



"Ready & Easy-to-use" kits.  
Lyophilised product



Transport and storage at room temperature.  
Shelf-life: 24 months



Validated according to ISO 13485  
and CE marked

## CTX, TEM, SHV & mcr

- ▶ **β-Lactams** are the most widely used class of antibiotics. Since the discovery of benzylpenicillin in the 1920s, new penicillin derivatives and related β-lactam classes of cephalosporins, cephamycins, monobactams, and carbapenems have been discovered. Each new class of β-lactam has been developed either to increase the spectrum of activity to include additional bacterial species or to address specific resistance mechanisms that have arisen in the targeted bacterial population. Resistance to β-lactams is primarily because of bacterially produced β-lactamase enzymes that hydrolyze the β-lactam ring, thereby inactivating the drug. The newest effort to circumvent resistance is the development of novel broad-spectrum β-lactamase inhibitors that work against many problematic β-lactamases, including cephalosporinases and serine-based carbapenemases, which severely limit therapeutic options.

On the other hand, only two polymyxins, polymyxin E (colistin) and polymyxin B, are currently commercially available. Colistin has re-emerged as a last-hope treatment in the mid-1990s against multidrug-resistant Gram-negative pathogens due to the development of extensively drug-resistant Gram-negative bacteria. Unfortunately, rapid global resistance towards colistin has emerged following its resurgence. Different mechanisms of colistin resistance have been characterized, including intrinsic, mutational, and transferable mechanisms.

Multidrug-resistant pathogens are a serious problem not only making treatment difficult but also worsening the prognosis of infected patients.

The detection of the common ESBL genes such as TEM, SHV and CTX-M by molecular methods in the ESBL producing bacteria and their patterns of antimicrobial resistance can provide useful information about their epidemiology and can aid a rational antimicrobial therapy.

- ▶ **VIASURE CTX, TEM, SHV & mcr Real Time PCR Detection Kit** is designed for the diagnosis family-specific CTX-M, TEM and SHV genes in gram-negative bacteria associated to resistances in clinical samples. After DNA isolation, the detection of β-lactamases (CTX-M, TEM, SHV) and colistin (mcr-1) resistance genes is performed by the amplification of a conserved region of the BlaCTX-M1, BlaCTX-M9, (Cluster A or BlaCTX-M-A), BlaCTX-M-2, BlaCTX-M-8, BlaCTX-M25 (Cluster B or BlaCTX-M-B), BlaTEM, BlaSHV genes for β-lactamases resistances and mcr-1 gene for colistin resistances, using specific primers and fluorescent-labelled probes.

## CTX, TEM, SHV & mcr

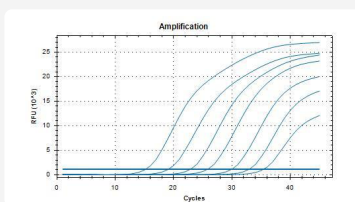
**VIASURE CTX, TEM, SHV & mcr Real Time PCR Detection Kit** for the qualitative detection and differentiation of family-specific  $\beta$ -lactamases *CTX-M*, *TEM* and *SHV*; and *mcr-1 colistin* genes in gram-negative bacteria associated to resistances in blood culture and swab samples, BAS, BAL and sputum specimens by their healthcare professional (HCP).

This test is intended to be used as an aid in the diagnosis of family-specific *CTX-M*, *TEM* and *SHV*; and *mcr-1* genes in gram-negative bacteria in clinical samples in both, surveillance and timely identification of antibiotic-resistant infections and colonization, in combination with clinical and epidemiological risk factors.

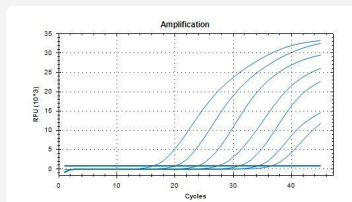
DNA is extracted from clinical specimens amplified using real time PCR and detected using fluorescent reporter dye probes specific for *CTX-M*, *TEM*, *SHV* and *mcr-1* genes resistances.

### ► Analytical sensitivity

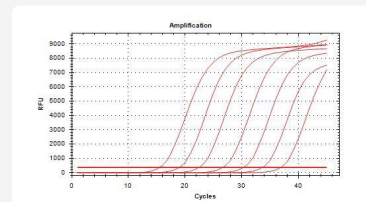
**VIASURE CTX, TEM, SHV & mcr Real Time PCR Detection Kit** has a detection limit of 0.02 CFU per reaction for  $\beta$ -lactamase resistance gene *CTX* (*BlaCTX-M1*, *BlaCTX-M9*, (Cluster A or *BlaCTX-M-A*) and *BlaCTX-M2*, *BlaCTX-M8*, *BlaCTX-M25* (Cluster B or *BlaCTX-M-B*)), 0.08 CFU per reaction for  $\beta$ -lactamase resistance gene type *TEM* (*BlaTEM* gene), 8.75 copies per reaction for  $\beta$ -lactamase resistance gene type *SHV* (*BlaSHV* gene), and 0.02 CFU per reaction for colistin resistance gene *mcr-1*, with a positive rate of 95%. (Figures 1, 2, 3, 4 and 5).



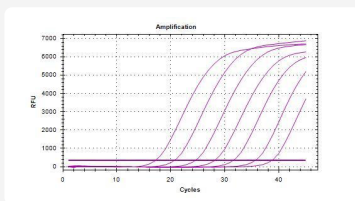
**Figure 1.** Dilution series of CTX-M-1 and CTX-M-9 gene ( $10^7$ - $10^1$  copies/rxn) template run on the CFX96TM Real-Time PCR Detection System (Bio-Rad) (channel FAM).



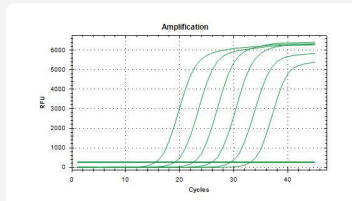
**Figure 2.** Dilution series of CTX-M-2, CTX-M-8 and CTX-M-25 gene ( $10^7$ - $10^1$  copies/rxn) template run on the CFX96TM Real-Time PCR Detection System (Bio-Rad) (channel FAM).



**Figure 3.** Dilution series of CTX-M-1 and CTX-M-9 gene ( $10^7$ - $10^1$  copies/rxn) template run on the CFX96TM Real-Time PCR Detection System (Bio-Rad) (channel FAM).



**Figure 4.** Dilution series of *mcr-1* genes ( $10^7$ - $10^1$  copies/rxn) template run on the CFX96TM Real-Time PCR Detection System (Bio-Rad) (channel Cy5).



**Figure 5.** Dilution series of TEM genes ( $10^7$ - $10^1$  copies/rxn) template run on the CFX96TM Real-Time PCR Detection System (Bio-Rad) (channel HEX).

### ► References - VIASURE CTX, TEM, SHV & mcr Real Time PCR Detection Kit

1 x 8-well strips, low profile ..... VS-BLC101L  
6 x 8-well strips, low profile ..... VS-BLC106L  
12 x 8-well strips, low profile ..... VS-BLC112L  
96-well plate, low profile ..... VS-BLC113L  
4 tubes x 24 reactions ..... VS-BLC196T  
2 x 4-well strips, Rotor-Gene® ..... VS-BLC101

1 x 8-well strips, high profile ..... VS-BLC101H  
6 x 8-well strips, high profile ..... VS-BLC106H  
12 x 8-well strips, high profile ..... VS-BLC112H  
96-well plate, high profile ..... VS-BLC113H  
9 x 4-well strips, Rotor-Gene® ..... VS-BLC136  
18 x 4-well strips, Rotor-Gene® ..... VS-BLC172