todylaboratories®

Microbiology Reagents

CE IVD

GN 24 sp

Identification system for Gram negative bacteria

REFERENCE CODE	
C53MR1001	(sp) Strip Plate – 40 tests

SUMMARY AND EXPLANATION

GN 24 is standardized identification system for common species of Gram negative bacteria, it is based on 24-29 miniaturized biochemical tests and internet database. List of all microorganisms, for which is kit determined, is placed at the end of leaflet.

PRINCIPLE

The GN 24 kit consists of 24 well strips of microtitration plate in classic 96 wells format containing dehydrated substrates. Reconstitution of substrates is carried by inoculation of bacterial suspension. During incubation, colour change occurs in wells because of the metabolic activity of microorganisms. The evaluation of the test results is visual, based on a colour scheme, or by colour formulation described in leaflet. Results of the identification can be obtained from the evaluation table or with the help of the evaluation software, which can be provided by the manufacturer.

KIT CONTAINS - ACCORDING TO PACKAGING 40 TESTS (sp)

- 10 microtitration plates of GN 24
- 40 result forms
- 10 incubation packets
- information leaflet

REQUIRED MATERIAL

Reagents and necessary volumes:

- Unbuffered saline 0,85 % - 3,5-5 ml
- Paraffin oil (Ref. C53MR1017) – 30,4 ml
- PHE reagent (Ref. C53MR1023) – 1,6 ml
- PHS reagent (Ref. C53MR1024) – 3,2 ml
- IND reagent (Ref. C53MR1018) – 4,8 ml
- NIT reagent (Ref. C53MR1021) – 3,2 ml
- Zn (Zinc Dust) (Ref. C53MR1028) – 40 µl
- OXI (Ref. C53MR1008) – recommended separate test
- Identification software

* The quantities described above are sufficient for a complete GN 24 kit, with the exception of the unbuffered saline. A drop is approximately 40µl.

Materials:

- Pipettes
- Tampons, loops, burner, tubes and other basic laboratory equipment.

SUPPLEMENTARY MATERIALS

Materials not required, but that can be used for additional tests:

- PYR and PYR reagent (Ref. C53MR1010, C53MR1019)
- VP and VP reagent (Ref. C53MR1011, C53MR1020)

SAMPLES

1. Isolate microorganisms have to be first identified from a suitable unselective cultivation medium (for example blood agar, tryptone - soy agar etc.) according to standard microbiological techniques.
2. Make Gram colouring and analyse microscopically the pure culture.
3. Perform the cytochromoxidase test – OXI (eventually catalase test - CAT). This is a very important test that is performed separately from the kit itself, but can aid in a better identification of the microorganism. Similarly, the PYR (Diagnostic strip for proof of pyrrolidonylarylamidase) and VP (Diagnostic strip for Voges – Proskauer test) can be performed, separately from the kit.

Identify confirmed isolates on GN 24 kit.

RECOMENDED PROCEDURE

Preparation of the inoculum

- Open the tube with saline or use a sterile solution of 0,85% sodium chloride in deionized / distilled water.
- Take some well isolated colonies with the help of the inoculation loop. These need to be pure cultures of 18-24 hours.
- Prepare a well homogenized suspension of a 2 McF turbidity.

Use suspension immediately after preparation.

TIP: Eventually make proof of purity by braying of same loop or tampon, by which the suspension was done.

The prepared Petri dish can be used the next day to make other additional tests!

Preparation of microtitration plate

- Prepare microtitration plate
- Mark strips with the numbers of the examined cultures

TIP: When using GN 24 sp, you can take the unused strips and put them back in the original aluminium packet with desiccant and close carefully.
Save the frame of microtitration plate after incubation for next use.

Inoculation

- Inoculate 0,1 ml of well homogenized suspension into each well of strip.
- Cover tests from **URE** to **LYS** (wells from **H** to **C**) with **three drops** of paraffin oil. Cover test **GLU** (well G) with **four drops** of paraffin oil.

Incubation

- Put the microtitration plate into the packed PE packet, then bend the end of the packet under the plate – this is to avoid the drying of the bacterial suspension.
- Incubate at a common atmosphere at a temperature of 35 ± 2 °C for 18 - 24 hours.

TIP: For optimal incubation conditions, make a higher humidity in the incubator, for example by adding a beaker of clear water or incubating in an incubator with managed humidity.

If there is a suspicion of the presence of non-fermenting rods, the recommendation is to evaluate the GLU test after 4 hours. If the test is negative after this time, it is a clear sign that the microorganisms are glucose non-fermenting bacteria. Continue the incubation until de recommended 24 hours.

If the test is still negative after 24 hours or **if the colouring of the well is unverifiable**, this may mean that there is a slow or non-sufficient bacterial growth present in the microplate. In this case, a prolonged incubation of 48 hours may be necessary.

! For the Enterobacteriaceae family, the GLU test will be read directly after 24 hours.

In the identification program use the result of GLU obtained after 4 hours of incubation.

EVALUATION AND INTERPRETATION

After incubation, evaluate the tests with the help of the interpretation table, colour scheme, or by the results of the control strain.

Tests **NAG / IND**, **GLR / ESL**, **bGL / PHE**, **bGA / NIT** and **GGT / PHS** are **bifunctional** so after the evaluation of the primary reaction another result can be obtained from the evaluated wells of the microtitration plate.

Make the following bifunctional tests:
Well H2: NAG / IND - add 3 drops of IND reagent and wait 1-2 minutes for colouring of the test.
Well H3: GLR / ESL - evaluate positive test GLR for *E. coli., Shigella* and some *Salmonella* strains. This test can provide the following results: GLR – ESL – which is colorless, GLR + ESL – which is yellow or GLR – ESL + which is brown. When marking the result, it is vital to write both the GLR and ESL results, as described above. Always mark the negative result of the test GLR (GLR – ESL -).
Well A1: bGL / PHE - add 1 drop of reagent PHE and evaluate.
Well A3: bGA / NIT - add 2 drops of NIT reagent and evaluate. In case of a negative reaction, add Zinc dust to well (on tip of 1µl loop). If it shows dark pink/ red colour until 10 minutes the test is negative.

For non-fermenting bacteria make also following bifunctional tests:
Well A2: GGT / PHS - add 2 drops of PHS reagent and evaluate.

- Write down the results of the bifunctional tests to the results form or into the evaluating software.
- In case of the identification of a Gram negative, oxidase negative, glucose non-fermenting bacteria, write down into the software the results of the following additional tests, that are not present in the microplate: bHEM (beta-hemolisys – observed in Blood Agar), YEP (yellow pigment production – colonies of a yellow color, observed in Petri plate) and G42 (growth in 42°C – observed for Acinetobacters, when Petri dish is incubated). These will significantly increase identification of this group of microorganisms.

IDENTIFICATION

Result of the identification can be obtained by:
- Identification table
- Identification software

Identification by identification table:
Compare the results of tests and make the identification using the results of tests present in the **Identification table** (**page 4**).

Identification by identification software:
Enter the results of individual tests into the software. When some of the tests cannot be evaluated, they can be excluded. The software allows the inputting of additional tests and so it increases identification effectiveness.

Software microID is available free for our customers upon request.

QUALITY CONTROL

The quality of the produced diagnostic kits is systematically controlled. Chemicals are bought exclusively from certified companies and the quality of these chemicals is confirmed by an analytical certificate. The functionality of the kits is tested with control collection strains. They are also controlled and tested for the presence of bacterial contamination. The kits are exposed to tests of a higher temperature and samples of each batch are saved for the right advisement of later reclamations.

FOR INTERNAL CONTROL, USE THE FOLLOWING RECOMMENDED BACTERIAL STRAINS:

Bacterial strain	CCM / ATCC		URE	GLU	H2S	ARG	ORN	LYS	SCI	bGL	PHE
E. coli	4225 / 35218		-	+	-	+/-	+	+	-	-	-
		IND	NAG	SUC	TRE	MAN	LAC	CEL	MAL	GGT	PHS
		+	-	+	+	+	+	-	-	+	-
		GLR	ESL	DUL	ADO	SOR	RHA	RAF	INO	bGA	NIT
		+	-	+/-	-	+	+	-	-	+	+

Bacterial strain	CCM / ATCC		URE	GLU	H2S	ARG	ORN	LYS	SCI	bGL	PHE
Proteus sp.	1799 / -		+	+	+	-	-	-	-	-	+
		IND	NAG	SUC	TRE	MAN	LAC	CEL	MAL	GGT	PHS
		+	+	+	+	-	-	-	-	+	+
		GLR	ESL	DUL	ADO	SOR	RHA	RAF	INO	bGA	NIT
		-	-	-	-	-	+	-	-	-	+

Bacterial strain	CCM / ATCC		URE	GLU	H2S	ARG	ORN	LYS	SCI	bGL	PHE
K. pneumoniae	5852 / 13882		+	+	-	-	-	+	+	+	-
		IND	NAG	SUC	TRE	MAN	LAC	CEL	MAL	GGT	PHS
		-	+	+	+	+	+	+	+	+	+
		GLR	ESL	DUL	ADO	SOR	RHA	RAF	INO	bGA	NIT
		-	+	+	+	+	+	+	+	+	+

Bacterial strain	CCM / ATCC		URE	GLU	H2S	ARG	ORN	LYS	SCI	bGL	PHE
P. aeruginosa	3955 / 27853		+	-	-	+	-	-	+	-	-
		IND	NAG	SUC	TRE	MAN	LAC	CEL	MAL	GGT	PHS
		-	-	-	-	-	-	-	+	+	+
		GLR	ESL	DUL	ADO	SOR	RHA	RAF	INO	bGA	NIT
		-	-	-	-	-	-	-	-	-	+

ATCC: American Type Culture Collection, 10801 University Boulevard, Manassas, VA 20110-2209, USA.

Control strains serves to check the functionality of individual tests only, not for proof control of identification.

CONSTRAINTS OF THE METHOD AND MOST OFTEN CAUSES OF MISIDENTIFICATION

- The diagnostic kit GN 24 is manufactured for the identification of the bacteria named in this leaflet only.
- Only a pure culture of a microorganism can be used.
- Tests were not covered by paraffin oil.
- Contamination of wells by the inoculum of the next strip.
- The used culture is an atypical strain.
- Some point of the leaflet was not kept.

DETERMINATION CHARACTERISTICS

150 collection strains, strains from clinical backgrounds and veterinary strains mentioned in the database were tested:

GLU fermenting bacteria

- 92 / 88 % of the strains were identified correctly with additional tests
- 89 / 87 % of the strains were identified correctly without additional tests

GLU non-fermenting bacteria

- 96 / 87 % of the strains were identified correctly with additional tests
- 81 / 74 % of the strains were identified correctly without additional tests

Note: Data before / after slash response to genus / species identification.

By interpretation of the results of the anamnesis of a patient, source of the sample, morphology of the colony, microscopic morphology of the strain and if necessary, results of all performed tests, mainly results of the susceptibility testing have to be considered.

WARNINGS AND SAFETY PRECAUTIONS

- **For in vitro diagnostic use and microbial control only**
- **For professional use only**
- Follow the instructions exactly!
- Used strips should be considered as potentially infectious and this must be respected when handling.
- Observe common safety measures according to the regulations of your country.
- Before use, check if the packaging is intact. Do not use damaged kit.

STORAGE CONDITIONS

Diagnostic kits are delivered in multilayer packets of an aluminium base and organic polymers. Part of each packet is silica gel desiccant. Store kits at temperature from +2 to +25°C. The expiration date is placed on each packaging.

Put unused leftover microtitration plates in prepacked Al packet with original silica gel desiccant, close packet carefully and let it reach laboratory temperature. Product can be stored two weeks in such conditions (or to date of expiration if it passes earlier).

WASTE LIQUIDATION

Work with the material as with potentially infectious agents. Liquidate leavings according to internal procedures and legislative of your country.

INTERPRETATION TABLE

WELL - 1. line	TEST SHORTCUT	TEST NAME	RESULTS INTERPRETATION	
			NEGATIVE	POSITIVE
H	URE	Urea	yellow / yellow orange	red-purple / red
G	GLU	Glucose	green	yellow / yellow-green
F	H2S	Hydrosulphide	turbidity of suspension	black / silver-black
E	ARG	Arginine	green	blue
D	ORN	Ornithine	yellow / green	blue
C	LYS	Lysine	yellow / green	blue
B	SCI	Simmons citrate	yellow / green	blue
A	bGL	b-glucoronidase	without colour	yellow
A´	PHE	Phenylalanine	yellow / turbidity of suspension	dark green / green
WELL - 2. line	**TEST SHORTCUT**	**TEST NAME**	**NEGATIVE**	**POSITIVE**
H´	IND	Indol	yellow / pink	red / red-orange
H	NAG	N – acetyl-glucosaminide	turbidity of suspension	yellow
G	SUC	Sucrose	green	yellow / yellow-green
F	TRE	Trehalose	green	yellow / yellow-green
E	MAN	Mannitol	green	yellow / yellow-green
D	LAC	Lactose	green	yellow / yellow-green
C	CEL	Celobiose	green	yellow / yellow-green
B	MAL	Malonate	yellow / green	blue
A	GGT	Gamma-glutamyl transferase	turbidity of suspension	yellow
A´	PHS	Phosphatase	yellow / turbidity of suspension	pink
WELL - 3. line	**TEST SHORTCUT**	**TEST NAME**	**NEGATIVE**	**POSITIVE**
H´	GLR	b-glucoronidase	turbidity of suspension	yellow
H	ESL	Esculine	colorless / light brown	dark brown
G	DUL	Dulcitol	green	yellow / yellow-green
F	ADO	Adonitol	green	yellow / yellow-green
E	SOR	Sorbitol	green	yellow / yellow-green
D	RHA	Rhamnose	green	yellow / yellow-green
C	RAF	Raffinose	green	yellow / yellow-green
B	INO	Inositol	green	yellow / yellow-green
A	bGA	b-galactosidase	turbidity of suspension	yellow
A´	NIT	Nitrates	turbidity of suspension / yellow	dark pink/red

Identification table:	1. LINE									2. LINE										3. LINE									
	H	G	F	E	D	C	B	A	A	H´	H	G	F	E	D	C	B	A	A´	H´	H	G	F	E	D	C	B	A	A´
	URE	GLU	H2S	ARG	ORN	LYS	SCI	bGL	PHE	IND	NAG	SUC	TRE	MAN	LAC	CEL	MAL	GGT	PHS	GLR	ESL	DUL	ADO	SOR	RHA	RAF	INO	bGA	NIT
Acinetobacter Junii	-	(-)	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	v	-	-	-	v	-	-	-
Acinetobacter lwoffii	-	(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	v	-	-	-	v	-	-	-
Acinetobacter baumannii (G42+)/ Acinetobacter calcoaceticus (G 42-)	(-)	(-)	-	-	-	-	+	-	-	-	-	-	-	-	+	+	v	+	-	-	-	v	-	-	-	v	-	-	-
Acinetobacter haemolyticus	-	(-)	-	-	-	-	(+)	-	-	-	-	-	-	-	(+)	v	v	-	-	-	-	v	-	-	-	v	-	-	-
Acinetobacter radioresistens	-	(-)	-	-	-	-	-	(-)	-	-	-	-	-	-	-	-	+	(-)	-	-	-	v	-	(-)	-	v	-	-	(+)
Aeromonas caviae	-	+	-	+	-	-	(-)	v	(-)	+	v	+	+	+	v	+	-	v	v	-	+	-	-	-	-	-	-	+	+
Aeromonas eucrenophila	-	+	-	+	-	-	-	v	-	+	v	-	+	+	+	+	-	v	v	-	+	-	-	-	-	-	-	+	+
Aeromonas hydrophila	-	+	-	+	-	(+)	v	+	-	+	(+)	+	+	+	v	(-)	-	v	v	-	+	-	-	(-)	-	-	-	+	+
Aeromonas jandaei	-	+	-	+	-	(+)	(+)	v	-	+	v	-	+	+	(-)	-	-	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas media	-	+	-	+	-	-	(-)	v	-	(+)	v	+	+	+	+	+	-	v	v	-	(+)	-	-	+	-	v	-	+	+
Aeromonas schubertii	-	+	-	(+)	-	+	v	v	v	-	v	-	+	-	-	-	-	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas sobria	-	+	-	+	-	(+)	(-)	-	(-)	+	(-)	+	+	+	(-)	v	-	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas trota	-	+	-	+	-	(+)	+	v	-	+	v	(-)	+	+	(-)	+	-	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas veronii	-	+	-	-	(+)	+	+	v	+	+	v	+	+	+	-	(+)	-	v	v	-	(+)	-	-	-	-	-	-	+	+
Aeromonas encheleia	-	+	-	+	-	-	-	v	-	+	v	(+)	+	-	-	-	-	v	v	-	+	-	-	-	(+)	-	-	+	+
Aeromonas enteropelogenes	-	+	-	+	-	+	(-)	v	-	+	v	-	+	+	(-)	+	-	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas ichthiosmia	-	+	-	+	-	(-)	-	v	-	+	v	+	+	+	-	v	-	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas popoffii	-	+	v	+	-	-	(+)	v	-	(+)	v	-	+	+	-	-	+	v	v	-	-	-	-	-	-	-	-	+	+
Aeromonas bestiarum	-	+	-	+	-	(-)	(-)	v	-	+	v	+	+	+	(-)	-	-	v	v	-	+	-	-	-	(+)	-	-	(+)	+
Achromobacter xylosooxidans	(-)	(-)	-	-	-	-	(+)	-	-	-	-	-	-	-	-	-	-	(-)	(+)	-	-	v	-	-	(-)	v	-	-	+
Alcaligenes faecalis	-	(-)	-	-	-	-	(+)	-	-	-	-	-	-	-	-	-	(-)	-	(+)	-	-	v	-	-	-	v	-	-	-
Bordetella bronchiseptica	+	(-)	-	-	-	-	+	-	(-)	-	-	-	-	-	-	-	-	(-)	v	-	-	v	-	(-)	-	v	-	-	+
Brevundimonas vesicularis	-	(-)	-	-	-	-	-	-	-	-	-	-	(-)	-	-	(-)	-	-	+	-	+	v	-	(-)	(-)	v	(-)	(-)	-
Brevundimonas diminuta	-	(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	v	-	-	v	-	(-)	(-)	v	-	-	-
Burkholderia cepacia - komplex	v	(-)	-	-	v	(+)	+	v	-	-	+	(+)	+	+	+	+	-	+	+	-	v	v	-	-	-	-	+	v	(-)
Citrobacter amalonaticus	+	+	-	(+)	+	-	+	+	-	+	(-)	-	+	+	(-)	+	-	v	v	-	-	-	-	+	+	-	-	+	+
Citrobacter braakii	(-)	+	v	(+)	+	-	(+)	v	-	(-)	-	-	+	+	(+)	(+)	-	v	v	-	-	(-)	-	+	+	-	-	+	+
Citrobacter farmeri	v	+	-	(+)	+	-	-	+	-	+	-	+	+	+	-	+	-	v	v	-	-	-	-	+	+	+	-	+	+
Citrobacter freundii	v	+	v	v	-	-	(+)	(-)	-	(-)	-	+	+	+	(+)	v	-	v	v	-	-	-	-	+	+	v	-	(+)	+
Citrobacter koseri	v	+	-	(+)	+	-	+	(+)	-	+	(-)	v	+	+	v	+	+	v	v	-	-	v	+	+	+	-	-	+	+
Citrobacter sedlakii	+	+	-	+	+	-	(+)	v	-	(+)	-	-	+	+	+	+	+	v	v	-	(-)	+	-	+	+	-	-	+	+
Citrobacter werkmanii	+	+	+	+	-	-	+	v	-	-	-	-	+	+	(-)	-	+	v	v	-	-	-	-	+	+	-	-	+	+
Citrobacter youngae	(+)	+	(+)	v	-	-	(+)	v	-	-	-	(-)	+	+	(-)	+	-	v	v	-	-	(+)	-	+	+	-	-	+	(+)
Cronobacter sakazakii	-	+	-	+	+	-	+	+	v	-	+	+	+	+	+	+	(-)	v	v	-	+	-	-	-	+	+	(+)	(+)	+
Delftia acidovorans (MAN+) / C.testosteroni (MAN-)	-	(-)	-	-	-	-	+	-	-	-	-	-	-	v	-	-	(-)	+	v	-	-	v	-	-	-	v	-	-	(+)
Edwardsiella tarda	-	+	+	-	+	+	-	-	-	+	(-)	-	-	-	-	-	-	v	v	-	-	-	-	-	-	-	-	-	+
Elizabethkingia meningoseptica	(-)	(-)	-	-	-	-	(-)	(+)	-	(+)	v	-	+	+	+	-	-	+	+	-	+	v	-	-	-	v	-	+	-
Enterobacter aerogenes	-	+	-	-	+	+	+	+	-	-	(+)	+	+	+	+	+	+	v	v	-	+	-	+	+	+	+	+	+	+

Enterobacter cloacae ssp. cloacae	(+)	+	-	+	+	-	+	+	-	-	(+)	+	+	+	+	+	(+)	v	v	-	(-)	-	(-)	+	+	+	-	+	+
Escherichia coli	-	+	-	(-)	(+)	+	-	-	-	+	-	v	+	+	+	-	-	v	v	+	(-)	(+)	-	+	(+)	v	-	+	+
Escherichia fergusonii	-	+	-	-	+	+	(-)	-	-	+	(-)	-	+	+	-	+	(-)	v	v	-	v	v	+	-	+	-	-	+	+
Escherichia hermannii	-	+	-	-	+	-	-	v	-	+	-	v	+	+	v	+	-	v	v	-	(-)	(-)	-	-	+	(-)	-	+	+
Escherichia vulneris	-	+	-	(-)	-	(+)	-	+	-	-	-	-	+	+	-	+	(+)	v	v	-	(-)	-	-	-	+	+	-	+	+
Ewingella americana	-	+	-	-	-	-	+	+	-	-	(-)	-	+	+	(+)	-	-	v	v	-	v	-	-	-	(-)	-	-	+	+
Hafnia alvei	v	+	-	-	+	+	v	(-)	-	-	(+)	-	+	+	-	-	v	v	v	-	-	-	-	-	+	-	-	(+)	+
Chryseobacterium indologenes	-	(-)	-	-	-	-	-	(-)	-	+	(-)	(-)	-	(-)	-	-	v	+	+	-	+	v	-	-	-	v	-	(-)	(-)
Klebsiella oxytoca	+	+	-	-	-	+	+	+	-	+	-	+	+	+	+	+	+	v	v	-	+	v	+	+	+	+	+	+	+
Klebsiella pneumoniae ssp. ozaenae	-	+	-	-	-	(-)	(-)	+	-	-	(-)	(-)	+	+	(-)	+	-	v	v	-	(+)	-	+	(+)	v	+	v	+	(+)
Klebsiella pneumoniae ssp. pneumoniae	+	+	-	-	-	+	+	+	-	-	v	+	+	+	+	+	+	v	v	-	+	(-)	+	+	+	+	+	+	+
Kluyvera ascorbata	-	+	-	-	+	+	+	+	-	+	-	+	+	+	+	+	+	v	v	-	+	(-)	-	(-)	+	+	-	+	+
Leclercia adecarboxylata	v	+	-	-	-	-	-	+	-	+	-	(+)	+	+	+	+	+	v	v	-	+	+	+	-	+	(+)	-	+	+
Moraxella lacunata / nonliquifaciens	-	(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(-)	-	-	v	-	(-)	(-)	v	-	-	+
Moraxella oslovensis	-	(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	v	-	(-)	(-)	v	-	-	(-)
Morganella morganii ssp.morgani	+	+	-	-	+	-	-	-	+	+	v	-	-	-	-	-	-	v	v	-	-	-	-	-	-	-	-	-	+
Myroides odoratimimus	+	(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(-)	(-)	+	-	-	v	-	(-)	(-)	v	-	-	-
Myroides odoratus	+	(-)	-	-	-	-	-	(-)	-	-	(-)	-	-	-	-	-	-	(+)	+	-	-	v	-	(-)	(-)	v	-	-	-
Ochrobactrum anthropi	+	(-)	v	(-)	-	-	v	-	-	-	-	v	+	(+)	-	+	-	(+)	-	-	-	v	-	-	-	v	+	-	+
Oligella ureolytica	+	(-)	-	-	-	-	-	-	v	-	-	-	-	-	-	-	-	+	(-)	-	-	v	-	(-)	(-)	v	-	-	+
Oligella urethralis	-	(-)	-	-	-	-	v	-	+	-	-	-	-	-	-	-	-	(+)	-	-	-	v	-	(-)	(-)	v	-	-	-
Pantoea agglomerans	-	+	-	-	-	-	(+)	v	-	-	-	-	+	+	(-)	v	+	v	v	-	+	-	-	-	-	-	-	v	+
Pantoea dispersa	-	+	-	-	-	-	+	v	-	-	-	+	+	+	-	v	-	v	v	-	-	-	-	-	+	-	(+)	+	(+)
Plesoimonas shigelloides	-	+	-	+	+	+	-	(-)	-	+	(-)	-	+	-	(+)	-	-	v	-	-	-	-	-	-	-	-	+	+	+
Proteus mirabilis	+	+	+	-	+	-	(+)	-	+	-	(-)	-	+	-	-	-	-	v	v	-	-	-	-	-	-	-	-	-	+
Proteus penneri	+	+	(-)	-	-	-	-	-	+	-	-	+	v	-	-	-	-	v	v	-	-	-	-	-	-	-	-	-	+
Proteus vulgaris	+	+	+	-	-	-	-	v	+	+	v	+	(-)	-	-	-	-	v	v	-	v	-	-	-	-	-	-	-	+
Providencia alcalifaciens	-	+	-	-	-	-	+	-	+	+	(-)	-	-	-	-	-	-	v	v	-	-	-	+	-	-	-	-	-	+
Providencia rettgeri	+	+	-	-	-	-	+	v	+	+	(+)	-	-	+	-	-	-	v	v	-	(-)	-	+	-	(+)	-	+	-	+
Providencia stuartii	(-)	+	-	-	-	-	+	-	+	+	+	v	+	-	-	-	-	v	v	-	-	-	-	-	-	-	+	-	+
Pseudomonas mendocina	(+)	v	-	+	-	-	+	-	v	-	-	-	-	-	-	-	+	v	-	-	-	-	-	-	-	-	-	-	+
Pseudomonas putida	(-)	v	-	+	-	-	+	-	-	-	-	-	-	(-)	-	-	v	+	-	-	-	-	-	-	-	-	-	-	-
Pseudomonas aeruginosa	(+)	v	-	+	-	-	+	-	-	-	-	-	v	(+)	-	-	+	+	v	-	-	-	-	-	-	-	-	-	+
Pseudomonas alcaligenes	-	v	-	(-)	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(+)
Pseudomonas fluorescens	v	v	-	+	-	-	+	-	-	-	-	v	(+)	+	-	(-)	v	(+)	-	-	-	-	-	(-)	(-)	-	v	-	(-)
Pseudomonas stutzeri	-	v	-	-	-	-	(+)	-	(-)	-	-	-	-	(-)	-	-	(+)	v	-	-	-	-	-	-	-	-	-	-	+
Pseudomonas aeruginosa	(+)	(-)	-	+	-	-	+	-	-	-	-	-	v	(+)	-	-	+	+	v	-	-	-	-	-	-	-	-	-	+
Pseudomonas oryzihabitans (Flavimonas)	v	(-)	-	-	-	-	+	(-)	(-)	-	(-)	(-)	+	+	-	(-)	(+)	(-)	(-)	-	-	v	-	-	(-)	v	+	-	-
Pseudomonas luteola (Chryseomonas)	(-)	(-)	-	+	-	-	+	+	-	-	+	-	+	+	-	-	+	(-)	+	-	+	v	-	-	(-)	v	+	+	(+)
Ralstonia picketti	+	(-)	-	-	-	-	v	-	-	-	-	-	(-)	-	v	+	-	+	-	-	-	v	-	(-)	(-)	v	-	-	+
Raoultella ornithinolytica	+	+	-	-	+	+	+	+	-	+	-	+	+	+	+	+	+	v	v	-	+	-	+	+	+	+	+	+	+
Rhizobium radiobacter	(-)	(-)	-	-	-	-	(-)	-	(+)	-	-	-	-	-	(+)	(-)	-	(+)	(-)	-	-	v	-	-	-	v	-	(-)	(+)

Salmonella enterica ssp. enterica	-	+	v	v	+	+	(-)	-	-	-	-	-	-	+	-	-	-	v	v	-	-	-	-	+	+	-	-	-	+
Salmonella serovar paratyphi	-	+	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	v	v	-	-	+	-	+	+	-	-	-	+
Salmonella serovar enteritidis	-	+	+	(+)	+	+	+	-	-	-	-	-	+	+	-	-	-	v	v	-	-	+	-	+	+	-	(-)	-	+
Salmonella enterica ssp. salamae	-	+	+	+	+	+	+	-	-	-	-	-	+	+	-	-	+	v	v	-	-	+	-	+	+	-	-	-	+
Salmonella enterica ssp. arizonae	-	+	+	(+)	+	+	+	-	-	-	-	-	+	+	-	-	+	v	v	v	-	-	-	+	+	-	-	+	+
Salmonella enterica ssp. diarizonae	-	+	+	(+)	+	+	+	-	-	-	-	-	+	+	(+)	-	+	v	v	v	-	-	-	+	+	-	-	+	+
Salmonella enterica ssp. houtanae	-	+	+	(+)	+	+	+	-	-	-	-	-	+	+	-	v	-	v	v	-	-	-	-	+	+	-	-	-	+
Salmonella bongori	-	+	+	+	+	+	+	-	-	-	-	-	+	+	-	-	-	v	v	-	-	+	-	+	+	-	-	+	+
Salmonella serovar typhi	-	+	+	-	-	+	-	-	-	-	-	-	+	+	-	-	-	v	v	-	-	-	-	+	-	-	-	-	+
Serratia ficaria	-	+	-	-	-	-	+	+	-	-	(+)	+	+	+	-	+	-	v	v	-	+	-	-	+	(-)	(+)	v	+	+
Serratia marcescens	-	+	-	-	+	+	+	+	-	-	+	+	+	+	-	-	-	v	v	-	+	-	(-)	+	-	-	(+)	+	+
Serratia odorifera bv.1	-	+	-	-	+	+	+	+	-	(+)	+	+	+	+	(+)	+	-	v	v	-	+	-	-	+	+	+	+	+	+
Serratia rubidaea	-	+	-	-	-	v	+	+	-	-	+	+	+	+	+	+	+	v	v	-	+	-	+	-	-	+	(-)	+	+
Shewanella putrefaciens	-	(-)	+	-	+	-	-	-	-	-	v	-	-	-	-	-	-	(+)	+	-	-	v	-	-	-	v	-	-	+
Shigella boydii (gr. C)	-	+	-	(-)	-	-	-	-	-	(-)	-	-	(+)	+	-	-	-	v	v	(-)	-	-	-	v	-	-	-	-	+
Shigella dysenteriae (gr. A)	-	+	-	-	-	-	-	-	-	v	-	-	+	-	-	-	-	v	v	(-)	-	-	-	(-)	(-)	-	-	-	+
Shigella flexneri (gr. B)	-	+	-	-	-	-	-	-	-	-	-	-	(+)	+	-	-	-	v	v	(-)	-	-	-	(-)	-	(-)	-	-	+
Shigella sonnei	-	+	-	-	+	-	-	-	-	-	(-)	-	+	+	-	-	-	v	v	+	-	-	-	-	(+)	-	-	+	+
Sphingobacterium multivorum	+	(-)	-	-	-	-	-	(+)	-	-	+	+	+	-	+	+	-	-	+	-	+	v	-	-	-	v	-	+	-
Sphingobacterium spiritivorum	+	(-)	-	-	-	-	-	v	-	-	+	+	+	+	+	+	-	-	+	-	+	v	-	-	-	v	-	+	-
Sphingomonas paucimobilis	-	(-)	-	-	-	-	-	+	(-)	-	(+)	+	+	-	+	+	-	+	+	-	+	v	-	-	-	v	-	+	-
Stenotrophomonas maltophilia	-	(-)	-	-	-	+	(-)	+	-	-	(-)	(+)	-	-	(+)	-	v	+	+	-	+	v	-	-	-	(+)	-	(+)	(+)
Vibrio metschnikovii	-	+	-	(+)	-	v	v	+	-	(-)	v	+	+	+	v	-	-	v	-	-	(+)	-	-	(-)	-	-	(-)	(+)	-
Vibrio alginolyticus	-	+	-	-	(+)	+	(-)	+	-	+	-	+	+	+	-	(+)	-	v	-	-	(-)	-	-	-	-	-	-	-	+
Vibrio cholerae	-	+	-	-	+	+	(+)	+	-	+	-	+	+	+	-	v	-	v	-	-	(-)	-	-	-	-	-	-	+	+
Vibrio fluvialis	-	+	-	+	-	-	(+)	+	-	v	-	+	+	+	-	v	-	v	-	-	v	-	-	-	-	-	-	+	+
Vibrio parahaemolyticus	(-)	+	-	-	+	+	(-)	+	-	+	-	-	+	+	-	(+)	-	v	(+)	-	-	-	-	-	-	-	-	(-)	+
Vibrio vulnificus	-	+	-	-	(+)	+	-	+	-	+	-	-	+	v	+	+	-	v	-	-	(-)	-	-	-	-	-	-	+	+
Weeksella virosa	-	(-)	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	(-)	+	-	-	v	-	-	-	v	-	-	-
Yersinia enterocolitica	(+)	+	-	-	+	-	-	(+)	-	v	v	+	+	+	-	(+)	-	v	v	-	(-)	-	-	+	-	-	(-)	+	+
Yersinia kristensenii	(+)	+	-	-	+	-	-	(+)	-	(-)	v	-	+	+	-	+	-	v	v	(-)	-	-	-	+	-	-	-	+	+
Yersinia pestis	-	+	-	-	-	-	-	v	-	-	(-)	-	+	+	-	-	-	v	v	-	v	-	-	v	-	-	-	v	(+)
Yersinia pseudotuberculosis	+	+	-	-	-	-	-	+	-	-	(+)	-	+	+	-	-	-	v	v	-	+	-	-	-	(+)	-	-	+	+

Shortcuts: + = 90 – 99 %; (+) = 66 – 89 %; v = 34 – 65 %; (-) = 11 – 33 %; - = 1 – 10%

Kit components does not contain dangerous chemicals

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