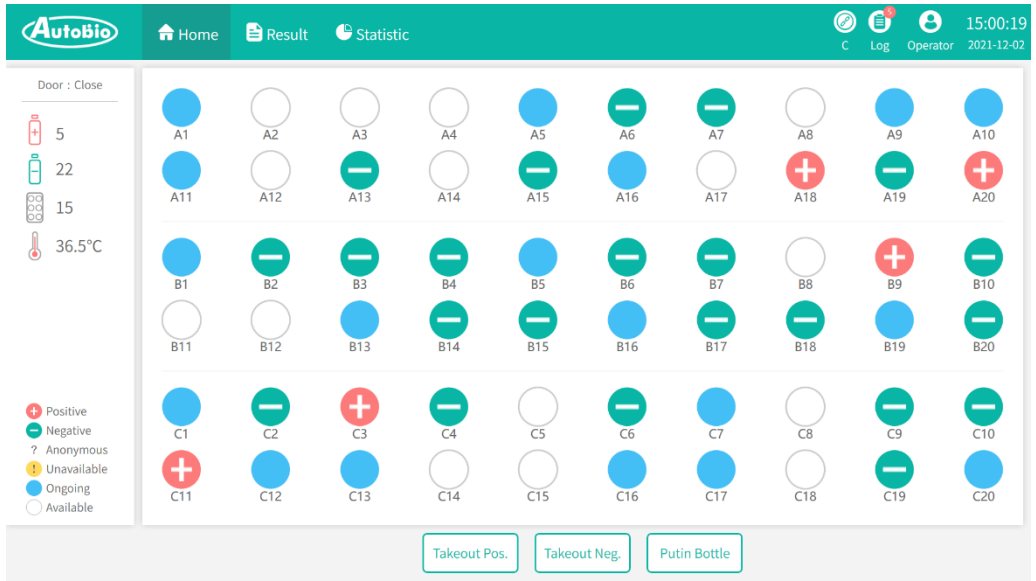
Fonction d'incubation : Unité indépendante.

Fonction de brassage : Module de mélange uniforme

Module de commande : Tablette ou ordinateur portable

Connexion maximale : 6 unités (360 positions)

Mode de chauffage : Chauffage solide



Matériel

- Le système de culture du sang est composé d'un module de commande connecté à au moins un module d'incubation.

- Un Module de commande est capable de prendre en charge jusqu'à 6 Modules d'incubation supplémentaires et utilise un système d'exploitation Windows 10.

- Sur la face extérieure du tiroir de l'incubateur se trouvent des indicateurs LED et des numéros.

1) La lumière LED blanche. Le système dispose d'un espace pour transporter des bouteilles de sang.
2) Lumière LED rouge lorsque une bouteille de culture positive est détectée.
3) Lumière LED verte lorsque une bouteille de culture négative est détectée.

Nouveau produit 2025

BC120Plus

- ✓ Volume plus important
- ✓ Performances éprouvées sur le marché
- ✓ Logiciel avancé

Module de pesée des échantillons

- ✓ Facile à utiliser
- ✓ Détection du volume de sang

AutoBes X

Système d’ hemoculture entièrement automatisé

- ✓ Opération en un seul geste
- ✓ Détection du volume de sang
- ✓ Déchargement automatisé
- ✓ Instrumentation flexible et extensible
- ✓ Interface tactile conviviale
- ✓ Gamme complète de types de flacons d’ hemoculture

Flacons d’ hemoculture

- Fournir 3 types de flacons d’ hemoculture en résine
- Fournir des flacons d’ hemoculture pour la culture de mycobactéries dans les crachats/liquides corporels (utilisation séparée requise)
- Applicables pour la récupération de bactéries et de champignons à partir du sang et des liquides corporels stériles normaux
- Emballage : 20 bouteilles/boîte; Durée de conservation : 18 mois; Conditions de stockage : 2-25°C

nticoagulant, SPS, neutralizes lysozyme, inhibits phagocytosis, inactivates some aminoglycosides, and inhibits part of the complement cascade.[79] The typical concentration of SPS ranges from 0.025 to 0.05%, although some commercial systems have concentrations as low as 0.006%. Despite inhibiting the growth

	Resin Aerobic	Resin Anaerobic	Resin Peds	Mycobacterium
Cap color	Green	Blue	Red	Gray
Blood Volume (mL)	8-10(min 0.5)	8-10(min 0.5)	1-5	**0.5 (After digestion)**
Culture Media (mL)	30	40	20	10
SPS %	0.025*	0.035*	0.025*	/
Bacteria type	Aerobe Facultative Anaerobe	Facultative Anaerobe Anaerobe	Aerobe Facultative Anaerobe	Mycobacterium

*Conforme aux recommandations de la CLSI

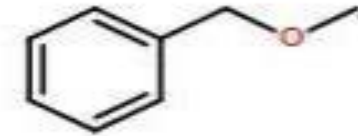
Mycobacterial culture bottle

Bouteille de culture de mycobactéries

Nom du produit	Mycobacterial culture bottle
Emballage	20 tests/box
Type d’ échantillon	Crachat, liquide biologique stérile (sauf le sang)
Volume de l'échantillon	0.5 mL
Stockage	2～8 ℃
Durée de conservation	12 Mois
Composition du conditionnement	20 bouteilles de culture + 2 vials d’agent antimicrobien (polymyxine B, amphotéricine B, acide naladixique, triméthoprime et azlocilline sodique) + 1 mode d’emploi
Temps de communication des résultats positifs	14 Jours
Temps de communication des résultats négatifs	42 Jours

Lytic Anaerobic culture bottle

Saponine de thé : Un agent lytique naturel et hautement efficace pour les globules rouges.



- **Lyse des globules rouges hautement efficace**
- **Nutriments adéquats**
- **Capacité accélérée de récupération anaérobie**
- **Résultats de coloration de Gram plus nets**
- **Identification ultérieure plus pratique**
- **Offrir davantage de solutions**

Lytic Anaerobic culture bottle

Plusieurs solutions pour s'adapter à différents scénarios d'utilisation

Standard Aerobic bottle + Lytic Anaerobic bottle

VS

Resin Aerobic bottle + Resin Anaerobic bottle

> Lorsque cela est possible, les échantillons doivent être prélevés avant l'administration d'agents antimicrobiens.
> --CLSI Guideline

Hemoculture “ satellite “

1 Bottles/Space rate≈ 0.0013 m³——Best in the world！ ！ ！

Emergency Department

Point of care

ICU

Laboratoire

- Il peut être réparti de manière aléatoire dans le service des urgences, le service clinique, le département des soins ambulatoires, etc.
- Réaliser la connexion réseau des hemocultures entre le service clinique et le laboratoire central.

BC60 Time-to-positivity (TTP)

Indian Journal of Medical Microbiology 53 (2025) 100754

Contents lists available at ScienceDirect

Indian Journal of Medical Microbiology

journal homepage: www.journals.elsevier.com/indian-journal-of-medical-microbiology

Original Research Article

Comparison of intra-assay and inter-assay reproducibility and positive detection times of two different (BacT/Alert 3D and Autobio BC) commercial blood culture systems

Nilgün Kansak [a,*], Nilay Zeynep Kalender [a], Neslihan Arıcı [a], Rıza Adaleti [b], Sebahat Aksaray [b], Handan Ankaralı [c], Nevriye Gönüllü [d]

[a] University of Health Sciences, Haydarpaşa Numune Training and Research Hospital, Laboratory of Medical Microbiology, Istanbul, Turkey
[b] University of Health Sciences, Hamidiye Medical Faculty, Department of Medical Microbiology, Istanbul, Turkey
[c] Istanbul Medeniye University, Faculty of Medicine, Biostatistics, Istanbul, Turkey
[d] Istanbul University-Cerrahpasa, Cerrahpasa School of Medicine, Department of Medical Microbiology, Istanbul, Turkey

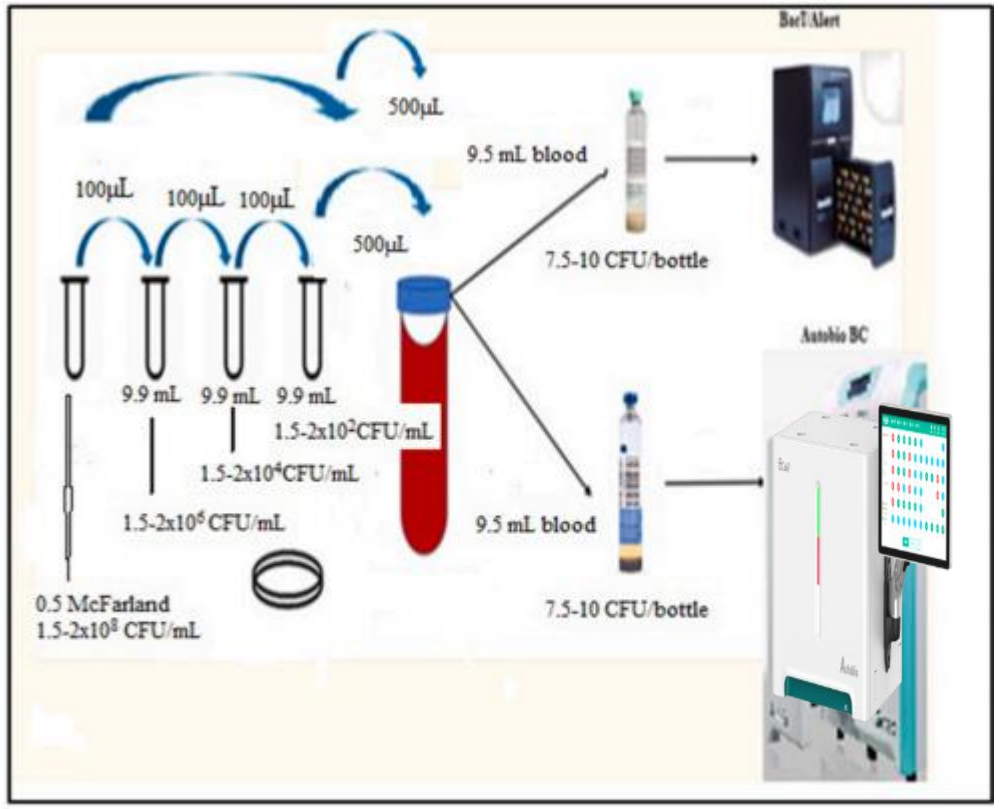


Fig. 1. Preparation of samples and inoculation of blood culture bottles.

Results: Recovery rates were 100 % in both systems, and when positive detection times were compared, it was found that there was no difference between the two devices in clinical isolates (p:0.262) but that Autobio BC gave significantly ($p < 0.001$) earlier results in standard strains.

BC60 Efficient months after their expiration date

FI
Dia

ELSEVI

Letter to t

Blood c
date: ir

Liselotte
Jan Jacob

1) Institute of T
2) FIND, Geneva
3) KU Leuven, L

A. Overall yield (%) (5 species each tested in triplicate, resulting in a total of 15 spiked BCBs) — Expiration date reached — Colour key

Brand		6M	7M	8M	9M	10M	11M	12M	13M	14M	15M	16M	17M	18M	19M
DL-biotech	RT	100	100	100		100	100	100	100	100	100	100	100		
	45°C	100	100	100		100	100	53 (8) FN	33 (5) FN	27 (4) FN	20 (3) FN	13 (2) FN	0 (0) FN		
Scenker	RT	100	100	100		100	100	100	100	93 (14) FS	93 (14) FS	93 (14) FS	73 (11) FS		
	45°C	100	100	100		100	100	100	100	100	100	100	100		
Mindray	RT	100	100		100	100	100	100	100	100	100	100			
	45°C	100	100		100	100	100	100	100	100	100	67 (10) FS			
Autobio	RT	100	100	100		100	100	100	100	100	100	100	100		
	45°C	93 (14) FS	93 (14) FS	93 (14) FS		100	100	100	100	93 (14) FS	100	100	100		
bioMérieux	RT			100	100	100		100	100	100	100	100	100	100	100
	45°C			73 (11) FN	67 (10) FN	60 (9) FN		60 (9) FN	67 (10) FN	60 (9) FN	73 (11) FN	73 (11) FN	60 (9) FN	67 (10) FN	60 (9) FN

B. Median TTP (median delay of growth of the BCBs out of the 15 BCBs spiked, hh:mm)

		6M	7M	8M	9M	10M	11M	12M	13M	14M	15M	16M	17M	18M	19M
DL-biotech	RT	14:19	16:26	15:55		16:11	17:33	17:12	15:48	15:46	14:51	15:44	15:57		
	45°C	14:11	14:58	14:34		18:20	19:10	24:37	26:03	23:20	23:47	36:14	NEG		
Scenker	RT	13:08	13:49	13:05		13:17	14:09	13:57	14:36	14:04	14:47	14:01	14:31		
	45°C	14:01	14:50	13:38		14:57	15:00	14:07	15:12	15:27	16:12	16:51	17:45		
Mindray	RT	15:24	14:02		15:00	15:28	15:20	14:44	15:38	14:34	14:48	15:10			
	45°C	15:14	14:54		16:04	17:06	17:48	17:28	17:16	17:36	18:32	18:36			
Autobio	RT	12:33	12:32	11:39		12:05	12:30	12:51	12:11	12:29	12:24	12:01	12:36		
	45°C	14:09	13:29	13:03		13:55	14:43	14:59	15:02	15:40	14:42	16:42	16:06		
bioMérieux	RT			14:09	14:09	13:55		14:24	14:48	14:28	14:24	15:02	14:19	14:09	15:26
	45°C			15:19	14:43	14:04		14:00	15:33	14:38	16:26	16:26	14:06	15:52	14:09

Fig. 1. Overview of the performance of spiked BCBs after storage up to and after the expiration date at room temperature and high temperature/humidity. Panel A depicts the overall yield (percentage of true positives) at each evaluation moment. Panel B gives the median TTP for all true positives of the 15 spiked BCBs at each evaluation moment. The heatmap in panel A is constructed using all data of the whole panel, whereas in B it is constructed per brand. RT = room temperature, M = months after production, blank cells = not done. Reasons for failure: FN = false negative BCB (no signal but subculture growth), TN = true negative BCB (no signal and no subculture growth), FS = false signal BCB (signal within 4 hours of incubation).

BC60 Neutralizing Capacity

Evaluation of antibiotic neutralization ability of new-generation Autobio blood culture bottles

Results

Autobio Culture Bottle is capable of neutralizing β-lactams, aminoglycosides, macrolides, polymyxins, oxazolidinones, fluoroquinolones, sulfonamides, polyenes, echinocandins, tetracyclines, carbapenems, glycopeptides, and some cephalosporins, as well as azoles, showing consistency with the results of the referenc culture bottles.

Methods

Activate the standard strains and prepare a 0.5 McFarland bacterial suspension, then perform serial dilution to a concentration of 100 CFU/ml. Add 9.5 ml of sheep blood, 0.5 ml of antibiotics, and 0.3 ml of the bacterial suspension into each blood culture bottle. For each antibiotic test group, repeat with 5 bottles, and for the control group, repeat with 3 bottles. After inoculation, place the bottles into the Autobio Automated Blood Culture System BC120 for incubation.

Results

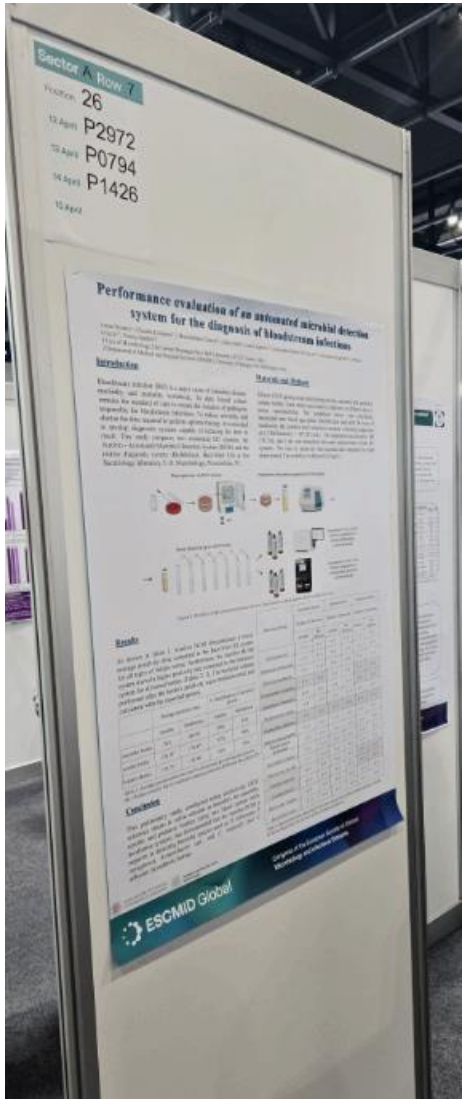
Autobio Culture Bottle is capable of neutralizing β-lactams, aminoglycosides, macrolides, polymyxins, oxazolidinones, fluoroquinolones, sulfonamides, polyenes, echinocandins, tetracyclines, carbapenems, glycopeptides, and some cephalosporins, as well as azoles, showing consistency with the results of the referenc culture bottles.

Conclusions

In clinical practice, Escherichia coli, Pseudomonas aeruginosa, and Staphylococcus aureus are the most commonly encountered pathogens, while Candida albicans is the most frequently detected fungus, and Bacteroides fragilis is the most common anaerobic bacterium. After empirical antibiotic therapy for these common clinical pathogens, the next-generation Autobio Blood Culture Bottle shows excellent antibiotic neutralization effects. Such as cefoperazone, levofloxacin, piperacillin, and vancomycin, covering a wide range of antibiotics including β-lactams, macrolides, cephalosporins, fluoroquinolones, glycopeptides, carbapenems, and echinocandins. In some antibiotic neutralization test groups, a phenomenon of prolonged positive detection time was observed (highlighted in the result table), such as with Amphotericin B, caspofungin, micafungin, imipenem, meropenem, and teicoplanin. This may be due to the limited neutralization speed of the blood culture bottle for these specific antibiotics.

Type	Antibiotics	PSL Concentration（ug/ml)	Strains	TTD (Days)				ΔTTD (Days)			
				AT-FA Plus	Ref.-FA	AT-FN Plus	Ref.-FN	AT-FA Plus	Ref.-FA	AT-FN Plus	Ref.-FN
			Escherichia coli	0.45	0.48	0.45	0.45	/	/	/	/
	Clarithromycin	4	*S. aureus*	0.53	0.57	0.66	0.68	-0.01	-0.03	0	0.01
Polymyxins	Polymyxin B	2.8	*P. aeruginosa*	0.66	0.73	N	N	0.12	0.02	/	/
Oxazolidinones	Linezolid	20	*E. faecalis*	0.46	0.54	0.63	0.54	0	0.01	0.11	0.02
Fluoroquinolones	Levofloxacin	8.6	*E. faecalis*	0.48	0.53	0.51	0.55	0.02	0	-0.01	0.03
		8.6	*S. aureus*	0.57	0.63	0.77	0.65	0.03	0.03	0.11	-0.02
	Ciprofloxacin	4.6	*E. faecalis*	0.45	0.53	0.44	0.42	-0.01	0	-0.08	-0.1
Sulfonamides	Sulfamethoxazole/trimethoprim	9/105	*E. coli*	0.42	0.53	0.49	0.46	-0.03	0.05	0.04	0.01
Polyenes	Amphotericin B	3.5	*C. albicans*	1.44	1.21	N	N	0.21	0.09	/	/
Echinocandins	Caspofungin	9.9	*C. albicans*	1.46	1.45	N	N	0.23	0.33	/	/
	Micafungin	10.1	*C. albicans*	1.32	1.4	N	N	0.09	0.28	/	/
Tetracyclines	Tetracycline	2.2	*S. aureus*	0.58	0.64	0.77	0.68	0.04	0.04	0.11	0.01
	Tigecycline	0.63	*S. aureus*	0.52	0.63	0.72	0.69	-0.09	-0.06	0.04	0.04
Carbapenems	Meropenem	49	*B. fragilis*	N	N	1.65	1.5	/	/	0.45	0.45
	Imipenem	40	*B. fragilis*	N	N	1.62	1.53	/	/	0.42	0.48
Glycopeptides	Teicoplanin	50	*S. aureus*	0.63	1.08	0.73	0.75	0.09	0.48	0.07	0.08
	Vancomycin	50	*S. aureus*	0.64	0.63	0.72	0.75	0.1	0.03	0.06	0.08
Cephalosporins	Cefuroxime	80	*E. coli*	0.4	0.45	0.6	0.48	-0.05	-0.03	0.15	0.03
	Ceftaroline	21	*E. coli*	0.42	0.49	0.61	0.53	-0.03	0.01	0.16	0.08
	Ceftaroline	21	*S. aureus*	0.5	0.57	0.65	0.57	-0.04	-0.03	-0.01	-0.1
	Sulbactam and Cefoperazone	82.9/45.5	*P. aeruginosa*	0.64	0.71	N	N	-0.02	0	/	/
	Ceftriaxone	150	*S. aureus*	Negative	Negative	Negative	Negative	/	/	/	/
	Cefotaxime	100	*E. coli*	Negative	Negative	Negative	Negative	/	/	/	/
Azoles	Voriconazole	3	*C. albicans*	1.25	1.07	N	N	0.02	-0.05	/	/
	Fluconazole	14	*C. albicans*	1.21	1.07	N	N	-0.02	-0.05	/	/

BC60 Italian Re



Results

As shown in Table 1, Autobio BC60 demonstrated a lower average positivity time compared to the Bact/Alert 3D system for all types of bottles tested. Furthermore, the Autobio BC/60 system showd a higher positivity rate compared to the reference system for all tested bottles (Tables 2, 3). The bacterial cultures performed after the bottle's positivity were monomicrobial and consistent with the expected species.

	Average positivity time		% identification of microbial growth	
	Autobio	BioMérieux	Autobio	BioMérieux
Anaerobic Bottles	24 h	24h 30'	80%	67%
Aerobic Bottles	17h 14'	17h 45'	87%	80%
Pediatric Bottles	13h 75'	15h 96'	82%	53%

Table 1. Average positivisation time and % of microbial growth identification for the 3 bottles used for the two methods compared (Autobio BC60 and Bact/Alert 3D).

Conclusion

This preliminary study, conducted using exclusively ATCC reference strains in saline solution as inoculum for anaerobic, aerobic and pediatric bottles, using two blood culture bottle incubation systems, has demonstrated that the Autobio BC60 is superior in detecting bacterial species such as *H. influenzae*, *P. aeruginosa*, *Acinetobacter spp.*, and *C. tropicalis* and *C. albicans* in pediatric bottles.

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

Azienda Unità Sanitaria Locale della Romagna

ESCMID Global

3.3.4 Result of Delayed Loading Bottles

Types of strains	4h- Delayed				6h- Delayed			
	Autobio		Biomerieux		Autobio		Biomerieux	
	FA	FN	FA	FN	FA	FN	FA	FN
Staphylococcus aureus	11h 41'	17h 42'	15h 50'	20h 10'	10h 43'	16h 54'	14h 32'	18h 31'
Staphylococcus epidermidis	21h 03'	31h 04'	18h 41'	27h 00'	19h 55'	28h 26'	15h 50'	25h 51'
Pseudomonas aeruginosa	12h 00'	53h 27'	14h 59'	NEG	11h 04'	52h 51'	14h 01'	NEG
Escherichia coli	8 h 36'	10h 20'	11h 10'	11h 00'	8 h 34'	8 h 54'	10h 22'	9 h 52'

4. Analysis

The Autobio - Automated Microbial Detection System (BC60) outperformed the BioMérieux Bact/Alert 3D system in detecting microbial growth in anaerobic, aerobic, and pediatric culture bottles.

Il Direttore dell'U.O.

SERVIZIO SANITARIO REGIONALE EMILIA-ROMAGNA
Azienda Unità Sanitaria Locale di Cesena
Prof. VITTORIO SAMBRI
C.F. SMB VTR 60E22 F257J
U.O. MICROBIOLOGIA
Il Direttore

BC60Plus

CE，IVD

BC60

Gamme de températures
35-37℃

BC60 plus

Module de refroidissement, adapté pour une utilisation en environnements extrêmes.

Pays à faible revenu, projet de l'NGO

PART 2

Inoculation

Pourquoi avez-vous besoin d'AutoStreak ?

Microbial Sample Pretreatment System

AutoStreak S1800

- C'est un système automatisé économe en espace.
- C'est un système économique abordable.
- C'est un système standardisé facile d'utilisation.
- C'est un système intelligent conforme aux besoins de gestion.

Automatique

Économiser de la main-d'œuvre / du temps

Standard

Réduire l'impact des opérations manuelles

Simple

Pas d'opérations complexes, faible taux de défaillance.

Prise en charge des types d'échantillons

Échantillon de crachats

A

Lavage broncho-alvéolaire (LBA) liquide

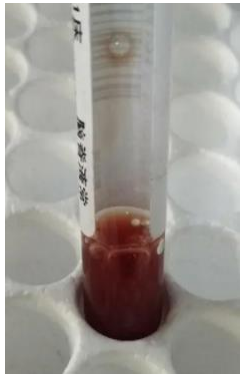
B

Échantillon d'urine

C

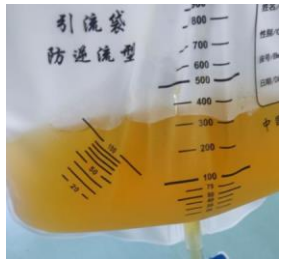
Cerebrospinal fluid(CSF)

D



Hydrothorax et ascite

E



Swab/stool

F

Culture de sang positive

G

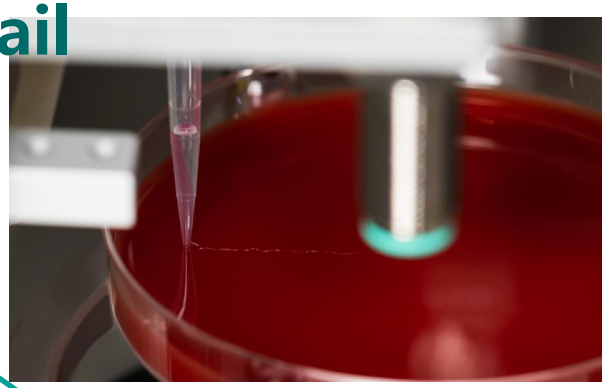
different types de prélèvement

Swab (matériel fécal) : Échantillons élués manuellement dans un gobelet à échantillons.

Cultures de sang positives : Injecter dans le gobelet à échantillons.

Flux de travail

1

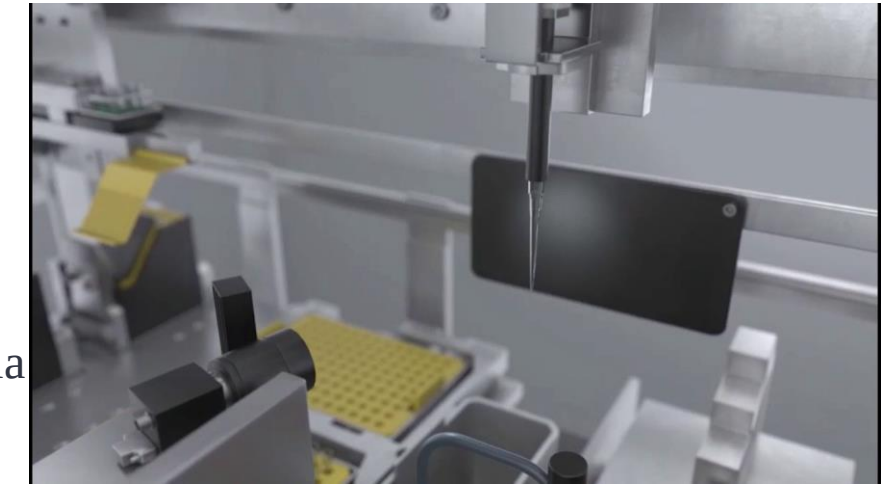


1. Module d'inoculation

- Le sonar (ou ultrasons) détecte automatiquement la hauteur du milieu de culture et sélectionne la forme adaptée pour une inoculation quantitative de 11 µl.

- Tête jetable et brosse d'inoculation, afin de réduire la contamination croisée.

2



7. Module de chargement des milieux de culture

Groupage libre selon l'environnement de culture ou le type d'échantillon, et retrait possible sans arrêt de fonctionnement.

2. Module d'impression et de collage des codes-barres

Le code-barre est imprimé et collé automatiquement.

3

Flux de travail élevé

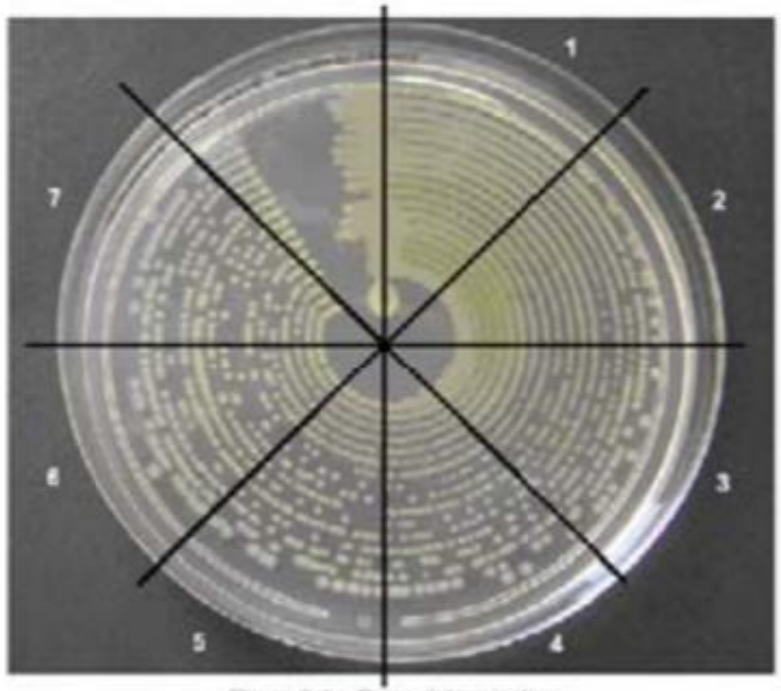


Figure 0-1 : Score determination

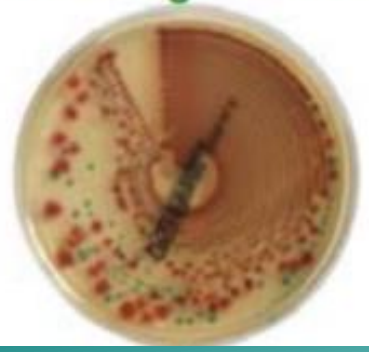
For sections 1 & 2:
Report as <10, 000 cfu/ml

For Section 3:
Report 10-40,000 cfu/ml

For sections 5- 8:
Report >100,000 cfu/ml

For section 4:
Report 50-100,000 cfu/ml

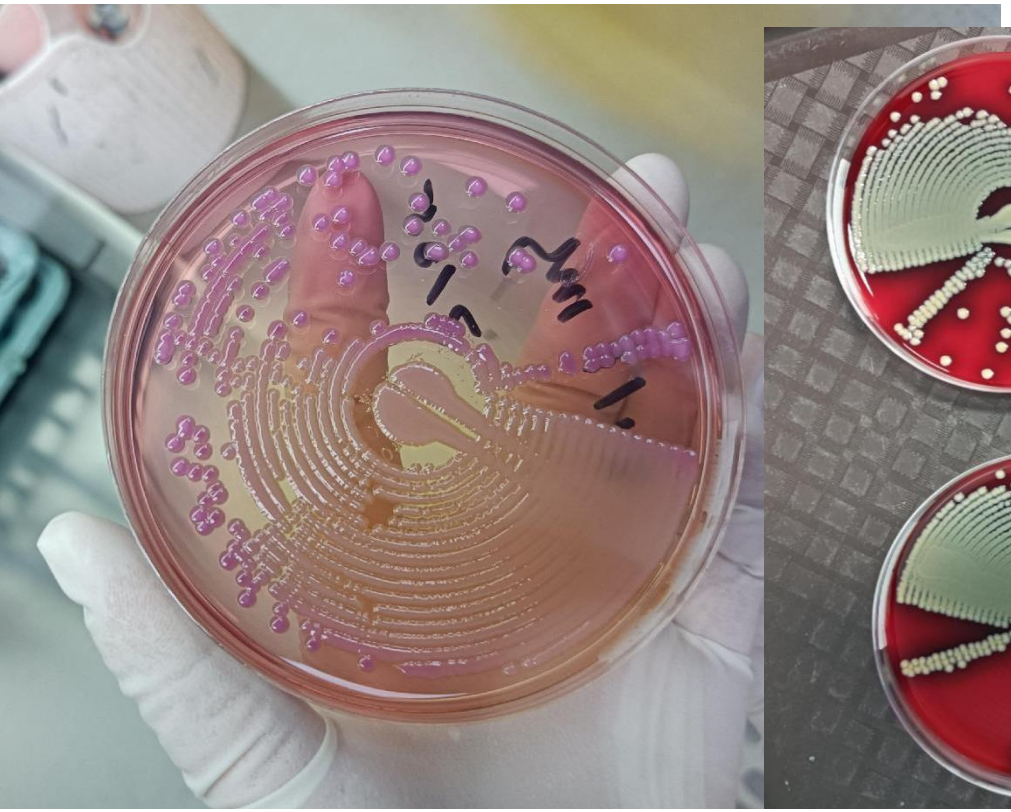
Fig 5. Isola Streak on Chromogenic Media

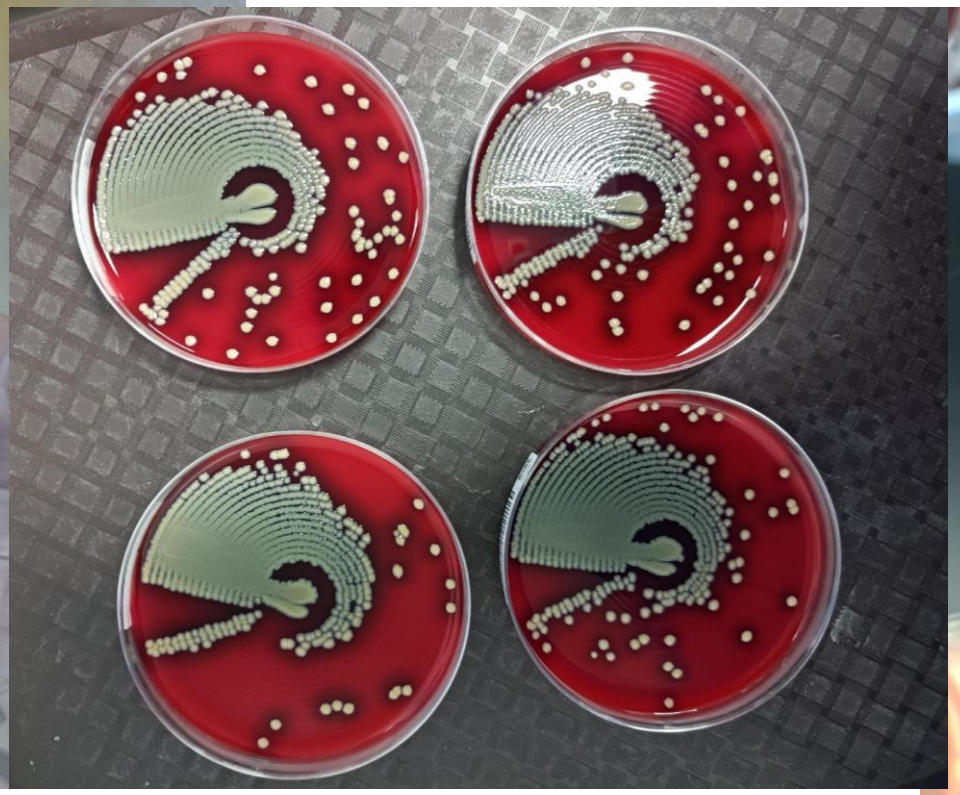


Repiquage en 6 secteurs, facilitant la localisation des colonies bactériennes isolées.

Prétraitement MALDI ou configuration de suspension bactérienne AST extrêmement simple.

La rétroaction





PART 3

MALDI TOF

Solutions d’ Autobio MALDI TOF

Dans le monde >
1000+ Unités
(Autof ms)

Autof T-series(2025)

· Plus petit
· Économique
· Clinique

Autof ms
·Volume important d’essais
·Recherche & Clinique

Débit et fonctionnalités variés pour les laboratoires de toutes tailles et besoins


Denmark
Poland
Russia
Germany
Bulgaria
France
UK
Belarus
Ireland
Belgium
Romania
Serbia
Turkey
Kazakhstan
USA
Spain
Italy
Greece
Czech
China
Lithuania
Kuwait
UAE
Algeria
South Korea
Morocco
Egypt
Iran
Thailand
India
Saudi Arabia
Vietnam
Japan
Mexico
Oman
Columbia
Nigeria
Philippines
Peru
Brazil
Malaysia
Indonesia
Chile
Paraguay

Autof ms

Matrix Assisted Laser Desorption Ionization Time-of-Flight Mass Spectrometry Analyzer

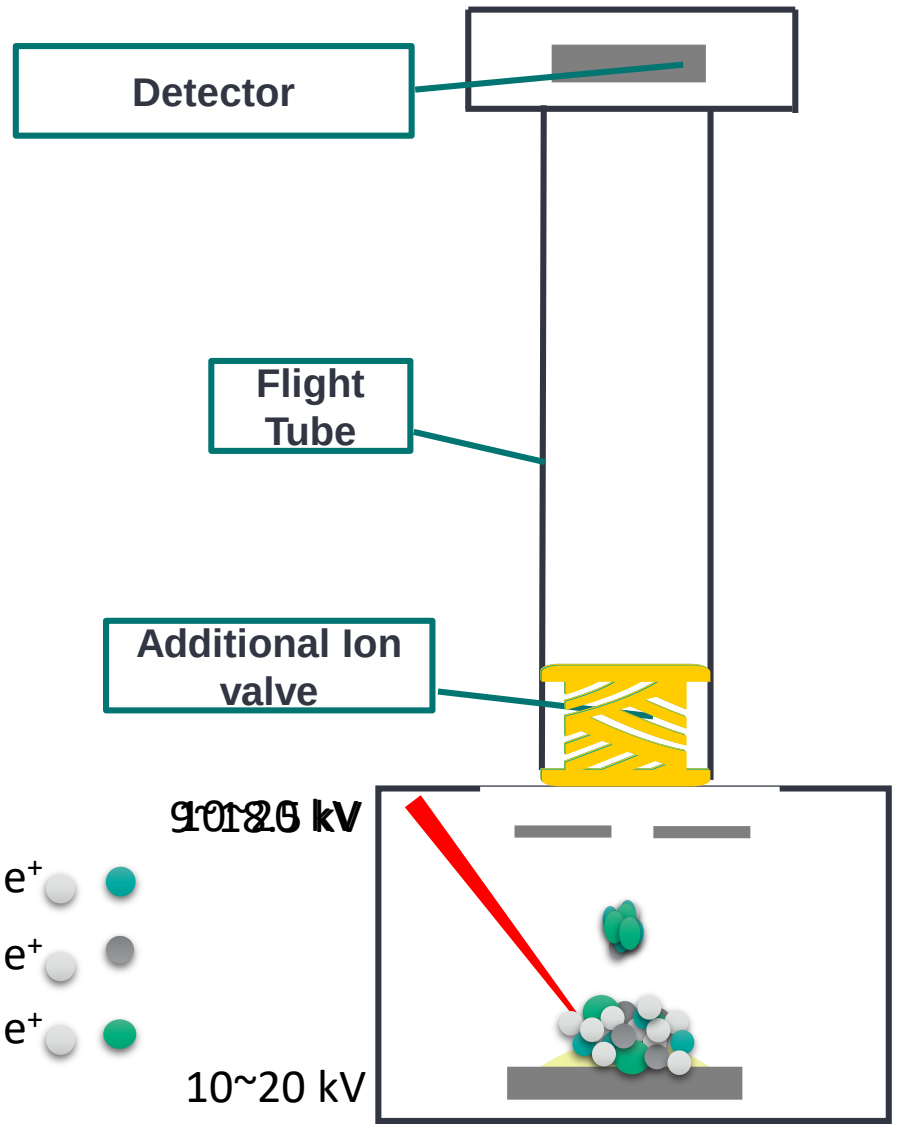
Autof ms

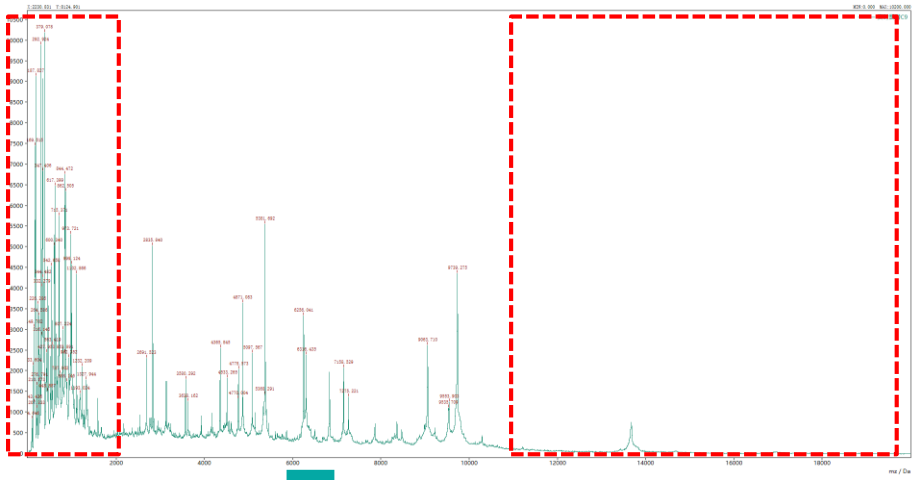
600/1000/1600/2000/2600

Champ d'application:

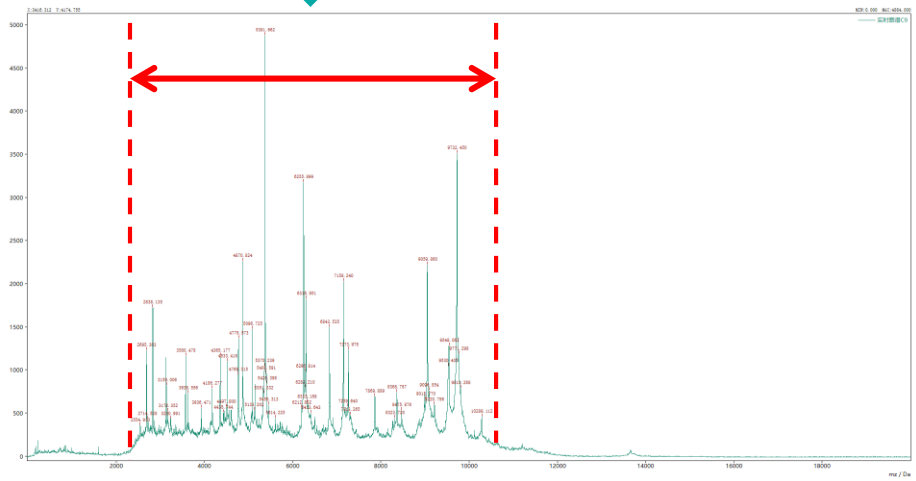
- **Usage clinique** : Identification rapide de bactéries et de champignons en microbiologie.
- **Usages non cliniques** : Contrôle alimentaire, analyse de l’ eau, tests vétérinaires, recherche scientifique, contrôle de la qualité du lait, etc.
- **Recherche** : Antibiogramme (AST) sur MALDI, analyse nucléique, mode ion négatif.

Module de dépistage d'ions (optional Autof 1600 2600)





Protéger le détecteur
· Obtenir les spectres souhaités



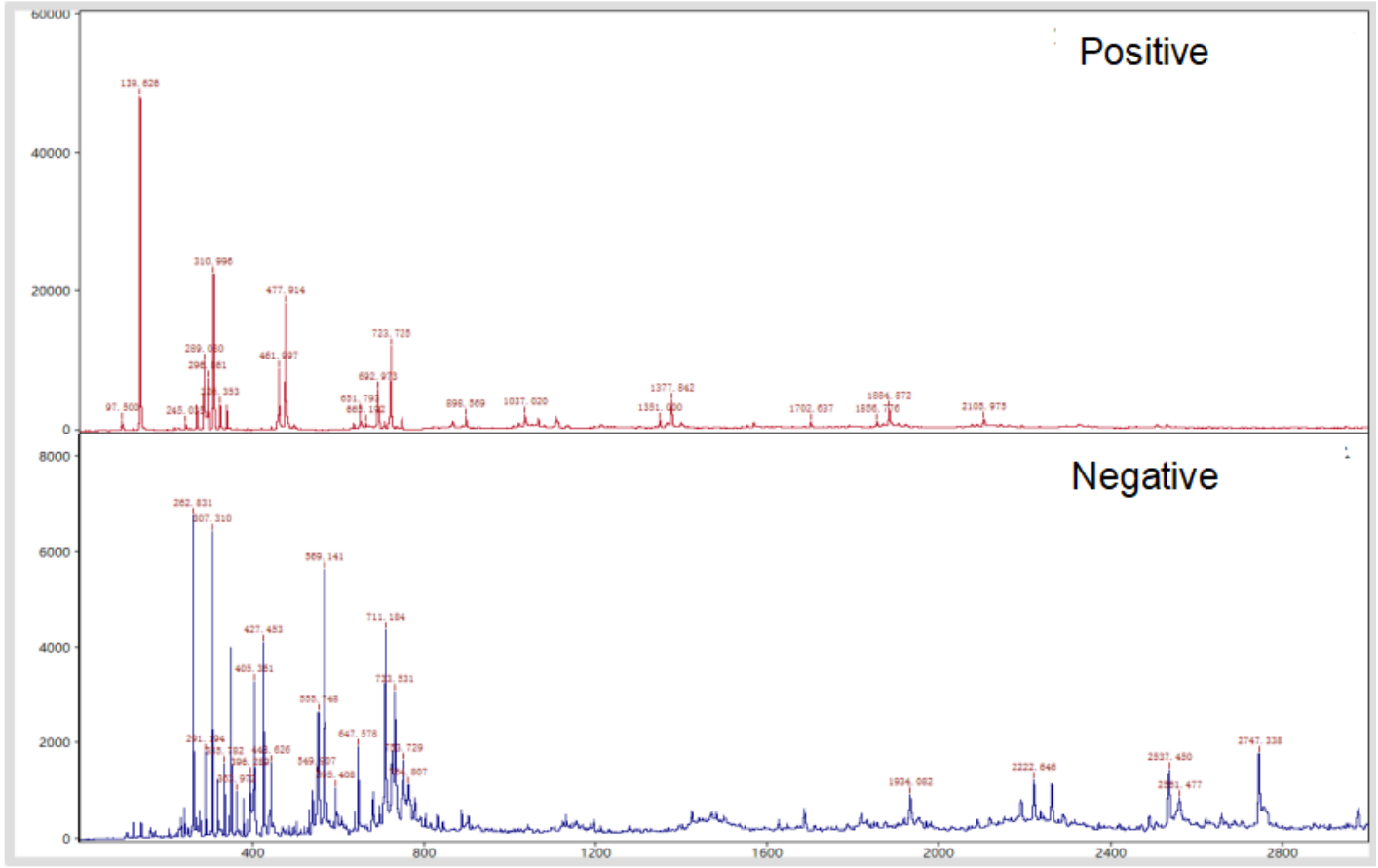
Negative ion mode (Research Use Only)

- **Mode ion négatif**

Possède deux fonctions de détection d'ions, cation et anion, permettant de détecter une gamme plus large de types d'échantillons.

Applications

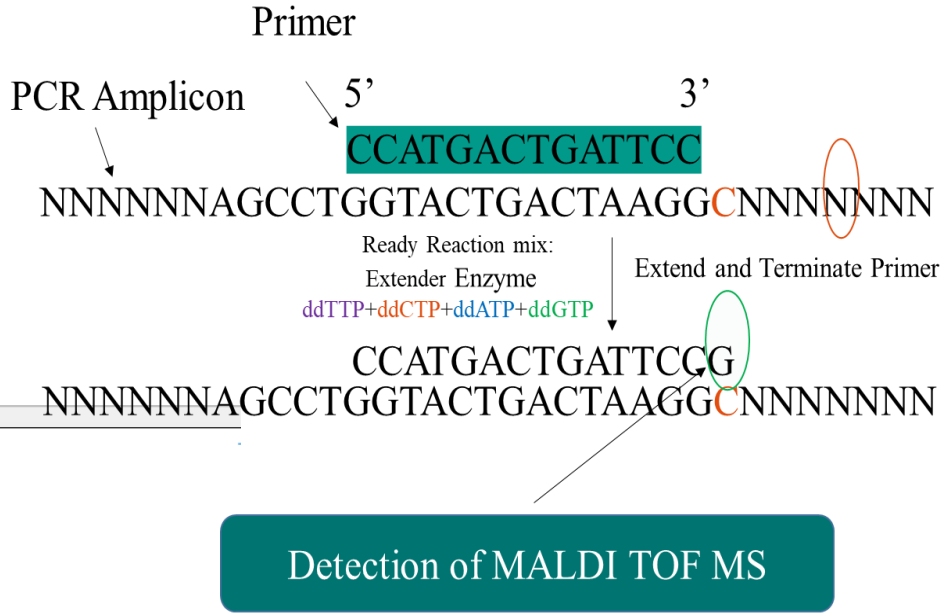
1. Recherche sur les hydrates de carbone
2. Recherche sur les lipides
3. Identification / Recherche sur les bactéries
4. Recherche sur les complexes protéiques homomériques



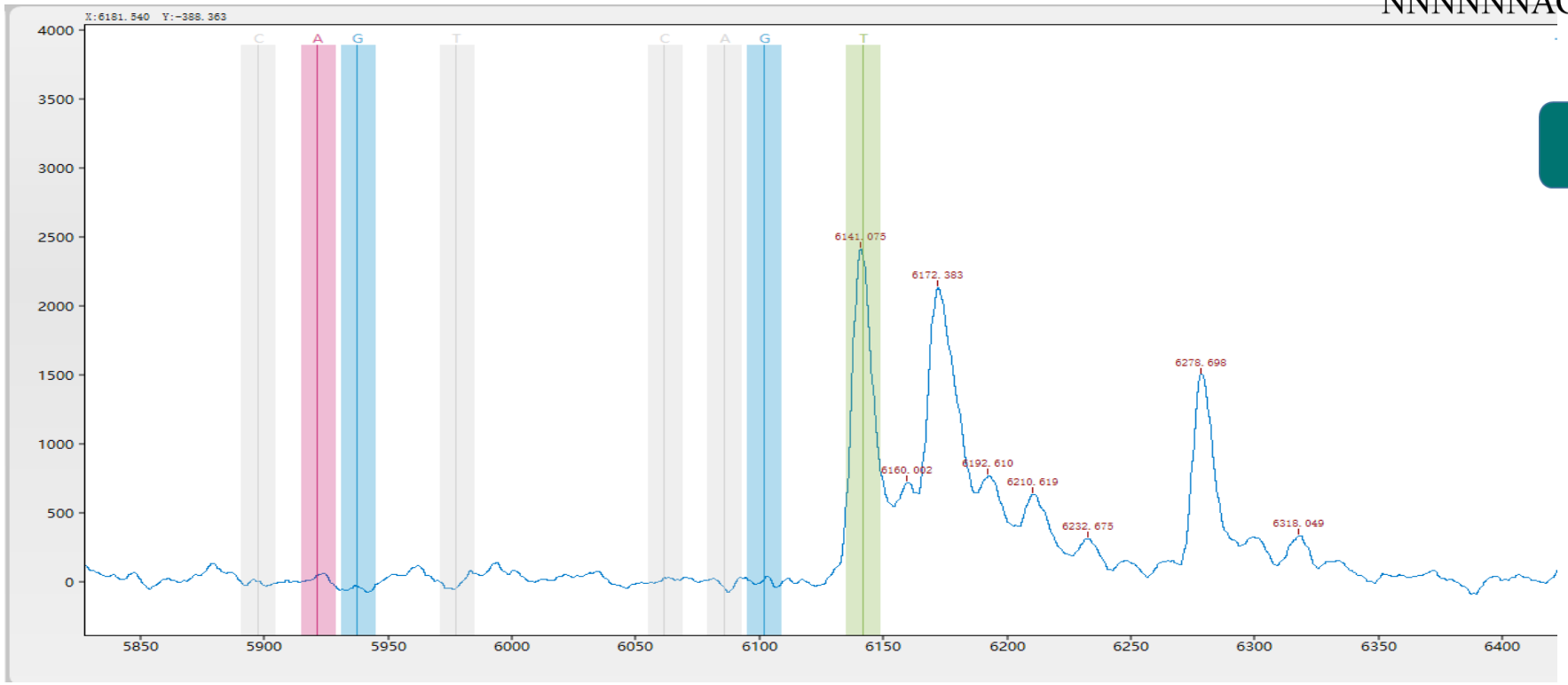
Comparative analysis of positive and negative ion spectra of *Acinetobacter baumannii* lipids

Nucleic acid function (RUO)

La spectrométrie de masse des acides nucléiques consiste à concevoir des amorces selon le site cible. Après l'amplification de l'échantillon par PCR multiplexe, la détection ciblée est effectuée avec une sonde d'extension spécifique.



Detection of MALDI TOF MS



Lorsque la sonde d'extension se lie au cible, elle ajoute une base nucléotidique, provoquant une variation de poids moléculaire de la sonde avant et après la détection. Cette variation est détectée par la spectrométrie de masse Autof MALDI-TOF pour obtenir le résultat de détection.

Taille plus petite

TX8 est adapté aux laboratoires à espace limité.

85%
Espace de banc conservé
70%
Volume réduit de manière drastique
50%
Poids réduit

Autof T-series

Brand New MALDI TOF
Microbial Identification System
Autof TX8

· MALDI de plus petite taille

Moins d’ espace

· MALDI économique

Petit volume

· Identification clinique

Besoins cliniques

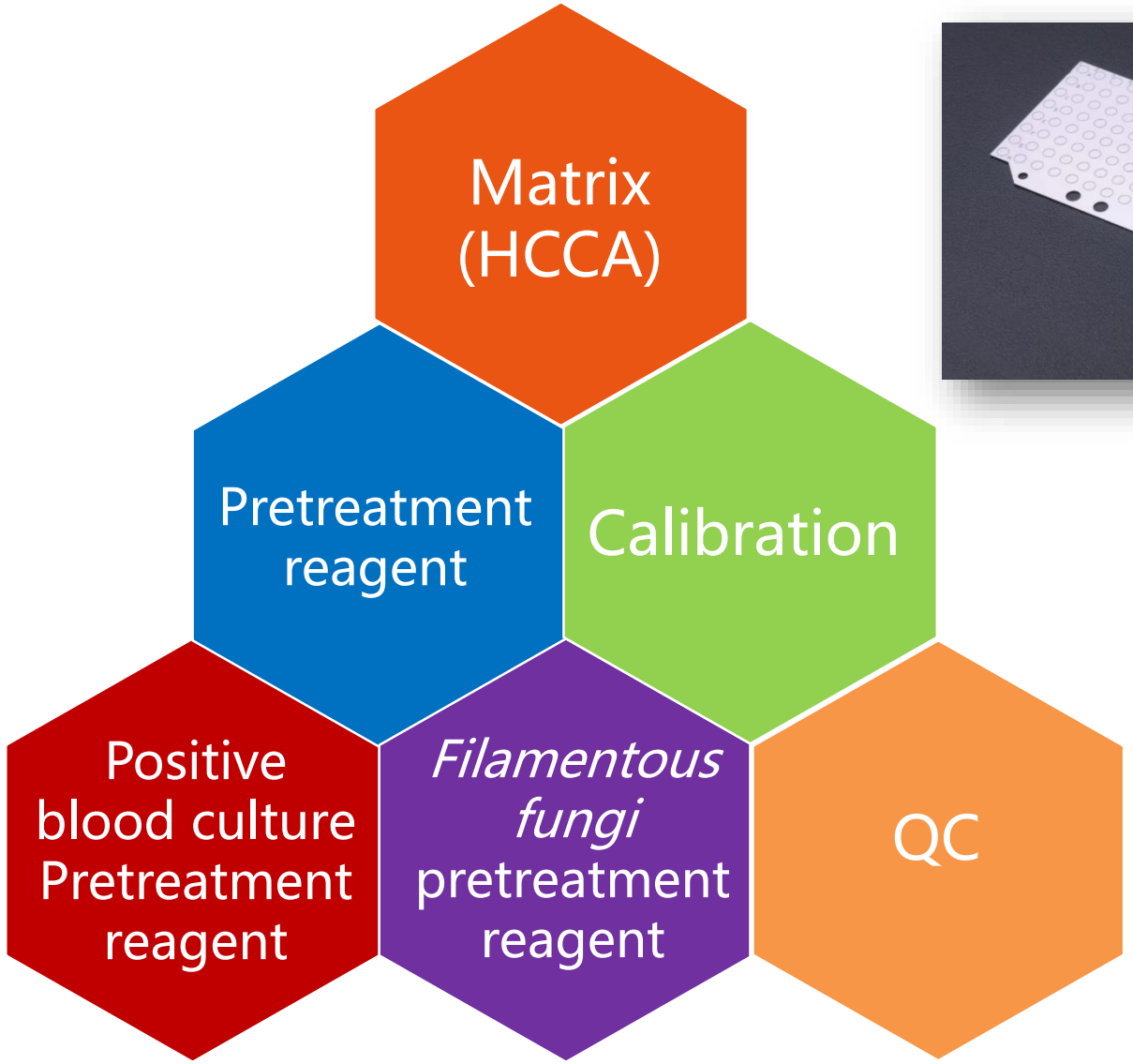
Démonstration du workflow

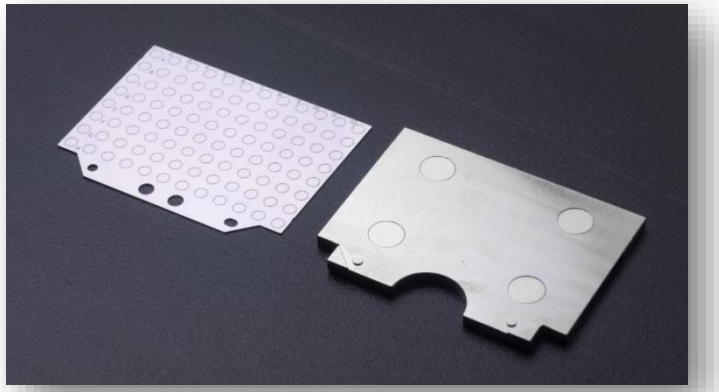
Pas besoin de retirer le masque

Effectuer le test en agitant les mains

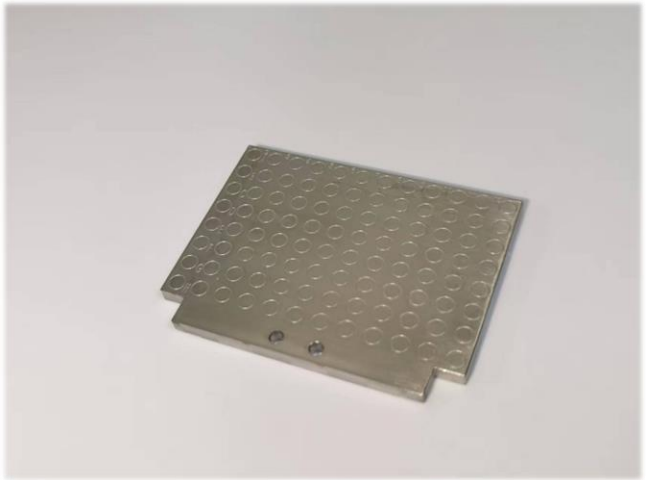
Contrôle à réponse extrêmement rapide

Autof MALDI TOF reagent



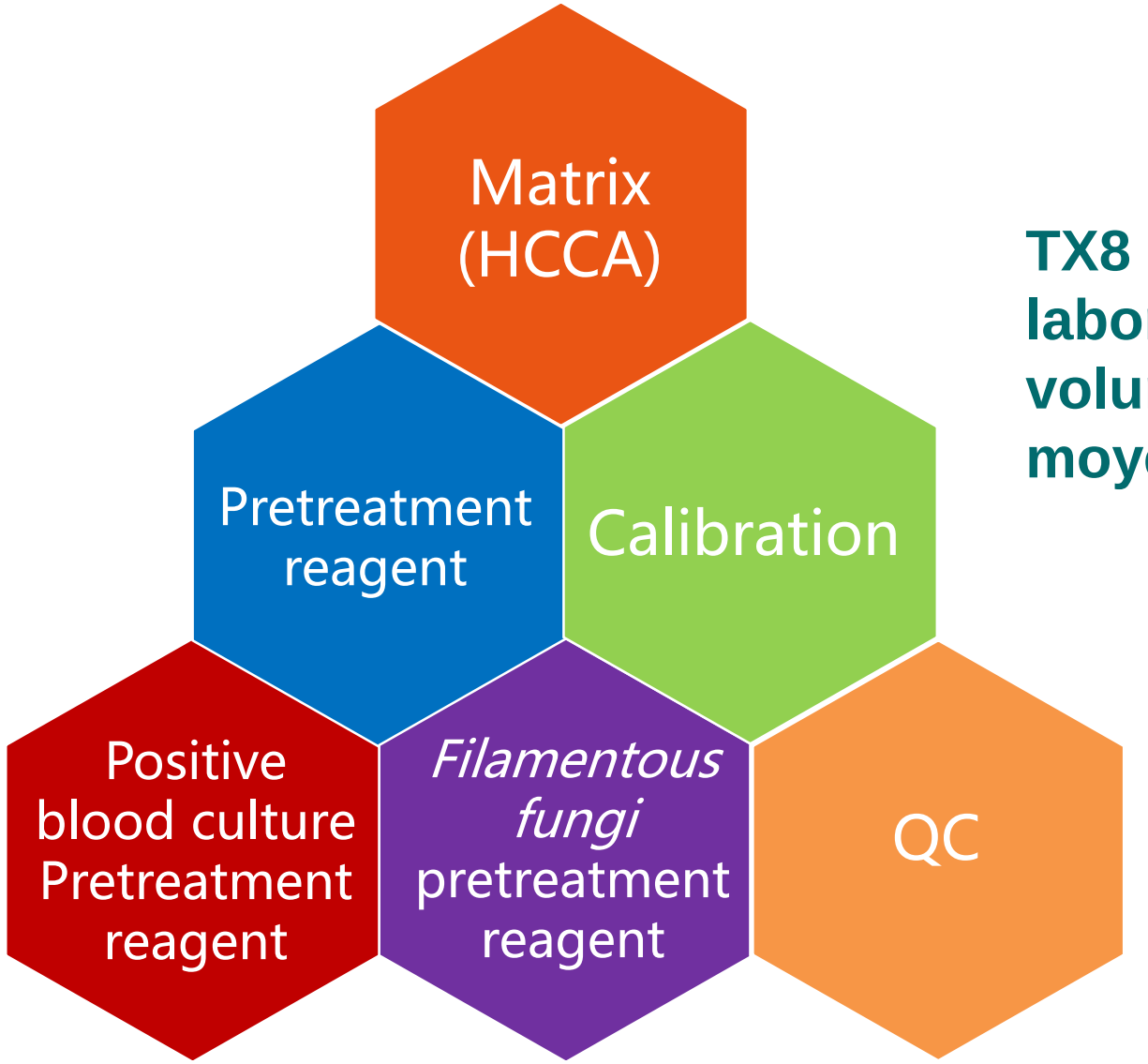


- Split target slide+slide holder
- Number of uses: 5 times
- 96 wells



- Integrate target plate
- Reusable > 200 times
- 96 wells

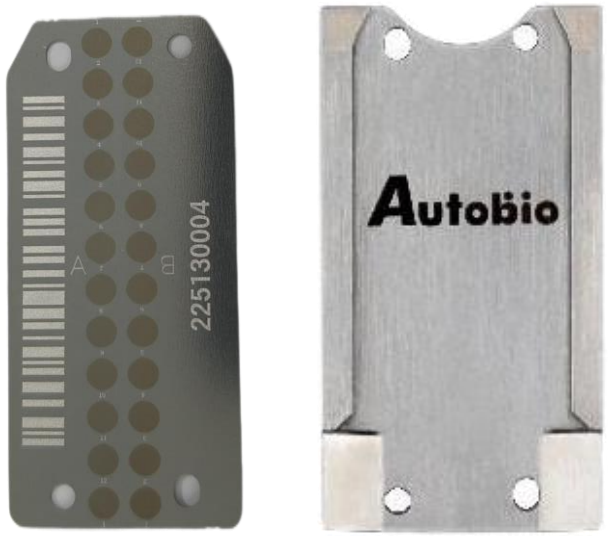
Autof MALDI TOF reagent



TX8 est adapté aux laboratoires avec des volumes d'essais moyens et petits.

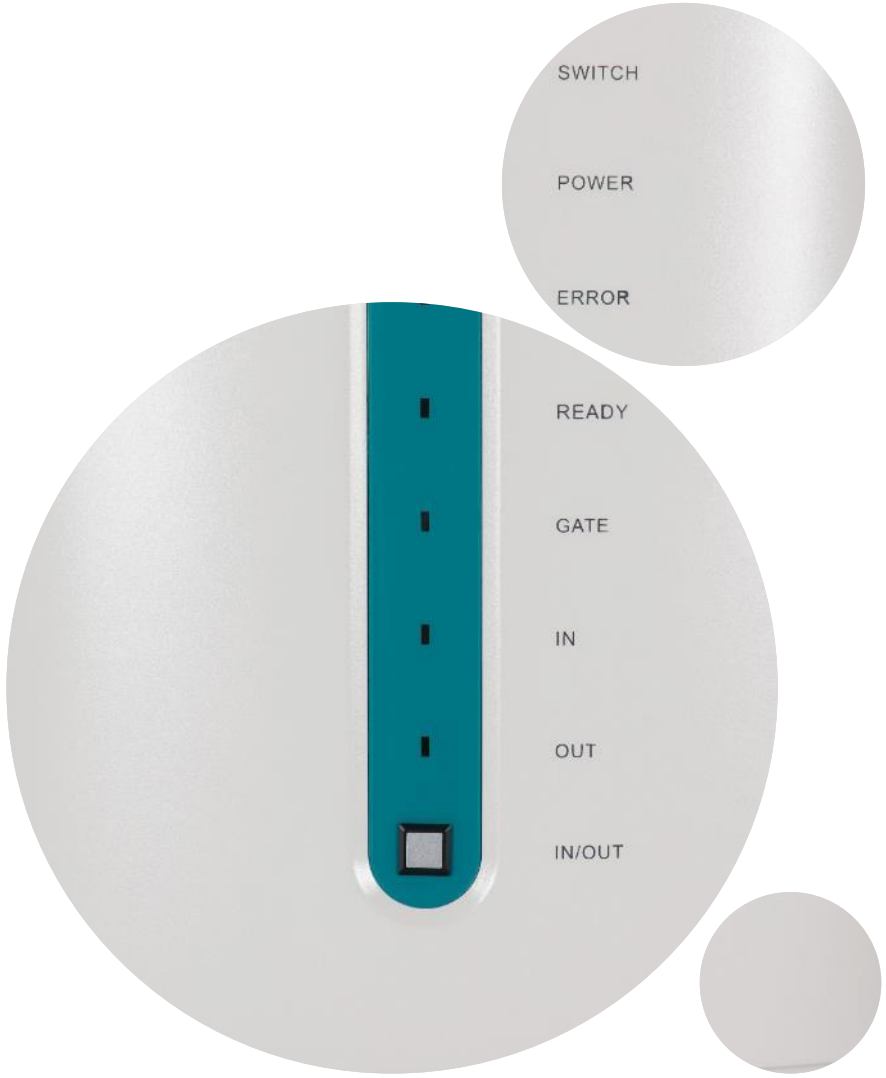
Autof *TX8*

Disposable 24T/Plate



5 min/Plate

Autof ms—Base de données



Autof ver.2026

01 1077 genus 5205 speices

18375 strains

02

Filamentous fungi	569 species
Mycobacteria spp.	173 species
Yeast	300 species

03 Bibliothèque bactérienne intégrée : y compris les usages industriels cliniques, vétérinaires, halieutiques, aquacoles, alimentaires, vaccinaux et autres.

Autof ms Publication

frontiers | Frontiers in Microbiology

frontiers in Cellular and Infection Microbiology

IDSA Infectious Diseases Society of America

Infection and Drug Resistance

BMC

MICROBIOLOGY SOCIETY

ROYAL SOCIETY OF CHEMISTRY

antibiotics

On a publié plus de 50 articles entre 2020 et 2025, dans le monde entier.

Autof ms Publication(Pretreatment)

Journal of MASS SPECTROMETRY WILEY

RESEARCH ARTICLE

TABLE 1 Identification of 321 clinical isolates using the Bruker biotyper system combined with three different extraction methods

Extraction method	Microorganism (N of isolates)	N(%) of isolates: Correct identification: Species level	Genus level	No identification	Misidentification
DCTM	Bacteria (291)	212	47	28	4
	Aerobes (277)	203	43	27	4
	Gram-positive (114)	65	32	16	1[a]
	Gram-negative (163)	138	11	11	3[b]
	Anaerobes (14)	9	4	1	-
	Gram-positive (5)	4	1	-	-
	Gram-negative (9)	5	3	1	-
	Yeasts (30)	2	8	20	-
	Total (321)	214 (66.7)	55 (17.1)	48 (15.0)	4 (1.2)
OTEM	Bacteria (291)	254	26	7	4
	Aerobes (277)	241	25	7	4
	Gram-positive (114)	97	13	3	1[c]
	Gram-negative (163)	144	12	4	3[d]
	Anaerobes (14)	13	1	-	-
	Gram-positive (5)	5	-	-	-
	Gram-negative (9)	8	1	-	-
	Yeasts (30)	17	11	2	-
	Total (321)	271 (84.4)	37 (11.5)	9 (2.8)	4 (1.2)
ITEM	Bacteria (291)	240	39	8	4
	Aerobes (277)	227	38	8	4
	Gram-positive (114)	89	22	3	-
	Gram-negative (163)	138	16	5	4[e]
	Anaerobes (14)	13	1	-	-
	Gram-positive (5)	4	1	-	-
	Gram-negative (9)	9	-	-	-
	Yeasts (30)	22	5	3	-
	Total (321)	262 (81.6)	44 (13.7)	11 (3.4)	4 (1.2)

Abbreviations: DCTM, direct colony transfer method; OTEM, on-target extraction method; ITEM, in-tube extraction method.
[a]One isolate of *Bacillus subtilis* was misidentified as *Bacillus mojavensis* by the Bruker biotyper system after the DCTM.
[b]One isolate of *Burkholderia cepacia*, one isolate of *Ochrobactrum anthropi*, and one isolate of *Yersinia kristensenii* were misidentified as *Burkholderia cenocepacia*, *Ochrobactrum intermedium*, and *Yersinia enterocolitica*, respectively, by the Bruker biotyper system after the DCTM.
[c]One isolate of *Paenibacillus polymyxa* was misidentified as *Paenibacillus jamilae* by the Bruker biotyper system after the OTEM.
[d]One isolate of *Burkholderia cepacia*, one isolate of *Serratia marcescens*, and one isolate of *Yersinia kristensenii* were misidentified as *Burkholderia cenocepacia*, *Serratia ureilytica*, and *Yersinia enterocolitica*, respectively, by the Bruker biotyper system after the OTEM.
[e]Two isolates of *Serratia marcescens* were misidentified as *Serratia ureilytica*, and one isolate of *Burkholderia cepacia* and one isolate of *Yersinia kristensenii* were misidentified as *Burkholderia cenocepacia* and *Yersinia enterocolitica*, respectively, by the Bruker biotyper system after the ITEM.

TABLE 2 Identification of 321 clinical isolates using the Autof ms1000 system combined with three different extraction methods

Extraction method	Microorganism (N of isolates)	N (%) of isolates: Correct identification: Species level	Genus level	No identification	Misidentification
DCTM	Bacteria (291)	277	9	5	-
	Aerobes (277)	263	9	5	-
	Gram-positive (114)	104	7	4	-
	Gram-negative (163)	159	2	1	-
	Anaerobes (14)	14	-	-	-
	Gram-positive (5)	5	-	-	-
	Gram-negative (9)	9	-	-	-
	Yeasts (30)	12	15	3	-
	Total (321)	289 (90.0)	24 (7.5)	8 (2.5)	-
OTEM	Bacteria (291)	287	4	-	-
	Aerobes (277)	273	4	-	-
	Gram-positive (114)	112	2	-	-
	Gram-negative (163)	161	2	-	-
	Anaerobes (14)	14	-	-	-
	Gram-positive (5)	5	-	-	-
	Gram-negative (9)	9	-	-	-
	Yeasts (30)	30	-	-	-
	Total (321)	317 (98.8)	4 (1.2)	-	-
ITEM	Bacteria (291)	286	4	-	1
	Aerobes (277)	272	4	-	1
	Gram-positive (114)	112	2	-	-
	Gram-negative (163)	160	2	-	1[a]
	Anaerobes (14)	14	-	-	-
	Gram-positive (5)	5	-	-	-
	Gram-negative (9)	9	-	-	-
	Yeasts (30)	30	-	-	-
	Total (321)	316 (98.4)	4 (1.2)	-	1 (0.3)

Abbreviations: DCTM, direct colony transfer method; OTEM, on-target extraction method; ITEM, in-tube extraction method.
[a]One isolate of *Burkholderia cepacia* was misidentified as *Burkholderia cenocepacia* by the Autof ms1000 system after the ITEM.

Extraction method

DCTM OTEM ITEM DCTM OTEM ITEM

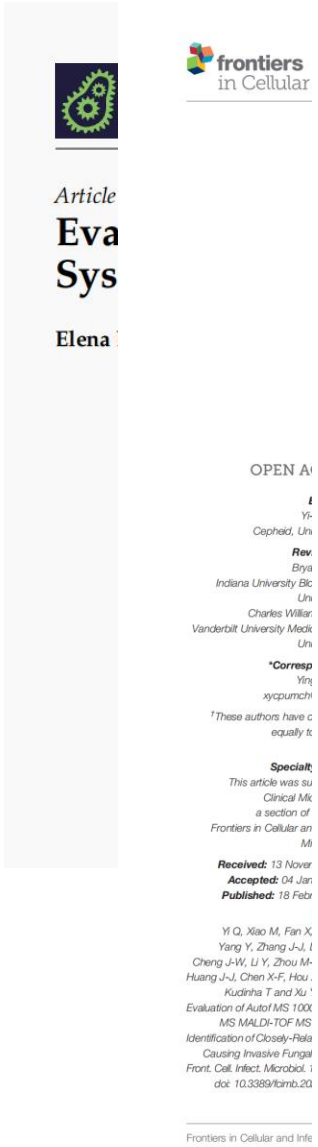
Bruker biotyper Autof MS 1000

the
TOF MS

uan Liu[2] |

ong identification
rect identification

Autof ms Publication (Comparison)



frontiers in Cellular

Article

Eva
Sys

Elena

OPEN A

Yi-
Cepheid, Un

Rev
Brya
Indiana University Blo
Un
Charles Williar
Vanderbilt University Medi
Un

*Corresp
Yin
xycpumch

†These authors have c
equally t

Specialt
This article was su
Clinical Mic
a section of
Frontiers in Cellular an
Mi

Received: 13 Nover
Accepted: 04 Jan
Published: 18 Febr

Yi Q, Xiao M, Fan X,
Yang Y, Zhang J-J, L
Cheng J-W, Li Y, Zhou M-
Huang J-J, Chen X-F, Hou
Kudinha T and Xu
Evaluation of Autof MS 100
MS MALDI-TOF MS
Identification of Closely-Rela
Causing Invasive Fungal
Front. Cell. Infect. Microbiol.
doi: 10.3389/fcimb.20

Frontiers in Cellular and Infe

Journal of Microbiology, Immunology and Infection (2019) 52, 456–464

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jmii.com

Original Article

Evaluat
MS 100
identif
isolate
these i
hospita

Yao Wang
Yang Yang
Qian Zhar

[a] Department c
College, Chines
[b] Beijing Key La
Beijing, China
[c] Graduate Sch
[d] Department c
[e] Department c
[f] Department o
[g] Department c

Received 24 Nov
Available online

KEYWORDS
MALDI-TOF M
VITEK 2 ANC card;
Bacteroides fragilis group;
Identification;
Antimicrobial susceptibility

ToF-II MS, Autof MS 1000 and VITEK 2 ANC card on the identification of clinical *B. fragilis* group isolates, as well as to determine their antimicrobial susceptibilities.

Methods: A total of 138 isolates of *B. fragilis* group isolates were identified with the three MALDI-TOF MS systems and VITEK 2 ANC cards. 16S rRNA gene sequencing was used as the reference identification method for comparison. Antimicrobial susceptibilities were determined by agar dilution method to 19 antimicrobial agents recommended by Clinical and Laboratory Standards Institute (CLSI).

* Corresponding author. Department of Clinical Laboratory, Peking Union Medical College Hospital, No 1, Shuai-Fu-Yuan, Dong-Cheng District, Beijing, China.
E-mail address: xycpumch@139.com (Y.-c. Xu).

https://doi.org/10.1016/j.jmii.2018.12.009

TABLE 1 | Results of matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) identification by Autof MS 1000 and Vitek MS.

Autof MS 1000								Vitek MS							
Agree		ME		MIE		No ID		Agree		ME		MIE		No ID	
474	99.0%	2	0.4%	0	0.0%	3	0.6%	379	79.1%	9	1.9%	40	8.4%	51	10.6%
380	99.0%	1	0.3%	0	0.0%	3	0.8%	366	95.3%	3	0.8%	0	0.0%	15	3.9%
64	100.0%	0	0.0%	0	0.0%	0	0.0%	3	4.7%	5	7.8%	25	39.1%	31	48.4%
25	96.2%	1	3.8%	0	0.0%	0	0.0%	6	23.1%	1	3.8%	15	57.7%	4	15.4%

Table 1 Identification of 138 *Bacteroides fragilis* group isolates by VITEK MS, Clin-ToF II MS, Autof MS 1000 and VITEK 2 ANC card.

Species	No.	VITEK MS				Clin-ToF-II MS			Autof MS 1000		VITEK 2 ANC		
		Species level	Mixed species	Genus level	No ID	Species level	Mixed species	Genus level	Species level	Genus level	Species level	Genus level	No ID
Bacteroides fragilis	108	108				108			108		106	2	
Bacteroides thetaiotaomicron	11	11				11			11		11		
Bacteroides vulgatus	5	5				1	4		5		5		
Bacteroides ovatus	4	0	4			2	2		4		4		
Bacteroides uniformis	2	2				2			2		2		
Bacteroides caccae	1	1				1			1		1		
Bacteroides dorei	1	0		1		0	1		0	1			1
Bacteroides intestinalis	1	0	1			1			1			1	
Parabacteroides spp.	1	0			1	0		1	0	1			1
Parabacteroides distasonis	3	3				3			3		2	1	
Parabacteroides gordonii	1	0	1			1			1				1
Total isolates (%)	138	130 (94.2%)	6 (4.3%)	1 (0.7%)	1 (0.7%)	130 (94.2%)	7 (5.1%)	1 (0.7%)	136 (98.6%)	2 (1.4%)	131 (94.9%)	4 (2.9%)	3 (2.2%)

Vitek MS system.

vantages	database expansion, outstanding yeast identification performance	database updates for improved yeast identification accuracy

Autof ms installation (Non-clinical)

US

Cornell University

rinary Medicine

Cornell University Project

Autobio 安图生物

- Reducing antibiotic use for cow:

In the dairy industry, mastitis is one of the most common and costly diseases. Traditional treatments rely on the high use of antibiotics, which is not only costly, but can also lead to increased drug resistance. As a result, finding ways to reduce antibiotic use has become an important goal for the industry.

- Environmental Control & Disease Prevention:

Recycled sand bedding used in dairy farms is an economical and environmentally friendly choice of bedding material that reduces moisture content and bacteria count by separating sand from manure/organic detritus, then recycling and stacking. But it can be a potential hiding place for pathogens. By accurately identifying microbial species in sand, disease risk in these environments can be better understood and managed.

- Improving hygiene standards in the dairy industry

In the dairy industry, the Laboratory Pasteurization Count (LPC) is an important indicator to evaluate the effectiveness of farm hygiene and cleaning. High LPC values are often indicative of contamination and may stem from a failed cleaning of the milking system or poor animal hygiene. Therefore, accurate identification of bacterial species that cause elevated LPCs is essential to address this issue.

- **Quality Assurance in the Beer Industry**

Beer production is a complex process involving multiple stages, each of which may introduce or cultify different bacterial and fungal species. These microorganisms can affect the flavor, quality, and safety of beer, so effective quality control and monitoring are essential to guarantee the consistency and quality of beer.

T
Y
U
se
m
m
er
A
((
and Warsaw;

Autof ms installation (Non-clinical)

US

THEORY AND PRACTICE OF MEAT PROCESSING, 2024, vol. 9, no. 4

DOI: https://doi.org/10.21323/2414-438X-2024-9-4-304-313
Received 19.05.2024
Accepted in revised 11.12.2024
Accepted for publication 15.11.2024
Available online at https://w

EXPLORATION OF THE POTENTIAL RESERVOIRS OF *PSEUDOMONAS* SPP. BACTERIA AT MEAT PROCES FACTORIES AND POULTRY FARMS

Dagmara S. Bataeva*, Yulia K. Yushina, Anastasiya A. Semenova, Elena V. Zaiko, Maria A. Gr
VM Gorbatov Federal Research Center for Food Systems, Moscow, Russia

Keywords: *reservoir, pseudomonas, spoilage, meat, equipment, air*

Abstract

One of the microorganisms that cause spoilage of meat during its storage is the bacteria Pseudomonas. To preven the finished products with these bacteria, it is important to find the places at the enterprise where they aggregate. work of this study, the objects and premises of the production facilities at meat processing factories and poultry fa to detect their contamination with bacteria of Pseudomonas spp. The potential reservoirs of those bacteria we plants. In addition, the species diversity of Pseudomonas was established at the production facilities environmen 27 production facilities environments (structures, equipment, package containers) were examined for the presen the method of washings. The samples were examined to detect Pseudomonas bacteria, with their subsequent the method of time-of-flight mass spectrometry MALDI-Tof-MS. 487 strains of bacteria of the genus Pseudom which strains are represented by 47 species. As a result of the study it was found that all 27 production facilities with various species of Pseudomonas. From two to fourteen species of Pseudomonas bacteria were detected at all ties of the enterprise for slaughter and processing of broiler chickens were contaminated with Pseudomonas gessa bacteria spp. (identification is traced down only to its genus) were found at 10 objects. Pseudomonas tolaasii brenneri were found at 9 and 8 objects, respectively. The surfaces of 6 objects demonstrated contamination chlororaphis ssp chlororaphis and Pseudomonas koreensis. Other Pseudomonas species were found at 1–5 sites. rescens were detected at 8 pork processing plant sites, Pseudomonas gessardii were found at 5 sites. 4 sites were Pseudomonas chlororaphis ssp. chlororaphis and Pseudomonas koreensis, 3 objects contained Pseudomonas tola spp., Pseudomonas rhodesiae, Pseudomonas libanensis and Pseudomonas extremorientalis. The remaining spe nas were found at one or two sites in the territory of the pork processing plant. It was found that all production regardless of their distance from the raw materials and the finished products, were contaminated with Pseudor the same time, the sites that had no contact with the food products showed wider diversity of Pseudomonas places where the contact took place. Thus, all the explored objects of the production environment at the pork pro and the facilities for slaughter and processing of broiler chickens are the potential reservoirs of Pseudomonas ba

For citation: Bataeva, D. S., Yushina, Yu. K., Semenova, A. A., Zaiko, E. V., Grudistova, M. A. (2024). Explo reservoirs of *Pseudomonas* spp. bacteria at meat processing factories and poultry farms. *Theory and Practice* 9(4), 304–313. https://doi.org/10.21323/2414-438X-2024-9-4-304-313

Funding:
The article was published as part of the research topic No. FGUS-2024-0002 of the state assignment of the V. M. Research Center for Food Systems of RAS.

Introduction

Modern technologies of food production and sanitization have changed the distribution and spatial arrangement of bacteria within the enterprises, and have led to circulation and contamination of the objects with microorganisms in the production sites. This is particularly acute issue for the production environment objects and facilities. Some are very difficult to sanitize, and due to it the organic residues and moisture accumulate and build up there for a long time. Such objects serve as reservoirs of various microorganisms, and upon contact with them, food products are contaminated [1]. Microorganisms at processing plant facilities can be either accidental contaminants or can be those microorganisms that have survi due to their resistance to various factor

Scientists around the world keep stu bacterial contamination in the food pr

It is necessary to take into account th meat processing flow line (equipment, structures, etc.), which are made mair (pipelines, hooks, knives), plastic (tefl belts) and polymers (polymer self-lev colonized by microorganisms. Microc nate solid objects or the areas inacce both inside and outside of the equipme holes and hollow parts, gaskets, unpoli

foods

Article

Staphylococcus spp. in Salad Vegetables: Biodiversity, Antimicrobial Resistance, and First Identification of Methicillin-Resistant Strains in the United Arab Emirates Food Supply

Ihab Habib [1,2,*], Glindya Bhagya Lakshmi [1,2], Mohamed-Yousif Ibrahim Mohamed [1,2], Akela Gh Mushtaq Khan [3,4], Rami H. Al-Rifai [4,5], Afra Abdalla [1,2], Febin Anes [1], Mohammed Elbediwi [6], Hazim O. Khalifa [1,8] and Abiola Senok [9,10]

1 Department of Veterinary Medicine, College of Agriculture and Veterinary Medicine, United University, Al Ain P.O. Box 15551, United Arab Emirates; glindya_l@uaeu.ac.ae (G.B.L.); mohamed-yousif-i@uaeu.ac.ae (M.-Y.I.M.); afra.abdalla@uaeu.ac.ae (A.A.); hfebin@uaeu.ac.a hazimkhalifa@uaeu.ac.ae (H.O.K.)
2 ASPIRE Research Institute for Food Security in the Drylands (ARIFSID), United Arab Emirat Al Ain P.O. Box 15551, United Arab Emirates
3 Department of Medical Microbiology and Immunology, College of Medicine and Health Scie United Arab Emirates University, Al Ain P.O. Box 15551, United Arab Emirates; akelag@uae mushtaq.khan@uaeu.ac.ae (M.K.)
4 Zayed Center for Health Sciences, United Arab Emirates University, Al Ain P.O. Box 15551, United Arab Emirates; rrifai@uaeu.ac.ae
5 Institute of Public Health, College of Medicine and Health Sciences, United Arab Emirates U Al Ain P.O. Box 15551, United Arab Emirates
6 Evolutionary Biology, Institute for Biology, Freie Universität Berlin, 14195 Berlin, Germany; mohammed.elbediwi@fu-berlin.de
7 Animal Health Research Institute, Agriculture Research Centre, Cairo 12619, Egypt
8 Department of Pharmacology, Faculty of Veterinary Medicine, Kafrelsheikh University, Kafr El Sheikh 33516, Egypt
9 College of Medicine, Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai P.O. Box 50505, United Arab Emirates; abiola.senok@mbru.ac.ae or abiola.senok@dub
10 School of Dentistry, Cardiff University, Cardiff CF14 4XY, UK
* Correspondence: i.habib@uaeu.ac.ae; Tel.: +97-150-133-6803

check for updates

Citation: Habib, I.; Lakshmi, G.B.; Mohamed, M.-Y.I.; Ghazawi, A.; Khan, M.; Al-Rifai, R.H.; Abdalla, A.; Anes, F.; Elbediwi, M.; Khalifa, H.O.; et al. *Staphylococcus* spp. in Salad Vegetables: Biodiversity, Antimicrobial Resistance, and First Identification of Methicillin-Resistant Strains in the United Arab Emirates Food Supply. *Foods* **2024**, *13*, 2439. https://doi.org/10.3390/foods13152439

Academic Editor: Alberto Cepeda Sáez

Received: 30 June 2024
Revised: 18 July 2024
Accepted: 26 July 2024
Published: 2 August 2024

Abstract: Contamination of leafy greens with *Staphylococcus* spp. can occur at various stages, from farm to table. This study comprehensively analyzes the species diversity, resistance, and virulence factors of *Staphylococci* in salad vegetables from markets in th Emirates (UAE). A total of 343 salad items were sampled from three major cities in t May 2022 to February 2023 and tested for the presence of *Staphylococcus* spp. using sta based methods. Species-level identification was achieved using matrix-assisted las ionization-time of flight mass spectrometry. Antimicrobial susceptibility testing w using the VITEK-2 system with AST-P592 cards. Additionally, whole genome sequ of ten selected isolates was performed to characterize antimicrobial resistance dete toxin-related virulence factors. Nine *Staphylococcus* species were identified in 37.6% the tested salad items, with coagulase-negative *staphylococci* (CoNS) dominating (87. and *S. xylosus* being the most prevalent (89.4% [101/113]). *S. aureus* was found in 4.6 the salad samples, averaging 1.7 log10 CFU/g. One isolate was confirmed as methic *S. aureus*, harboring the *mecA* gene. It belonged to multi-locus sequence type ST-672 t384 and was isolated from imported fresh dill. Among the characterized *S. xylosus* (tested positive in the cefoxitin screen test, and 6.6% were non-susceptible to oxacillin. revealed that the cytolysin gene (*cylR2*) was the only toxin-associated factor found in *S.* a methicillin-sensitive *S. aureus* isolate harbored the Panton-Valentine Leukocidin (*Luk*: This research is the first to document the presence of methicillin-resistant *S. aureus* in chain. Furthermore, *S. xylosus* (a coagulase-negative *staphylococcus* not commonly scr

Journal of Agriculture and Food Research 17 (2024) 101237

Contents lists available at ScienceDirect

Journal of Agriculture and Food Research

journal homepage: www.sciencedirect.com/journal/journal-of-agriculture-and-food-research

Genomic insights into antimicrobial resistant *Salmonella* in internationally traded chicken meat: First baseline findings in the United Arab Emirates

Ihab Habib [a,b,c,*], Afra Abdalla [a,b], Mohamed-Yousif Ibrahim Mohamed [a,b], Akela Ghazawi [d], Mushtaq Khan [d], Mohammed Elbediwi [e,f], Febin Anes [a], Glindya Bhagya Lakshmi [a,b]

[a] *Veterinary Public Health Research Laboratory, Department of Veterinary Medicine, College of Agriculture and Veterinary Medicine, United Arab Emirates University, Al Ain P.O. Box 1555, United Arab Emirates*
[b] *ASPIRE Research Institute for Food Security in the Drylands (ARIFSID), United Arab Emirates University, Al Ain P.O. Box 15551, United Arab Emirates*
[c] *Department of Environmental Health, High Institute of Public Health, Alexandria University, Alexandria P.O. Box 21511, Egypt*
[d] *Department of Medical Microbiology and Immunology, College of Medicine and Health Sciences, United Arab Emirates University, Al Ain, P.O. Box 1555, United Arab Emirates*
[e] *Animal Health Research Institute, Agriculture Research Centre, Cairo, Egypt*
[f] *Evolutionary Biology, Institute for Biology, Freie Universität Berlin, Berlin, Germany*

ARTICLE INFO

Keywords:
Antibiotic resistance
Chicken
UAE
Salmonella
Genomic characterization

ABSTRACT

Non-typhoidal *Salmonella* is among the most prevalent foodborne zoonoses, challenging food safety and One Health worldwide. A dearth of knowledge exists regarding non-typhoidal *Salmonella* prevalence and genomic features within the United Arab Emirates (UAE), one of the top markets in chicken meat consumption worldwide. In this study, *Salmonella* was detected in 16 out of 254 (6.30 %, 95 % confidence interval: 3.64 %, 10.03 %) samples of imported frozen chicken carcasses sampled from UAE retails. Among the recovered serotypes, *S.* Minnesota; ST 548 (10/16) emerged as the most prevalent, trailed by *S.* Heidelberg; ST 15 (4/16), and then *S.* Kentucky; ST 198, and ST 152 (2/16). Antimicrobial resistance (AMR) was most prevalent against tetracycline (93.7 %), followed by ampicillin (68.7 %), and extended-spectrum cephalosporins (ceftriaxone and cefoxitin) (56.2 %); with 68.7 % (11/16) of the isolates classified as multidrug resistant (MDR). Whole-genome sequencing (WGS) analysis revealed the existence of 14 AMR genes, among which the bla_{CMY-2}, an AmpC cephalosporinases resistance gene, presented in 10 of the 16 isolates. Among the ten out of the eleven MDR *Salmonella* isolates, both IncC and Col(pHAD28) plasmid incompatibility types were concurrently featured. The range of virulence genes varied from 149 to 165 genes, with an average of 168 genes per isolate. Except for one isolate, all other isolates possessed type III secretion system (TTSS) related genes known to be encoded by the *Salmonella* pathogenicity island-1 (SPI-1). This study contributes to our global understanding of *Salmonella* epidemiology, specifically focusing on the Middle East. The insights gained from this study are significant in shaping import risk analyses aimed at mitigating *Salmonella* exposure risks through globally traded chicken. The research underscores the value of WGS as a crucial tool for substantiating evidence-based food safety hazard assessment.

1. Introduction

Non-typhoidal *Salmonella* is one of the most prevalent bacterial causes of foodborne illnesses in the Middle East and North Africa, imposing a considerable economic burden on global and local public health systems [1]. Human infections with *Salmonella* typically result from consuming contaminated foods and water and direct or indirect contact with infected animals and their environment. Gastroenteritis induced by non-typhoidal *Salmonella* manifests symptoms such as diarrhea, fever, vomiting, and abdominal cramps [2]. However, vulnerable populations such as children, immunocompromised individuals, and the elderly are more susceptible to severe manifestations and heightened risks of secondary complications [3]. The primary antibiotics employed in treating invasive *Salmonella* infections in humans, especially among children and the elderly, include ciprofloxacin and extended-spectrum cephalosporins [4]. Recently, the escalating prevalence of multidrug

* Corresponding author. Veterinary Public Health Research Laboratory, Department of Veterinary Medicine, College of Agriculture and Veterinary Medicine, United Arab Emirates University, Al Ain, United Arab Emirates.
E-mail address: i.habib@uaeu.ac.ae (I. Habib).

https://doi.org/10.1016/j.jafr.2024.101237
Received 14 February 2024; Received in revised form 17 April 2024; Accepted 31 May 2024
Available online 1 June 2024

Autof ms installation (Non-clinical)

US

AOAC Certification

Autobio 安图生物

The AOAC（Association of Official Agricultural Chemists） certification is the standard for confirmation method of reference methods (FDA, ISO, and USDA) in the scope of the food microbiology.

The study design is based on the current ISO 16140-6, Microbiology of the food chain - Method validation- Part 6: Protocol for the validation of alternative (proprietary) methods for Microbiological confirmation and typing procedures and the AOAC Appendix J Guidelines for Validation of Microbiological Methods for Food and Environmental Surfaces (2012). The maximum requirements in the study design are indeed taken into account to fulfill both standard/guidelines. The inclusivity and exclusivity testing will be run in the related Method Comparison Studies, and an inter-laboratory study will be organized for each target analyte

AOAC Certification Expected 2025Q3

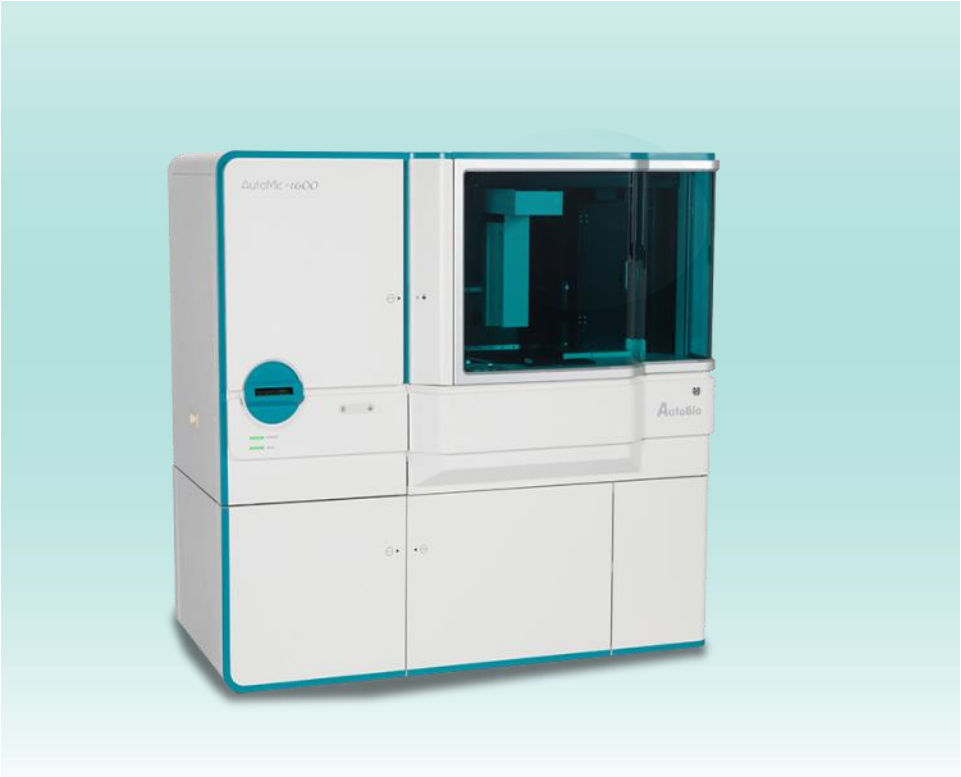
- OMA Claim - Confirmation of Salmonella spp.
  Confirmation of Cronobacter spp.
  Confirmation of Campylobacter spp.
  Confirmation of Legionella spp.
  Confirmation of Listeria spp. Including Listeria monocytogenes,
  Confirmation of Bacillus cereus group,
  Confirmation of yeast and molds,
  Confirmation of other Gram negative and Gram-positive organisms.

AOAC INTERNATIONAL

PART 4

ID&AST

ID/AST Solutions



Automated Microorganism Identification and Antimicrobial Susceptibility Testing Analyzer

AutoMic-i600

- Haute capacité de détection

  64 cards+120 wells

- Types de tests antimicrobiens

  26EB+20NF+23GP+19ST+10YE

- Détection en temps réel

  Surveillance continue et dynamique

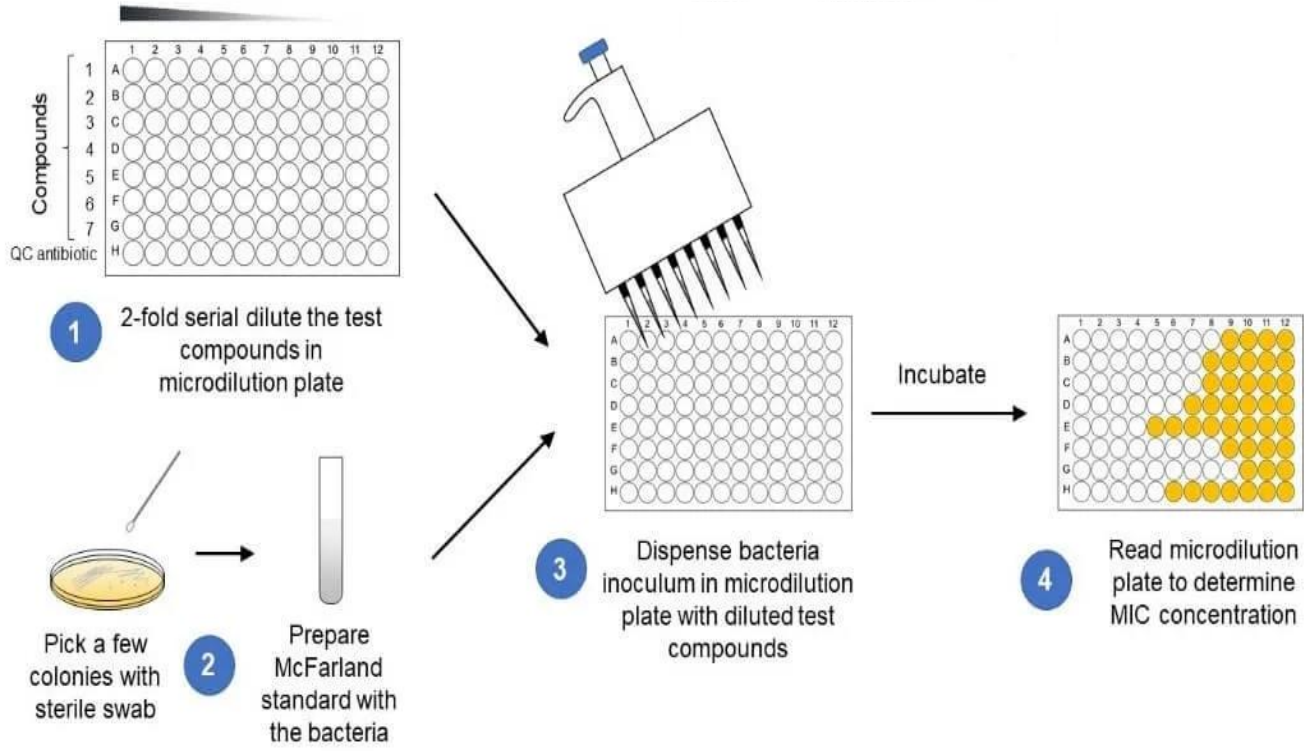
  Détection à 4 longueurs d'onde

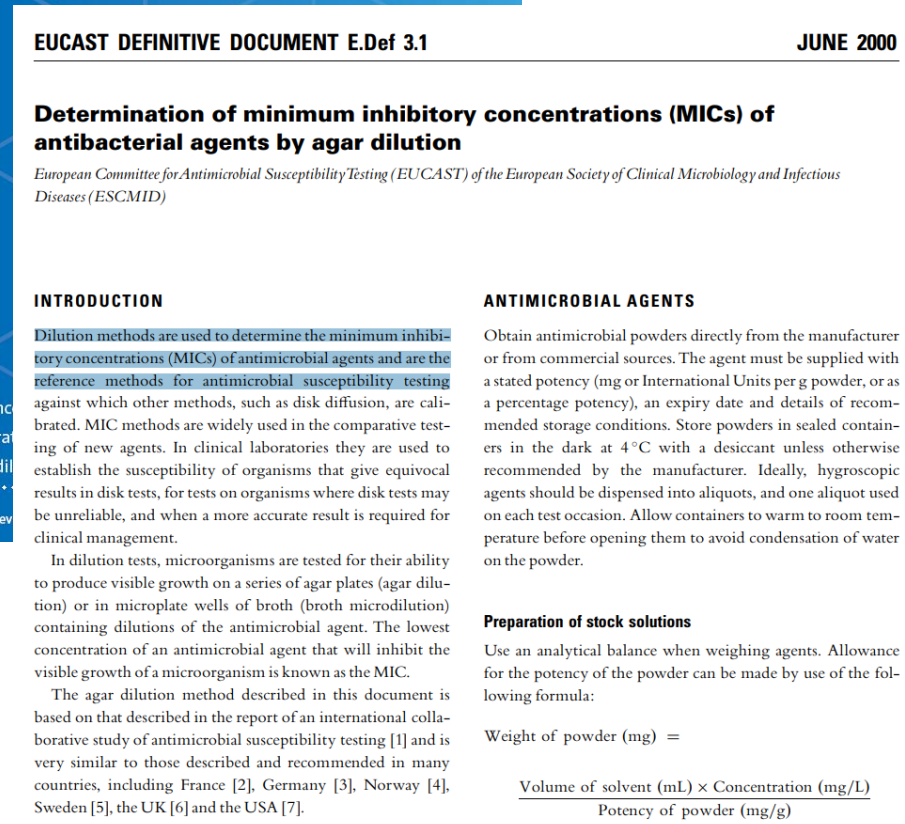
  2 méthodes (Colorimétrie, Turbidimétrie)

Méthode de référence

Méthode de microdilution en bouillon

——Le standard d'or des tests de sensibilité aux antimicrobiens (AST)





EUCAST DEFINITIVE DOCUMENT E.Def 3.1 JUNE 2000

Determination of minimum inhibitory concentrations (MICs) of antibacterial agents by agar dilution

European Committee for Antimicrobial Susceptibility Testing (EUCAST) of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID)

INTRODUCTION

Dilution methods are used to determine the minimum inhibitory concentrations (MICs) of antimicrobial agents and are the reference methods for antimicrobial susceptibility testing against which other methods, such as disk diffusion, are calibrated. MIC methods are widely used in the comparative testing of new agents. In clinical laboratories they are used to establish the susceptibility of organisms that give equivocal results in disk tests, for tests on organisms where disk tests may be unreliable, and when a more accurate result is required for clinical management.

In dilution tests, microorganisms are tested for their ability to produce visible growth on a series of agar plates (agar dilution) or in microplate wells of broth (broth microdilution) containing dilutions of the antimicrobial agent. The lowest concentration of an antimicrobial agent that will inhibit the visible growth of a microorganism is known as the MIC.

The agar dilution method described in this document is based on that described in the report of an international collaborative study of antimicrobial susceptibility testing [1] and is very similar to those described and recommended in many countries, including France [2], Germany [3], Norway [4], Sweden [5], the UK [6] and the USA [7].

ANTIMICROBIAL AGENTS

Obtain antimicrobial powders directly from the manufacturer or from commercial sources. The agent must be supplied with a stated potency (mg or International Units per g powder, or as a percentage potency), an expiry date and details of recommended storage conditions. Store powders in sealed containers in the dark at 4 °C with a desiccant unless otherwise recommended by the manufacturer. Ideally, hygroscopic agents should be dispensed into aliquots, and one aliquot used on each test occasion. Allow containers to warm to room temperature before opening them to avoid condensation of water on the powder.

Preparation of stock solutions

Use an analytical balance when weighing agents. Allowance for the potency of the powder can be made by use of the following formula:

$$\text{Weight of powder (mg)} = \frac{\text{Volume of solvent (mL)} \times \text{Concentration (mg/L)}}{\text{Potency of powder (mg/g)}}$$

ID/AST Solutions

AST

1. Gram-positive
2. Non-fermenters
3. Enterobacteriaceae
4. Streptococcus **β-hemolytic Streptococcus, Viridans Streptococci，etc.**
5. Fungus **Cryptococcus and Aspergillus etc.**

RIF 1	RIF 2	RIF 3	RIF 4	RIF 5	RIF 6	RIF 7	RIF 8	RIF 9	ERY 1	ERY 2	ERY 3
OXA 1	OXA 2	OXA 3	OXA 4	OXA 5	OXA 6	OXA 7	OXA 8	OXA 9	ERY 4	ERY 5	ERY 6
FOX 1	FOX 2	FOX 3	FOX 4	NIT 1	NIT 2	NIT 3	NIT 4	SXT 1	SXT 2	SXT 3	SXT 4
AMP 1	AMP 2	AMP 3	AMP 4	AMP 5	AMP 6	CPT 1	CPT 2	CPT 3	CPT 4	CPT 5	CPT 6
PEN 1	PEN 2	PEN 3	PEN 4	PEN 5	PEN 6	PEN 7	PEN 8	GEN 1	GEN 2	GEN 3	GEN 4
DAP 1	DAP 2	DAP 3	DAP 4	DAP 5	DAP 6	TEC 1	TEC 2	TEC 3	TEC 4	TEC 5	TEC 6
									VAN 6	VAN 7	ERY/CLI 1
		LNZ 3	LNZ 4	TGC 1	TGC 2	TGC 3	TGC 4	TGC 5	GEH 1	STH 1	CON
		CIP 3	CIP 4	CIP 5	CIP 6	TCY 1	TCY 2	TCY 3	TCY 4	TCY 5	TCY 6
MFX 1	MFX 2	MFX 3	MFX 4	MFX 5	CLI 1	CLI 2	CLI 3	CLI 4	CLI 5	CLI 6	CLI 7

Conception à 120 puits, De nombreux tests d'antibiotiques, une plage de concentrations plus large.

ID/AST

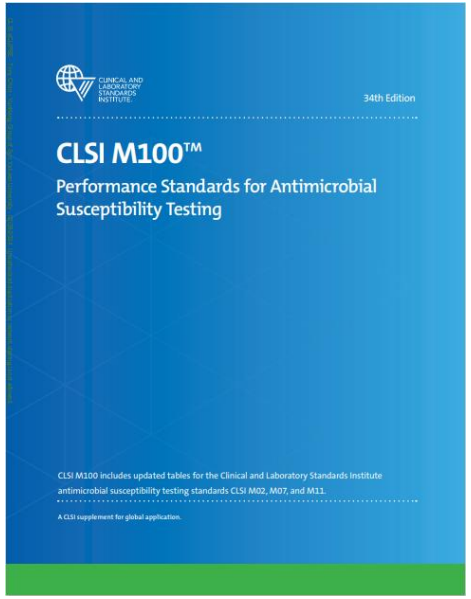
1. Gram-positive
2. Gram-negative
3. Yeast

Total ＞500

ID

1. Gram-positive
2. Gram-negative
3. *Neisseria* and *Haemophilus*

(Under development)



EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

Expected Resistant Phenotypes
Version 1.2 January 2023

FDA U.S. FOOD & DRUG ADMINISTRATION

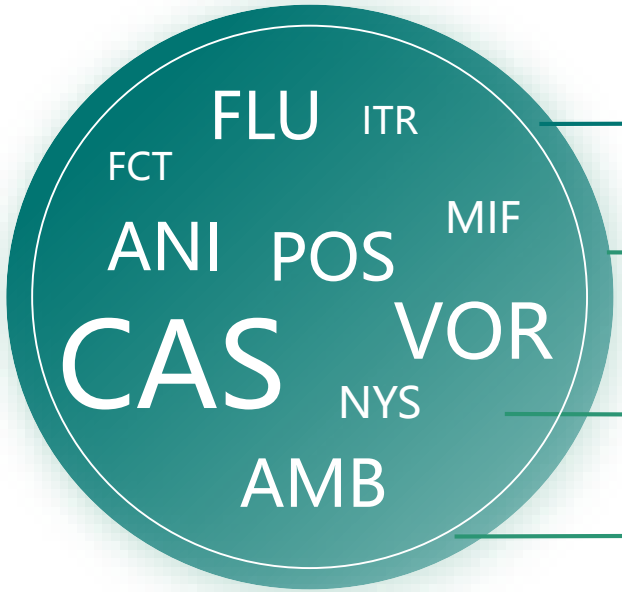
CLSI + EUCAST Règles d'expertise

Unique Fungal AST solution

	1	2	3	4	5	6	7	8	9	10	11	12
A	ANI 64	32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03
B	CAS 64	32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03
C	MIF 64	32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03
D	AMB 16	8	4	2	1	0.5	0.25	0.12	0.06	0.03	ITR 8	4
E	ITR 2	1	0.5	0.25	0.12	0.06	0.03	0.015	0.008	0.004	0.002	0.001
F	FLU 64	32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03
G	VOR 32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03	CON
H	POS 2	1	0.5	0.25	0.12	0.06	0.03	0.015	0.008	0.004	0.002	0.001
I	NYS 64	32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03
J	FCT 64	32	16	8	4	2	1	0.5	0.25	0.12	0.06	0.03

10 Agent antifongique

10-14 Concentrations



- Echinocandins: anidulafungin, caspofungin, micafungin
- Polyenes: amphotericin B, nystatin
- Azoles: fluconazole,posaconazole, itraconazole, voriconazole
- Pyrimidines: Flucytosine

Resistance phenotype detection

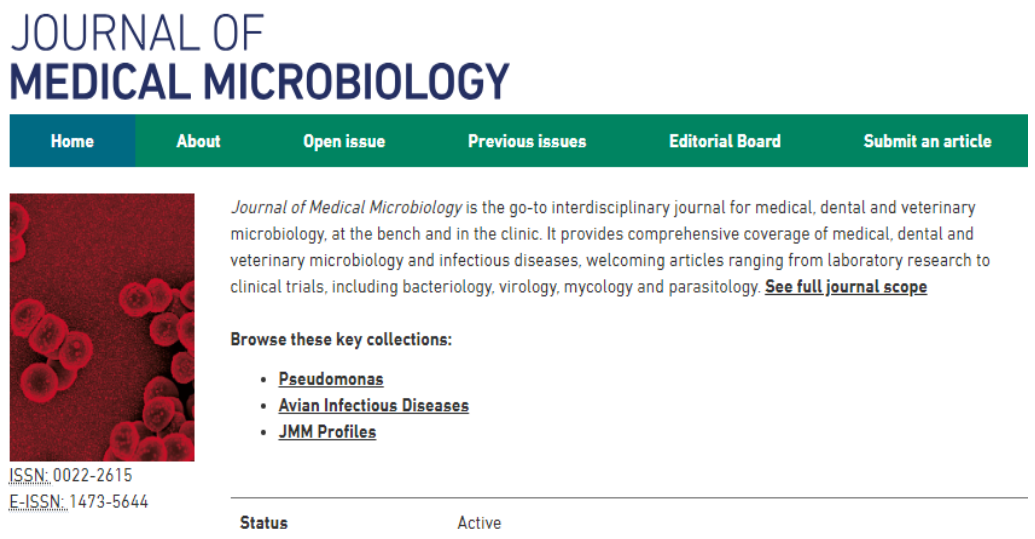
- **MRSA:** Methicillin-resistant *Staphylococcus aureus*
- **D test:** Erythromycin induces clindamycin resistance
- **VISA:** Vancomycin-mediated *Staphylococcus aureus*
- **VRSA:** Vancomycin-resistant *Staphylococcus aureus*
- **VRE:** Vancomycin-resistant *Enterococcus*
- **PRSP:** Penicillin-resistant *Streptococcus pneumoniae*
- **HLAR:** High-level aminoglycoside-resistant Enterococci
- **ESBL :** Extended-spectrum β-lactamase producing bacteria
- **CRE:** Carbapenem-resistant *Enterobacteriaceae*
- **FOX:** Cefoxitin Screening Test
- **CRAB:** Carbapenem-resistant *Acinetobacter baumannii*
- **CRPA:** Carbapenem-resistant *Pseudomonas aeruginosa*
- **CRKP:** Carbapenem-resistant *Klebsiella pneumoniae*

AutoMic-i600 Publications

《Novel automated antifungal susceptibility testing system for yeasts based on dual-detection algorithm of turbidimetry and colorimetry》

Plusieurs experts de l'Université médicale du Sud ont effectué une évaluation systématique du kit Autobio Fungus AST en le comparant à la méthode de dilution en microbroth:

- **Quality Control:** The quality control verification of all drugs by both methods was under control, and the repeatability was 100%.
- **EA:** In terms of clinical bacteria verification, the Essential agreement (EA) of 10 antifungal drugs was >95%, of which 4 drugs (micafungin, posaconazole, nystatin, 5-fluorocytosine) had a basic consistency of 100%.
- **CA:** The Categorical agreement (CA) of all antifungal drugs (except drugs without breakpoints) was >90%, and the CA of the remaining drugs except voriconazole was >95%. VMEs/MEs<3%.



AutoMic-i600 Publications

《 New Option for Antibiotic Susceptibility Testing in Clinical Practice: Performance Evaluation of AutoMic-i600 Automatic System Based on Broth Microdilution 》

- Based on the gold standard of broth microdilution (BMD), AutoMic-i600 showed high consistency of **93.2%/93.5% and 98.5%/97.8%** in AST of Gram-negative and Gram-positive bacteria, which is significantly better than the mainstream Vitek 2 system in the market. Especially in the detection of drug-resistant bacteria, AutoMic-i600 has a basic consistency of 98.1% and a classification consistency of 97.5%, far exceeding the 94.8% and 92.0% of Vitek 2, and the **VRE** is as low as 1.0%, ensuring accurate clinical decision-making.

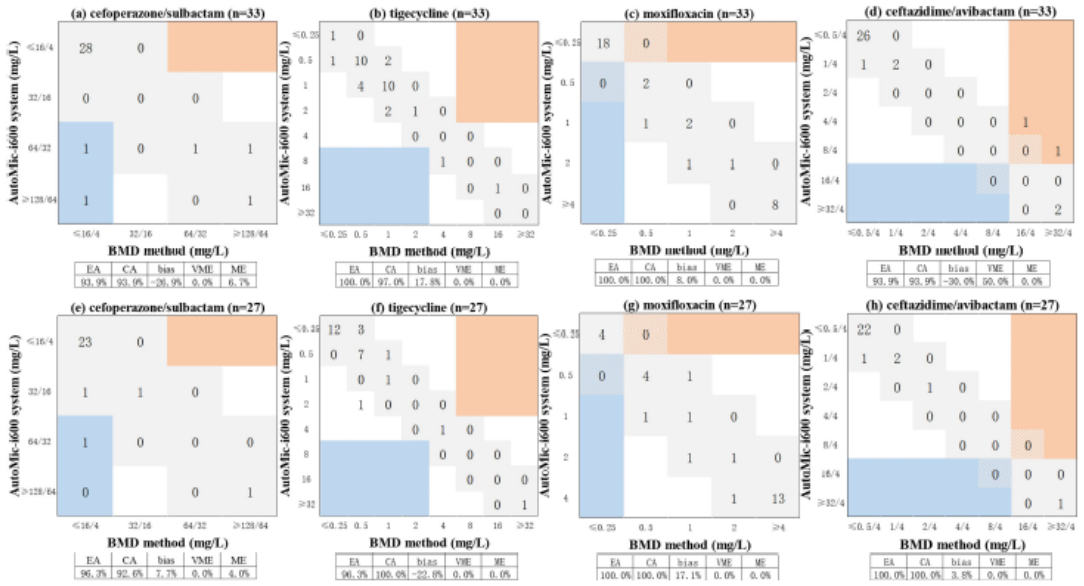


Figure 2 MICs of novel antibiotics for *K. pneumoniae* and *E. coli* using the AutoMic-i600 system compared with the BMD reference method. (a) Comparison of MICs obtained for cefoperazone/sulbactam-*K. pneumoniae* combination. (b) Comparison of MICs obtained for tigecycline-*K. pneumoniae* combination. (c) Comparison of MICs obtained for moxifloxacin-*K. pneumoniae* combination. (d) Comparison of MICs obtained for ceftazidime/avibactam-*K. pneumoniae* combination. (e) Comparison of MICs obtained for cefoperazone/sulbactam-*E. coli* combination. (f) Comparison of MICs obtained for tigecycline-*E. coli* combination. (g) Comparison of MICs obtained for moxifloxacin-*E. coli* combination. (h) Comparison of MICs obtained for ceftazidime/avibactam-*E. coli* combination. MICs corresponding to EA are in grey, VME in Orange and ME in blue. Hatching on the grey boxes within the orange (VME) and blue (ME) boxes corresponds to MICs that are also in the EA.
Abbreviations: VME, very major error; mE, minor error.

AutoMic-i600 Publications

Isolation and antifungal resistance analysis of 10 strains of *Candida auris*

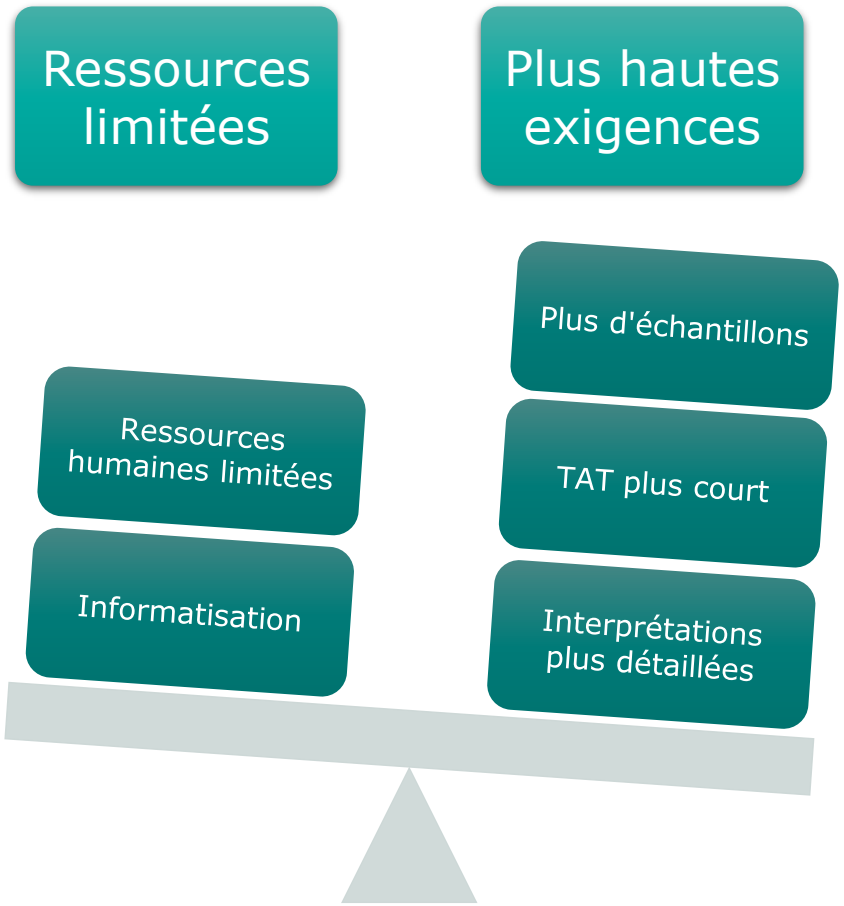
Table 1 Clinical characteristics of 10 cases of *Candida auris*

Case No.	Gender	Age (Years old)	Department	Sample source	Isolation date	Time from admission to first isolation of *Candida auris* (days)
1	Male	72	Surgical Intensive Care Unit	Skin secretions	October 27, 2023	74
2	Male	66	Surgical Intensive Care Unit	Aspirated sputum	September 22, 2023	31
3	Male	63	Medical Intensive Care Department Unit II	Central venous catheter	October 26, 2023	7
4	Female	66	Medical Intensive Care Department Unit II	Catheter	December 5, 2023	61
5	Female	77	Medical Intensive Care Department Unit III	Venous blood	December 7, 2023	65
6	Male	61	Medical Intensive Care Department Unit III	Venous blood	December 14, 2023	14
7	Male	38	Medical Intensive Care Department Unit IV	Bronchoalveolar lavage fluid	October 16, 2023	47
8	Male	63	Medical Intensive Care Department Unit IV	aspirated sputum	November 17, 2023	29
9	Male	40	Medical Intensive Care Department Unit IV	Bronchoalveolar lavage fluid	December 13, 2023	32
10	Male	41	General Rectal Surgery Department	Drainage fluid	December 19, 2023	11

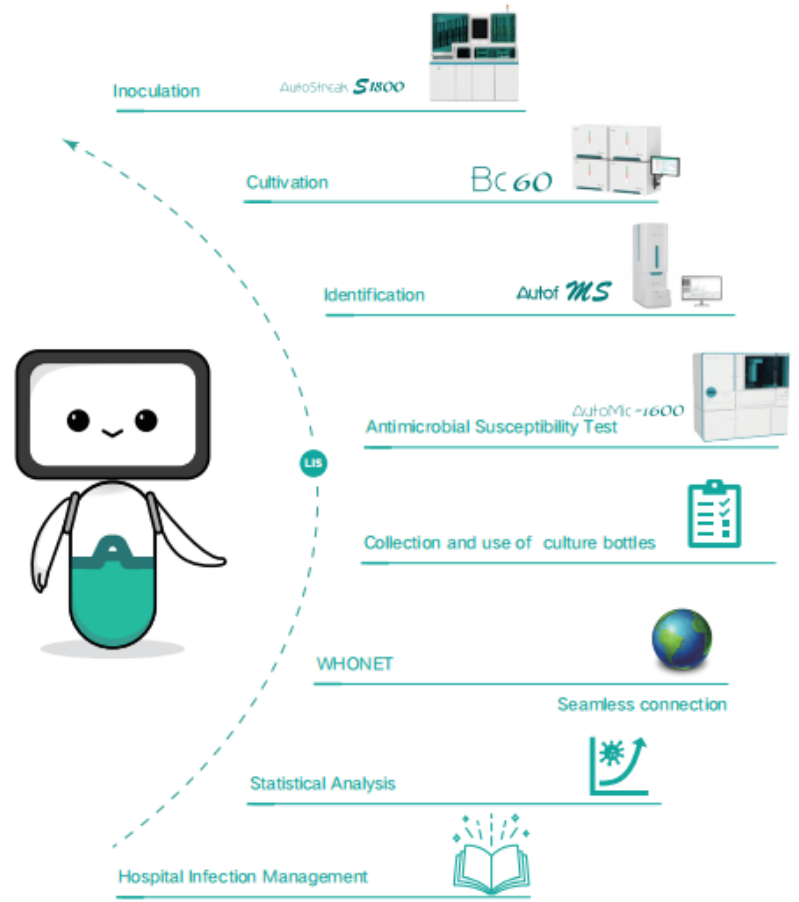
Candida auris is a multidrug-resistant, highly transmissible, and deadly fungus. Almost all international isolates of Candida auris are highly resistant to fluconazole, and a few are resistant to Echinocandins [1]; domestically isolated *Candida auris* are mostly sensitive strains, with a few resistant strains [2-3]. The drug sensitivity identification system used in this study was the Autobio fully automated microbial mass spectrometry system, and the drug sensitivity results showed that all **10 strains** of *Candida auris* were resistant to **fluconazole** and sensitive to **Echinocandins**, with **3 strains resistant to amphotericin B**. Further detection using E-test showed consistent results with the MIC.

[1] Ma Yilin. Current status and research progress of invasive super fungus Candida auris infection. Chinese Journal of Clinical Infectious Diseases, 2020, 13(6):460-466.
[2] Chen Y, Zhao J, Han L, et al. Emergency of fungemia cases caused by fluconazole-resistant Candida auris in Beijing, China[J]. J Infect, 2018, 77(6):561-571.
[3] Yang M, Duan X, Zhang S, et al. A case of candidemia caused by Candida auris[J]. Chinese Journal of Clinical Laboratory Science, 2022, 40(8):639-640.

Microbiology Laboratory Management System



La situation actuelle des laboratoires de microbiologie

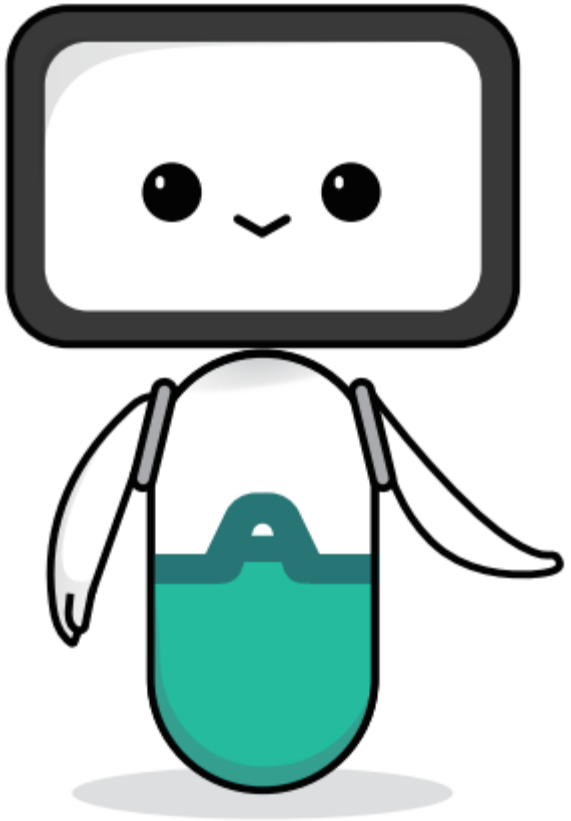


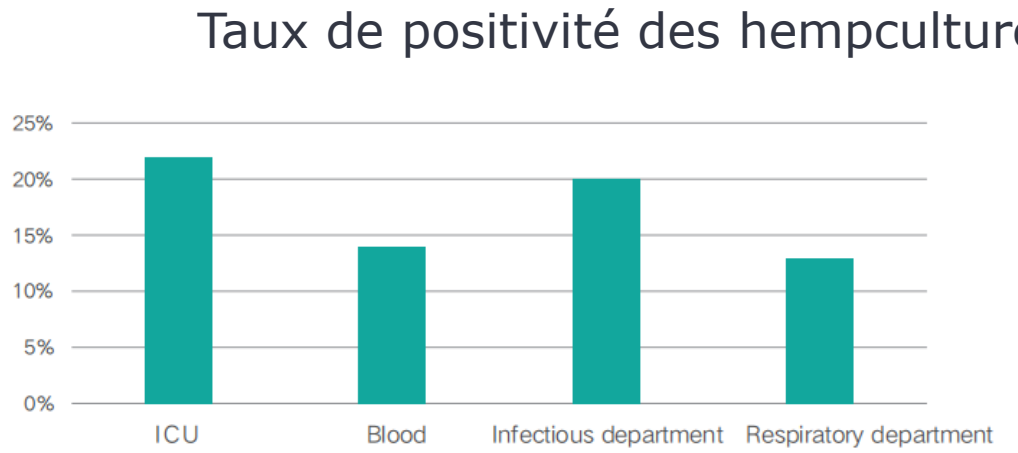
Une solution globale d’ informatisation pour la microbiologie

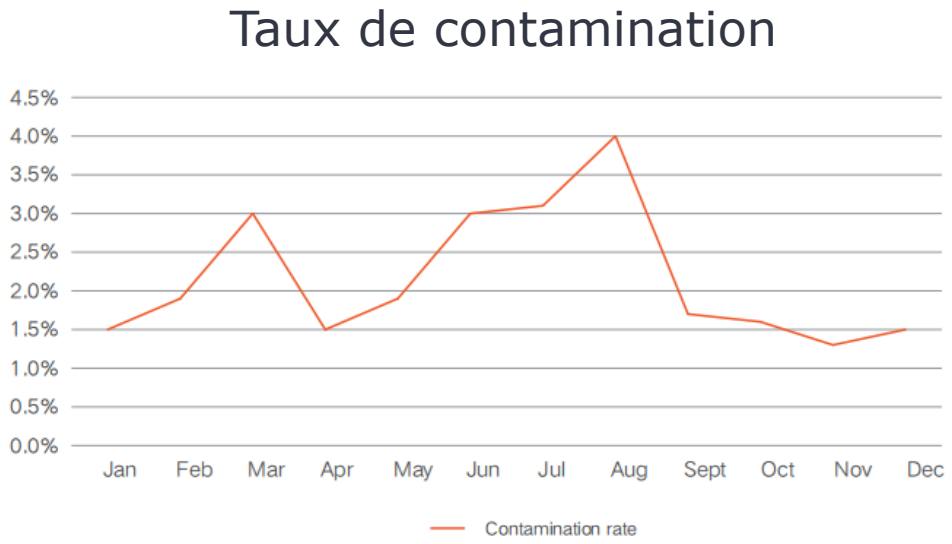
Amélioration de l'efficacité - Écran géant dédié à la microbiologie

- L'écran géant dédié à la microbiologie surveille chaque étape expérimentale.
- Il signale les résultats positifs des cultures sanguines par des alertes visuelles (couleurs), auditives (sons), etc.
- Il suit la transmission automatique des résultats d'identification (ID) à l'instrument de test de sensibilité aux antimicrobiens (AST).
- Il indique l'état d'achèvement des analyses ID/AST, ainsi que l'état de la chambre d'incubation.

L'analyse statistique des cultures de sang.



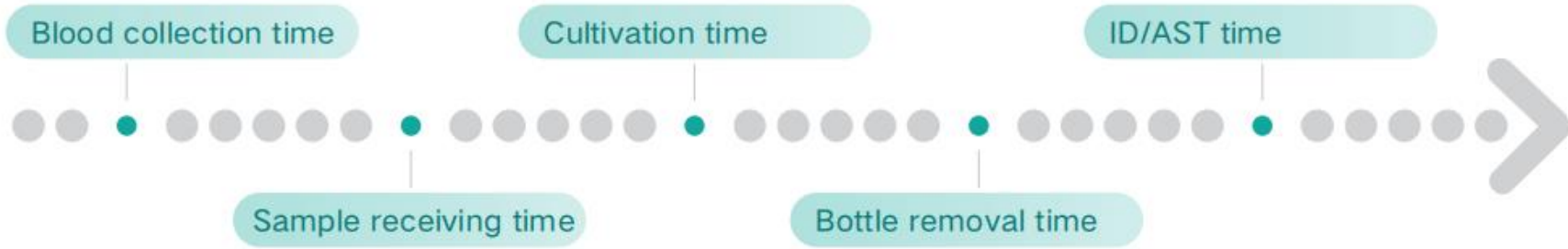




Briser les barrières de données - Optimisation des processus.

- Établir un pont entre les barrières de données entre les instruments. Les résultats de la MALDI sont automatiquement transmis à l'Automic-i600 sans transcription manuelle.

- Réduire le temps de diffusion du rapport final.



R&D Centers

Une équipe de R&D composée de 1800 personnes au total.

Zhengzhou
HQ, Reagents & Instrument R&D
Bioyuan, Immuno

Beijing
Clinical Chemistry Reagents R&D

Shenzhen
Instrument R&D

United States
Los Angles
Autoimmune product R&D

Suzhou
Coagulation R&D

Shanghai
Precision Medicine R&D

Manufacture

Autobio a toujours privilégié la qualité des produits et une excellente fabrication dans ses priorités de développement..

Autobio Microbial installation

Thanks!

Your Reliable Partner in Diagnostics

Autobio Diagnostics Co., Ltd.

Add: No.199, 15th Ave, National Eco & Tech Zone, Zhengzhou, China

E: info@autobio-diagnostics.com

W: https://en.autobio.com.cn