

**RealLine Candida albicans  
Str-Format****Instructions for Use****RealLine Candida albicans  
Str-Format**

ASSAY KIT FOR THE QUALITATIVE DETECTION OF *CANDIDA ALBICANS* DNA BY  
REAL-TIME PCR METHOD










*In vitro* Diagnostics



RealLine Candida albicans (Str Format)	VBD4698	96 Tests
valid from	September 2019	

## RealLine Candida albicans Str-Format

### Explanation of symbols used in labeling

	<i>In vitro</i> diagnostic medical device
	Batch code
	Catalogue number
	Contains sufficient for <n> tests
	Use-by-date
	Temperature limit
	Consult instructions for use
	Keep away from sunlight
	Manufacturer



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## RealLine *Candida albicans* Str-Format

### ASSAY KIT FOR THE QUALITATIVE DETECTION OF *CANDIDA ALBICANS* DNA BY REAL-TIME PCR METHOD

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#### 1. INTENDED USE

##### Clinical Information:

***Candida albicans*** caused Candidiasis an infection which encompasses a range from superficial, such as oral thrush and vaginitis, to systemic and potentially life-threatening diseases. *Candida albicans* infections of the latter category are also referred to as Candidemia and are usually confined to severely immunocompromised persons, such as cancer, transplant, and AIDS patients, as well as non-trauma emergency surgery patients.

**RealLine *Candida albicans* (Str-format)** assay kit is designed to detect and *Candida albicans* DNA isolated from clinical specimens using the extraction kits:

**RealLine DNA-Express (REF VBC8899)**

**RealLine DNA-Extraction 2 (REF VBC8897)**

**RealLine DNA-Extraction 3 (REF VBC8889)**

**RealLine Extraction 100 (REF VBC8896)**

The **RealLine *Candida albicans* (Str-format)** kit is designed for the analysis of clinical materials: saliva, urine, and scrapings of epithelial cells.

The assay is based on real-time polymerase chain reaction (PCR) method with fluorescent detection of amplified products.

The **Str-Format Kit** contains 96 tubes (0.2 ml) in strips with lyophilized Mastermix. 50 µl of extracted DNA have to be pipetted into the tube and the ready mastermix is diluted. The kit contains reagents required for 96 tests, including control samples and the positive control sample.

The kit is validated for use with: iQ™5 iCycler (Bio-Rad, USA). RealLine Cycler (BIORON Diagnostics), CFX™96 (Bio-Rad, USA) and DT-96 (DNA-Technology, Russia).

##### The use of:

- ! Extraction Kits for nucleic acids from clinical specimen from other supplier
- ! other real-time PCR devices
- ! appropriate reaction volumes, other than 50 µl

has to be validated in the lab by the user. The special notes regarding the internal control IC have to be strongly followed.

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### 2. KIT CONTENTS

Universal Positive Control Sample (PC)	1 tube, 1 ml;
Ready Master Mix (RMM), lyophilized	96 test-tubes (12 strips x 8 tubes);
The kit is additionally supplied with optical-quality PCR-film	

### 3. PRINCIPLE OF THE METHOD

The Real time PCR is based on the detection of the fluorescence, produced by a reporter molecule, which increases as the reaction proceeds. Reporter molecule is dual-labeled DNA-probe, which specifically binds to the target region of pathogen DNA. Fluorescent signal increases due to the fluorescent dye and quencher separating by Taq DNA-polymerase exonuclease activity during amplification. PCR process consists of repeated cycles: temperature denaturation of DNA, primer annealing and complementary chain synthesis.

Threshold cycle value – Ct – is the cycle number at which the fluorescence generated within a reaction crosses the fluorescence threshold, a fluorescent signal rises significantly above the background fluorescence. Ct depends on initial quantity of pathogen DNA template.

The use of **Internal Control (IC)** prevents generation of false negative results associated with possible loss of DNA template during specimen preparation. IC indicates if PCR inhibitors occur in the reaction mixture. IC template should be added in each single sample (including control samples) prior to DNA extraction procedure. The amplification and detection of IC does not influence the sensitivity or specificity of the target DNA PCR.

**Note:** IC is a component of the NA extraction kits of RealLine series. Internal Control is added to the sample during NA isolation step and is used throughout the whole process of NA extraction, amplification, detection.

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### 4. SPECIFICATIONS

- 4.1 Specificity** of *Candida albicans* DNA detection is determined using the Standard Reference Panel of negative DNA-extracts, as a percentage of the samples determined by the kit as negative. Specificity equals 100%.
- 4.2 Sensitivity** is determined on five samples containing 100 copies of *Candida albicans* DNA per a sample, prepared from the Standard Reference Sample, as a percentage of the samples determined by the kit as positive. Sensitivity equals 100%.
- 4.3 Diagnostic sensitivity** of the *Candida albicans* DNA detection: clinical tests performed on 94 positive samples showed 100% sensitivity (interval 97% -100% with a confidence level of 90%);
- 4.4 Diagnostic specificity** of the *Candida albicans* DNA detection: clinical trials performed on 94 negative samples showed 100% specificity (interval 97% -100%, with a confidence level of 90%).

Analysis by the CE-marked reference kit showed full match of results.

### 5. PRODUCT USE LIMITATIONS

- This assay must not be used on the clinical specimen directly. Appropriate nucleic acids extraction methods have to be conducted prior to using this assay.
- The presence of PCR inhibitors (e.g. heparin) may cause false negative or invalid results.
- When monitoring a patient the same extraction method must be used in all determinations. Otherwise, results may not be comparable.
- The kit is designed for use in patients with a clinical history and/or symptoms consistent with *Candida* infections. The kit may be used for screening purposes.
- Diagnostic sensitivity of the kit may vary depending on the pathogen prevalence and characteristics of the enrolled cohort.
- Reliable results depend on adequate specimen sampling.
- Positive results indicate active or asymptomatic infection; clinical history and symptoms should be taken into account.
- Negative results indicate lack of detectable DNA but do not exclude the infection or disease.
- Potential mutations within the target regions of the *Candida albicans* genome covered by the primers and/or probes used in the kit may result in failure to detect the presence of the pathogens.
- The kit is not intended to replace culture and other methods (e.g., cervical exam) for diagnosis of infections.

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### 6. WARNING AND PRECAUTIONS

- ☞ The kits must be used by skilled personnel only.
- ☞ For in vitro use only.
- ☞ When handling the kit, follow the national safety requirements for working with pathogens.
- ☞ To prevent contamination, the stages of DNA isolation and PCR test run must be spatially separated.
- ☞ Avoid microbial and ribonuclease contamination of reagents when removing aliquots from reagent vials.
- ☞ Wear protective disposable gloves, laboratory coats and eye protection when handling specimens and kit reagents.
- ☞ Every workplace must be provided with its own set of variable-volume pipettes, necessary auxiliary materials and equipment. It is prohibited to relocate them to other workplaces.
- ☞ The use of sterile disposable pipette tips is recommended.
- ☞ Never use the same tips for different samples.
- ☞ Do not pool reagents from different lots or from different vials of the same lot.
- ☞ Dispose unused reagents and waste in accordance with country, federal, state and local regulations.
- ☞ Do not use the kit after the expiration date at the side label of the kit..

### 7. ADDITIONAL MATERIALS AND DEVICES REQUIRED BUT NOT SUPPLIED

- real time PCR system, like described in p.1
- DNA-Extraction Kit: **RealLine DNA-Express**, **RealLine DNA-Extraction 2**, **RealLine DNA-Extraction 3**, or **RealLine Extraction 100**;
- Internal Control reagent (VBC8881) and Negative Control Sample, if the kit is used with the extraction kits of other supplier;
- laminar safety box;
- refrigerator;
- half-automatic variable-volume single-channel pipettes;
- disposable medical non-sterile powder-free gloves;
- disposable pipette tips with aerosol barrier;
- biohazard waste container;
- razor or scalpel.

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### 8. PREPARATION OF THE ANALYSED SAMPLES AND REAGENTS

*Each group of samples undergoing the procedure of DNA isolation must include a **Positive Control sample (PC)** from this kit and a **Negative Control sample (NC)** which is a component of the DNA extraction kit.*

We strongly recommend the implementation of the Internal Control IC, the Negative Control NC and Positive Control PC samples to the extraction procedure.

When using a kit of another supplier for the extraction of nucleic acids as recommended in chapter 1, add **20 µl** of **IC (VBC8881)** to each tube:

- For the **NC** use **100 µl** of the Negative Control Sample
- For the **PC** use **70 µl** of Negative Control Sample and **30 µl** of Positive Control to the tube marked PC.

The assay is performed on extracted DNA samples obtained from the clinical material using one of the DNA extraction kits listed in p.1, according to the Instruction Manual to the kit.

If samples of extracted DNA were stored frozen prior the assay, thaw them and keep at least 30 min at (18 – 25) °C.

Store the extracted DNA at (2 – 8) °C for no more than 24 hours.

*After initial opening of the tube, store PC at (2–8) °C for no more than 1 month or in 50 µl aliquots at minus (18 - 60) °C for up to 3 months*



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### 9. PROCEDURE

#### 9.1. Preparation of the reagents.

Prior to the test take the kit out of the refrigerator and keep the **Ready Master Mix (RMM)** closed in the package at 18 - 25°C for at least 30 minutes. Then open the package and cut the necessary number of tubes in strips with RMM (*including prepared samples and controls: 1 NC and 1 PC*) with the razor or scalpel. Cut the tubes together with the covering film.

Put the remaining strips immediately back into the foil pouch, squeeze the air out and tightly close with the clip.

*After initial opening the shelf life of RMM at (2 – 8) °C is 3 months.*

#### 9.2. Label the tubes with RMM for each specimen and control.

**Attention!** Labels should be placed on the lateral side of the tubes.

#### 9.3. Add 50 µl of corresponding isolated DNA solution to each tube using a separate pipette tip with filter. Tightly close the tubes with caps or seal with the PCR transparent film.

#### 9.4. Place the tubes into the real-time PCR system.

#### 9.5. Program real time PCR system as follows:

Stage 1:	50°C	2min	50 cycles
Stage 2:	95°C	2min	
Stage 3:	94°C	10 sec	
	60°C*	20 sec	

\* Measure the fluorescence at 60°C

#### 9.6. Select the amplification detection channels:

- Collect real-time PCR data through the **FAM** channel for detection of amplification of IC DNA.
- Collect real-time PCR data through the **ROX** channel for detection of amplification of *Candida albicans* DNA.

#### 9.7. Program the positions of test tubes with samples, positive and negative controls according to the instruction manual for the real time PCR system in use.

#### 9.8. Run the program.

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### 10. DATA ANALYSIS AND INTERPRETATION

When using iQ™5 iCycler and CFX™96 (Bio-Rad, USA) or similar real time PCR systems analysis is carried out in accordance with the enclosed instruction manual.

**10.1** For **PC** the program should detect:

- increase of the IC DNA amplification signal (channel **FAM**) and determine the threshold cycle, IC **Ct**;
- increase of the *Candida albicans* DNA amplification signal (channel **ROX**) and determine the **Ct** value.

**10.2** For **NC** the program should detect the increase of the amplification signal of IC DNA (channel **FAM**) and determine the threshold cycle, IC **Ct**. No-**ROX** fluorescent increase should appear (*no Candida albicans DNA amplification*).

When **Ct** value for NC through **ROX is less than or equal to 35**, this indicates the presence of contamination (see paragraph 9.7).

**10.3** For each sample the program should detect the increase of the amplification signal of IC DNA (channel **FAM**) and determine IC **Ct**.

**10.4** Calculate (IC **Ct**)<sub>av</sub> as an average IC **Ct** of all analyzed samples (including PC and NC). IC **Ct** values that differ by more than 2 from the (IC **Ct**)<sub>av</sub> should be ignored. Recalculate the (IC **Ct**)<sub>av</sub> for the remaining values after the screening.

**10.5** The sample is considered **negative** (not containing *and Candida albicans DNA*), if **Ct** value for this sample via **ROX** channel is **above 35** or is not determined.

When IC **Ct** value for such sample differs from the (IC **Ct**)<sub>av</sub> value by more than 2, the result is regarded as equivocal. A repeated analysis of the sample, starting with the DNA isolation step is necessary.

**10.6** The sample is considered **positive**, i.e. contains *Candida albicans* DNA, when **Ct** value via **ROX** channel for this sample is **less than or equals to 35**.

**10.7** In case of contamination all positive results of this individual PCR run are considered equivocal. Actions are required to identify and eliminate the source of contamination, and repeat the analysis of all samples of this run that were identified as positive. Samples that showed negative results in this run should be considered as negative.

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### 11. STORAGE AND TRANSPORTATION

- Store the assay kit at (2 - 8) °C in the manufacturer's packing.
- Transport at (2 - 8) °C. Transportation up to 25 °C for no more than 10 days is allowed.
- Do not freeze the kit!
- Do not pool reagents from different lots or from different vials of the same lot.
- Strictly follow the Instruction manual for reliable results.
- Do not use kits with damaged inner packages and get in contact with BIORON Diagnostics GmbH.
- **Storage and shelf life of solutions and components of the kit after initial opening:**
  - Positive Control sample: 1 month at (2 – 8) °C or in 50 µl aliquots at minus (18 - 60) °C for up to 3 months.
  - Unused Ready Master Mix (RMM): 3 months at (2 – 8) °C

Technical support: [techsupport@bioron.de](mailto:techsupport@bioron.de)

### ANNEX I: Settings for RealLine Cyclers and DT96:

for these cyclers the measurement exposure must be adjusted. Choose the **Operation with the device** mode in the **Settings** menu, select the item **Measurement exposition:**

- **FAM** to **250**
- **HEX** and **ROX** to **1000**

Confirm that the current exposure value is saved by pressing **YES**

**Attention!** The specified exposure values are applicable only for RealLine kits and, if necessary, must be changed for other purposes.

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