IVD solutions through partnership

Mast Group

MASTISOPLEX®
VTEC & E.coli O157

Individual Kits for the Rapid Detection of VTEC and *E.coli* O157

- Multiplex with novel probe technology
- For the detection of VT1 and VT2
- For the detection of *E.coli* O157
- Inhibition controls included in each test
- Results achieved in 40 minutes

Introduction

Escherichia coli is a Gram-negative, rod-shaped bacterium commonly found in the gastrointestinal tract of humans and warm-blooded animals. While most *E.coli* constitute the commensal flora of the gastrointestinal tract, there are a number of pathogenic *E.coli* strains which can cause a variety of illness in humans and animals.[1]

Verotoxin-producing *Escherichia coli* (VTEC) is one of the major causes of food-borne illness in humans, particularly *E.coli* O157. It is transmitted via the faecal-oral route when food becomes contaminated with the faeces of infected animals, predominantly cattle. The main virulence factors (genes) identified for human pathogenic VTEC are those encoding for verotoxins (VT1, VT2). VTEC causes the onset of bloody diarrhoea and has the potential to cause infections of a more severe nature including haemolytic uraemic syndrome (HUS), which can be problematic for infants often causing renal failure.[1]

Rapid detection and identification of VTEC is essential in order to maintain infection control and carry out vital monitoring. The majority of microbiology laboratories use traditional culture methods to perform a single screen for VTEC-O157 such as Sorbitol MacConkey Agar supplemented with cefixime tellurite (CT-SMAC). However, this can result in other serogroups and Sorbitol-fermenting-O157 strains being overlooked, with an average of 80% of cases going undetected.[2]

Using novel MAST patented probe technology [3]

MAST ISOPLEX® *VTEC* & **MAST** ISOPLEX® *E.coli* O157 use loop mediated isothermal amplification (LAMP) technology and come in a convenient lyophilised format.

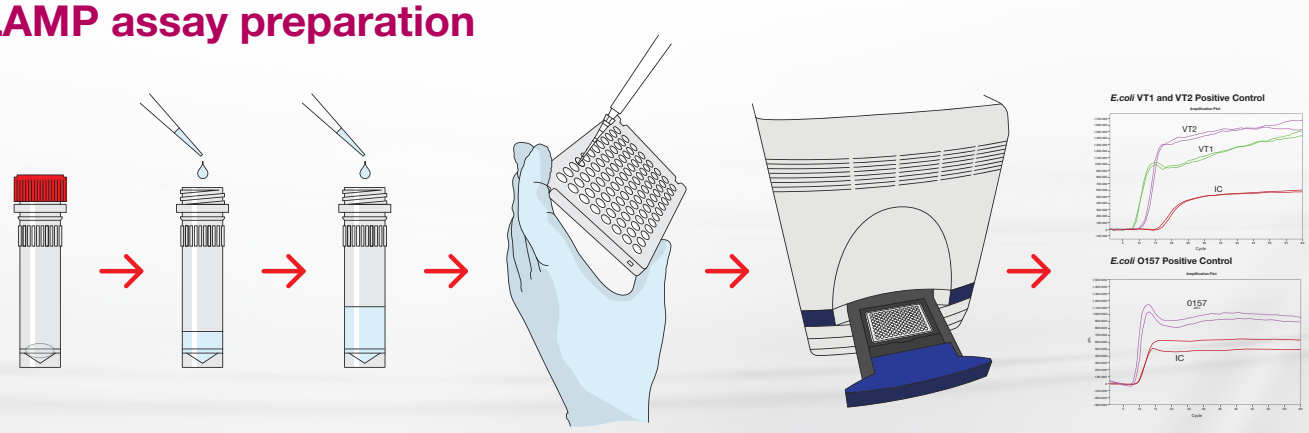
For use with real time thermal cyclers with FAM, TAMRA and CY5 channels

MAST ISOPLEX® *VTEC* kit is optimised for typing of VTEC variants 1 and 2 (VT1 and VT2). VT1 and VT2 genes can be detected simultaneously in a triplex assay format with an inhibition control DNA (IC DNA).

For use with real time thermal cyclers with FAM and TAMRA channels

MAST ISOPLEX® *E.coli* O157. The kit contains reagents for detection of Perosamine synthetase (RfbE) expressed by *E.coli* O157. *E.coli* O157 genes can be detected simultaneously in a duplex assay format with an inhibition control DNA (IC DNA).

LAMP assay preparation



Microtube containing VTEC or *E.coli 0157* Pellet

Resuspend pellet in reconstitution buffer

Add Primer and Probe mix with inhibition control DNA.

Pipette 10µl of reaction mix into reaction wells, add DNA

Place in real-time analyser

Read and interpret results with ease

Benefits

Kits contain inhibition controls

- Reducing false-negative results.

Differentiation between VT1 and VT2

- **MAST** ISOPLEX® *VTEC* detects VT1 and VT1 genes simultaneously

E.coli O157 gene detected

- **MAST** ISOPLEX® *E.coli* O157 detects *E.coli* O157 gene

Highly specific and sensitive

- Highly efficient amplification process can detect femtogram levels of target DNA

Rapid & easy to use

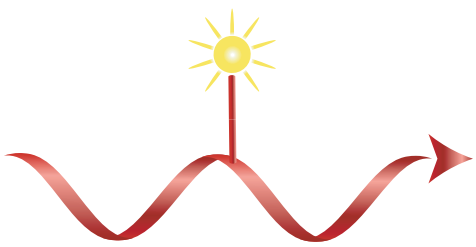
- Results within 40 minutes, permitting rapid reporting and effective outbreak monitoring

CE marked kits

- **MAST** ISOPLEX® *VTEC* and **MAST** ISOPLEX® *E.coli* O157 can be applied within clinical laboratories.

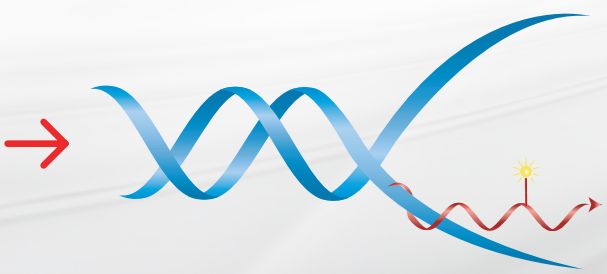
Novel probe technology enabling multiplexing

MAST ISOPLEX® LAMP assays rely on 6 specific primers that recognise 8 locations within a target DNA sequence. **MAST** ISOPLEX® Probe technology[3] consists of single gene-specific oligonucleotides labelled with a fluorophore of choice. These oligonucleotides are incorporated into LAMP primer sets against targets of interest and enable accurate, real-time detection and amplification of target DNA.

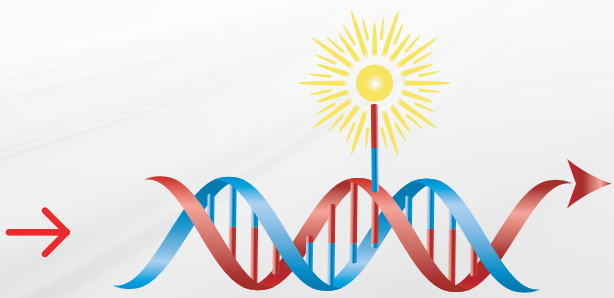


Single stranded primer with fluorophore

Double stranded DNA



Displacement by DNA polymerase.
Single stranded primer with fluorophore binds to the DNA.



Extended primer fluorescence occurs with primer elongation into double stranded product

Kit Contents

MAST ISOPLEX VTEC	Quantity
LAMP Pellets (PEL1) **Red Cap**	X2
VTEC Primer and Probe Mix with Inhibition Control DNA (PP1) **White Cap**	X2
Positive Control DNA **Green Cap**	X1
Reconstitution Buffer **Yellow Cap**	X1
Molecular Grade Water **Black Cap**	X1

MAST ISOPLEX *E.coli* O157	Quantity
LAMP PELLETS (PEL2) **Violet Cap**	X2
E.coli O157 Primer and Probe Mix with Inhibition Control DNA (PP2) **Blue Cap**	X2
Positive Control DNA **Brown Cap**	X1
Reconstitution Buffer **Yellow Cap**	X1
Molecular Grade Water **Black Cap**	X1

Ordering Information

Order Code	Product	Pack Size
67DNALY3	**MAST** ISOPLEX® *VTEC (*DNA/LYO3)	20 Tests
67DNALY4	**MAST** ISOPLEX® *E.coli O157 (*DNA/LYO4)	20 Tests

References

1. Public Health England (www.gov.uk) 2018 - Interim Public Health Operational Guidance for Shiga toxin producing *Escherichia coli* (STEC)

2. Van Duynhoven, Y.T. H. P. et al. 2008. Prevalence, characterisation and clinical profiles of Shiga toxin producing *Escherichia coli* in The Netherlands. *Clin Microbiol Infect* **14**, 437 – 445

3. Suwara MI, Javed S, Gillies EA. Nucleic acid probe with single fluorophore label bound to internal cytosine for use in loop mediated isothermal amplification. World intellectual Property Organization WO2015/063498.

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