Venor®GeM Classic

Mycoplasma Detection Kit for conventional PCR including Taq Polymerase

INSTRUCTIONS FOR USE

FOR USE IN RESEARCH AND QUALITY CONTROL

Symbols

Lot No.

Cat. No.

Expiry date

Storage temperature

Number of reactions

Manufacturer

INDICATION

The Venor®GeM Classic Kit is designed for the detection of *Mollicutes*, such as *Mycoplasma* (frequently used interchangeably with *Mollicutes*), *Acholeplasma*, and *Spiroplasma*, in cell cultures and other biological matrices.

The Venor®GeM Classic Kit is based on conventional (or endpoint) PCR, as the established method of choice for rapid, robust, and sensitive detection of mycoplasma contamination. The assay is targeting a highly conserved region within the mycoplasma genome to detect all species included in the European Pharmacopoeia (EP), in the Japanese Pharmacopoeia (JP), in the US Pharmacopoeia (USP), and many more (see section "ASSAY CHARACTERISTICS").

The assay is suitable for direct mycoplasma detection in cell culture supernatants usually applicable in research, for the "cell culture enrichment" method, or after DNA extraction. The kit ensures nucleic acid amplification (NAT)-based mycoplasma detection: a valid alternative to the culture-based test, as specified in the EP 2.6.7, USP <63>, and JP G3.

This new convenient version of the Venor®GeM Classic kit already contains a lyophilized DNA Taq polymerase in the Classic PCR Mix.

TEST PRINCIPLE

Mollicutes are specifically detected by amplifying the 16S rRNA coding region of the mycoplasma genome, whereas eukaryotic and other bacterial DNA (except those reported in the section "Assay Characteristics") are not amplified by the Venor®GeM Classic kit. Depending on the mycoplasma species, the amplicon is in the 265-278 bp size range. The kit contains lyophilized components such as Classic PCR Mix (primer sets, nucleotides, and polymerase), Internal Control DNA, Positive Control DNA as well as 10x Reaction Buffer and PCR grade Water.

The instructions for use include protocols for both screening of cell culture supernatants as well as EP-compliant testing with defined DNA extraction and sample volume specifications. The entire test requires less than 3 hours, and, in contrast to methods like luminescence-based enzyme assays, fluorescent staining, or culture methods, does not require viable mycoplasma cells. Notably, the detection by PCR is considered to be superior in terms of sensitivity and precision in comparison to several biochemical and cellular approaches.

The Internal Control DNA as well as the Positive Control DNA are tools to assess the assay performance and for optional process monitoring. The Internal Control DNA gives rise to a 191 bp amplicon. The Classic PCR Mix contains dUTP instead of dTTP to facilitate the degradation of amplicon carry-over by use of uracil-DNA glycosylase (UNG). This minimizes the probability of false positive results. Please note that UNG is not included in the Venor®GeM Classic Kit.

CONTENT

Each kit contains reagents for 25, 100, or 250 reactions. The expiry date of the unopened package is marked on the package label. The kit components must be stored at +2 to +8 °C until use. The rehydrated components must be stored at ≤ -18 °C.

Component	Quantity			Cap color
	25 Reactions Order No. 11-1025G	100 Reactions Order No. 11-1100G	250 Reactions Order No. 11-1250G	
Classic PCR Mix	1 vial, lyophilized	4 vials, lyophilized	10 vials, lyophilized	red
10x Reaction Buffer	1 vial, 0.5 ml	1 vial, 0.5 ml	2 vials, 0.5 ml	blue
Positive Control DNA	1 vial, lyophilized	1 vial, lyophilized	1 vial, lyophilized	green
Internal Control DNA	1 vial, lyophilized	1 vial, lyophilized	3 vials, lyophilized	yellow
PCR grade Water	1 vial, 2.0 ml	2 vials, 2.0 ml	4 vials, 2.0 ml	white

The lot-specific quality control certificate (Certificate of Analysis) can be downloaded from our website (www.minervabiolabs.us).

USER-SUPPLIED CONSUMABLES AND EQUIPMENT

The Venor®GeM Classic Kit contains PCR reagents for the specific detection of mycoplasma. Additional PCR consumables and equipment are supplied by the user:

- PCR cycler and suitable PCR reaction tubes
- 1.5 ml reaction tubes, DNA-free
- Microcentrifuge for 1.5 ml and PCR reaction tubes
- Pipettes with corresponding filter tips (10, 100, and 1000 µl)
- Agarose gel electrophoresis system including dye, marker, and loading buffer
- Explicitly required for EP 2.6.7 / JP G3 compliant testing:

  DNA extraction kit, e.g. Venor®GeM Sample Preparation Kit (Cat. No. 56-1010/50/200)
  10 mM Tris-HCl, pH 8.4

- Optional for process validation and EP/JP compliant testing:

  Internal Control DNA extra (Cat. No. 11-1905)
  10CFU™ Sensitivity Standards (e.g. Cat. No. 102-0002) for all EP/JP listed mycoplasma species
  100CFU™ Sensitivity Standards (e.g. Cat. No. 103-6003)

- Optional for carry-over prevention: Uracil DNA glycosylase (UNG)

SAMPLES FOR CELL CULTURE SCREENING

Samples should be collected when cell cultures reach 80 to 90 % confluence. Cell culture supernatants are very well suited for the mycoplasma test and do not require additional sample preparation. However, PCR inhibiting substances may accumulate in the cell culture medium, which will make it necessary to extract the DNA prior to PCR test (see “DNA extraction” below for further information). Note that penicillin or streptomycin in the culture media are not known to inhibit mycoplasma nor affect the test’s sensitivity.

The average mycoplasma titer in cell culture is ~10^6 particles per ml, with a maximum of 10^8 particles per ml. Within this range, a sufficient amount of mycoplasma DNA is present in the supernatant for successful application of the PCR test. Prepare the PCR template as follows:

1.	Transfer 100 µl of the supernatant from the cell culture to a 1.5 ml reaction tube. Close the lid tightly.
2.	Incubate the sample supernatant at 95 °C for 10 min (at least 5 min).
3.	Centrifuge the sample at max. speed for 15 s to pellet cellular debris.
4.	Use 2 µl directly for PCR, or store the sample for up to 6 days at +2 to +8 °C or at ≤ –18 °C for longer periods.

Cell pellets cannot be used directly for the test, due to the negative influence of cell debris on the PCR reaction. Cell pellets, higher PCR input volumes (> 2 µl), or other biological materials such as foetal calf serum (> 5 %), vaccines, cryo stocks, and paraffin-embedded samples require DNA extraction prior to PCR. The Venor®GeM Classic Kit was tested with Venor®GeM Sample Preparation kit (Cat. No. 56-1010/-1050/-1200) for DNA extraction. Extracted DNA may be stored at +2 to +8 °C for up to 6 days. Long-term storage must be at ≤ –18 °C.

SAMPLES FOR EP/JP/USP COMPLIANT TESTING

EP- and JP-compliant testing explicitly require mycoplasma DNA extraction prior to PCR. The type and volume of starting material to be used for the extraction may vary. Follow the sample concentration protocol on the next page if the sample volume is > 200 µl. Specimen should be stabilized after collection if DNA extraction is not performed immediately (see below).

Sample stabilization (optional)

Cell culture samples are likely to contain high concentrations of DNases, which will degrade mycoplasma DNA even at low temperatures. Therefore, we recommend stabilizing the sample as described in the following steps. These steps can be omitted if DNA extraction is performed immediately after sample collection.

1.	Transfer an appropriate volume (e.g. 500 µl) of cell culture or cell culture supernatant to a 1.5 ml reaction tube. Close the lid tightly.
2.	Incubate the sample at 95 °C for 10 min.
3.	Centrifuge the sample at approx. 13,000 × g for 15 s to pellet cellular debris.
4.	Use the supernatant for DNA extraction. Store the sample for up to 6 days at +2 to 8 °C or at ≤ –18 °C for long term storage.

DNA Extraction (required)

A substantial number of studies shows that DNA extraction is required to achieve the highest level of sensitivity. Numerous DNA extraction methods are established for a vast variety of sample materials. However, the DNA extraction method must be compatible with the mycoplasma- and sample-specific characteristics. For EP- and JP-compliant testing, the specific DNA extraction method must be tested in combination with the PCR kit.

We recommend our Venor®GeM Sample Preparation Kit (Cat. No. 56-1010/-1050/-1200). This DNA extraction kit was tested extensively. Please see the Instructions for Use of the Venor®GeM Sample Preparation Kit for the detailed protocol.

Sample concentration (optional)

For sample volumes > 200 µl, a concentration step is recommended to achieve optimal sensitivity. Please note that the sample concentration protocol works only with intact mycoplasma cells. Therefore, any procedure disrupting the cells (e.g. by heat inactivation) prior to sample concentration must be avoided. Samples up to 200 µl volume can be processed directly without the sample concentration step.

1.	Transfer up to 1 ml supernatant of the sample into a 1.5 ml reaction tube.
2.	Centrifuge the sample at ≥ 10,000 × g for 15 min (or ≥ 13,000 × g for 6 min) to pellet mycoplasma particles.
3.	Discard the supernatant and re-suspend the pellet in 200 µl Tris buffer (10 mM Tris-HCl, pH 8.4).
4.	Vortex the sample briefly and proceed immediately with sample stabilization or DNA extraction.

RECOMMENDATIONS

According to EP 2.6.7 / JP G3, a sensitivity of 10 CFU/ml must be demonstrated. The sample material can be spiked with 10 CFU of inactivated mycoplasma by using special reference materials (10CFU™ Sensitivity Standards, Cat. No. 102-0002) and processed in parallel.

Ideally, the Internal Control DNA of Venor®GeM Classic Kit is used to validate the DNA extraction step as well. Please note that the actual sample volume that will be spiked is not relevant for the required volume of Internal Control DNA. The volume of Internal Control DNA depends on the final elution volume (containing the DNA extract) of the DNA extraction step. In general, add 5 µl per 10 µl DNA extract directly to the sample, vortex briefly and proceed with the DNA extraction. (For example: add 30 µl Internal Control DNA to the original sample if the elution volume will be 60 µl Elution Buffer.) Do not add further Internal Control DNA to the PCR master mix if the internal control was already added to the sample. Internal Control DNA can be purchased separately (Internal Control DNA Extra, Cat. No. 11-1905).

REMARKS ON EP 2.6.7 / JP G3 COMPLIANT VALIDATION

Please note that validation data are provided for information purpose only, containing basic information on specificity and sensitivity. EP 2.6.7 clearly states “Where commercial kits are used …, documented validation points already covered by the kit manufacturer can replace validation by the user. Nevertheless, the performance of the kit with respect to its intended use has to be demonstrated by the user (e.g. detection limit, robustness, cross-detection of other classes of bacteria)“. A similar statement is included in the JP G3. Please contact us for further assistance.

PRECAUTIONS

The Venor®GeM Classic Kit is intended for in vitro use only. The kit should be used by trained laboratory staff only.

All samples should be considered as potentially infectious and handled with all due care and attention. Always wear a suitable lab coat and disposable gloves.

This kit does not contain hazardous substances. Remnants can be discarded according to local regulations.

IMPORTANT NOTES

⇒ These instructions must be understood to successfully use the Venor®GeM Classic Kit. The reagents supplied should not be mixed with reagents from different lots and used as an integral unit. The reagents of the kit must not be used beyond the expiry date.

⇒ Follow the exact protocol. Any deviation may affect the test method and the results.

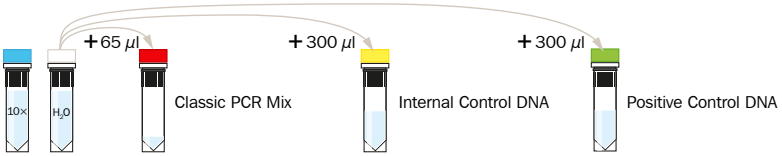
⇒ It is important to include control samples on a regular basis to monitor the reliability of your results. Positive and negative controls are essential in case of troubleshooting. Use fresh cell culture medium or elution buffer for the negative controls in case of extracted DNA.

⇒ Avoid carry-over contaminations by preparing the positive controls after the negative controls and test reactions and, whenever possible, in separated work areas.

⇒ PCR inhibition is likely to be caused by the sample matrix, or, in case of extracted DNA, by the elution buffer. Thus, we recommend our Venor®GeM Sample Preparation Kit. Any other DNA extraction kit needs to be validated.

PROCEDURE - OVERVIEW

1. Reagent preparation



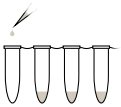
5 min briefly 5 sec

2. Reaction mix preparation

for cell culture screening

mix components*
15.5 µl H_2O
2.5 µl 10×
2.5 µl Classic PCR Mix
2.5 µl IC

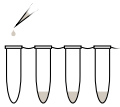
aliquot 23 µl



for EP/JP/USP testing

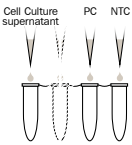
mix components*
7.5 µl H_2O
2.5 µl 10×
2.5 µl Classic PCR Mix
2.5 µl IC

aliquot 15 µl



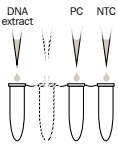
3. Add samples

+ 2 µl



briefly

+ 10 µl



briefly

4. PCR amplification

1 cycle	94 °C for 2 min
39 cycles	94 °C for 30 sec
	55 °C for 30 sec
	72 °C for 30 sec
hold	4 - 10 °C

5. Gel electrophoresis

+ add vortex incubate centrifuge * example composition

This procedure overview is not a substitute for the detailed manual.

MB_SI_VGM-Classic-US_03_EN

PROCEDURE - STEP BY STEP

1. Reagent preparation

1.	Classic PCR Mix Internal Control DNA Positive Control DNA	red cap yellow cap green cap	Centrifuge all components at max. speed for 5 sec
2.	Classic PCR Mix	red cap	Add 65 µl PCR grade Water (white cap) For sample kit only: Add 15 µl PCR grade Water
3.	Internal Control DNA	yellow cap	Add 300 µl PCR grade Water (white cap)
4.	Positive Control DNA	green cap	Add 300 µl PCR grade Water (white cap)
5.	Classic PCR Mix Internal Control DNA Positive Control DNA	red cap yellow cap green cap	Incubate at room temperature for 5 min
6.	Classic PCR Mix Internal Control DNA Positive Control DNA	red cap yellow cap green cap	Vortex briefly and spin down for 5 sec

After reconstitution, the reagents must be stored at ≤ –18 °C. Repeated freeze-thaw-cycles should be avoided. For small sample numbers, we recommend preparing aliquots of reconstituted Classic PCR Mix, the Positive Control DNA and the Internal Control DNA.

2. Reaction mix preparation

Prepare the required amount of reaction mix at room temperature in a 1.5 ml reaction tube for all control and test reactions.

2a) Reaction mix for cell culture screening (2 µl sample volume)

	for 1 reaction	for 25 reactions
PCR grade Water	15.5 µl	387.5 µl
10x Reaction Buffer	2.5 µl	62.5 µl
Classic PCR Mix	2.5 µl	62.5 µl
Internal Control DNA	2.5 µl	62.5 µl

2. Vortex the reaction mix briefly and spin down for 5 s.
3. Pipet 23 µl to each PCR tube, discard remaining material.

2b) Reaction mix for EP- / JP- / USP-compliant testing (10 µl sample volume)

	for 1 reaction	for 25 reactions
PCR grade Water	7.5 µl	187.5 µl
10x Reaction Buffer	2.5 µl	62.5 µl
Classic PCR Mix	2.5 µl	62.5 µl
Internal Control DNA	2.5 µl	62.5 µl

2. Vortex the reaction mix briefly and spin down for 5 s.
3. Pipet 15 µl to each PCR tube, discard remaining material.

3. Add samples

⇒ Include negative (no template controls, NTCs) and positive controls in each PCR.

3a) for cell culture screening (2 µl sample volume)

1. Negative Controls: add 2 µl PCR grade Water (white cap).
2. Samples: add 2 µl of cell culture supernatant or DNA extract.
3. Positive Control: add 2 µl Positive Control DNA (green cap).
4. Close and spin all PCR tubes briefly, load the PCR cycler and start the program.

3b) for EP-/JP-/USP-compliant testing (10 µl sample volume)

1.	Negative Controls: add 10 µl elution buffer from DNA extraction kit (see “Samples Material“).
2.	Samples: add 10 µl DNA extract.
3.	Positive Control: add 2 µl Positive Control DNA (green cap) and 8 µl of PCR grade Water (white cap).
4.	Close and spin all PCR tubes briefly, load the PCR cycler and start the program.

4. Start PCR amplification

1.	Place the PCR tubes in the cycler and close the lid tightly.
2.	Program the PCR cycler or check stored temperature profiles. 94 °C for 2 min 94 °C for 30 sec 55 °C for 30 sec 72 °C for 30 sec
3.	Start the program.

5. Agarose gel electrophoresis

⇒ Use your established gel electrophoresis system, agarose gel and DNA stain if compatible with PCR products between 200 and 300 bp. Otherwise follow this example:

1.	Prepare a 1.5 to 2.0 % agarose gel including DNA stain (~5 mm thick, 5 mm comb).		
2.	Mix 5 µl from each PCR reaction with a suitable loading buffer and load the mix. Note: Bromophenol blue will run similarly to ~270 bp PCR fragments and may therefore mask the PCR product. Make sure to use bromophenol blue in a low concentration or other dyes such as Orange G or Xylene Cyanol.		
3.	Perform the gel electrophoresis (e.g. 20 min at 100 V). Visualize the PCR results on a suitable transilluminator.		
4.	Expected amplicon sizes:	Internal control Mycoplasma spp.	191 bp 265-278 bp

DATA INTERPRETATION

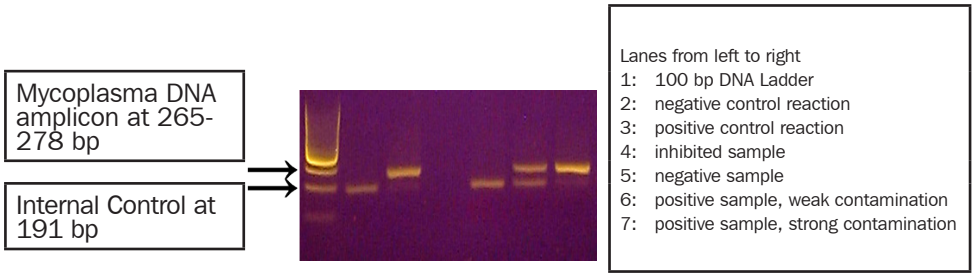
The Internal Control DNA gives rise to a distinct 191 bp band in every lane indicating a successfully performed PCR. Due to competition between the internal control and the target reaction, this band will fade out when large amounts of primary target are initially present (e.g. mycoplasma DNA input of > 10^3 copies per PCR). The DNA input in the positive control DNA is higher than 10^4 copies per PCR. Consequently, the internal control is usually not visible in the positive control reaction.

Other PCR products may be visible in the gel as faint, diffuse bands of unexpected sizes (neither 191 bp nor ~270 bp). These bands do not indicate positive results and may be due to considerable amount of background DNA (DNA input > 100 µg/ml), leading to unspecific annealing reactions. Also, primer self-annealing may give rise to a band of 80-90 bp in size, which - again - does not affect the sensitivity, precision, or results of the test.

If the PCR test shows inhibition due to the characteristics of the sample (lower intensity of the Internal Control band compared to negative controls), DNA extraction needs to be performed prior to re-testing (see chapter „SAMPLES FOR EP-/JP-/USP-COMPLIANT TESTING“).

Detection of Mycoplasma band at 265-278 bp	Internal control band at 191 bp	Interpretation
Positive	Irrelevant	Mycoplasma present in the sample
Negative	Negative	PCR inhibition
Negative	Positive	No mycoplasma detectable in the sample

Fig. 1: A typical agarose gel image



ASSAY CHARACTERISTICS

An extensive validation study is available on request.

Sensitivity

The detection limit depends on the species and ranges from ≤ 5 to ≤ 10 CFU/ml using the protocol with 10 µl sample volume per PCR reaction. For all EP / USP / JP listed mycoplasma species, the required detection limit of 10 CFU/ml can be reached with a pre-analytical DNA extraction using the Venor® GeM Sample Preparation Kit.

Species	Detection limit LOD_{95} [CFU/ml]	Species	Detection limit LOD_{95} [CFU/ml]
Acholeplasma laidlawii	≤ 5	*Mycoplasma pneumoniae*	≤ 10
Mycoplasma hyorhinis	≤ 10	*Mycoplasma arginini*	≤ 10
Mycoplasma fermentans	≤ 10	*Mycoplasma gallisepticum*	≤ 10
Mycoplasma orale	≤ 10	*Spiroplasma citri*	≤ 10
Mycoplasma synoviae	≤ 10	*Mycoplasma salivarium*	≤ 10

Specificity

The specificity of the assay was assessed on DNA extracts of *Mollicutes*, non-*Mollicutes* bacteria, and eukaryotic cell/tissue samples. As shown in the table on the following page, the PCR assay detects several *Mollicutes* species, but not any of the phylogenetically related microorganisms, such as *Clostridium*, *Lactobacillus*, and *Streptococcus*. The table lists all positively tested species as well as those that were not detected. Cross-reactivity with eukaryotic DNA could not be observed. Likewise, the waterborne germ *Burgholderia* was not detected. The test was positive for *Staphylococcus epidermidis* at concentrations above 10^4 genome copies/µl. Unspecific PCR products such as faint, diffuse bands of different sizes are rarely observed (see chapter “DATA INTERPRETATION“).

Positive tested Mollicutes	Negative tested		
	EP listed bacteria	Other microorganisms	Mammals
Acholeplasma laidlawii	*Clostridium acetobutylicum*	*Chlamydia trachomatis*	Vero-B4
Mycoplasma arginini	*Lactobacillus acidophilus*	*Legionella pneumophila*	Per.C6
Mycoplasma arthritidis	*Streptococcus pneumoniae*	*Micrococcus luteus*	RK13
Mycoplasma fermentans		*Candida albicans*	CHO-K1
Mycoplasma gallisepticum		*Enterococcus faecalis*	*Murine genomic DNA*
Mycoplasma genitalium		*Enterobacter aerogenes*	*Calf thymus DNA*
Mycoplasma hominis		*Escherichia coli*	*Foetal bovine serum*
Mycoplasma hyorhinis		*Proteus mirabilis*	
Mycoplasma orale		*Bacillus cereus*	
Mycoplasma penetrans			
Mycoplasma pneumoniae			
Mycoplasma salivarium			
Mycoplasma synoviae			
Spiroplasma citri			
Ureaplasma urealyticum			

APPENDIX

Limited Product Warranty

This warranty limits our liability for replacement of this product. No warranties of any kind, express or implied, including, without limitation, implied warranties of merchantability or fitness for a particular purpose, are provided. Minerva Biolabs shall have no liability for any direct, indirect, consequential, or incidental damages arising from the use, the results of use, or the inability to use this product.

Trademarks

Venor, Mynox, Onar, and ZellShield are registered trademarks and 100CFU, 10CFU, Cycler Check, PCR Clean, Mycoplasma Off, and WaterShield are trademarks of Minerva Biolabs GmbH.

Related Products

Contamination Control Kits for conventional PCR		
11-8025/-8100/-8250	Venor®GeM OneStep Mycoplasma Detection Kit	25/100/250 reactions
12-1025/-1100/-1250	Onar® Bacteria Detection Kit	25/100/250 reactions
Contamination Control Kits for qPCR		
11-9025/-9100/-9250	Venor®GeM qEP Mycoplasma Detection Kit	25/100/250 reactions
11-91025/-91100/-91250	Venor®GeM qOneStep Mycoplasma Detection Kit	25/100/250 reactions
Sample Preparation		
56-1010/-1050/-1200	Venor®GeM Sample Preparation Kit	10/50/200 extractions
Mycoplasma Elimination		
10-0200/-0500/-1000	Mynox® Mycoplasma Elimination Reagent	2/5/10 treatments
10-0201/-0501/-1001	Mynox® Gold Mycoplasma Elimination Reagent	2/5/10 treatments
10CFU™ Sensitivity Standards, 3 vials with 10 CFU each, 2 vials negative control		
102-1003	*Mycoplasma arginini*	
102-2003	*Mycoplasma orale*	
102-3003	*Mycoplasma gallisepticum*	
102-4003	*Mycoplasma pneumoniae*	
102-1103	*Mycoplasma salivarium*	
102-5003	*Mycoplasma synoviae*	
102-6003	*Mycoplasma fermentans*	
102-7003	*Mycoplasma hyorhinis*	
102-8003	*Acholeplasma laidlawii*	
102-9003	*Spiroplasma citri*	
102-0002	Mycoplasma Set, all EP / JP listed species	2 vials per species, 10 CFU each
100CFU™ Sensitivity Standards, 3 vials with 100 CFU each, 2 vials negative control		
103-1003	*Mycoplasma arginini*	
103-2003	*Mycoplasma orale*	
103-3003	*Mycoplasma gallisepticum*	
103-4003	*Mycoplasma pneumoniae*	
103-1103	*Mycoplasma salivarium*	
103-5003	*Mycoplasma synoviae*	
103-6003	*Mycoplasma fermentans*	
103-7003	*Mycoplasma hyorhinis*	
103-8003	*Acholeplasma laidlawii*	
103-9003	*Spiroplasma citri*	
PCR Cycler Validation		
57-2102	PCR Cycler Check™ Advance	6 strips, 8 vials each
57-2103	PCR Cycler Check™ OneStep	100 reactions
57-2202	qPCR Cycler Check™	100 reactions
PCR Clean™		
15-2025/15-2200	Decontamination Reagent, Spray bottles/canister	250 ml/4×500 ml/5 l
15-2001	Decontamination Reagent, Wipes in a dispenser box	50 wipes
15-2002	Decontamination Reagent, Wipes in refill packs	5×50 wipes
Mycoplasma Off™		
15-1000/-5000	Surface Disinfectant Spray, Spray bottle/canister	1 l/5 l
15-1001	Surface disinfectant Wipes in dispenser box	50 wipes
15-5001	Surface Disinfectant Wipes in refill packs	5×50 wipes
ZellShield®		
13-0050/-0150	Contamination Prevention Reagent 100× concentrate	50 ml/ 3×50 ml
WaterShield™		
15-3015/3020/3050	Water Disinfection Additive for incubators and water baths, 200× concentrate	15×10 ml/ 3×50 ml/ 500 ml

PCR Quantification Standards, 10^8 genomes / vial

52-0116	*Acholeplasma laidlawii*
52-0129	*Mycoplasma arginini*
52-0117	*Mycoplasma fermentans*
52-0115	*Mycoplasma gallisepticum*
52-0130	*Mycoplasma hyorhinis*
52-0112	*Mycoplasma orale*
52-0119	*Mycoplasma pneumoniae*
52-0103	*Mycoplasma salivarium*
52-0124	*Mycoplasma synoviae*
52-0164	*Spiroplasma citri*
52-5571	*Bordetella pertussis*
52-0083	*Escherichia coli*
52-0101	*Legionella pneumophila*
52-0071	*Pseudomonas aeruginosa*

See MB homepage for further available species

Genomic DNA Extracts, 10 ± 2 ng / vial

51-0116	*Acholeplasma laidlawii*
51-0129	*Mycoplasma arginini*
51-0117	*Mycoplasma fermentans*
51-0115	*Mycoplasma gallisepticum*
51-0130	*Mycoplasma hyorhinis*
51-0112	*Mycoplasma orale*
51-0119	*Mycoplasma pneumonia*
51-0124	*Mycoplasma synoviae*
51-0164	*Spiroplasma citri*
2101-00819	*Aspergillus fumigatus*
51-0031	*Bacillus cereus*
51-0010	*Bacillus subtilis*
51-5571	*Bordetella pertussis*
51-1386	*Candida albicans*
51-7058	*Salmonella enterica*
51-0231	*Staphylococcus aureus*
51-0044	*Staphylococcus epidermidis*

See MB homepage for further available species

Notes

Minerva Biolabs GmbH
Schkopauer Ring 13
D-12681 Berlin, Germany

www.minerva-biolabs.com
Ordering: order@minerva-biolabs.com
Support: support@minerva-biolabs.com

USA & Canada

Minerva Biolabs Inc.
1 Jill Ct., Building 16, Unit 10
Hillsborough, NJ 08844
USA

www.minervabiolabs.us
Ordering: order@minervabiolabs.us
Support: help@minervabiolabs.us

Made in Germany

HB44.06EN

minerva biolabs®