

MALDI Biotyper

Enabling rapid detection of carbapenemase activity



The raise of multi-resistant bacteria is an ever increasing health-care threat demanding reliable, rapid and cost-efficient assays for detection of resistances. Amongst the different resistance mechanisms used by bacteria, an important one is the enzymatic inactivation of antibiotics by carbapenemases.

MALDI-TOF beyond microorganism identification

The MBT STAR-Carba IVD Kit in combination with the MBT STAR-BL IVD Module allows rapid identification of bacteria and detection of carbapenemase activity in one workflow. This is the first mass spectrometric resistance assay expanding the application of MALDI-TOF mass spectrometry in clinical microbiology beyond microorganism identification.



The MBT STAR-Carba Assay principle

The MBT STAR-Carba IVD Kit uses a benchmark carbapenem antibiotic. Incubation of carbapenemase producing bacteria with the antibiotic reagent results in cleavage (hydrolysis) of the antibiotic's β -lactam ring, hence converting the antibiotic into an inactive metabolite. Incubation time is only 30 minutes for *Enterobacteriaceae* and *Pseudomonas spp.* and 60 min for *Acinetobacter spp.*

After incubation, cleavage of the benchmark antibiotic is monitored by detection of a specific mass shift in the MALDI-TOF mass spectrum (Figure 1).

This fully automated monitoring is performed by the MBT STAR-BL IVD Module – an addition to the regular MBT Compass IVD software. Based on acquired mass spectra of the incubated solution, an automatic intensity calculation of the antibiotic peaks and corresponding ratio hydrolyzed / non-hydrolyzed is performed. The resulting report is easy to interpret by means of color codes, as shown in Figure 2.

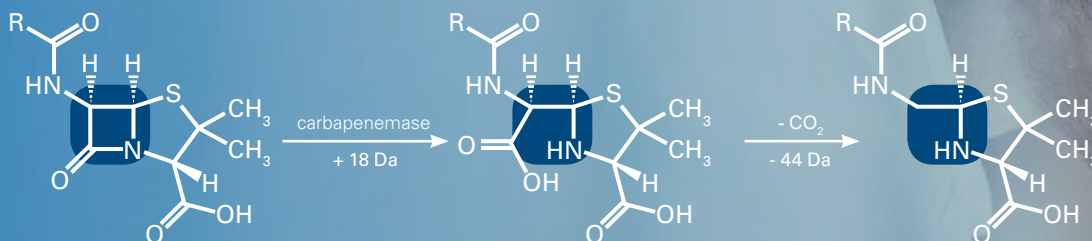


Figure 1: Hydrolysis of an antibiotic's β -lactam ring leads to mass shifts that can easily be detected by MALDI-TOF mass spectrometry

Sample	Species	Control ID	Carba
Sample 1	<i>Klebsiella pneumoniae</i>	confirmed	1.09 H
Sample 2	<i>Klebsiella pneumoniae</i>	confirmed	0.98 H
Sample 3	<i>Escherichia coli</i>	confirmed	0.02 NH
neg.control		not performed	-0.03 NH
pos.control		not performed	1.09 H
Δ controls			1.47

H	Hydrolyzed ¹
NH	Non-hydrolyzed ²

Figure 2 : Result report allowing easy and objective interpretation of the detection of carbapenemase activity
¹ carbapenemase activity detected; ² no carbapenemase activity detected

What is the MBT STAR-Carba Assay good for?

The MBT STAR-Carba Assay is designed ...

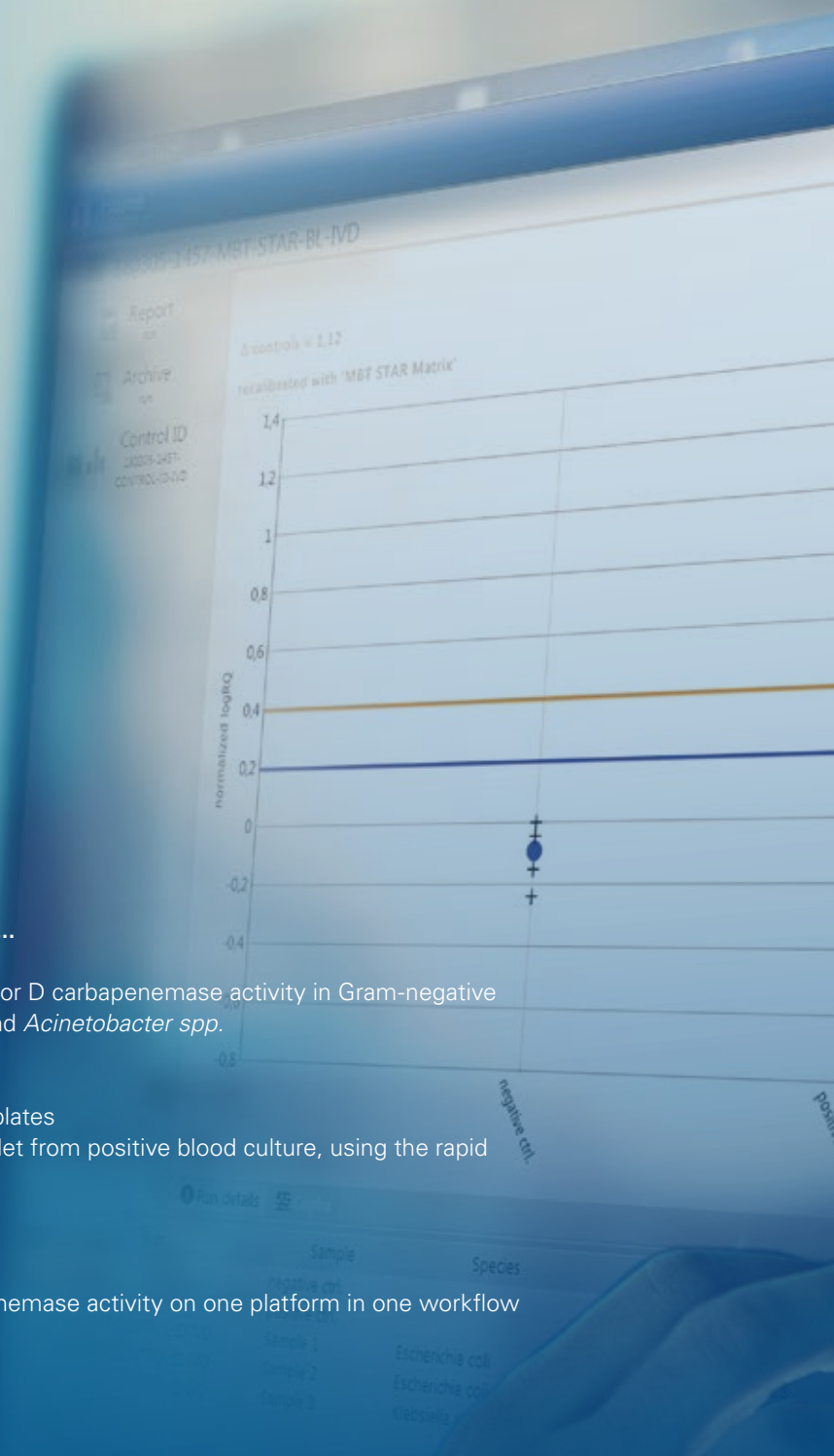
... for rapid detection of prevalent Class A, B or D carbapenemase activity in Gram-negative *Enterobacteriaceae*, *Pseudomonas spp.* and *Acinetobacter spp.*

And can be used for ...

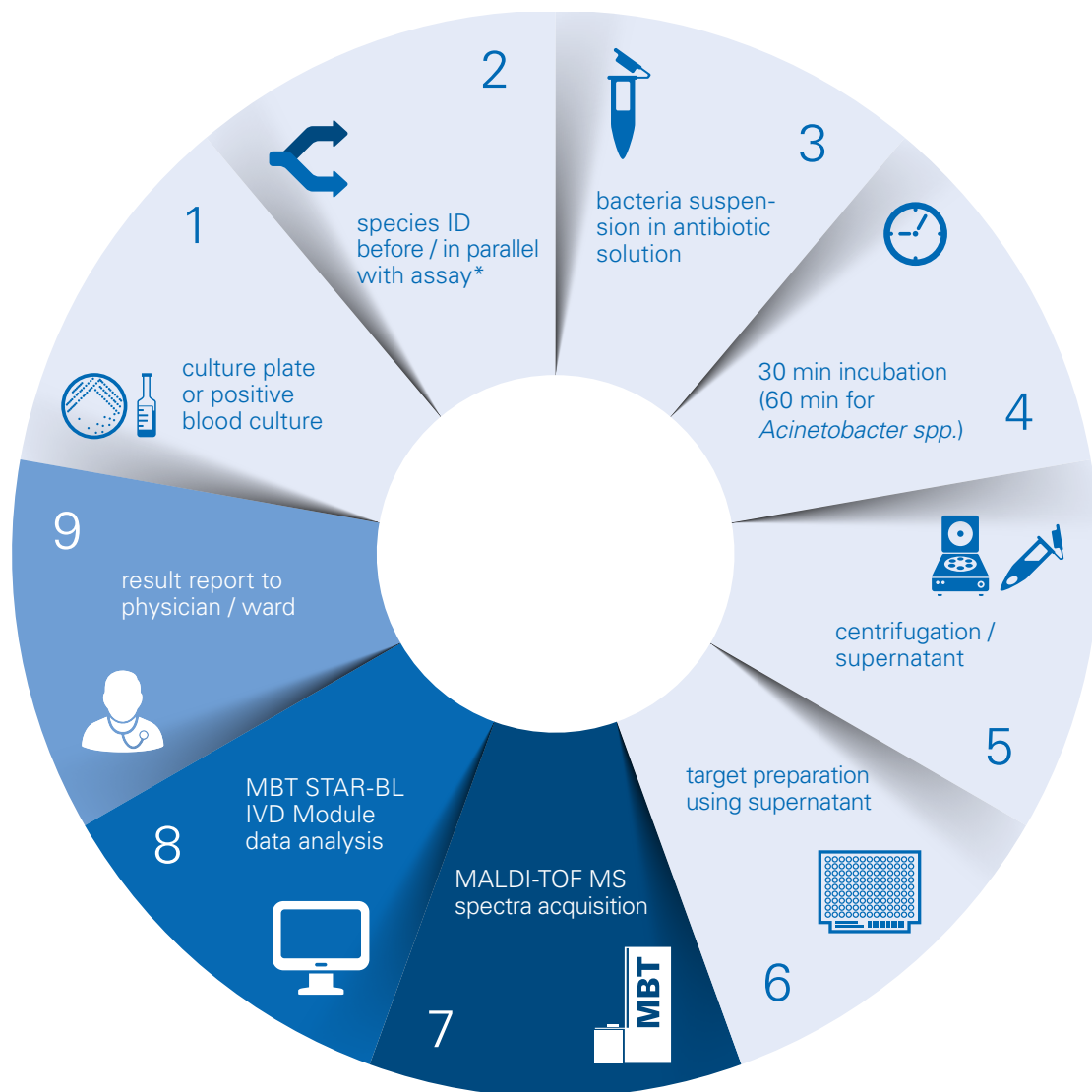
- microorganisms derived from subculture plates
- microorganisms isolated as a bacterial pellet from positive blood culture, using the rapid MBT Sepsityper IVD Kit workflow
- screening and confirmation purposes

And allows to ...

... rapidly identify bacteria and their carbapenemase activity on one platform in one workflow



Identification of microorganisms and detection of their carbapenemase activity on one system



* The detection workflow is always coupled with identification of the respective microorganism. This can be done after an initial identification run by selecting respective samples for subsequent carbapenemase activity testing, or by parallel identification and carbapenemase activity testing.

Order Information

Pre-requisite for the MBT STAR-Carba IVD Assay is the MBT Compass IVD (Part-No. 1832771).

Part-No. 1848467

MBT STAR-Carba IVD Kit

The MBT STAR-Carba IVD Kit provides all necessary reagents and components to conduct the carbapenemase assay.

Part-No. 1850907

MBT STAR-BL IVD Module

Software for the analysis of co-incubation assays for the detection of carbapenemase activity in bacteria. Incl. 2 licenses to install MBT STAR-BL IVD Module on the acquisition system and on one additional client PC.

Part-No. 1834338

MBT Sepsityper IVD Kit

For the isolation of microorganisms from positive blood culture. Please refer to the specific product information.

Quality control strains:

K. pneumoniae ATCC® BAA-1705™ (positive control) and *K. pneumoniae* ATCC® 700603™ (negative control) are recommended for the performance of the MBT STAR-Carba IVD Assay.

Please contact your local representative for availability in your country.
Not for sale in the USA.

MALDI Biotyper, MBT STAR and Sepsityper are registered trademarks of Bruker Daltonik GmbH in the European Union and the USA.

 **Bruker Daltonik GmbH**

Bremen · Germany
Phone +49 (0)421-2205-0



ms.sales.bdal@bruker.com - www.bruker.com/microbiology