DATA SHEET

Jena Bioscience

CPPP-2

Cell-penetrating and cytoprotective pentapeptide
Cell penetrating
peptide for transduction of peptides, proteins and nucleotides into live cells and for cytoprotection

Cat. No.	Amount
CPP-P06S	1,2 mg
CPP-P06L	6 mg

For *in vitro* use only!

Shipping: shipped on blue ice

Storage Conditions: store at -20 °C

Shelf Life: 12 months after date of delivery

Molecular Weight: 605 Da confirmed by MALDI-MS.

Purity: > 95 % (HPLC)

Form: Synthetic peptide, water soluble powder, contains CF_3COO^- (trifluoro acetate) as counter ion.

Description:
CPPP-2 is one of the cell penetrating pentapeptides (CPPPs) designed from Bax inhibiting peptides (BIPs). It is used for internalization of peptides and proteins (GFP) into different types of live cells. CPPP-2 uses yet unidentified mechanisms for cell penetration including mechanisms not requiring interaction with proteoglycans. The transport of cargo requires in some cases only formation of a non-covalent complex however, for most applications a conjugate with the cargo has to be formed and an excess of free peptide is added to improve internalization. The peptide shows some cytoprotective activity. It suppresses Bax-mediated apoptosis and is therefore recommended to protect cells from cytotoxic stress. CPPPs may be utilized for non-toxic drug delivery. The influence of CPPP-2 on cell viability is tested on different cell lines (including HeLa, Jurkat, Swiss 3T3, NIH 3T3, NB-4 and COS-7). For most of these cells it has no toxic effect up to a concentration of 20 µg/ml serum-free transduction medium. In many cell lines it even improves the viability. Thus, it can be widely used for internalization of proteins. But, it requires a molar ratio of about 1:100.

Sequence:
KLPVM

Positive Charges:
Peptide provides 2 positive charges for complex formation, 2 trifluoro acetate residues are present resulting in an apparent MW of about 0.9 kDa.

Stock solution:
Dissolve 1.2 mg (1 vial) in 1 ml sterile and oxygen-free water according to the **general manual**. Use the solution immediately or aliquot and store at -20 °C. Avoid freeze / thaw cycles. Please note that the peptide may form S-oxide (Met) when stored in solution.

Usage:

Perform calculation, complex formation and cargo transduction according to the detailed protocols given in the **general manual**.

Jena Bioscience Publications using CPPP-2:
Formation of non-covalent complexes with different cargos, transport into different cell lines, uptake efficiencies and cytotoxicity's are described in four publications:
Mussbach *et al.* (2011). Internalization of nucleoside phosphates into live cells by complex formation with different cell penetrating peptides and JBS-Nucleoducin. In: Langel U., Editor. Cell penetrating peptides Methods and Protocols. Methods in Molecular Biology, vol. 683, Humana Press, Springer, New York, Dordrecht, Heidelberg, London. pp. 375-389.
Mussbach *et al.* (2011). Transduction of peptides and proteins into live cells by cell penetrating peptides. J. Cell. Biochem. 112: 3824.
Keller *et al.* (2013). Relationships between cargo, cell penetrating

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peptides and cell type for uptake of non-covalent complexes into live cells. Pharmaceuticals **6**: 184.
Keller *et al.* (2014). Transduction of proteins into Leishmania tarentolae by formation of non-covalent complexes with cell-penetrating peptides. J. Cell. Biochem. **115**: 243.

Activity:
1 µl of stock solution is able to form a non-covalent complex with 1 µg of a protein of MW of 100 kDa. For different MWs adjust amount of stock solution accordingly.

Selected References:

Handbook of Cell-Penetrating Peptides, Second Edition, Ed. by Ü. Langel, CRC Taylor and Francis, Boca Raton, London, New York (2007).

Cell-Penetrating Peptides, Methods and Protocolls, Edited by Ülo Langel, Methods in Molecular Biology **683**, Springer New York, Dodrecht, Heidelberg, London (2011).

Pharmaceuticals, Special Issue 'Cell penetrating Peptides' (2010-2013).

Morris *et al.* (2008). Cell-penetrating peptides: from molecular mechanism to therapeutics. *Biology of the Cell* **100**: 201.

Gros *et al.* (2006) A non-covalent peptide-based strategy for protein and peptide nucleic acid transduction. *Biochim. Biophys. Acta* **1758**:384.

Gomez *et al.* (2007) Bax-inhibiting peptides derived from Ku70 and cell-penetrating pentapeptides. *Biochem. Soc. Trans.* **35**:797.

Mussbach *et al.* (2011) Internalization of nucleoside phosphates into live cells by complex formation with different CPPs and JBS-Nucleoducin. *Methods in Molecular Biology* **683**:375.

Gomez *et al.* (2010). Cell-penetrating penta-peptides (CPP5s): Measurement of cell entry and protein transduction activity. *Pharmaceuticals* **3**: 3594.

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