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Technical Information about 8-(4-chlorophenylthio)-cAMP

Potent membrane-permeant activator of both cAMP- and cGMP-dependent protein kinases and of Epac

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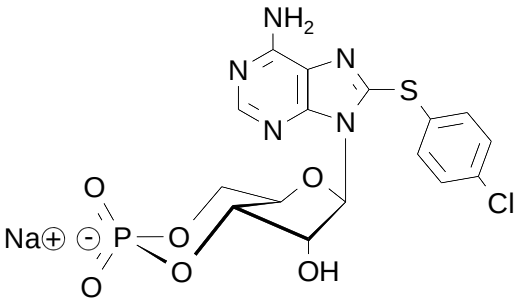

Abbreviation: **8-CPT-cAMP**

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat.No.
$C_{16}H_{14}ClN_5O_6PS{\cdot}Na$	[93882-12-3]	493.8	λ_{max} 282 nm / ε 16000 / pH 7	C 010

Name: 8- (4- Chlorophenylthio)adenosine- 3', 5'- cyclic monophosphate (8-CPT-cAMP) or *para*- chlorophenylthioadenosine- 3', 5'- cyclic monophosphate (8-pCPT-cAMP)

Description: 8-CPT-cAMP is an analogue of the natural signal molecule cyclic AMP in which the hydrogen in position 8 of the heterocyclic nucleobase is replaced by the lipophilic 4-chlorophenylthio moiety.

Properties: 8-CPT-cAMP is a potent stimulator of cAMP-dependent protein kinases and of the exchange protein activated by cyclic AMP (Epac). Due to its high lipophilicity (Braumann & Jastorff 1985) (> dibutyryl-cAMP), allowing good membrane permeability in most biosystems, and its good activation properties, 8-CPT-cAMP is very often used in signal transduction studies. However, good results obtained with 8-CPT-cAMP are not necessarily a definite proof of cAMP participation and we recommend being rather critical with published data and results concerning this analogue:
Caution: In contrast to its name, 8-CPT-cAMP is a potent stimulator of both, cAMP-and cGMP-dependent protein kinases (Miller et al. 1973, Ogreid et al. 1989, Sandberg et al. 1991, Sugita et al. 1994)!
In addition, it is a rather good inhibitor of cGMP-specific PDE (V) and thus increases basal cGMP. Both properties result in lacking cA/cG pathway specificity (Connolly et al. 1992).
The compound is metabolized more slowly by PDE compared to cAMP, but is not as resistant as often stated, releasing metabolites (Coulson et al. 1983) with disturbing effects (Sandnes et al. 1996).
If a much more specific activator of protein kinase A is needed, we recommend 6-Phe-cAMP (Cat. No. P 006) or Sp-5,6-DCl-cBIMPS (Cat. No. D 014).
Interestingly, for specific activation of the cGMP pathway the corresponding 8-pCPT-cGMP (Cat. No. C 009) is a good choice.

BIOLOG also offers the metabolically stable phosphorothioates, the inhibitory Rp-8-CPT-cAMPS (Cat. No. C 011), and the agonistic Sp-8-CPT-cAMPS (Cat. No. C 012) (Singh et al. 1998), as well as potential metabolites of 8-CPT-cAMP such as 8-pCPT-5'-AMP (Cat. No. C 101) and 8-pCPT-Ado (Cat. No. C 086).

Specification: Lyophilized or crystallized sodium salt. The free acid or other salt forms are available upon request. Equal concentrations of 8-CPT-cAMP can appear very different in volume due to sensitivity of the lyophilized form to humidity. The compound can even contract to small volume droplets. Normally the product is located in the conical bottom of the tube. Micromolar quantities are determined by UV at λ_{max}.

Purity: Typical analysis is better than 99% (HPLC / UV / 282 nm). Traces of fluorescent impurities inevitably formed during production have been removed by an additional purification step. The product is not sterile and has not been tested for endotoxins.

Stability and Storage: 8-CPT-cAMP is chemically stable under conditions of biological systems and media. Nevertheless, we recommend that the compound should be stored in the freezer, for longer storage periods preferably in freeze-dried form.
Since UV radiation develops a fluorescent impurity which can disturb in fluorescence assays, avoid bright light during handling.

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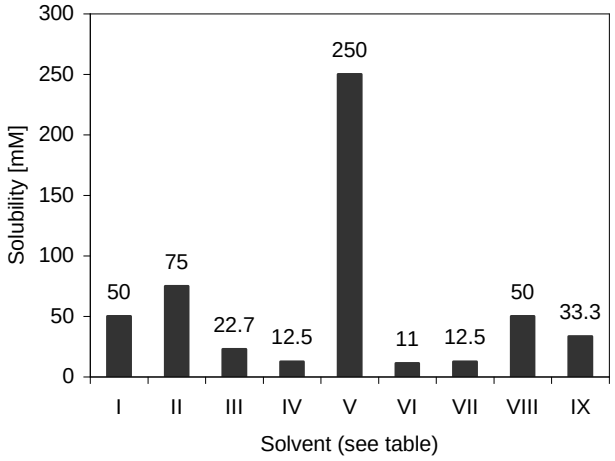
Toxicity and Safety: Since cyclic AMP has multiple tasks in every organism it is very likely that lipophilic cAMP analogues will interfere with many cell regulation processes *in vivo*. However, due to the rather small quantities to work with no health hazards have been reported. Nevertheless please keep in mind that the *in vivo* properties of this compound are not sufficiently characterized up to now. Avoid skin contact or ingestion and allow only trained personnel to handle the product.
Our products are designed, developed and sold for research purposes only. They are intended for *in vitro* and nonhuman *in vivo* laboratory applications. Any other use requires approval of health authorities.
Not for drug, household or related uses!

Solubility: Detailed information on the solubility of 8-pCPT-cAMP in water and various buffers are listed in the solubility chart below. Concentrations have been determined at ambient temperature and can be considered as minimum concentrations usually obtainable, however, slight batch-to-batch variations cannot be ruled out. When opening the tube please make sure that no substance is lost within the cap. Please rinse tube walls carefully and preferably use ultrasonic or vortex to achieve total and uniform mixing.

No.	Solvent	Solubility [mM]
I	H_2O	50
II	DMSO	75
III	DMF	22.7
IV	Ethanol 96%	12.5
V	Methanol	250
VI	PBS, pH 7.4	11
VII	100 mM Na_2HPO_4, pH 7.0	12.5
VIII	25 mM Hepes/NaOH, pH 7.2	50
IX	25 mMTris/HCl, pH 7.4	33.3



Selected References for 8-CPT-cAMP:
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