Technical Information about N⁶-Benzoyl-cAMP

Potent membrane-permeant and site-selective activator of cAMP-dependent protein kinases, but poor Epac-agonist

Update: April 24, 2014 CT

Abbreviation: 6-Bnz-cAMP

<table>
<thead>
<tr>
<th>Formula</th>
<th>CAS No.</th>
<th>Molecular Weight</th>
<th>UV</th>
<th>BIOLOG Cat. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁₇H₁₅N₅O₇P·Na</td>
<td>[30275-80-0]</td>
<td>455.3</td>
<td>λₓₓₓ 279 nm / ε 17000 / pH 7</td>
<td>B 009</td>
</tr>
</tbody>
</table>

Name: N⁶-Benzyladenosine-3', 5'-cyclic monophosphate

Description: 6-Bnz-cAMP is an analogue of the natural signal molecule cyclic AMP in which one hydrogen atom of the amino group in position 6 of the heterocyclic nucleobase is replaced by a lipophilic benzoyl group.

Properties:
- good activator of protein kinase A (PKA), but poor Epac agonist, thus PKA selective
- site selective for site A of PKA I and II and hence a suitable partner for synergistic activation by pairs of analogues with opposite site selectivity
- increased metabolic stability towards cyclic nucleotide-responsive phosphodiesterases
- high lipophilicity and good membrane permeability while still soluble in aqueous solvents

6-Bnz-cAMP is a potent, selective activator of cAMP-dependent protein kinase, which is only slowly metabolized by mammalian cyclic nucleotide-responsive phosphodiesterases. Due to its unique site selectivity it is often used as a partner for selective stimulation of PKA type I or type II by synergistic pairs of cAMP analogues. The substitution with the benzoyl group results in considerably higher lipophilicity and membrane permeability compared to cAMP.

Application: If 6-Bnz-cAMP is combined with an analogue which selects site B of PKA I (e.g. 8-AHA-cAMP, Cat. No. A 011), selectively type I of PKA is activated. On the other hand, combination with a structure that prefers site B of PKA II (such as Sp-8-CPT-cAMPS or Sp-8-PIP-cAMPS, Cat. No's. C 012/P 005), selective synergistic stimulation of only type II of PKA can be achieved. Please ask for the special corresponding technical leaflet (No. T1001) on this topic. Furthermore, 6-Bnz-cAMP shows only neglectable agonistic properties on Epac (exchange protein activated by cyclic AMP) and thus can be used as an Epac-negative control.

Specification: Crystallized or lyophilized sodium salt. Other salt forms are available upon request. Equal concentrations of 6-Bnz-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 λₓₓₓ.

Stability and Storage: 6-Bnz-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.

Purity: Typical analysis is better than 98% (HPLC / UV / 279 nm). The product is not sterile and has not been tested for endotoxins.
Solubility: Detailed information on the solubility of 6-Bnz-cAMP in water and various buffers is 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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Solvent</th>
<th>Solubility [mM]</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>H&lt;sub&gt;2&lt;/sub&gt;O</td>
<td>200</td>
</tr>
<tr>
<td>II</td>
<td>DMSO</td>
<td>200</td>
</tr>
<tr>
<td>III</td>
<td>DMF</td>
<td>200</td>
</tr>
<tr>
<td>IV</td>
<td>Ethanol 96%</td>
<td>6</td>
</tr>
<tr>
<td>V</td>
<td>Methanol</td>
<td>200</td>
</tr>
<tr>
<td>VI</td>
<td>PBS, pH 7.4</td>
<td>200</td>
</tr>
<tr>
<td>VII</td>
<td>100 mM Na&lt;sub&gt;2&lt;/sub&gt;HPO&lt;sub&gt;4&lt;/sub&gt;, pH 7.0</td>
<td>200</td>
</tr>
<tr>
<td>VIII</td>
<td>25 mM Heps/NaOH, pH 7.2</td>
<td>200</td>
</tr>
<tr>
<td>IX</td>
<td>25 mMTris/HCl, pH 7.4</td>
<td>200</td>
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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 laboratory applications. Any other use requires approval of health authorities.

Selected References for 6-Bnz-cAMP:
For a detailed list please inquire or visit our website (http://www.biolog.de).


