BPP Bioportide™ Bacterial Transformation Kit for *E. coli*

Product Overview

The BPP Bioportide™ kits provide a ready-to-use system for efficient transformation of various microorganisms, including *E. coli* and gram-negative bacteria. Each vial contains **lyophilized BPP Bioportide™**, supplemented by a separate vial with **sterile 50% glycerol** for storage at -20°C. This innovative reagent facilitates the uptake of nucleic acids without requiring inducing cell stress, i.e. heat shock, or competent cells, i.e. by means of electroporation or chemical treatment of cell wall and cell membrane.

Components Supplied

1. **BPP Bioportide™**: Contains HEPES and arginine as buffer material. One vial contains **1 µg** of lyophilized BPP Bioportide™ which is equal to **ten reactions** for transformation of *E. coli*. One reaction corresponds to a volume of transformed cells of 1 ml, which is available for plating. Kits are available in sizes 30, 50 and 100 reactions.
2. **BPP Bioportide™ Buffer**: The fluid component is delivered in a separate vial that contains 500 µl of sterile 50% glycerol.

Storage, Handling and Stability

- Store lyophilized BPP Bioportides™ at **-20°C** or -80°C for long-term storage, respectively.
- The **BPP Bioportide™ buffer** can also be stored at **-20°C** or -80°C.
- Once dissolved, the **BPP Bioportide™ working solution** must be stored at **-20°C**.

Caution

BPP Bioportides™ should be handled with care. As effects to prolonged or unprotected exposure are not foreseeable, precautions are strictly advised, and users should always follow mandatory lab safety regulations and especially adhere to the following safety standards:

- Avoid skin or eye contact. Wearing gloves and eye protection when handling the product is strongly recommended. In case of contact, rinse skin or eyes thoroughly with water immediately.
- Do not inhale or consume. Avoid the formation of and exposure to aerosols, e.g. by working under a safety cabinet or in well-ventilated workspaces. Avoid ingestion.
- Do not use it while pregnant or breastfeeding.
- Only use within the parameters detailed in this manual and do not leave open on a bench.

Product Description

BPP Bioportide™ is a recombinant protein with a molecular weight of roughly **37.5 kDa**. The exact size depends on the kind of BPP Bioportide™. They are distinguished by their cell-penetrating domain, which were designed for specific cell envelope compositions. The protein enables the transport of nucleic acids, ranging from **22 nt to >10 kb**, into cells of a wide range of organisms, i.e. bacteria, archaea, fungi, plants, and animals (depending on the BPP Bioportide™ in use). Both **RNA** and **DNA**, including single- and double-stranded, linear or circular forms, can be transferred reliably. BPP Bioportides™ are designed for robust performance in extreme environments (up to 80°C, pH > 9.0, high salt concentrations).

Key Features

- No need for competent cells, heat shock, or electroporation.
- Efficient transformation, with up to **3 × 10^8 cfu/µg** for **pUC19** in ***E. coli***, and **6 × 10^5 cfu** for a **10 kb plasmid** in *E. coli*.
- Works with **picogram** quantities of nucleic acids in ***E. coli.***
- Short and easy protocol.
- Suitable for special applications in *E. coli* like library cloning, fragment cloning or cloning of large plasmids (>10kb).

General Considerations

- You can adapt our standard protocol as a starting point to the specific needs of your *E. coli* strain.
- Note, that you do not have to prepare competent cells although you can still use them for BPP Bioportide™ transformation. BPP Bioportide™ transformation works best with early to mid log phase cells. **The optimal OD_{600} is 0.4**.
- You can use fresh cells as well as cells from a frozen glycerol stock.
- As the carrier domain has an affinity for polysaccharides, avoid those within the medium that you use for incubation to bring in contact your nucleic acid / BPP Bioportide™ complex with your cells.
- Consider using a known and easy to handle plasmid as control in addition to your main experiment.

General Transformation Protocol for *E. coli*

1. **Material preparation**
    - Grow cells according to your standard protocol. Optimal OD_{600} for BPP Bioportide™ transformation would be 0.4. Alternatively, thaw an *E. coli* frozen stock culture (50 µl aliquot per reaction needed). **Note**: Please thaw your cells as described in steps 3 and 4 of the protocol.
    - At the end, one reaction of BPP Bioportides™ corresponds to a volume of transformed cells of 1 ml, which is available for plating. Please calculate the material for your planned experiments accordingly.
    - Prepare **SOC medium** and **LB agar plates** with appropriate antibiotics.
    - Bring all materials to **37°C**.
2. **Prepare BPP Bioportide™ Working Solution**
    - Add **10 µl of BPP Bioportide™ buffer** to one vial of BPP Bioportide™ (yielding a **100 ng/µl working solution**).
    - Incubate at **room temperature** for **20 minutes** without agitating.
3. **Prepare Nucleic Acid Mixture**
    - Mix **1 µl** of nucleic acid (10 ng/µl) with **1 µl** of **BPP Bioportide™ Working solution**.
    - Incubate the mixture at **room temperature** for **5 minutes**.
4. **Transform the Cells**
    - Use **50 µl of *E. coli*** cells. If you use glycerol stocks, thaw for 5 minutes at 0-4°C. Perform this step simultaneously to complex incubation (see step 3).
    - Add **50 µl of cells** to the BPP Bioportide™/nucleic acid mixture (**2 µl**; see step 3) and keep at **0-4°C** for **10 minutes**.
5. **Recover and Plate**
    - Add **950 µl of SOC medium** to the cells and incubate at **37°C** with shaking at 100 rpm for **60 minutes**.
    - Perform a dilution series and spread **100 µl** on selection plates. If you wish to assess transformation frequencies include non-selection plates.
    - Incubate plates **overnight at 37°C**.

Documentation and support

Customer and technical support

Visit www.badische-peptide-proteine.de for the latest service and support information.

Limited product warranty

Badische Peptide und Proteine GmbH warrant their products as set forth in the General Terms and Conditions of Sale at www.badische-peptide-proteine.de. If you have any questions, please contact Badische Peptide und Proteine GmbH at www.badische-peptide-proteine.de.

Manufacturer

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Liability

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Revision

The information in this user guide is subject to change without notice.

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