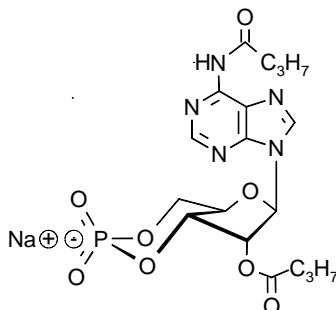


## Technical Information about N<sup>6</sup>, 2'- O- Dibutyryl-cAMP ( DB-cAMP )

Update: October 16, 2009 HU



### Abbreviation:

**DB-cAMP**

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
C <sub>18</sub> H <sub>23</sub> N <sub>5</sub> O <sub>8</sub> P·Na	[16980-89-5]	491.4	λ <sub>max</sub> 273 nm / ε 17000 / pH 7	D 009 / D 009 E

**Name:** N<sup>6</sup>, 2'- O- Dibutyryl-adenosine- 3', 5'- cyclic monophosphate, Dibutyryl cyclic AMP, Bucladesine, Actosin™, DBcAMP, Db-cAMP, bt<sub>2</sub>-cAMP, Bu<sub>2</sub>-cAMP

**Description:** DB-cAMP is an analogue of the natural signal molecule cyclic AMP where both, the amino group in position 6 of the adenine nucleobase and the ribose 2'-hydroxyl group are modified with a butyrate moiety.

**Bulk Supply:** DB-cAMP can be offered in multigram quantities at extremely competitive prices. Please ask for a corresponding quotation.

### Properties:

- releases N<sup>6</sup>- monobutyryl cAMP, an activator of protein kinase A, preferring type I of PKA,
- increased metabolic stability towards cyclic nucleotide-responsive phosphodiesterases,
- increased lipophilicity and membrane permeability while still soluble in aqueous solvents.

DB-cAMP is a common and widely used tool for proving the responsibility of cAMP for certain biological effects. However, in spite of the intensive use of this second messenger analogue there exist serious pitfalls which can falsify the results obtained with it.

In its native form DB-cAMP is nearly inactive towards protein kinase A, and needs to split off one of its butyryl groups at the ribose 2'-position in order to release the kinase-active N<sup>6</sup>-monobutyryl cAMP. Induced by esterases, this should normally take place inside the cell, but can also happen already in the medium if serum is used.

Unfortunately, the released butyrate induces a lot of effects which are often interfering with second messenger pathways. That means, that for each experiment with Db-cAMP, the influence of butyrate has to be determined in control runs with sodium butyrate or tributyrin. Nowadays, there are much better and more selective tools available.

**Specification:** Crystallized or lyophilized sodium salt. Other salt forms of DB-cAMP are available upon request. Please keep in mind that equal concentrations of the compound may look 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. Micro molar quantities are determined by UV at λ<sub>max</sub>.

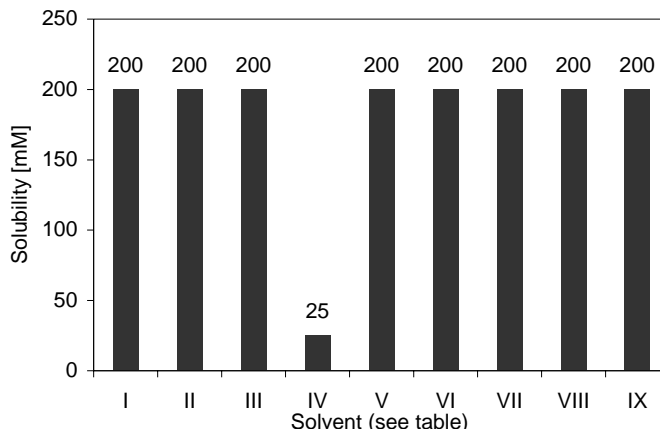
**Purity:** Typical analysis is better than 97% (HPLC / UV / 273 nm) for the economy grade and better than 98% for high purity grade material. The product is not sterile and has not been tested for endotoxins.

**Stability and Storage:** DB-cAMP has sufficient stability at room temperature and does not need special care during handling or shipment. Nevertheless, we recommend that the compound should be stored in the freezer, for longer storage periods preferably in freeze-dried form.

P.t.o.

**Solubility:** Detailed information on the solubility of DB-cAMP in water and various buffers are listed in the solubility chart below. Concentrations have been tested at ambient temperature and can be considered as minimum concentrations usually obtainable. 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 <sub>2</sub> O	200
II	DMSO	200
III	DMF	200
IV	Ethanol 96%	25
V	Methanol	200
VI	PBS, pH 7.4	200
VII	100 mM Na <sub>2</sub> HPO <sub>4</sub> , pH 7.0	200
VIII	25 mM HEPES/NaOH, pH 7.2	200
IX	25 mM Tris/HCl, pH 7.4	200



**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!**

**Selected References for DB-cAMP and butyrate problems:** Since DB-cAMP is a well known biochemical structure there exist numerous citations for almost every biosystem. The following papers give basic information on various aspects of this molecule. For more information on the butyrate effects please visit our website <http://www.biolog.de/technical-info/dbcamp-butyrate-pitfalls/>.

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