*recom*Line Parvovirus B19 IgG [Avidität]
*recom*Line Parvovirus B19 IgM

MIKROGEN DIAGNOSTIK

IVD

Instructions for use (English)

1 Purpose

The *recom*Line Parvovirus B19 IgG, IgM is a qualitative test to detect IgG or IgM antibodies, as well as to determine the avidity of IgG antibodies against Parovirus B19 in human serum or plasma.

2 Intended use

Parvovirus B19 causes Erythema infectiosum. A Parvovirus B19 infection during pregnancy may result in spontaneous abortion, still birth or Hydrops fetalis in sero-negative pregnant women. Parvovirus B19 IgG antibodies are retained for life after contact with the virus. Parvovirus B19 IgM-antibodies can be detected at the earliest approx. 10 days after contact with the virus. The *recom*Line B19 IgG, IgM is a line immunoassay. The test principle allows the identification of specific antibodies against the individual antigens of Parvovirus B19, in contrast with ELISAs, by separately lining up the individual antigens. Various antigen reaction patterns and the option of an avidity measurement allow additional statements concerning the state of the infection.
The *recom*Line Parvovirus B19 IgG, IgM is a confirmation test that can be used to validate unclear screening results and can also provide additional information concerning the infection status.

3 Test principle

The following, highly purified recombinant Parvovirus B19 antigens are fixed on nitrocellulose membrane strips:

Vp-2p	Main capsid antigen (confirmation epitope)
VP-N	N-terminal half of the structure proteins VP-1 and VP-2
VP-1S	specific segment (differentiation to VP-2)
VP-2r	Main capsid antigen (linear epitope)
VP-C	C-terminal half of the structure proteins VP-1 and VP-2
NS-1	Non-structure protein

1. The test strips are incubated with the diluted serum or plasma sample, with specific antibodies attached to the pathogen antigens on the test strip.
2. Unbound antibodies are then flushed away.
3. In a second step, the strips are incubated with anti-human immunoglobulin antibodies (IgG and /or IgM), which are coupled to horseradish peroxidase.
4. Unbound conjugate antibodies are then flushed away.
5. Specifically bound antibodies are detected by a peroxidase-catalysed colour reaction. If an antigen-antibody reaction has taken place, a dark band will appear on the strip at the corresponding point.

There are control bands at the upper end of the test strips:

a) The reaction control band under the strip number, which must show a reaction for every serum/plasma sample.
b) The conjugate controls (IgG, IgM) are used for the inspection of the antibody class detected. If, for example, the test strip is used for the detection of IgG antibodies, the IgG conjugate will show this clearly on the band.
c) "Cut-off control": The intensity of this band allows the assessment of the reactivity of each antigen band (see 9.2. Evaluation).

4 Reagents

4.1 Package contents

The reagents in one package are sufficient for 20 tests.

Each test kit contains:

WASHBUF A 10 X	**100 ml** Wash Buffer A (**10 times concentration**) Contains phosphate buffer, NaCl, KCl, detergent, preservative: MIT (0.1%) and Oxypyrion (0.2%)
SUBS TMB	**40 ml** Chromogenic substrate Tetramethylbenzidin (**TMB, ready-to-use**)
MILKPOW	**5 g** skimmed milk powder
INSTRU	**1** Instructions for use
EVALFORM	**1** Evaluation form

4.1.1 *recomLine Parvovirus B19 IgG [Avidität]*

In addition to the components listed in 4.1, each test kit contains:

TESTSTR	**2** tubes, each with 10 numbered test strips
CONJ IgG	**500 µl** anti-human IgG conjugate **(100-fold concentration, green cap)** From rabbit, containing NaN3 (<0.1%), MIT (0.1%) and chloroacetamide (0.1%)

4.1.2 *Determining the avidity*

The avidity reagent with appropriate usage information can be provided on request to determine the avidity of Parvovirus B19 IgG antibodies.

AVIDI Item No. 11010	**1** avidity reagent (solid substance 25g) for 60 ml ready-to-use solution

4.1.3 *recomLine Parvovirus B19 IgM*

In addition to the components listed in 4.1, each test kit contains:

TESTSTR	**2** tubes, each with 10 numbered test strips
CONJ IgM	**500 µl** anti-human IgM conjugate **(100-fold concentration, purple cap)** From rabbit, containing NaN3 (<0.1%), MIT (0.1%) and chloroacetamide (0.1%)

4.2 Materials required but not supplied

- Incubation trays (can be purchased as needed from MIKROGEN)
- Deionised water (high quality)
- Plastic forceps
- Horizontal shaker
- Vortex mixer or other rotators
- Vacuum pump or similar device
- Volumetric cylinders, 50 ml and 1000 ml
- Micropipettes with disposable tips, 20 µl and 1000 µl
- 10 ml pipette or dispenser
- Timer
- Absorbent paper towels
- Disposable protective gloves
- Waste container for bio-hazardous materials

5 Shelf life and handling

- Store reagents at +2 to 8°C before and after use, **do not freeze**.
- Subject all ingredients to room temperature (+18 to 25°C) for at least 30 minutes before beginning the test. The test procedure is carried out at room temperature.
- Washing Buffer, Milk Powder, Dilution Buffer, Conjugate and TMB can be interchanged between the different *recom*Line and *recom*Blot test systems, if these components carry the same symbols. Consider the shelf life of these components.
- Mix the concentrated reagents and samples thoroughly before use. Avoid the build-up of foam.
- Only open the tube containing the test strip immediately before use to avoid condensation. Leave unused strips in the tube and continue to store at +2 °C to +8 °C (reseal tube tightly, test strips must not become moist before the test!).
- The strips are marked with the serial number, as well as the test code.
- The packages bear an expiration date. After this has been reached no guarantee of quality can be offered.
- Protect kit components from direct sunlight throughout the entire test procedure. The substrate solution (TMB) is especially sensitive to light.
- The test should only be carried out by trained and authorised personnel.
- In case of significant changes by the user to the product and/or the instructions for use, application may be beyond the purpose specified by MIKROGEN.
- Cross-contamination of patient samples or conjugates can lead to inaccurate test results. Add patient samples, test strips and conjugate solution carefully. Make sure that incubation solutions do not flow over into other wells. Carefully drain liquids.
- The strips must be completely wetted and immersed throughout the entire procedure.
- Automation is possible; you will receive further information from MIKROGEN.

6 Warnings and precautions

- For *In vitro* diagnostic use only.
- MIKROGEN has not validated these tests for screening of blood, blood components, cells, tissues, organs or any of their derivatives in order to assess the suitability for transfusion, transplantation or cell administration.
- All blood products must be treated as potentially infectious.
- The test strips were manufactured with inactivated whole cell lysates and / or recombinant produced bacterial, viral or parasitic antigens.
- After the addition of patient or control specimens the strip material must be considered infectious and treated as such.
- Suitable disposable gloves must be worn throughout the entire test procedure.
- The reagents contain the antimicrobial agents and preservatives sodium azide, MIT (methylisothiazolone), oxypyrion and chloroacetamide and hydrogen peroxide. Avoid contact with the skin or mucous membrane. Sodium azide can form an explosive azide upon contact with heavy metals such as copper and lead azide.
- All siphoned liquids must be collected. All containers must include appropriate disinfectants for the inactivation of pathogenic human viruses and other pathogens. All reagents and materials contaminated with potentially infectious samples must be treated with disinfectants or disposed of according to your hygiene regulations. The concentrations and incubation periods stated by the manufacturer must be observed.
- Use incubation trays only once.
- Handle strips carefully using plastic forceps.
- Do not substitute or mix the reagents with reagents from other manufacturers.
- Read through the entire instructions for use before carrying out the test and carefully follow the directions. Deviation from the test protocol provided in the instructions for use can lead to erroneous results.

7 Sampling and preparation of reagents

7.1 Samples

The sample can be serum or plasma (EDTA, citrate, heparin, CPD), which needs to be separated from the blood clot as soon as possible after sampling so as to avoid haemolysis. Avoid Microbial contamination of the samples. Insoluble substances must be removed from the sample prior to incubation.
The use of heat-inactivated, icteric, haemolysed, lipemic or turbid samples is not recommended.

Caution!
If the provisions are not made immediately, the sample can be stored for up to 2 weeks at +2 to +8 °C. Prolonged storage of the samples is possible at −20°C or below. Repeated freezing and thawing of samples is not recommended due to the risk of producing inaccurate results. Avoid more than 3 cycles of freezing and thawing.

7.2 Preparation of solutions

7.2.1 *Preparation of ready-to-use wash buffer A*

This buffer is required for serum and conjugate dilution as well as washing stages.
Prior to dilution, the volume of wash buffer A must be determined for the corresponding number of tests.
First, the skimmed milk powder is dissolved in wash buffer A concentrate, and then deionised water is added to bring the solution up to the final volume (dilution: 1 + 9). The quantities required for a defined number of test strips are to be mathematically determined according to the following formula (device-specific dead volume is not considered):

Reagent	Formula	Example: 5 strips
Skimmed milk powder [g]	= number of strips x 0.1	0.5 g
Wash buffer A concentrate [ml]	= number of strips x 2	10 ml
Deionised water [ml]	= number of strips x 18	90 ml
Ready-to-use wash buffer A [ml]	= number of strips x 20	100 ml

Ready to use wash buffer A can be stored at 2 °C – 8 °C for up to four weeks. The ready to use wash buffer A is odourless and easily marred.

7.2.2 *Preparation of conjugate solutions*

The conjugate solution must be prepared immediately before use. It is not possible to store the ready for use conjugate solution.
One part of the conjugate concentrate is diluted with 100 parts of the ready to use wash buffer A (1 + 100).
The quantities required for a defined number of test strips are to be calculated according to the following formula:

Reagent	Formula	Example: 5 strips
Conjugate concentrate [µl]	= number of strips x 20	100 µl
Ready-to-use wash buffer A [ml]	= number of strips x 2	10 ml

The conjugate quantities are calculated without dead volume. Depending on handling (manual or on a device), please mix additional conjugate for 1 to 3 strips.

8 Test procedure

No.	Execution	Note
1	Temper all reagents for at least 30 minutes at 18°C - 25° (room temperature) before beginning the test.	The test procedure is carried out at room temperature.
2	Prepare test strips Place the strips in **2 ml** of ready-to-use **wash buffer A**.	Do not touch the strips with bare hands - use tweezers instead. The strip number points upward. A well is required in the incubation tray (see 4.2)
3 a) b)	Incubation of samples **20 µl** of undiluted sample (human serum or plasma) is pipetted on to the test strip for each incubation mixture. (Dilution 1 + 100) Incubate for **1 hour** with gentle shaking	 Pipette the sample at one end of the immersed strip in the wash buffer A and mix as quickly as possible by carefully shaking the tray. Cover the incubation tray with plastic cover and place in the shaker.
4 a) b) c)	Washing Carefully remove the plastic cover from the incubation trays. Gently siphon serum dilution from the individual wells. Pipette **2 ml** of ready to use **wash buffer A** into each well, wash for 5 minutes with gentle shaking and then siphon off the wash buffer A.	Carry out washing stages 8.4a-8.4c three times in total. Avoid cross-contamination The manufacturer's instructions must be followed during automatic processing.
5	Incubation with conjugate Add **2 ml** of ready-to-use **conjugate solution** and incubate for **45 minutes** while shaking gently.	Cover the incubation tray with plastic cover and place in the shaker.
6	Washing see under 8.4	Carry out washing stages three times in total (see 8.4a-8.4c)
7	Substrate reaction Add **1.5 ml** of ready-to-use **substrate solution** and incubate for **8 minutes** while shaking gently.	
8	Stopping the reaction Wash at least three times **briefly** with **deionisied water**.	
9	Drying the strips Dry the strips between 2 layers of absorbent paper for **2 hours** prior to analysis.	Carefully remove strips from water using plastic forceps. Store strip away from light.
Caution! **Incubation solutions must not flow into other wells. Splashing must be avoided especially when opening and closing the lid.**		

9 Results

Caution:
Please do not use automated interpretation without consideration of the information on interpretation given below.

9.1 Validation – Quality Control

An analysis of the test can be carried out if the following criteria have been fulfilled:

1. Reaction control band (top line) with clearly visible stain, dark band.
2. Antibody class (second and third bands): The IgG and / or IgM conjugate control band must show a clear staining. The respective, other conjugate band may show weak, unspecific staining.
3. Cut-off control (fourth band): weak, but visible staining.

9.2 Evaluation

The analysis of the test strips can be visual or computer-assisted - using the test strip analysis software *recom*Scan. The *recom*Scan software is designed to support the evaluation of test strips. Further information and related instructions for the computer-assisted analysis is available on request from MIKROGEN. The following instructions relate to visual analysis.

9.2.1 *Assessment of band intensity*

1. Note the date and batch number, as well as the detected antibody class, on the attached evaluation form.
2. Enter the sample identification numbers to the evaluation sheet.
3. Now stick the corresponding test strip onto the appropriate fields on the evaluation form using a glue stick. Align the test strip with the reaction control bands along the marked lines. Then use a transparent adhesive tape to attach the test strip to the left of the marked lines (do not tape over the reaction control band!). Sticking the entire test strip down flat using glue or tape can lead to changes in colour.
4. Now identify the bands of the developed test strip on the basis of the printed control strip of the evaluation sheet and enter this in the evaluation sheet. For each corresponding immunoglobulin class, assess separately the intensity of the bands occurring on the basis of Table 1.

Table 1: Assessment of band intensity in relation to the cut-off band

Stain intensity of the bands	Assessment
No reaction	-
Very low intensity (lower than the cut-off band)	+/-
Low intensity (equivalent to the cut-off band)	+
High intensity (higher than the cut-off band)	++
Very strong intensity	+++

Caution!

The band patterns in the *recom*Line Parvovirus B19 IgG and IgM test can show different intensities. It is possible that the IgG *recom*Line shows stronger and darker bands than the IgM *recom*Line. The intensity of the protein bands is dependent on the concentration of the Parvovirus B19-specific antibodies
Assessment of avidity: See Chapter 9.5.

9.3 Interpretation of test results

Table 2: Evaluation of the bands for the IgG test (without evaluation of NS-1 reactivity)

No reaction or different constellation as shown below		**IgG negative**
VP-N **or** VP-2r **or** VP-C	at least with +	**IgG questionable**
VP-2p **or** two antigens (VP-N, VP-1S, VP-2r, VP-C)	at least with +	**IgG positive**

Table 3: Evaluation of the bands for the IgM proof (without evaluation of the NS-1 reactivity)

No reaction or different constellation as shown below		**IgM negative**
VP-N **or** VP-1S **or** VP-2r **or** VP-C	at least with +	**IgM questionable**
two antigens (VP-2p, VP-N, VP-1S, VP-2r, VP-C)	at least with +	**IgM positive**

Interpretation of the NS-1 reactivity (IgG)

The NS-1 reaction should only be considered in IgG. The NS-1 reaction should not be used for the positive/negative assessment of the anti-Parvovirus B19.
The possible time of infection in the event of **present** NS-1 reactivity in the IgG can be estimated by assuming that the infection happened at least six weeks ago. It must be considered that NS-1 antibodies are only formed in approx. 20% of all cases.
A NS-1 titre can provide information concerning the possible persistence of this virus when viewed in connection with the relevant symptoms and preliminary clinical findings.
However, the diagnosis "persistent Parvovirus B19 infection" may never be based on the serological findings alone. The main criterion remains the detection of the Parvovirus B19 antigen or Parvovirus B19 DNA. It must also be considered that NS-1 antibodies only develop after some time, and that DNA detection with PCR does not have to be positive at any time during the persistence period. It is therefore always necessary to perform several tests during the course of the condition.

9.4 Typical Parvovirus B19 reaction profiles:

The following IgG and IgM reaction patterns can provide indications for a specific Parvovirus B19 status, based on the assessments performed thus far. However, it must be pointed out that these are only typical reaction patterns and that there may be deviations.

- Infections that happened a long time ago often show IgG reactivity against VP-2p and/or VP-N (usually with VP-1S).
- In the event of a new infection, strong IgG reactivity against VP-C and VP-2r can be found in addition to VP-2p, VP-N and VP-1S reactivity. This strong reactivity against VP-C is usually found with a new or recent infection (duration usually no longer than 6 months).
- In some cases, strong reactivity against VP-2r-IgG and no or only a weakly positive reaction against VP-C-IgG can be found with the *recom*Line Parvovirus B19 test in the early phase after infection. The VP-C-IgG titre is still increasing in these cases.

Table 4: Parvovirus B19 status and typical IgG- and IgM-antibody reaction patterns

IgG	IgM	Possible Parvovirus B19 Status
VP-2p, VP-N, VP-2r, VP-C (reactivities usually ≤ cut-off bands)	VP-2p, VP-N, VP-2r, VP-C	**Acute infection**, IgG titre only weakly or not present
VP-2p, VP-N, VP-1S, VP-2r, VP-C	VP-2p, VP-N, VP-2r (reactivities usually ≥ cut-off bands)	**Status after infection** (weeks to months) IgM and IgG response
VP-2p, VP-N, VP-2r, VP-C, usually with VP-1S	Negative or questionable	**Status after infection** (months)
VP-2p and/or VP-N with VP-1S and VP-2r	negative	**Past infection (**months to years)
VP-2p and/or VP-N with VP-1S	negative	**Infection long ago** (years)
VP-2p, VP-N and VP-2r, (reactivities usually only around the cut-off band)	VP-2p, VP-N and/or VP-2r (possibly VP-1S), (reactivities usually only around cut-off bands)	Unclear status, possibly caused by boosting; test should be repeated at a later stage
VP-2p, VP-N, VP-1S	VP-N, VP-1S (reactivities usually ≤ cut-off bands)	Past infection determined by IgG findings with atypical IgM reactivity (constellation was observed in some serums with positive rheumatoid factor, test should be repeated after some time)

The interpretation of a positive or questionable IgM result must always include the IgG reactivity pattern. The concentration of the IgM-antibodies, in particular of the antibodies directed against linear epitopes, drops again very rapidly in some patients. In some cases, positive IgM reactivity can no longer be determined after approx. 4 weeks.

The assessment of NS-1 titre in IgG for verification of persistent Parvovirus B19 infections, reactive arthropathies, chronic anaemias or other symptoms with suspicion of Parvovirus B19 persistence was not considered in Table 4, as a multitude of combinations are possible, depending on the duration, hospital and immune competence. NS-1 titres should only be included in the interpretation for specific questions (see 9.3).

9.5 Extended diagnosis by determining the avidity

The avidity determination in the *recom*Line Parvovirus B19 IgG can be used to improve the diagnosis regarding Parvovirus B19 serology.

9.5.1 *Test principle and test execution*

The avidity reagent, Item No. 11010, can be used to determine the avidity of Parvovirus B19 IgG. The instructions for performing the test are given in the instructions for the use of the avidity reagent.

9.5.2 *Avidity in the recomLine Parvovirus B19 IgG*

The avidity against VP-N and VP-1S is assessed on IgG antibodies. In many cases, no highly avid IgG antibodies are formed during the course of the infection against the linear epitopes of the VP-2r and VP-C, which are presented in the *recom*Line Parvovirus B19. The conformation of the VP-2p antigen, and therefore also its bonding properties, are changed by the avidity reagent. A reliable assessment of avidity for the VP-2P cannot therefore be provided.

9.5.3 *Assessment and interpretation of avidity in the recomLine Parvovirus B19 IgG*

- The avidity is only determined when the overall IgG results have been positive.
- Avidity determination only for anti-VP-N and anti-VP-1s-IgG antibodies.
- Bands on the IgG strip that have a lower reactivity than the cut-off are not taken into account when determining the avidity.
- Compare the intensities of the corresponding bands on the two test strips (IgG strips and avidity strips) incubated with the same patient sample. Pay attention to any change in intensity.
- A decrease in the intensity of the VP-N and VP-1S band by significantly more than 50% can be interpreted as lower avidity, while an increase by approx. 50% indicates intermediary avidity.
- When the avidity is high, the band intensity of the avidity strip does not decrease or hardly decreases, as the IgG antibodies are considered to be highly avid.
- The IgG antibodies against VP-N and VP-1S reach high avidity at the earliest after approx. 4 weeks and at the latest 6 to 8 weeks after infection. A low or intermediary avidity of the VP-N or VP-1S band is therefore a clear indication of an acute infection. An infection within the last 4 weeks can usually be excluded when the IgG antibodies against VP-N and VP-1S are highly avid. When the avidities of VP-N and PV-1S differ from one another, the avidity of VP-1S takes precedence.
- In general, it is not possible to make absolute rules for avidity evaluation. It must be considered in some cases that low avidities are also possible after past infections, as the maturation of the avidity can be delayed (see (11.5). The avidity must always be interpreted within the context of all other examination results.

10 Limitations of the method - restrictions

- Serological test results must always be considered in the context of other medical assessments of the patient. Therapeutic consequences of the serological findings must always be taken in context with the clinical data.
- IgG and IgM findings should always be jointly considered when evaluating the test results.
- For all test interpretations, especially in the case of slightly positive or questionable results, the incorporation of possible clinical information is essential. Once again, close cooperation between the laboratory and the attending physician is recommended. Samples with inconclusive or questionable results should be followed up after 2-3 weeks, subject to the clinical situation.
- A negative result does not entirely exclude the possibility of a Parvovirus B19 infection in general. False negative results can occur if the sampling is made before the initial reaction of the immune system.
- Isolated IgM-positive results without a positive IgG result require careful interpretation. They may indicate an acute infection.
- A weak IgM reactivity due to persistent IgM antibodies can also be caused in connection with clear IgG findings concerning a Parvovirus B19 infection that occurred long ago.
- Polyclonal stimulation of B-lymphocytes by an acute Epstein-Barr virus infection can reactivate the formation of Parvovirus B19 IgM antibodies and thus lead to a positive Parvovirus B19 IgM result.
- The use of icteric serums can lead to an increased number of positive results.
- Dark test strips:Some patient samples can produce a dark, uniform or patterned staining across the entire nitrocellulose strip (e.g. on serums from patients with milk protein allergies). Various factors in each patient serum are responsible for this. The evaluation of these strips is usually only partly feasible. Thus, "inverse" bands (white bands on dark background), for example, should be evaluated as negative. The respective serum should always be examined using other serological methods.

11 Test performance

Samples from routine practice, samples from pregnant women, samples from children with an acute Parvovirus B-19 infection and blood donors were tested to calculate the sensitivity and specificity. The data were compared with another, commercially available ELISA that also works with VP2 particles.

11.1 Sensitivity

*recom*Line Parvovirus B19	IgM % (n)	IgG % (n)
Negative	2,3 % (2/87)	0% (0/149)
Borderline	0 % (0/87)	0% (0/149)
Positive	97,7% (85/87)	100% (149/149)
Sensitivity	97,7%	100%

11.2 Specificity

*recom*Line Parvovirus B19	IgM % (n)	IgG % (n)
Negative	97,0% (164/169)	98,4% (60/61)
Borderline	1,8%(3/169)	0% (0/61)
Positive	1,2% (2/169)	1,6% (1/61)
Specificity	97,0%	98,4%

11.3 Sero-prevalence

*recom*Line Parvovirus B19	IgM % (n)	IgG % (n)
Negative	94,9 % (167/176)	33,7 %(63/187)
Inconclusive	1,7 % (3/176)	0 % (0/187)
Positive	3,4 % (6/176)	66,3 % (124/187)
Seroprevalence among blood donors	3,4 %	66 %

11.4 Determining the avidity of the IgG antibodies

A total of 67 serum samples of acute, recent or somewhat earlier Parvovirus B19 infections were investigated for avidity in the *recom*-Line Parvovirus B19 IgG. The results of the avidity investigation correlated reliably with the clinical data. The data showed that the IgG antibodies against VP-N and VP-1S had matured to high avidity at the earliest after 4 weeks and usually after 6-8 weeks. Thereafter, only highly avid IgG antibodies were found in these samples.
A further test on 58 preselected blood donor samples that all showed positive overall IgG findings with typical antibody reaction patterns for "infections a long time ago" or "status after infection (months)" found six samples (10,3%) with intermediary IgG antibodies and one sample (1.7%) with low-avidity IgG antibodies. All these samples were negative in regards to IgM serology.

11.5 Analytical sensitivity

Analytical determination of sensitivity with WHO Standard IgG: Diluted versions of the WHO Standard IgG (100 IU/ml) were investigated with the *recom*Line Parvovirus B19 IgG and a comparative ELISA IgG. The WHO Standard IgG diluted to 1.5 IU/ml still showed a questionable result with the *recom*Line Parvovirus B19 (isolated, positive VP-N reactivity). The comparison ELISA IgG also showed a borderline result.

11.6 Analytical specificity

The analytical specificity is defined as the capacity of the test to determine the analytes exactly in the presence of potential interference factors in the sample matrix (e.g. anticoagulants, haemolysis, effects of the sample treatment) or cross reactions with potentially interfering antibodies.

a) Interferences: Control studies on potentially interfering factors have shown that anticoagulants (sodium citrate, EDTA, heparin), lipaemia or cycles of freezing and thawing do not affect the performance of the test. Bilirubinaemia (up to 20 mg/dl bilirubin) and haemolysis (up to 1000 mg/dl haemoglobin) resulted in a slightly increased number of positive IgM results, see Table 4.

b) Cross-reactions:Potential interference from antibodies against EBV, as well as from other conditions that are due to atypical behaviour of the immune system, such as anti-nuclear auto-antibodies, can be practically ruled out. Rheumatoid factor-positive samples showed a slightly increased number of positive IgM results, see Table 4.

12 Literature

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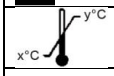
We will gladly send you further literature on the diagnosis of Parvovirus B19 on request.

13 Explanation of symbols

	Content is sufficient for <n> applications Number of applications
WASHBUF A 10 X	Wash Buffer A (**10 times concentration)**
SUBS TMB	Chromogenic substrate Tetramethylbenzidin
MILKPOW	Skimmed milk powder
TESTSTR	Test strips
CONJ IgG	Anti-human IgG conjugate
AVIDI	Avidity reagent
ADD	Additional reagent, available on request
CONJ IgA	Anti-human IgA conjugate
CONJ IgM	Anti-human IgM conjugate
EVALFORM	Evaluation form
INSTRU	Instructions for use
	See instructions for use
CONT	Contents, includes
IVD	In vitro test
LOT	Batch/version number
	Do not freeze
REF	Order number
	Use by Expiry date
	Store at x°C to y°C
	Manufacturer

14 Manufacturer and version information

***recom*Line Parvovirus B19 IgG [Avidität]** ***recom*Line Parvovirus B19 IgM**		Item no. **4472** Item no. **4473**
Instructions for use valid from		GARLPA011EN 2023-05
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