# Instructions for use
# MSB® Spin PCRapace

INVITEK diagnostics

Language: EN

RUO

REF 1020220300
1020220400

Σ 250 preprarations
500 preprarations

ALS Life Sciences Portugal, S.A.
Zona Industrial de Tondela, ZIM II,
Lote 6, 3460-070 Tondela
Portugal

## Important notes

Thank you for purchasing the **MSB® Spin PCRapace** from Invitek Diagnostics.

The product serves the purpose of semi-automated isolation of nucleic acids (genomic DNA, bacterial DNA, viral DNA/RNA) from a variety of samples using magnetic beads technology.

WARNING! Improper handling and use for other than the intended purpose can cause danger and damage. Therefore, we ask you to read through these instructions for use and follow them carefully. Always keep them handy. To avoid personal injury, also observe the safety instructions.

All versions of the instructions for use can be found on our website for download or can be requested from us: www.invitek.com

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# Table of content

## Kit contents of the MSB® Spin PCRapace

| | 250 preps | 500 preps |
|---|---|---|
| **Catalogue No.** | 1020220300 | 1020220400 |
| **Binding Buffer** | 63 ml<br>(final volume 163 ml) | 2 x 63 ml<br>(final volume 2 x 163 ml) |
| **Elution Buffer** | 30 ml | 60 ml |
| **Spin Filter** | 5 x 50 | 10 x 50 |
| **2.0 ml Receiver Tubes** | 5 x 50 | 10 x 50 |
| **1.5 ml Receiver Tubes** | 5 x 50 | 10 x 50 |
| **Manual** | 1 | 1 |
| **Initial steps** | add 100 ml 99.7% Isopropanol to the **Binding Buffer**, mix by intensive shaking for 1 min. Shortly before use mix by inverting several times. | add 100 ml 99.7% Isopropanol to each bottle **Binding Buffer**, mix by intensive shaking by inverting for 1 min. Shortly before use mix by inverting several times. |

## Symbols used on product and labeling


Manufacturer

Lot number

Catalogue number


Expiry date


Consult operating instructions


Temperature limitation


Do not reuse


Amount of sample preparations

Research Use Only

## Storage

All buffers and kit contents of the **MSB® Spin PCRapace** should be stored at room temperature, buffer stability is guaranteed for 12 months.

**Room temperature (RT is defined as range of 15-30°C.**

Before every use make sure that all components have room temperature. If there are any precipitates in the provided solutions, they can be dissolved by careful warming (up to 30°C).

## Warranty

Invitek Diagnostics guarantees the correct function of the kit for applications described in this manual and in accordance with the intended use. In accordance with Invitek Diagnostics's EN ISO 13485 and ISO 9001 certified Quality Management System the performance of all kit components has been tested to ensure product quality.
Any problems, incidents or defects shall be reported to Invitek Diagnostics immediately upon detection. Immediately upon receipt, inspect the product to ensure that it is complete and intact. In the event of any discrepancies, you must inform Invitek Diagnostics immediately in writing. Modifications of the kit and protocols and use that deviate from the intended purpose are not covered by any warranty.

Invitek Diagnostics reserves the right to change, alter, or modify any product to enhance its performance and design at any time.
Invitek Diagnostics warrants products as set forth in the General Terms and Conditions available at www.invitek.com. If you have any questions, please contact techsupport@invitek.com.

## Intended use

Before using the kit, please ensure that you have read the instructions and are fully informed about the purpose and limitations of use of the kit. (see "Product use limitation", and "Features of the MSB® Spin PCRapace").

THE PRODUCT IS INTENDED FOR USE BY PROFESSIONALS ONLY, SUCH AS TECHNICIANS, PHYSICIANS AND BIOLOGISTS TRAINED IN MOLECULAR BIOLOGICAL TECHNIQUES. It is designed to be used with any downstream application employing enzymatic amplification or other enzymatic modifications of DNA followed by signal detection or amplification.

The kit is developed, designed, and sold for research purposes only.

## Product use limitation

For purification DNA fragments should not be bigger than 30 kb and not smaller than 80 bp. Single stranded DNA may diverge. The maximum length of primers witch can be removed is 40 bp. The included chemicals can only be used once.

## Safety information

Ensure that anyone using this product has received instructions in general safety practices for laboratories and the safety information provided in this document.

- When and while working with chemicals, always wear protective clothing, disposable gloves and safety glasses.
- Always change pipette tips between liquid transfers. To avoid cross-contamination, we recommend the use of aerosol-barrier pipette tips.
- Do not reuse any consumables.
- Discard gloves if they become contaminated.
- Do not combine components of different kits.
- Avoid microbial contamination of the kit reagents.
- To minimize the risk of infections from potentially infectious material, we recommend working under laminar airflow until the samples are lysed.

Before handling chemicals read and understand all applicable safety data sheets (MSDS). These are available online at www.invitek.com.

Dispose of kit residues and waste fluids in accordance with your country's regulations, again refer to the MSDS. Invitek Diagnostics has not tested the liquid waste generated by the kit for residual infectious materials. Contamination of the liquid waste with residual infectious materials is highly unlikely but cannot be excluded completely. Therefore, liquid waste must be considered infectious and must be handled and disposed of according to local safety regulations.

**Emergency medical information can be obtained 24 hours a day from infotrac, www.infotrac.net:**

**outside of USA:** **1 – 352 – 323 – 3500**
**in USA:** **1 – 800 – 535 – 50**

# PCR product & DNA fragment purification and concentration

This manual describes the membrane adsorption-based purification of PCR products as well the purification of DNA fragments from enzymatic reaction mixtures using the high-performance **MSB® technology**.

| | **MSB® Spin PCRapace** |
|---|---|
| **Sample Volume** | up to 100 µl |
| **Recovery** | 80 – 95 % |
| **Binding capacity** | 10 µg |
| **Elution Volume (minimal)** | 10 µl |
| **Sample Source :** | |
| - PCR reaction mixture | x |
| - Ligation reaction mixture | x |
| - Enzyme digestion mixture | x |
| - cDNA synthesis mixture | x |
| - Cycle sequencing reaction | x |
| - DNA fragments | x |

**Advantages:**

- convenient and fast sample processing
- the most efficient removal of contaminants
- high recovery rate of PCR products or DNA fragments
- broad range of fragment sizes: 80 bp - 30 kb can be purified

The spin columns are designed to give high final concentrations of purified DNA fragments for subsequent reactions. Special buffers provided with each kit are optimized for efficient recovery of DNA and removal of contaminants like salts, enzymes, nucleotides, and other impurities from DNA samples. Specialized binding buffers promote selective adsorption of DNA fragments and PCR products. The pure DNA is eluted in a small volume of buffer or water, ready to use for any subsequent application. The innovative **MSB® technology** is described on the following pages.

# MSB® technology

**The a fast and reliable technology for purification of DNA fragments with high recovery rates.**

The MSB® technology offers a new option for the purification process in which handling steps are greatly simplified and processing times are significantly reduced. The **MSB® kit** has been designed for efficient purification and/or concentration of PCR products and DNA fragments from enzymatic reaction mixtures in **only two steps**.

The DNA fragments adsorb at the silica membrane in the presence of minimal concentrations of non-chaotropic salts, while impurities pass through the column. Therefore, a washing step is not required. High concentrated, pure DNA fragments are eluted ready for use.

**Advantages:**

- ultra-fast and easy (two step protocol), only binding and elution
- excellent purity without washing
- 80 – 95 % recovery rate

DNA purified with the MSB® system is much more concentrated than DNA purified with other methods. The highly concentrated DNA allows the use of small reaction volumes, which are useful for any downstream application, leading to increased efficiency (e.g. in ligations).

## Features of the MSB® Spin PCRapace

| Starting material | Yield | Time for preparation |
|---|---|---|
| up to 100 µl reaction volume like PCR reaction mixture,<br>up to 100 µl restriction digestion mixture,<br>up to 100 µl ligation mixture,<br>up to 100 µl cDNA synthesis mixture,<br>up to 100 µl cycle sequencing reaction mixture | 80 – 95 %, depends on fragment length | approx. 7 min |

The **MSB® Spin PCRapace** is specially designed for ultra-fast and efficient direct purification of approx. 100 µl PCR products from 80 bp up to 30 kb from amplification reactions.
With max. 7 min of hands on time the **MSB® Spin PCRapace** is the fastest system for the separation of PCR products from dNTPs, primers, additives, labelling reagents (biotin, radioactive ATP etc.) and salts. Also all enzymes are removed, independent of size and secondary structure. The recovery of PCR product is 80 – 95 %. The kit is also useful for cleanup of DNA fragments from:

- restriction digestion mixture
- dephosphorylation
- primed synthesis
- endlabeling
- nick translatation
- ligation mixture
- cDNA synthesis mixtures

Additionally, the kit can be used for:

- concentration of DNA fragments
- purification of linearized pDNA from restriction mixtures
- removal of dye terminators from DNA cycle sequencing reactions

The DNA-fragments will be bound directly onto the surface of a spin filter column based on new buffer composition. No additional and common used washing steps are necessary. Finally, the DNA fragments will be eluted with 10 µl low salt buffer or Water.

The purified PCR product can be used in subsequent downstream applications:

- Sequencing
- Labeling experiments
- Hybridization
- Transcription
- Digestion with restriction enzymes
- Amplification
- Ligation and transformation

## Important points before starting a protocol

Check the product and its components as well as the packaging for obvious damage, correct quantities and quality immediately upon receipt of the product. If there are any deviations, please notify Invitek Diagnostics in writing with immediate effect after examination. If bottles containing buffer are damaged, contact the Invitek Diagnostics Technical Services or your local distributor. In case of liquid spillage, refer to “Safety Information” (see page 5). Do not use damaged kit components, since their use may lead to poor kit performance.

- Always change pipette tips between liquid transfers. To avoid cross-contamination, the use of filter tips is recommended.
- All centrifugation steps are carried out at room temperature.
- When working with chemicals, always wear a lab coat, disposable gloves and protective goggles.
- Discard gloves if they become contaminated.
- Do not mix kit components with components from other kits unless the lot numbers are identical.
- Avoid microbial contamination of the kit reagents.
- To minimize the risk of infections from potentially infectious material, we recommend working under laminar air-flow until the samples are lysed.
- This kit should only be used by personnel trained in vitro diagnostic laboratory practice.

## Equipment and reagents to be supplied by user

- Microcentrifuge (≥ 11.100 x g)
- Pipettes and filter tips
- 1.5 ml and 2.0 ml reaction rubes
- Isopropanol (99.7%)

# Principle and procedure of the MSB® Spin PCRapace

The **MSB® Spin PCRapace** procedure comprises the following steps:

- Selective binding of DNA fragments to the surface of the DNA-binding spin filter
- Elimination of contaminants like enzyme buffer, enzyme, primers and nucleotides during the binding step
- Elution of highly pure DNA fragment or PCR product

### Sampling and storage of starting material

Best results are obtained using freshly prepared PCR or enzymatic reaction mixtures to prevent DNA digestion. The samples can be stored for some weeks at 4 - 8°C.

### Binding of DNA fragments

The reaction mixture is mixed in a ratio of 1:5 with the **Binding Buffer** to provide the appropriate condition for the binding of DNA fragments in a range of 80 bp - 30 kb to the silica membrane under minimal concentrations of non-chaotropic salts.
The binding of small DNA fragments can be supported by the addition of small amounts of isopropanol, but this ratio is very sensitive.

### Removal of Contaminants

The DNA fragments bind to the membrane at minimal concentrations of non-chaotropic salts. Therefore, a washing step is not required. Unwanted primers and impurities such as salts, enzymes, unincorporated nucleotides, dyes, ethidium bromide, oils, and detergents do not bind to the silica membrane; instead, they are pulled through the column by centrifugal force together with the large access of Binding Buffer. Any remaining Binding Buffer, which may interfere with subsequent enzymatic reactions, is removed by additional centrifugation.

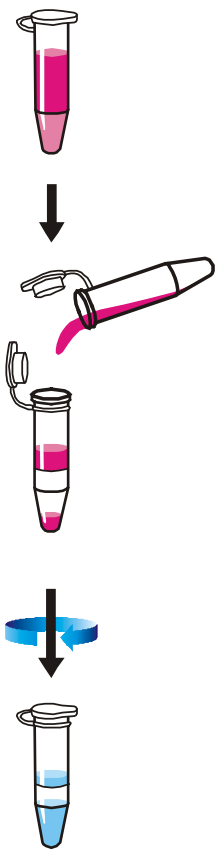
### Elution of PCR products or DNA fragments

DNA is eluted from the column using 10 - 50 µl Elution Buffer.
Eluting twice with 30 - 50 µl each leads to complete recovery of DNA. By the use of smaller elution volumes DNA concentration can be increased. Elution volumes should not fall below 10 µl, otherwise the yield will be reduced. The eluted DNA is ready to use in different downstream applications.

# Preparing reagents and buffers of the MSB® Spin PCRapace

| **250 preps** |
|---|
| Add 100 ml 99.7% Isopropanol to the **Binding Buffer**; Mix by intensive shaking for 1 min. Shortly before use mix by inverting several times |
| **500 preps** |
| Add 100 ml 99.7% Isopropanol to each bottle **Binding Buffer**; Mix by intensive shaking for 1 min. Shortly before use mix by inverting several times |

## Scheme for DNA fragment purification



**Please read the protocols carefully prior starting the preparation procedure**

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up to 50 µl PCR-mixtures or enzymatic reaction mixtures
add 250 µl **Binding Buffer** to the PCR sample
> 50 µl up to 100 µl PCR-mixtures or enzymatic reaction mixtures
add 500 µl **Binding Buffer** *(follow preparing instructions)* to the PCR sample

mix very well by pipetting up and down or vortexing

transfer the sample completely onto the provided Spin Filter
incubate for 1 minute at room temperature
centrifuge for 4 min at maximum speed

place the Spin Filter into a new 1.5 ml Receiver Tube
add at least 10 µl **Elution Buffer** (or dd$H_20$) directly onto the center of the Spin Filter

incubate for 1 minute at room temperature
centrifuge for 1 minute at 11.000 x g (11.000 rpm)

DNA in the eluate is now ready to use

## *Protocol 1*: Purification and concentration of DNA fragments from enzymatic reactions, e.g. PCR products from PCR reactions, cDNA synthesis, enzyme restriction digestions

Please read the instructions carefully and carry out preparatory arrangements in advance.

***Note:*** *Before starting with the purification procedure please place a Spin Filter into a 2.0 ml Receiver Tube!*

***Attention:*** *Please prepare the* ***Binding Buffer*** *ahead - see instruction page: 9*

### 1. Binding of the PCR or DNA - fragments

### A. For PCR-mixtures up to 50 µl

Add **250 µl Binding Buffer** to the PCR sample and mix very well by pipetting or vortexing. Transfer the sample completely onto a Spin Filter, incubate for 1 minute at room temperature and centrifuge for 4 min at maximum speed.

### B. For PCR-mixture > 50 µl up to 100 µl

Add **500 µl Binding Buffer** to the PCR sample and mix very well by pipetting or vortexing. Transfer the sample completely onto a Spin Filter, incubate for 1 minute at room temperature and centrifuge for 4 min at maximum speed.

### 2. Elution of the PCR or DNA - fragments

Place the Spin Filter into a new 1.5 ml Receiver Tube.
Add at least 10 µl Elution Buffer (or $ddH_20$) directly onto the center of the Spin Filter.
Incubate for 1 minute at room temperature. Centrifugation for 1 minute at 11.000 x g (11.000 rpm)

***Important Notes:***

1. *If the PCR-mixture contains mineral oil, we recommend the addition of 500 µl of Binding Buffer independent of the starting volume. It is also possible to wash the bound PCR-fragment once with 500 µl of Binding Buffer.*
2. *To increase the final DNA yield we recommend an extended incubation time with Elution Buffer (up to 5 minutes), which will lead to a slightly higher final yield.*
3. *For concentration of PCR-fragments it is possible to elute with lower volume of Elution Buffer, than the volume of the starting PCR-mixture. The minimum volume is 10 µl.*
4. *For ligation mixtures please note, that ligation reactions give very often unwanted side products. These are purified and enriched as well.*

## *Protocol 2:* Removal of DyeDeoxy™ terminators from DNA cycle sequencing reactions of PCR products and plasmids after use ABI Prism™ terminator Kits

Please read the instructions carefully and carry out preparatory arrangements in advance.

***Note:*** *Before starting with the purification procedure please place a Spin Filter into a 2.0 ml Receiver Tube!*

***Attention:*** *Please prepare the* ***Binding Buffer*** *ahead - see instruction page: 9*

### 1. Binding of the (fluorescent) labeled DNA

Add **500 µl Binding Buffer** to the completed cycle sequencing reaction (100 µl) and mix thoroughly by pipetting or vortexing. Transfer the sample completely onto a Spin Filter and centrifuge for 4 min at maximum speed.

Note:
If sequences next to the primer (short fragments) shall be obtained, the addition of up to 150 µl of Isopropanol to the upper mixture may be helpful (the shorter the desired fragments are the more Isopropanol must be used). This leads to lower purity but also to recovery of shorter fragments.

### 2. Elution of the (fluorescent) labeled DNA

Place the Spin Filter into a new 1.5 ml Receiver Tube.
Add at least 10 µl Elution Buffer (or $ddH_20$) directly onto the center of the Spin Filter.
Incubate for 1 minute at room temperature. Centrifuge for 1 minute at 11.000 x g (11.000 rpm).
Discard the Spin Filter and proceed with the ABI sample loading.

# *Additional Protocol 3*: Purification and concentration of PCR products from 200 µl PCR reactions

Please read the instructions carefully and carry out preparatory arrangements in advance.

***Note:*** *Before starting with the purification procedure please place a Spin Filter into a 2.0 ml Receiver Tube!*

***Attention:*** *Please prepare the* ***Binding Buffer*** *ahead - see instruction page: 9*

### 1. Binding of the PCR-fragments

**For PCR-mixture 200 µl**

Add **1000 µl Binding Buffer** to the PCR sample and mix thoroughly by pipetting or vortexing. Transfer the sample in two aliquots onto a Spin Filter and centrifuge for 1 min at 11.000 x g (11.000 rpm) each. Remove the filtrate and centrifuge again for 4 minutes at maximum speed.

### 2. Elution of the PCR-fragments

Place the Spin Filter into a new 1.5 ml Receiver Tube.
Add at least 10 µl Elution Buffer (or $ddH_20$) directly onto the center of the Spin Filter.
Incubate for 1 minute at room temperature. Centrifugation for 1 minute at 11.000 x g (11.000 rpm).

***Important Notes:***

1. *The provided volume of Binding Buffer is calculated based on the required buffer volumes in protocol 1 and 2. The amount needed for protocol 3 is not considered.*
2. *If the PCR-mixture contains mineral oil, we recommend the addition of 500 µl of Binding Buffer independent of the starting volume. It is also possible to wash the bound PCR fragment once with 500 µl of Binding Buffer.*
3. *To increase the final DNA yield we recommend an extended incubation time with Elution Buffer (up to 5 minutes), which will lead to a slightly higher final yield.*
4. *For concentration of PCR-fragments, it is possible to elute with lower volume of Elution Buffer than the volume of the starting PCR-mixture. The minimum volume is 10 µl.*

## Troubleshooting for DNA fragment purification

| Problem | Cause | Comments and suggestions |
|---|---|---|
| **Low recovery** | Poor elution of DNA | Add the **Elution Buffer** directly onto the center of the Spin Filter (even if a small elution volume is used). |
| | Problems with mineral oil | Try to avoid pipetting of mineral oil. Apply the correct centrifugation steps. Take a higher volume of **Binding Buffer.** Wash once with **Binding Buffer.** |

## Ordering information

| Product | Package Size | Catalogue No. |
|---|---|---|
| MSB® Spin PCRapace | 250 purifications | 1020220300 |
| MSB® Spin PCRapace | 500 purifications | 1020220400 |
| InviSorb® Fragment CleanUp | 250 purifications | 1020300300 |

Revision history

| Revision | Date | Description |
|---|---|---|
| DE 572.01 | 2025-07-31 | New document |


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