



Ready To Use PCR Reagents

Canine *Ehrlichia canis*

Cat. No. 60CME100
INSTRUCTION MANUAL

I. Intended Use

CME Ready to Use PCR Reagents are intended for *Ehrlichia canis* amplifications. All reagents are ready to use for a successful amplification, from DNA extraction to obtaining PCR products suitable for loading onto Agarose gel.

II. General Information

Each package contains **Rapid One Step Extraction Buffer** (Tube A), which is intended for use with fresh or dry blood samples. The extraction step yields appropriate amount of crude DNA needed for a successful amplification of **CME** via PCR. No purification is needed! Tubes B, C and D are the components for subsequent use in PCR amplification. Tube B contains **CME-PCR mix**, Tube C contains **CME Activation Buffer** and Tube D contains the **Positive Control**. The Extraction Buffer (Tube A) also serves as **Negative Control**. Also included are **Tissue/Swab Extraction Buffer** (Tube E) and **Tissue/Swab Neutralization Buffer** (Tube F). Each PCR set up should include 3 reaction vials; each vial should be added with: **5µl CME-PCR mix**, **10µl CME Activation Buffer** and **5µl DNA product of the Extraction step / Positive Control/ Negative Control**. Following the addition and mixing of all the above ingredients, the reaction vials are placed in thermal cycler for amplification according to the program detailed in the Step by Step chapter (see section VIII). At the end of the program the product should be visualized on 1.5% Agarose gel, yielding a **320bp** band.

III. Description Of The Disease

Ehrlichia canis is a tick-borne obligate intracellular Gram negative bacterium that infects canine monocytes, giving the disease its name Canine Monocytic Ehrlichiosis (CME). The pathogen is transmitted to canines by the brown tick, *Rhipicephalus sanguineus*. Following incubation, CME infection may progress into three consecutive clinical stages: acute, sub-clinical and chronic. Symptoms of the acute phase: fever, anorexia, lethargy, lymphadenopathy, lymphocytosis and **thrombocytopenia**. During sub-acute phase, usually sub-clinical and may last from months to years, tests may discover hypergammaglobulinemia, high anti-CME specific antibodies titer, **thrombocytopenia** and anemia. The chronic phase is characterized with lethargy, weight loss, Pancytopenia, bone marrow suppression and hemorrhage. Animals with ehrlichiosis can also exhibit uveitis, retinal hemorrhages and CNS disease, due to either CNS vasculitis or hemorrhages.

IV. Diagnosis Of The Disease

The presence of *E. canis* DNA in infected dogs has been demonstrated by polymerase chain reaction (PCR) from the blood, bone marrow, spleen, liver, kidney and lymph nodes. In living dogs, the most commonly used source of sampling is blood. It has been shown that *E. canis* can be detected 72 hours post mortem from blood samples or lymph nodes.

V. Contents (Sufficient for 48 tests)

Tube A	Rapid One Step Blood Extraction Buffer
Tube B	CME-PCR mix (Green cap)
Tube C	Specific CME Activation Buffer (Blue cap)
Tube D	Specific CME Positive Control (Red cap)
Tube E	Tissue/Swab Extraction Buffer
Tube F	Tissue/Swab Neutralization Buffer
	CME Instruction Manual

VI. Essentials Not Included

RNAase free PCR reaction vials.
PCR Thermo-Cycler.
5-10µ, 100µl Pipettes and filter tips.
Micro-centrifuge.
Heating bath or heating block.
Agarose, DNA size marker.
Microwave for Agarose casting.
Horizontal Mini-Electrophoresis chamber, Comb and power pack.
TBE /TAE Buffer and Ethidium Bromide (EB).
UV Transilluminator (254nm for EB).
A pair of sterile scissors.
A cutter (for swab application).

VII. Storage And Handling

- Store at 4°C for 6 months or at -20°C for two years.
- Use gloves and maintain clean working conditions.
- Avoid spillage and cross contamination of solutions.
- Change tips between reagents and between reaction vials.
- Disinfect scissors before and after each cutting of blood filters.
- Do not mix reagents from different batches.
- Always treat samples with precaution, and dispose as biological material.
- Remember that Ethidium Bromide is hazardous, and use the UV transilluminator carefully.
- It is recommended to incinerate the contents after use.

VIII. Step By Step Protocol

Blood Extraction:

(1) Into an empty clean vial, add **100µl of Rapid OneStep Blood Extraction Buffer (Tube A)** for **every 5µl** of fresh blood sample or approximately 3/5 mm² piece of Whatman/tissue paper soaked with blood. Make sure the piece of paper is submerged underneath the extraction buffer.

(2) Incubate samples at **50°C** for **10 minutes** followed by a subsequent **95°C** for additional **10 minutes**.

(3) Centrifuge sample at **>10,000 rpm** for **1 minute** to allow the paper and cell debris to pellet. The extracted DNA product is in the liquid phase, ready to be used for PCR.

Tissue/Swab Extraction:

(1) Into a clean 1.5 ml vial add **300µl of Tissue/Swab Extraction Buffer (Tube E)**.

(2) When using tissue sample, cut a 3 mm² from the fresh or frozen tissue and add it to the 1.5 ml vial containing **300µl of Tissue/Swab Extraction Buffer**.

(3) Incubate the tissue within buffer **E** for **10 minutes at 95°C**.

(4) Add **300µl of Tissue/Swab Neutralization Buffer (Tube F)** and the product will be ready for PCR use.

Extracted DNA product (of any source)* may be applied immediately for PCR or stored for a few days at 4°C / several months at -20°C. Please mark the vial properly for future identification.

* Note: **The reagents have been adjusted for use with crude DNA extraction to enable better sensitivity (with less handling).**

PCR Procedure:

(1) Into a clean reaction vial add: **5µl CME-PCR mix (Tube B)**, **5µl of the Extracted DNA product** and **10µl of the specific CME-Activation Buffer (Tube C)**. Mark each reaction vial properly to avoid mistakes.

(2) Into a second clean reaction vial add **5µl CME-PCR mix (Tube B)**, **5µl of the Positive Control (Tube D)** and **10µl of the specific CME Activation Buffer (Tube C)**. Mark this vial as Positive Control reaction.

(3) Into a third clean reaction vial add **5µl CME-PCR mix (Tube B)**, **5µl of the Extraction Buffer (Tube A)** and **10µl of the specific CME Activation Buffer (Tube C)**. Mark this vial as **Negative Control** reaction.

(4) Gently mix each reaction vial (do not vortex!) and place in the thermal cycler for amplification.

PCR Program:

A. **95°C for 2 minutes**

38 cycles of:

B. **94°C for 30 seconds**

C. **51°C for 30 seconds**

D. **72°C for 30 seconds**

End cycles

E. **72°C for 2 minutes**

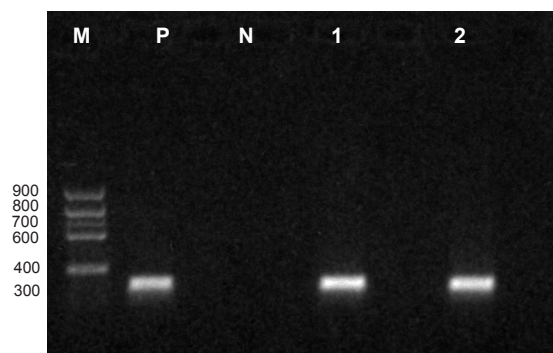
F. **Stop at 8°C**

(5) If not used immediately, store PCR products at 4°C until application on Agarose.

IX. Reading And Interpreting The Results

- Visualize PCR products on 1.5% Agarose gel, along with a size marker (see Fig. 1).
- Mark each well and load the whole content of each reaction vial into the relevant wells.
- The Positive Control should yield a single band at **320bp**.
- No band should be detected at the Negative Control lane.
- In case of positive result, a band at **320bp** band should be visible in the sample lane.

Fig. 1 - Visualization of the PCR product.



Lanes: M Size Marker, P Positive Control, N Negative Control. Lanes 1 - 2 are test samples which are positive for CME.

X. Limitations And Troubleshooting

- For *in vitro* use only. Do not use internally or externally in humans or animals.
- A false positive result may occur, even if precaution has been taken. To eliminate inconclusive results, always use the Negative Control in each PCR set.

XI. References

- Baneth G et al. (1996) Survey of *Ehrlichia canis* antibodies among dogs in Israel. *Veterinary Record* 138, 257–259.
- Gal A et al. (2008) Detection of *Ehrlichia canis* by PCR in different tissues obtained during necropsy from dogs surveyed for naturally occurring canine monocytic ehrlichiosis. *Vet J.* 175(2):212-7. Epub 2007 Mar 26
- Harrus S et al. (1996) Serum protein alterations in canine ehrlichiosis. *Veterinary Parasitology* 66, 241–249.
- Harrus S et al. (2004) Comparison of simultaneous splenic sample PCR with blood sample PCR for diagnosis and treatment of experimental *Ehrlichia canis* infection. *Antimicrob Agents Chemother.* 48, 4488–4490.

For further information and assistance please contact your local distributor or Biogal Galed Labs. Directly by e-mail: info@biogal.co.il or by tel: 972-4-9898605 / fax: 972-4-9898690.