



# Enterosystem 24R

System for the identification of Gram-negative, oxidase negative enterobacteria.

**Ref. 71619 - 79619**

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# Enterosystem 24R

System for the identification of Gram-negative, oxidase negative enterobacteria.

## DESCRIPTION

Enterosystem 24R is a 24-well system containing desiccated biochemical substrates for the identification of Gram-negative bacteria that belong to the family of Enterobacteriaceae. The system is inoculated with the suspension of the organism to be examined and incubated in thermostat. The wells are examined for color changes and the resulting pattern of positive and negative reactions determines the numerical profile used for identification. The complete list of those organisms that is possible to identify with this system is provided in the Identification Table at the end of this document.

## CONTENT OF THE PACKAGE

Ref. 71619	Ref. 79619
<ul style="list-style-type: none"> <li>• 20 Enterosystem 24R</li> <li>• 20 Vials of Physiological Solution (7.0 mL)</li> <li>• 1 Cartridge of Xylose Disc (20 discs)</li> <li>• 1 Cartridge of Arabinose Disc (20 discs)</li> <li>• Instructions sheet and Data chart</li> </ul>	<ul style="list-style-type: none"> <li>• 4 Enterosystem 24R</li> <li>• 4 Vials of Physiological Solution (7.0 mL)</li> <li>• 1 Cartridge of Xylose Disc (20 discs)</li> <li>• 1 Cartridge of Arabinose Disc (20 discs)</li> <li>• Instructions sheet and Data chart</li> </ul>

## ITEMS NECESSARY BUT NOT INCLUDED IN THE PACKAGE

- Enterosystem 18R Reagent (ref. 80252): Vaseline Oil, Indole Test Reagent, VP Test Reagents
- Gram Color Kit (ref. 80293)
- Oxidase Test Stick (ref. 88029)
- McFarland 0.5 Barium Sulphate Standard (ref. 80400)
- Identification Software online (free-access)

## PRINCIPLE OF THE METHOD

Enterosystem 24R allows the identification of Gram-negative, oxidase negative enterobacteria of clinical significance. 24 different tests are carried out, each in every single well of the system. These wells are inoculated with a bacterial suspension that reconstitutes the dehydrated media contained in. The reactions occurring in the wells during incubation produce color changes which are read according to the Interpretive Table. The organism numerical profile is determined and the identification is obtained by using the Identification Software on Liofilchem website.

## CONFIGURATION

Well	Test	Well	Test
<b>1-ONPG</b>	Hydrolysis of ONPG (Ortho-nitrophenyl- $\beta$ -galactoside)	<b>13-MAN</b>	Utilization of mannitol
<b>2-LDC</b> □	Decarboxylation of lysine	<b>14-INO</b>	Utilization of inositol
<b>3-ODC</b> □	Decarboxylation of ornithine	<b>15-SOR</b>	Utilization of sorbitol
<b>4-ADC</b> □	Decarboxylation of arginine	<b>16-SAC</b>	Utilization of saccharose
<b>5-PD</b>	Deamination of phenylalanine	<b>17-ARA</b>	Utilization of arabinose
<b>6-CIT</b>	Utilization of citrate	<b>18-RAF</b>	Utilization of raffinose
<b>7-UR</b> □	Hydrolysis of urea	<b>19-RAM</b>	Utilization of rhamnose
<b>8-H<sub>2</sub>S</b> □	Production of hydrogen sulphide	<b>20-MEL</b>	Utilization of melibiose
<b>9-MLN</b>	Utilization of malonate	<b>21-LAC</b>	Utilization of lactose
<b>10-VP</b> *	Production of acetoin (Voges-Proskauer test)	<b>22-TRE</b>	Utilization of trehalose
<b>11-IND</b> *	Production of indole (Kovac's test)	<b>23-XYL</b>	Utilization of xylose
<b>12-GLU</b>	Utilization of glucose	<b>24-DUL</b>	Utilization of dulcitol

□ : overlay the well with vaseline oil

\* : after incubation, add the indicated reagent to perform the test

## COLLECTION OF THE SAMPLE

Enterosystem 24R is not for use directly with clinical or other specimens. The microorganism to be identified must first be isolated on a culture medium suitable for growth of enterobacteria such as MacConkey Agar (ref. 10029), Eosin Methylene Blue Agar (ref. 10048), Salmonella and Shigella Agar (ref. 10036), Hektoen Enteric Agar (ref. 10043) as well as a non selective blood agar (e.g. Tryptic Soy Agar with 5% Sheep Blood, ref. 11037).

## TEST PROCEDURE

### PREPARATION OF BACTERIAL SUSPENSION

- The microorganism to be identified must be recently isolated (18-24 h); bacterial cultures older than 48 hours can provide not reliable results.
- Before inoculating the microorganism to be examined, Gram staining and oxidase testing are required. Use Enterosystem 24R with Gram-negative, oxidase negative bacteria only.
- Take one or more morphologically similar well isolated colonies from the agar culture medium and suspend in physiological solution. The final turbidity should be equal to 0.5 McFarland. This suspension must be used immediately after preparation.

**Note:** A drop from the inoculum tube, either before or after inoculating the system, can be spread onto an agar slant or plate (any appropriate media) for purity check.

### INOCULATION OF THE SYSTEM

1. Take a system from its wrapper and bring it to room temperature.
2. Write down the name of the patient and the date of the start of the examination.
3. Transfer a disc of Arabinose Disc into the well **17-ARA** and a disc of Xylose Disc into the well **23-XYL**.
4. Dispense 0.2 mL of bacterial suspension into each well of the system and overlay with 1 drop of vaseline oil the wells **2-LDC**, **3-ODC**, **4-ADC**, **7-UR** and **8-H<sub>2</sub>S**.
5. Cover the system with the lid provided and incubate at 36±1°C for 18-24 hours.

## INTERPRETATION OF THE RESULTS

At the end of the incubation period:

1. Add 2 drops of Alpha-naphthol and 1 drop of NaOH 40% to the well **10-VP** (wait 15-20 min for reading after adding the reagents).
2. Add 2 drops of Kovac's reagent to the well **11-IND** (wait 1-2 min for reading after adding the reagent).
3. Watch for the color change in the wells and interpret the results by referring to the Interpretive Table.
4. Note the results on the test results form and determine the 8-digit code following instructions provided as outlined under NUMERICAL CODE FORMATION.
5. Identify the organism by using the Identification Software.

**Interpretive table.**

Well	Test	Well color	
		Positive reaction	Negative reaction
<b>1-ONPG</b>	ONPG hydrolysis	yellow	colorless
<b>2-LDC</b>	Lysine decarboxylation	red	yellow-orange
<b>3-ODC</b>	Ornithine decarboxylation	red	yellow-orange
<b>4-ADC</b>	Arginine decarboxylation	red	yellow-orange
<b>5-PD</b>	Phenylalanine deamination	black-brown	yellow
<b>6-CIT</b>	Citrate utilization	blue-dark green	light green
<b>7-UR</b>	Urea hydrolysis	red-fuchsia	yellow-orange
<b>8-H<sub>2</sub>S</b>	Hydrogen sulphide production	black	yellow
<b>9-MLN</b>	Malonate utilization	blue-green	yellow
<b>10-VP</b>	Voges-Proskauer (add reagents)	pink-red	yellow
<b>11-IND</b>	Indole (add Kovac's Reagent)	red ring	yellow
<b>12-GLU</b>	Glucose	yellow	blue-green
<b>13-MAN</b>	Mannitol	yellow	blue-green
<b>14-INO</b>	Inositol	yellow	blue-green
<b>15-SOR</b>	Sorbitol	yellow	blue-green
<b>16-SAC</b>	Saccharose	yellow	blue-green
<b>17-ARA</b>	Arabinose	yellow	blue-green
<b>18-RAF</b>	Raffinose	yellow	blue-green
<b>19-RAM</b>	Rhamnose	yellow	blue-green
<b>20-MEL</b>	Melibiose	yellow	blue-green
<b>21-LAC</b>	Lactose	yellow	blue-green
<b>22-TRE</b>	Trehalose	yellow	blue-green
<b>23-XYL</b>	Xylose	yellow	blue-green
<b>24-DUL</b>	Dulcitol	yellow	blue-green

**NUMERICAL CODE FORMATION**

The biochemical tests are separated into 8 groups of 3 and a value of 1, 2 or 4 is indicated for each:

- Value 1 : first test positive in each group (**ONPG, ADC, UR, VP, MAN, SAC, RAM, TRE**);
- Value 2 : second test positive in each group (**LDC, PD, H<sub>2</sub>S, IND, INO, ARA, MEL, XYL**);
- Value 4 : third test positive in each group (**ODC, CIT, MLN, GLU, SOR, RAF, LAC, DUL**);
- Value 0 : every negative test.

A 8-digit code is obtained by adding together the values corresponding to positive reactions within each group.

The example below shows how a numerical code is formed.

	Group 1			Group 2			Group 3			Group 4			Group 5			Group 6			Group 7			Group 8		
Test	ONPG	LDC	ODC	ADC	PD	CIT	UR	H <sub>2</sub> S	MLN	VP	IND	GLU	MAN	INO	SOR	SAC	ARA	RAF	RAM	MEL	LAC	TRE	XYL	DUL
Value	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4
Result	+	-	+	+	-	+	-	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	-
Sum of values	5			5			4			5			7			7			7			1		
<b>NUMERICAL CODE: 55457771      IDENTIFICATION: <i>Enterobacter cloacae</i></b>																								

## QUALITY CONTROL

Each batch of Enterosystem 24R is subjected to the quality control using the following reference strains: *Escherichia coli* ATCC® 25922, *Salmonella* Typhimurium ATCC® 14028, *Proteus mirabilis* ATCC® 25933, *Klebsiella pneumoniae* ATCC® 13883, *Enterobacter cloacae* ATCC® 13047.

## PERFORMANCE

The results obtained with the Enterosystem 24R agree with those obtained using other microbiological and biochemical tests for microbial identification.

## FACTORS THAT MAY INVALIDATE THE RESULTS

Contaminated culture; Poor standardization of the inoculum; clinical material unsuitable; use of expired systems or expired supplementary reagents; non compliance with temperatures and times of incubation.

## PRECAUTIONS

The product Enterosystem 24R does not contain hazardous substances in concentrations exceeding the limits set by current legislation and therefore is not classified as dangerous. It is nevertheless recommended to consult the safety data sheet for its correct use. Enterosystem 24R is a disposable device to be used only for diagnostic use *in vitro*. The product must be used in the laboratory by properly trained personnel, using approved aseptic and safety methods for handling pathogenic agents.

## STORAGE

Store Enterosystem 24R at 2-8°C in the original packaging. Keep away from sources of heat and avoid excessive changes in temperature. In such conditions the product will remain valid until the expiry date indicated on the label. Do not use beyond that date. Eliminate without using if there are signs of deterioration.








## DISPOSAL OF USED MATERIAL

After use, Enterosystem 24R and material that has come into contact with the sample must be decontaminated and disposed of in accordance with the techniques used in the laboratory for decontamination and disposal of potentially infected material.

## PRESENTATION

Product	Ref.	Package
Enterosystem 24R	71619	20 tests
Enterosystem 24R	79619	4 tests

## TABLE OF SYMBOLS

<b>IVD</b> for <i>in vitro</i> diagnostic use	 Do not reuse	 Manufacturer	 Contains sufficient for <n> test	 Temperature limits
<b>REF</b> Catalogue number	 Fragile, handle with care	 Use by	 Caution, consult accompanying documents	<b>LOT</b> Batch number

