



Second Messenger and Signal Transduction Research High Purity Nucleotide & Nucleoside Analogues

- *Unique Collection of Cyclic Nucleotides*
- *Inhibitors and Activators of Protein Kinases A and G*
- *Specific Epac Modulators*
- *Widest Selection of NAD⁺ and cADPR Analogues*
- *c-diGMP and c-diAMP, Derivatives and Metabolites*
- *Nucleoside Mono-, Di-, Tri- and Polyphosphates*
- *Fluorescent and Biotinylated Analogues*
- *Affinity Chromatography Gels*
- *Bulk and Custom Syntheses*





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Catalogue Number Index

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BIOLOG Product List

Nucleoside- 5'- O- diphosphates

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Adenosine- 5'- O- (α , β - methylene)diphosphate (AMP-CP)	A 070	5
8- Aminoadenosine- 5'- O- diphosphate (8-NH ₂ -ADP)	A 144	5
N ⁶ - (4- Aminobutyl)adenosine- 5'- O- diphosphate (6-AB-ADP)	A 026	5
2'- Amino- 2'- deoxyadenosine- 5'- O- diphosphate (2'-NH ₂ -ADP)	A 106	5
3'- Amino- 3'- deoxyadenosine- 5'- O- diphosphate (3'-NH ₂ -ADP)	A 107	6
2'- / 3'- O- (2- Aminoethylcarbamoyl)adenosine- 5'- O- diphosphate (2'-/3'-AEC-ADP / EDA-ADP)	A 118	6
2'- / 3'- O- (6- Aminohexylcarbamoyl)guanosine- 5'- O- diphosphate (2'-/3'-AHC-GDP)	A 289	6
8- Azidoadenosine- 5'- O- diphosphate (8-N ₃ -ADP)	A 044	6
8- Azido- 1, N ⁶ - ethenoadenosine- 5'- O- diphosphate (8-N ₃ - ϵ -ADP)	A 210	6
N ⁶ - Benzyladenosine- 5'- O- diphosphate (6-Bn-ADP)	B 023	6
N ⁶ - (3- [Biotinyl]aminopropyl)adenosine- 5'- O- diphosphate (6-[Biotin]-APr-ADP)	B 076	6
N ⁶ - (3- [(Biotinyl)- 3- aminopropoxy(ethoxy)ethoxy]ethoxypropyl)adenosine- 5'- O- diphosphate	B 077	7
8- Bromoadenosine- 5'- O- diphosphate (8-Br-ADP)	B 067	7
2- Chloroadenosine- 5'- O- diphosphate (2-Cl-ADP)	C 055	7

**Nucleoside- 5'- O- diphosphates** *continued*

	Cat. No.	Page
8- Chloroadenosine- 5'- O- diphosphate (8-Cl-ADP)	C 042	7
6- Chloropurine riboside- 5'- O- diphosphate (6-Cl-PuDP)	C 015	7
N ⁶ - Cyclohexyladenosine- 5'- O- diphosphate (6-cHe-ADP)	C 085	7
N ⁶ - Cyclopentyladenosine- 5'- O- diphosphate (6-cPe-ADP / cpADP)	C 061	7
Cytidine- 5'- O- (α , β - methylene)diphosphate (CMP-CP)	C 077	8
7- Deazaadenosine- 5'- O- diphosphate (7-CH-ADP / 5'-TuDP)	D 091	8
7- Deaza- 2'- deoxyadenosine- 5'- O- diphosphate (7-CH-dADP / 5'-dTUDP)	D 061	8
2'- Deoxy- 3'- O- (N'- methylantraniloyl)adenosine- 5'- O- diphosphate (MANT-dADP)	D 083	8
2'- Deoxy- 3'- O- (N'- methylantraniloyl)guanosine- 5'- O- diphosphate (MANT-dGDP)	D 084	9
1, N ⁶ - Ethenoadenosine- 5'- O- diphosphate (ϵ -ADP)	E 007	9
N ⁶ - Furfuryladenosine- 5'- O- diphosphate (6-Fu-ADP)	F 006	9
Guanosine- 5'- O- (α , β - methylene)diphosphate (GMP-CP)	G 024	9
Isoguanosine- 5'- O- diphosphate (isoGDP)	I 038	10
2'- / 3'- O- (N'- Methylantraniloyl)adenosine- 5'- O- diphosphate (MANT-ADP)	M 040	10
2'- / 3'- O- (N'- Methylantraniloyl)guanosine- 5'- O- diphosphate (MANT-GDP)	M 041	10
N ⁶ - (3- Methylbenzyl)adenosine- 5'- O- diphosphate (6-(3-MeBn)-ADP)	M 024	10
N ⁶ - (1- Methylbutyl)adenosine- 5'- O- diphosphate (6-(1-MeBu)-ADP)	M 026	10
N ⁶ - (2- Methylbutyl)adenosine- 5'- O- diphosphate (6-(2-MeBu)-ADP)	M 028	11
2- Methylthioadenosine- 5'- O- diphosphate (2-MeS-ADP)	M 020	10
N ⁶ - Phenyladenosine- 5'- O- diphosphate (6-Phe-ADP)	P 014	11
N ⁶ - (2- Phenylethyl)adenosine- 5'- O- diphosphate (6-PhEt-ADP)	P 013	11
6- Thioguanosine- 5'- O- diphosphate (6-T-GDP)	T 015	11
Thymidine- 5'- O- (α , β - methylene)diphosphate (TMP-CP)	T 008	11
Uridine- 5'- O- (α , β - methylene)diphosphate (UMP-CP)	U 009	11
Analogues of nucleoside- 5'- O- diphosphates not specially listed.	Inquire	

Phosphorothioate- modified Nucleoside- 5'- O- diphosphates

	Cat. No.	Page
Adenosine- 5'- O- (1- thiodiphosphate), Rp- isomer (Rp-ADP- α -S)	A 037	5
Adenosine- 5'- O- (1- thiodiphosphate), Sp- isomer (Sp-ADP- α -S)	A 038	5
Adenosine- 5'- O- (2- thiodiphosphate) (ADP- β -S)	A 121	5
Cytidine- 5'- O- (2- thiodiphosphate) (CDP- β -S)	C 079	8
2'- Deoxyadenosine- 5'- O- (1- thiodiphosphate), Rp- isomer (Rp-dADP- α -S)	D 004	8
2'- Deoxyadenosine- 5'- O- (1- thiodiphosphate), Sp- isomer (Sp-dADP- α -S)	D 005	8
Guanosine- 5'- O- (1- thiodiphosphate), Rp- isomer (Rp-GDP- α -S)	G 012	9
Guanosine- 5'- O- (1- thiodiphosphate), Sp- isomer (Sp-GDP- α -S)	G 013	9
Guanosine- 5'- O- (2- thiodiphosphate) (GDP- β -S)	G 023	9
Uridine- 5'- O- (2- thiodiphosphate) (UDP- β -S)	U 011	12
Phosphorothioate analogues of nucleoside- 5'- O- diphosphates not specially listed.	Inquire	

Affinity Gels with immobilized diphosphates (Glycosyltransferase Affinity Gels)

	Cat. No.	Page
Cytidine- 5'- O- diphosphate, immobilized on a polymeric gel (CDP-Gel)	C 128	11
Guanosine- 5'- O- diphosphate, immobilized on a polymeric gel (GDP-Gel)	G 028	12
Uridine- 5'- O- diphosphate, immobilized on a polymeric gel (UDP-Gel)	U 017	12

Preparation of Stock Solutions

Most BIOLOG products are sold in micromol quantities in order to assist customers with the preparation of stock solutions. In contrast to often troublesome calculations regarding molecular weight, salt form, water content and purity percentages, simply add certain volumes of solvent (mostly water or buffer) and end up already with stock solutions of defined concentrations.

The following table shows how to dissolve the content of a vial with water or buffer in order to obtain defined stock solutions:

Concentration of stock solution	Content of vial					
	1 μmol	5 μmol	10 μmol	25 μmol	50 μmol	100 μmol
	⇓	⇓	⇓	⇓	⇓	⇓
	Water or buffer volumes to be added to achieve stock concentrations on the left					
	⇓	⇓	⇓	⇓	⇓	⇓
100 mM (1×10^{-1} M)	10 μl	50 μl	100 μl	250 μl	500 μl	1 ml
50 mM (5×10^{-2} M)	20 μl	100 μl	200 μl	500 μl	1 ml	2 ml
20 mM (2×10^{-2} M)	50 μl	250 μl	500 μl	1.25 ml	2.5 ml	5 ml
10 mM (1×10^{-2} M)	100 μl	500 μl	1 ml	2.5 ml	5 ml	10 ml
5 mM (5×10^{-3} M)	200 μl	1 ml	2 ml	5 ml	10 ml	20 ml
1 mM (1×10^{-3} M)	1 ml	5 ml	10 ml	25 ml	50 ml	100 ml
500 μM (5×10^{-4} M)	2 ml	10 ml	20 ml	50 ml	100 ml	200 ml

If a typical dilution series (1 mM, 100 μM , 10 μM , 1 μM ...) is prepared, respective final end volumes will be 90% of the starting stock solution. For example: The content of a 10 μmol vial that has been dissolved in 10 ml of water to result in a 1 mM stock solution, yields 9 ml of each concentration level after dilution.

Interested in our experience with nucleotides?

Since we collect scientific data for most of the structures offered, we can assist you with many of your specific questions connected to nucleotide-related compounds. Since our main competence lies in cyclic nucleotide-related issues we can offer here:

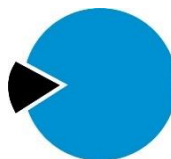
- lipophilic ranking of analogues and information about membrane permeability
- phosphodiesterase hydrolysis data
- protein kinase binding, activation and inhibition data
- application references
- potential analogue pitfalls
- selection of suitable structures for respective biological systems

We invite your questions and appreciate hearing about your results and papers related to our products. Confidentiality regarding sensitive matters is, of course, assured. You are encouraged to take advantage of this service regardless whether or not you are already a customer.

**Our products are designed, developed and sold for research purposes only!
They are intended for *in vitro* and nonhuman *in vivo* laboratory applications.
Contents of vials are not sterile and have not been tested for endotoxins.**

Please visit Biolog's new website

www.biolog.de



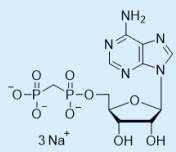
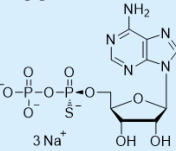

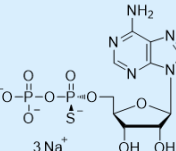

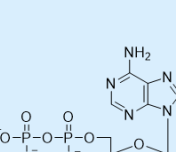

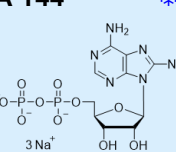

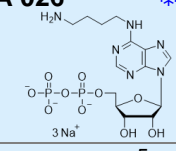

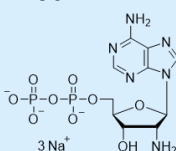

and discover a large variety of rare and sophisticated nucleotide analogues with interesting modifications and useful ligands connected, extended search functions and a convenient shop system

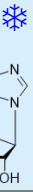

The screenshot shows the homepage of the Biolog Life Science Institute website. The header features the Biolog logo and the text "LIFE SCIENCE INSTITUTE". A search bar is located in the top right corner. Below the header, there is a "CATEGORIES" section on the left with a list of product types including Cyclic Nucleotides, Nucleobases, Epac Inhibitors, Nucleosides, and various phosphates. The main content area includes a banner for "Innovative reagents for life science research" with an image of colorful vials, a "NEW PRODUCTS" section with a chemical structure diagram, and a "NEWS & OFFERS" section with a table of recent events and product updates. At the bottom, there are three boxes for "TECHNICAL INFORMATION", "CUSTOM SYNTHESIS", and "LITERATURE DOWNLOAD". The footer contains a newsletter sign-up form and contact information.

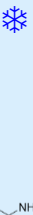

Date	Event/Update
2017-02-13	Microbiology and Infection 2017 Meeting
2016-12-23	New: 2'3'-c-diAMPSS and fluorescent cGAMP
2016-12-22	New products: 2',3'-cAMP and Monobutryl-cCMP
2016-10-26	International Signal Transduction Meeting

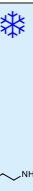



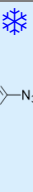

Nucleoside- 5'- O- diphosphates and 5'- O- thiodiphosphates

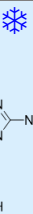

A 070 	Adenosine- 5'- O- (α, β- methylene)diphosphate (AMP-CP) [104835-70-3]; C ₁₁ H ₁₇ N ₅ O ₉ P ₂ ; MW 425.2 (free acid); λ _{max} 259 nm; ε 15000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Hydrolytically stable analogue of ADP and starting structure for synthesis of α/β hydrolysis-resistant tri- and polyphosphates. Inhibitor of CD73. Detailed technical information available. References: Hoehn et al., <i>J. Neurochem.</i> , 54 , 256 - 265 (1990); Synnestvedt et al., <i>J. Clin. Invest.</i> , 110 , 993 - 1002 (2002). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.
5 µmol / ~2.1 mg € 57.- (A 070 - 05)	5 x 5 µmol € 212.- (A 070 - 25)
A 037 	Adenosine- 5'- O- (1- thiodiphosphate), Rp- isomer (Rp-ADP-α-S) [59331-71-4]; C ₁₀ H ₁₅ N ₅ O ₉ P ₂ S; MW 443.3 (free acid); λ _{max} 259 nm; ε 15200; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of ADP binding proteins with often increased metabolic stability. Useful for characterization of ADP-responsive receptors and determination of their stereospecificity. Detailed technical information available. References: Marlier et al., <i>Biochemistry</i> , 20 , 2212 - 2219 (1981) and <i>ibid.</i> , 21 , 2349 - 2356 (1982). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.2 mg € 180.- (A 037 - 05)	5 x 5 µmol € 767.- (A 037 - 25)
A 038 	Adenosine- 5'- O- (1- thiodiphosphate), Sp- isomer (Sp-ADP-α-S) [59286-20-3]; C ₁₀ H ₁₅ N ₅ O ₉ P ₂ S; MW 443.3 (free acid); λ _{max} 259 nm; ε 15200; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of ADP binding proteins with often increased metabolic stability. Useful for characterization of ADP-responsive receptors and determination of their stereospecificity. Detailed technical information available. References: Marlier et al., <i>Biochemistry</i> , 20 , 2212 - 2219 (1981) and <i>ibid.</i> , 21 , 2349 - 2356 (1982). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.2 mg € 180.- (A 038 - 05)	5 x 5 µmol € 767.- (A 038 - 25)
A 121 	Adenosine- 5'- O- (2- thiodiphosphate) (ADP-β-S) [35094-45-2]; C ₁₀ H ₁₅ N ₅ O ₉ P ₂ S; MW 443.3 (free acid); λ _{max} 259 nm; ε 15200; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of ADP binding proteins with increased metabolic stability. Useful for characterization of ADP-responsive receptors and determination of their stereospecificity and for labelling with thio-reactive reporter groups. Other β-S-diphosphates are also offered (Cat. Nos. C 079, p. 8 , G 023, p. 9 and U 011, p. 11). Detailed technical information available. References: Palea et al., <i>J. Pharmacol. Exp. Ther.</i> , 269 , 193 - 197 (1994); Bolego et al., <i>Res. Commun. Mol. Pathol. Pharmacol.</i> , 87 , 75 - 77 (1995); Saiag et al., <i>Brit. J. Pharmacol.</i> , 118 , 804 - 810 (1996). Vial containing 500 µl of 10 mM aqueous solution of pH 8.5.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.2 mg € 114.- (A 121 - 05)	5 x 5 µmol € 353.- (A 121 - 25)
A 144 	8- Aminoadenosine- 5'- O- diphosphate (8-NH₂-ADP) [65312-53-0]; C ₁₀ H ₁₆ N ₆ O ₁₀ P ₂ ; MW 442.2 (free acid); λ _{max} 273 nm; ε 16400 (pH 11); sodium salt; purity > 95% HPLC. For other salt forms or higher purity please inquire. Analogue of adenosine-5'-O-diphosphate which can be useful in receptor mapping studies. The corresponding triphosphate form is offered as well (8-NH ₂ -ATP, Cat. No. A 115). Detailed technical information available. Reference: Howard et al., <i>Biochemistry</i> , 16 , 4637 - 4646 (1977). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.2 mg € 174.- (A 144 - 05)	5 x 5 µmol € 739.- (A 144 - 25)
A 026 	N⁶- (4- Aminobutyl)adenosine- 5'- O- diphosphate (6-AB-ADP) [767272-34-4]; C ₁₄ H ₂₄ N ₆ O ₁₀ P ₂ ; MW 498.3 (free acid); λ _{max} 268 nm; ε 16000; sodium salt; purity > 95% HPLC. Suitable as ligand in affinity chromatography and for modification with fluorophores or other markers. For other spacer lengths or custom synthesis of conjugates with various markers please inquire. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.5 mg € 210.- (A 026 - 05)	5 x 5 µmol € 891.- (A 026 - 25)
A 106 	2'- Amino- 2'- deoxyadenosine- 5'- O- diphosphate (2'-NH₂-ADP) [63545-57-3]; C ₁₀ H ₁₆ N ₆ O ₉ P ₂ ; MW 426.2 (free acid); λ _{max} 259 nm; ε 15000; sodium salt; purity > 95% HPLC. Suitable as ligand in affinity chromatography and for modification with fluorophores or other markers. For custom synthesis of conjugates with various markers please inquire. Detailed technical information available. Reference: Ikehara et al., <i>Nucleic Acids Res.</i> , 4 , 989 - 1000 (1977). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.1 mg € 164.- (A 106 - 05)	5 x 5 µmol € 692.- (A 106 - 25)

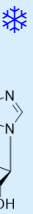

A 107 	3'- Amino- 3'- deoxyadenosine- 5'- O- diphosphate (3'-NH₂-ADP) [4360-06-9]; C ₁₀ H ₁₆ N ₆ O ₉ P ₂ ; MW 426.2 (free acid); λ _{max} 259 nm; ε 15000; sodium salt; purity > 95% HPLC. Suitable as ligand in affinity chromatography and for modification with fluorophores or other markers. For custom synthesis of conjugates with various markers please inquire. Detailed technical information available. Reference: Webb et al., <i>Biochemistry</i> , 43 , 14463 - 14471 (2004). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.1 mg € 179.- (A 107 - 05)	5 x 5 µmol € 759.- (A 107 - 25)

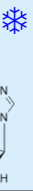

A 118 	2'- / 3'- O- (2- Aminoethylcarbamoyl)adenosine- 5'- O- diphosphate (2'-/3'-AEC-ADP / EDA-ADP) C ₁₃ H ₂₁ N ₇ O ₁₁ P ₂ ; MW 513.3 (free acid); λ _{max} 259 nm; ε 15000; sodium salt; purity > 95% HPLC. Suitable as ligand in affinity chromatography and for modification with fluorophores or other markers. For other spacer lengths or custom synthesis of conjugates with various markers please inquire. Detailed technical information available. Reference: Webb & Corrie, <i>Biophys. J.</i> , 81 , 1562 - 1569 (2001). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.6 mg € 152.- (A 118 - 05)	5 x 5 µmol € 647.- (A 118 - 25)


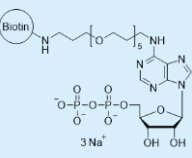

A 289 	2'- / 3'- O- (6- Aminoethylcarbamoyl)guanosine- 5'- O- diphosphate (2'-/3'-AHC-GDP) [1810735-99-9] / [1810737-23-5]; C ₁₇ H ₂₉ N ₇ O ₁₂ P ₂ ; MW 585.4 (free acid); λ _{max} 252 nm; ε 13500; sodium salt; purity > 95% HPLC. For other salt forms please inquire. 2'-/3'-AHC-GDP is suitable as a ligand in affinity chromatography or for coupling of various labelling structures including fluorophores. The spacer is connected to the ribose 2'-hydroxy group of the guanosine part. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.9 mg € 152.- (A 289 - 05)	5 x 5 µmol € 647.- (A 289 - 25)
Inquiries for bulk quantities welcome!	


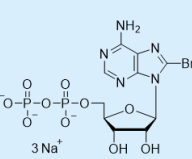

A 044 	8- Azidoadenosine- 5'- O- diphosphate (8-N₃-ADP) [59432-65-4]; C ₁₀ H ₁₄ N ₈ O ₁₀ P ₂ ; MW 468.2 (free acid); λ _{max} 281 nm; ε 13000 (pH 6); sodium salt; purity > 95% HPLC. For other salt forms please inquire. Useful for photoaffinity labelling of ADP binding proteins. Detailed technical information available. References: Czarnecki et al., <i>Methods Enzymol.</i> , 56 , 642 - 653 (1979); Potter & Haley, <i>Methods Enzymol.</i> , 91 , 613 - 633 (1983); Tomblin et al., <i>J. Biol. Chem.</i> , 279 , 31212 - 31220 (2004). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.3 mg € 95.- (A 044 - 05)	5 x 5 µmol € 407.- (A 044 - 25)
Inquiries for bulk quantities welcome!	


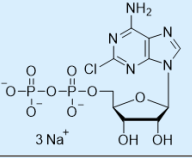

A 210 	8- Azido- 1, N^ε- ethenoadenosine- 5'- O- diphosphate (8-N₃-ε-ADP) 8-N ₃ -ε-ADP combines the photosensitive activity of 8-N ₃ -ADP (Cat. No. A 044) and the fluorescent properties of ε-ADP (Cat. No. E 007). It is useful for photoaffinity labelling of ADP binding proteins and subsequent detection of the fluorescent label (λ _{exc} 285 nm, λ _{em} 410 nm). Alternatively, detection may be achievable by using an ethenoadenosine-specific antibody (1G4, compare: Krebs et al., <i>Anal. Biochem.</i> , 314 , 108 - 115 (2003)). Detailed technical information available. For reference compare: Schäfer et al., <i>Anal. Biochem.</i> , 104 , 106 - 111 (1980); Schäfer et al., <i>Nucleic Acids Res.</i> , 5 , 1345 - 1351 (1978). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.5 mg € 207.- (A 210 - 05)	5 x 5 µmol € 880.- (A 210 - 25)
Inquiries for bulk quantities welcome!	


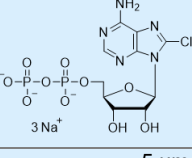

B 023 	N⁶- Benzyladenosine- 5'- O- diphosphate (6-Bn-ADP) [40811-89-0]; C ₁₇ H ₂₁ N ₅ O ₁₀ P ₂ ; MW 517.3 (free acid); λ _{max} 269 nm; ε 20500; sodium salt; purity > 95% HPLC. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i> , 276 , 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. B 024). Detailed technical information available. References: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i> , 94 , 3565 - 3570 (1997); Provance et al., <i>Proc. Natl. Acad. Sci. USA</i> , 101 , 1868 - 1873 (2004). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.6 mg € 174.- (B 023 - 05)	5 x 5 µmol € 739.- (B 023 - 25)


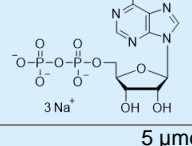

B 076 	N⁶- (3- [Biotinyl]aminopropyl)adenosine- 5'- O- diphosphate (6-[Biotin]-APr-ADP) C ₂₃ H ₃₆ N ₈ O ₁₂ P ₂ S; MW 710.6 (free acid); λ _{max} 267 nm; ε 17000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Biotin connected to the N ⁶ -position of adenosine-5'-O-diphosphate via an aminopropyl spacer. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
1 µmol / ~0.7 mg € 164.- (B 076 - 01)	5 x 1 µmol € 692.- (B 076 - 05)


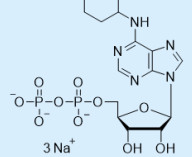

B 077  	N⁶- (3- [[([Biotinyl]- 3- aminopropoxy(ethoxy)ethoxy)ethoxy]ethoxypropyl)adenosine- 5'- O-diphosphate (6-[Biotin]-APrO-(EO)₄-Pr-ADP) $C_{34}H_{58}N_8O_{17}P_2S$; MW 944.9 (free acid); λ_{max} 267 nm; ϵ 17000; sodium salt, purity > 95% HPLC. For other salt forms please inquire. Biotin connected to the N ⁶ -position of adenosine-5'-O-diphosphate via a 20 atom spacer. Detailed technical information available. Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
1 μ mol / ~1 mg € 185.- (B 077 - 01)	5 x 1 μ mol € 786.- (B 077 - 05)


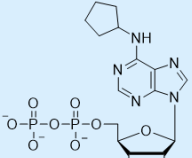

B 067  	8- Bromoadenosine- 5'- O- diphosphate (8-Br-ADP) [23600-16-0]; $C_{10}H_{14}BrN_5O_{10}P_2$; MW 506.1 (free acid); λ_{max} 264 nm; ϵ 17000; sodium salt, purity > 95% HPLC. For other salt forms or higher purity please inquire. Analogue of ADP with changed syn/anti ratio for receptor mapping studies and starting structure for 8-modified ADP derivatives. Detailed technical information available. References: Schlimme & Stahl, <i>Hoppe-Seyler's Z. Physiol. Chem.</i> , 355 , 1139 - 1142 (1974); Lascu et al., <i>Biochemistry</i> , 18 , 4818 - 4826 (1979); Ragatz, <i>Proc. Ind. Acad. Sci.</i> , 91 , 183 - 187 (1982). Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 μ mol / ~2.5 mg € 164.- (B 067 - 05)	5 x 5 μ mol € 692.- (B 067 - 25)

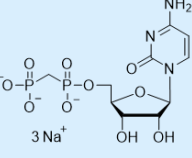
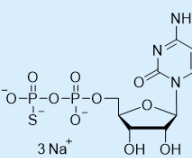
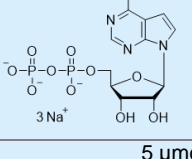
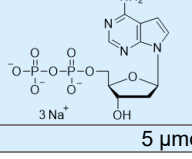
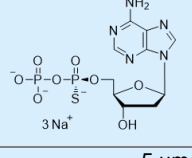
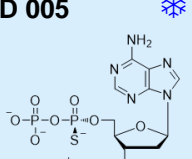
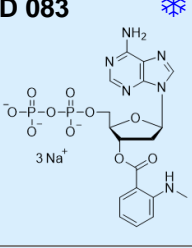
C 055  	2- Chloroadenosine- 5'- O- diphosphate (2-Cl-ADP) [16506-88-0]; $C_{10}H_{14}ClN_5O_{10}P_2$; MW 461.7 (free acid); λ_{max} 262 nm; ϵ 14300; sodium salt, purity > 95% HPLC. For other salt forms please inquire. Analogue of adenosine-5'-diphosphate and reactive precursor for 2-modified ADP derivatives. Detailed technical information available. References: Cusack et al., <i>Br. J. Pharmacol.</i> , 77 , 329 - 333 (1982); Geiger et al., <i>Eur. J. Pharmacol.</i> , 351 , 235 - 246 (1998). Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 μ mol / ~2.3 mg € 202.- (C 055 - 05)	5 x 5 μ mol € 859.- (C 055 - 25)

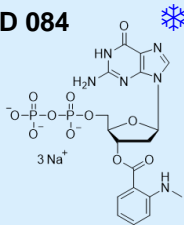

C 042  	8- Chloroadenosine- 5'- O- diphosphate (8-Cl-ADP) [185341-69-9]; $C_{10}H_{14}ClN_5O_{10}P_2$; MW 461.7 (free acid); λ_{max} 262 nm; ϵ 17000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Analogue of adenosine-5'-diphosphate, metabolite of 8-Cl-cAMP (Cat. No. C 007) and 8-Cl-adenosine (Cat. No. C 006), respectively, and reactive precursor for 8-modified ADP derivatives. Detailed technical information available. Reference: Gandhi et al., <i>Cancer Chemother. Pharmacol.</i> , 50 , 85 - 94 (2002). Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 μ mol / ~2.3 mg € 169.- (C 042 - 05)	5 x 5 μ mol € 716.- (C 042 - 25)

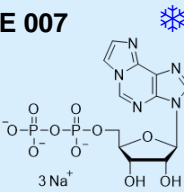

C 015  	6- Chloropurine riboside- 5'- O- diphosphate (6-Cl-PuDP) [59128-86-8]; $C_{10}H_{13}ClN_4O_{10}P_2$; MW 446.6 (free acid); λ_{max} 263 nm; ϵ 8900; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Analogue of adenosine-5'-diphosphate and reactive precursor for 6-modified ADP derivatives. Detailed technical information available. Reference: Geiger et al., <i>Eur. J. Pharmacol.</i> , 351 , 235 - 246 (1998). Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 μ mol / ~2.2 mg € 174.- (C 015 - 05)	5 x 5 μ mol € 739.- (C 015 - 25)

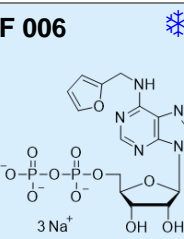

C 085  	N⁶- Cyclohexyladenosine- 5'- O- diphosphate (6-cHe-ADP) $C_{16}H_{25}N_5O_{10}P_2$; MW 509.3 (free acid); λ_{max} 270 nm; ϵ 19900; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i> , 276 , 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. C 084). Detailed technical information available. Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 μ mol / ~2.5 mg € 272.- (C 085 - 05)	5 x 5 μ mol € 1,116.- (C 085 - 25)

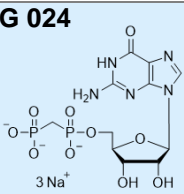
C 061  	N⁶- Cyclopentyladenosine- 5'- O- diphosphate (6-cPe-ADP / cpADP) [681175-79-1]; $C_{15}H_{23}N_5O_{10}P_2$; MW 495.3 (free acid); λ_{max} 270 nm; ϵ 19900; sodium salt; purity > 95% HPLC. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i> , 276 , 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. C 062). Detailed technical information available. References: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i> , 94 , 3565 - 3570 (1997); Provance et al., <i>Proc. Natl. Acad. Sci. USA</i> , 101 , 1868 - 1873 (2004). Vial containing 500 μ l of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 μ mol / ~2.5 mg € 272.- (C 061 - 05)	5 x 5 μ mol € 1,116.- (C 061 - 25)

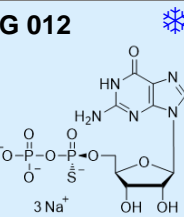

C 077 	Cytidine- 5'- O- (α, β- methylene)diphosphate (CMP-CP) [101536-15-6]; C ₁₀ H ₁₇ N ₃ O ₁₀ P ₂ ; MW 401.2 (free acid); λ _{max} 271 nm; ε 9000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Hydrolytically stable analogue of CDP and starting structure for synthesis of α/β hydrolysis-resistant tri- and polyphosphates. Detailed technical information available. Reference: Rezende et al., <i>Synth. Commun.</i> , 31 , 3699 - 3705 (2001). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. <div> <div>5 µmol / ~2 mg € 58.- (C 077 - 05)</div> <div>5 x 5 µmol € 245.- (C 077 - 25)</div> </div>
C 079 	Cytidine- 5'- O- (2- thiodiphosphate) (CDP-β-S) [497064-72-9]; C ₉ H ₁₅ N ₃ O ₁₀ P ₂ S; MW 419.2 (free acid); λ _{max} 271 nm; ε 9000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of CDP binding proteins with increased metabolic stability. Useful for characterization of CDP-responsive receptors and determination of their stereospecificity and suitable for labelling with thio-reactive reporter groups. Other β-S-diphosphates are also offered (Cat. Nos. A 121, p. 5, G 023, p. 9 and U 011, p. 11). Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 8.5. ❄ Shipment on dry ice is recommended to maintain original quality. <div> <div>5 µmol / ~2.1 mg € 93.- (C 079 - 05)</div> <div>5 x 5 µmol € 396.- (C 079 - 25)</div> </div>
D 091 	7- Deazaadenosine- 5'- O- diphosphate (7-CH-ADP / 5'-TuDP) [21080-53-5]; C ₁₁ H ₁₆ N ₄ O ₁₀ P ₂ ; MW 426.2 (free acid); λ _{max} 269 nm; ε 12000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Synonym: 2'-Tubercidin-5'-O-diphosphate. Isosteric modification of ADP. Detailed technical information available. Reference: Petrescu et al., <i>Biochemistry</i> , 21 , 886 - 893 (1982). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄ Shipment on dry ice is recommended to maintain original quality. <div> <div>5 µmol / ~2.1 mg € 217.- (D 091 - 05)</div> <div>5 x 5 µmol € 924.- (D 091 - 25)</div> </div>
D 061 	7- Deaza- 2'- deoxyadenosine- 5'- O- diphosphate (7-CH-dADP / 5'-dTuDP) [187478-96-2]; C ₁₁ H ₁₆ N ₄ O ₉ P ₂ ; MW 410.2 (free acid); λ _{max} 269 nm; ε 12000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Synonym: 2'-Deoxytubercidin-5'-O-diphosphate. Isosteric modification of dADP. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄ Shipment on dry ice is recommended to maintain original quality. <div> <div>5 µmol / ~2.1 mg € 250.- (D 061 - 05)</div> <div>5 x 5 µmol € 1.047.- (D 061 - 25)</div> </div>
D 004 	2'- Deoxyadenosine- 5'- O- (1- thiodiphosphate), Rp- isomer (Rp-dADP-α-S) [120496-69-7]; C ₁₀ H ₁₅ N ₅ O ₈ P ₂ S; MW 427.3 (free acid); λ _{max} 259 nm; ε 15200; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of dADP binding proteins with often increased metabolic stability. Useful for characterization of dADP-responsive receptors and determination of their stereospecificity. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄ Shipment on dry ice is recommended to maintain original quality. <div> <div>5 µmol / ~2.1 mg € 174.- (D 004 - 05)</div> <div>5 x 5 µmol € 739.- (D 004 - 25)</div> </div>
D 005 	2'- Deoxyadenosine- 5'- O- (1- thiodiphosphate), Sp- isomer (Sp-dADP-α-S) [120496-69-7]; C ₁₀ H ₁₅ N ₅ O ₈ P ₂ S; MW 427.3 (free acid); λ _{max} 259 nm; ε 15200; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of dADP binding proteins with often increased metabolic stability. Useful for characterization of dADP-responsive receptors and determination of their stereospecificity. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄ Shipment on dry ice is recommended to maintain original quality. <div> <div>5 µmol / ~2.1 mg € 174.- (D 005 - 05)</div> <div>5 x 5 µmol € 739.- (D 005 - 25)</div> </div>
D 083 	2'- Deoxy- 3'- O- (N'- methylanthraniloyl)adenosine- 5'- O- diphosphate (MANT-dADP) [91828-83-0]; C ₁₈ H ₂₂ N ₆ O ₁₀ P ₂ ; MW 544.4 (free acid); λ _{max} 255 nm (pH 8); ε 23300; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Fluorescent analogue of 2'-deoxyadenosine-5'-diphosphate (λ _{exc} 350 nm; λ _{em} 446 nm), useful for research into 5'-dADP-dependent receptor proteins. The MANT fluorophore has a certain sensitivity for its environment and can change its spectral properties upon binding (compare: Hiratsuka, <i>Biochim. Biophys. Acta</i> , 742 , 496 - 508 (1983)). Detailed technical information available. Reference: Bujalowski & Klonowska, <i>Biochemistry</i> , 33 , 4682 - 4694 (1994). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄ Shipment on dry ice is recommended to maintain original quality. <div> <div>5 µmol / ~2.7 mg € 164.- (D 083 - 05)</div> <div>5 x 5 µmol € 692.- (D 083 - 25)</div> </div>

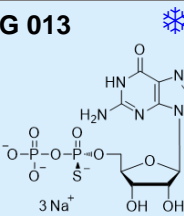

D 084 	2'- Deoxy- 3'- O- (N'- methylanthraniloyl)guanosine- 5'- O- diphosphate (MANT-dGDP) [127383-33-9]; C ₁₈ H ₂₂ N ₆ O ₁₁ P ₂ ; MW 560.4 (free acid); λ _{max} 252 nm (pH 8); ε 22600; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Fluorescent analogue of 2'-deoxyguanosine-5'-diphosphate (λ _{exc} 350 nm; λ _{em} 442 nm), useful for research into 5'-dGDP-dependent receptor proteins. The MANT fluorophore has a certain sensitivity for its environment and can change its spectral properties upon binding. Detailed technical information available. For reference compare: Hiratsuka, <i>Biochim. Biophys. Acta</i> , 742 , 496 - 508 (1983). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.8 mg € 164.- (D 084 - 05)	5 x 5 µmol € 692.- (D 084 - 25)

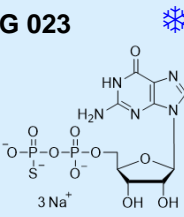

E 007 	1, N⁶- Ethenoadenosine- 5'- O- diphosphate (ε-ADP) [103213-52-1]; C ₁₂ H ₁₅ N ₅ O ₁₀ P ₂ ; MW 451.2 (free acid); λ _{max} 275 nm; ε 6000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Fluorescent ADP analogue with λ _{exc} 300 nm and λ _{em} 415 nm. Detailed technical information and references available. References: Secrist et al., <i>Biochemistry</i> , 11 , 3499 - 3506 (1972); Gräber, <i>Biochem. Biophys. Res. Comm.</i> , 96 , 1232 - 1239 (1980). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.3 mg € 150.- (E 007 - 05)	5 x 5 µmol € 638.- (E 007 - 25) Inquiries for bulk quantities welcome!

F 006 	N⁶- Furfuryladenine- 5'- O- diphosphate (6-Fu-ADP) C ₁₅ H ₁₉ N ₅ O ₁₁ P ₂ ; MW 507.3 (free acid); λ _{max} 267 nm; ε 20500; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Precursor of the corresponding radio-labelled triphosphate which may be useful for studies on kinase-substrate relationships (chemical genetics approach). The "cold" triphosphate 6-Fu-ATP is offered as well (Cat. No. F 007). Detailed technical information available. For information on related compounds as well as on the "chemical genetics approach" compare: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i> , 94 , 3565 - 3570 (1997); Habelhah et al., <i>J. Biol. Chem.</i> , 276 , 18090 - 18095 (2001); Eblen et al., <i>J. Biol. Chem.</i> , 278 , 14926 - 14935 (2003). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.5 mg € 272.- (F 006 - 05)	5 x 5 µmol € 1,116.- (F 006 - 25)

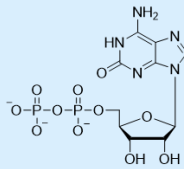
G 024 	Guanosine- 5'- O- (α, β- methylene)diphosphate (GMP-CP) [32381-15-0]; C ₁₁ H ₁₇ N ₅ O ₁₀ P ₂ ; MW 441.2 (free acid); λ _{max} 252 nm; ε 13500; sodium salt; purity > 95% HPLC. Hydrolytically stable analogue of GDP and starting structure for synthesis of α/β hydrolysis-resistant tri- and polyphosphates. Detailed technical information available. References: Sandoval et al., <i>Proc. Nat. Acad. Sci. USA</i> , 75 , 3178 - 3182 (1978); Vulevic et al., <i>Biochemistry</i> , 36 , 12828 - 12835 (1997); Byron, <i>Chemtracts</i> , 11 , 980 - 984 (1998). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.
5 µmol / ~2.2 mg € 64.- (G 024 - 05)	5 x 5 µmol € 274.- (G 024 - 25)

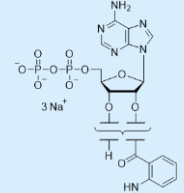
G 012 	Guanosine- 5'- O- (1- thiodiphosphate), Rp- isomer (Rp-GDP-α-S) [71481-44-2]; C ₁₀ H ₁₅ N ₅ O ₁₀ P ₂ S; MW 459.3 (free acid); λ _{max} 252 nm; ε 14300; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of GDP binding proteins with often increased metabolic stability. Useful for characterization of GDP-responsive receptors and determination of their stereospecificity. Detailed technical information available. References: Yamanaka et al., <i>Biochemistry</i> , 24 , 8094 - 8101 (1985); Tucker et al., <i>EMBO J.</i> , 5 , 1351 - 1358 (1986). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.3 mg € 180.- (G 012 - 05)	5 x 5 µmol € 767.- (G 012 - 25)

G 013 	Guanosine- 5'- O- (1- thiodiphosphate), Sp- isomer (Sp-GDP-α-S) [71481-45-3]; C ₁₀ H ₁₅ N ₅ O ₁₀ P ₂ S; MW 459.3 (free acid); λ _{max} 252 nm; ε 14300; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of GDP binding proteins with often increased metabolic stability. Useful for characterization of GDP-responsive receptors and determination of their stereospecificity. Detailed technical information available. References: Yamanaka et al., <i>Biochemistry</i> , 24 , 8094 - 8101 (1985); Tucker et al., <i>EMBO J.</i> , 5 , 1351 - 1358 (1986). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.3 mg € 180.- (G 013 - 05)	5 x 5 µmol € 767.- (G 013 - 25)

G 023 	Guanosine- 5'- O- (2- thiodiphosphate) (GDP-β-S) [71376-97-1]; C ₁₀ H ₁₅ N ₅ O ₁₀ P ₂ S; MW 459.3 (free acid); λ _{max} 252 nm; ε 14300; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Modulator of GDP binding proteins with increased metabolic stability. Useful for characterization of GDP-responsive receptors and determination of their stereospecificity and suitable for labelling with thio-reactive reporter groups. Other β-S-diphosphates are also offered (Cat. Nos. A 121, p. 5, C 079, p. 8 and U 011, p. 11). Detailed technical information available. Reference: Mazzoni et al., <i>Biochim. Biophys. Acta</i> , 1220 , 76 - 84 (1993). Vial containing 500 µl of 10 mM aqueous solution of pH 8.5.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.3 mg € 71.- (G 023 - 05)	5 x 5 µmol € 250.- (G 023 - 25)

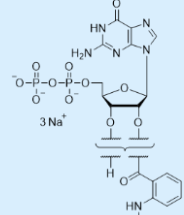


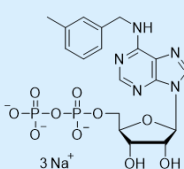
<p>I 038 ❄️</p> 	<p>Isoguanosine- 5'- O- diphosphate (isoGDP) [58083-94-6]; $C_{10}H_{15}N_5O_{11}P_2$; MW 443.2 (free acid); λ_{max} 292 nm; ϵ 11100; sodium salt; purity > 95% HPLC. For other salt forms or higher purity please inquire. iso-GDP is an analogue of adenosine-5'-O-diphosphate (ADP) with an additional carbonyl group at position 2 of the nucleobase and of guanosine-5'-O-diphosphate (GDP), respectively, where the carbonyl group at position 6 and the amino group at position 2 have changed places. iso-GDP can be useful in receptor mapping studies. The corresponding triphosphate form is offered as well (isoGTP, Cat. No. I 039). Detailed technical information available. References: Barzu et al., <i>Biochim. Biophys. Acta</i>, 452, 406 - 412 (1976); Lascu et al., <i>Biochim. Biophys. Acta</i>, 482, 251 - 260 (1977); Harris et al., <i>Biochim. Biophys. Acta</i>, 504, 364 - 383 (1978). Vial containing 500 μl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>1 μmol / ~0.4 mg € 100.- (I 038 - 01)</p>	<p>5 x 1 μmol € 425.- (I 038 - 05)</p>

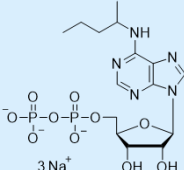
<p>M 040 ❄️</p> 	<p>2'- / 3'- O- (N'- Methylanthraniloyl)adenosine- 5'- O- diphosphate (MANT-ADP) [151481-85-5]; $C_{18}H_{22}N_6O_{11}P_2$; MW 560.4 (free acid); λ_{max} 255 nm (pH 8); ϵ 23300; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Fluorescent analogue of adenosine-5'-diphosphate (λ_{exc} 350 nm; λ_{em} 446 nm), useful for research into ADP-dependent receptor proteins. The MANT fluorophore has a certain sensitivity for its environment and can change its spectral properties upon binding (compare: Hiratsuka, <i>Biochim. Biophys. Acta</i>, 742, 496 - 508 (1983)). Detailed technical information available. Reference: Cheng et al., <i>Biochemistry</i>, 37, 5288 - 5295 (1998). Vial containing 500 μl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 μmol / ~2.8 mg € 169.- (M 040 - 05)</p>	<p>5 x 5 μmol € 716.- (M 040 - 25)</p>

<p>D 083</p>	<p>3'- O- (N'- Methylanthraniloyl)- 2'- deoxyadenosine- 5'- O- diphosphate (MANT-dADP) Please refer to 2'-Deoxy-3'-O-(N'-methylanthraniloyl)adenosine-5'-O-diphosphate, p. 8.</p>
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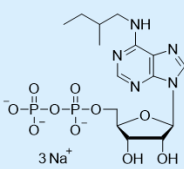
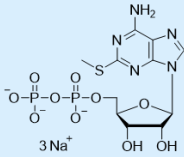
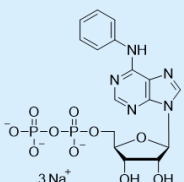
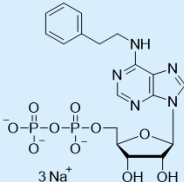
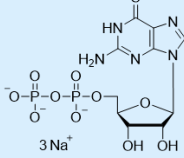
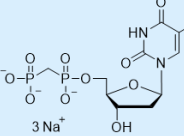
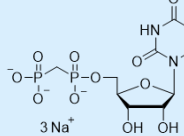
<p>D 084</p>	<p>3'- O- (N'- Methylanthraniloyl)- 2'- deoxyguanosine- 5'- O- diphosphate (MANT-dGDP) Please refer to 2'- Deoxy- 3'- O- (N'- methylanthraniloyl)guanosine- 5'- O- diphosphate , p. 9.</p>
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<p>M 041 ❄️</p> 	<p>2'- / 3'- O- (N'- Methylanthraniloyl)guanosine- 5'- O- diphosphate (MANT-GDP) [148821-02-7]; $C_{18}H_{22}N_6O_{12}P_2$; MW 576.4 (free acid); λ_{max} 252 nm (pH 8); ϵ 22600; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Fluorescent analogue of guanosine-5'-diphosphate (λ_{exc} 350 nm; λ_{em} 442 nm), useful for research into GDP-dependent receptor proteins. The MANT fluorophore has a certain sensitivity for its environment and can change its spectral properties upon binding (compare: Hiratsuka, <i>Biochim. Biophys. Acta</i>, 742, 496 - 508 (1983)). Detailed technical information available. References: Wieden et al., <i>J. Biol. Chem.</i>, 277, 6032 - 6036 (2002); Rehmann, <i>Methods Enzymol.</i>, 407, 159 - 173 (2006). Vial containing 500 μl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 μmol / ~2.9 mg € 169.- (M 041 - 05)</p>	<p>5 x 5 μmol € 716.- (M 041 - 25)</p>


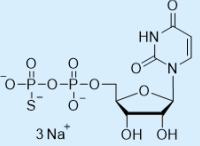

<p>M 024 ❄️</p> 	<p>N⁶- (3- Methylbenzyl)adenosine- 5'- O- diphosphate (6-(3-MeBn)-ADP) [681175-78-0]; $C_{18}H_{23}N_5O_{10}P_2$; MW 531.4 (free acid); λ_{max} 269 nm; ϵ 20500; sodium salt; purity > 95% HPLC. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i>, 276, 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. M 025). Detailed technical information available. References: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i>, 94, 3565 - 3570 (1997); Gillespie et al., <i>J. Biol. Chem.</i>, 274, 31373 - 31381 (1999). Vial containing 500 μl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 μmol / ~2.7 mg € 272.- (M 024 - 05)</p>	<p>5 x 5 μmol € 1,116.- (M 024 - 25)</p>

<p>M 026 ❄️</p> 	<p>N⁶- (1- Methylbutyl)adenosine- 5'- O- diphosphate (6-(1-MeBu)-ADP) $C_{15}H_{25}N_5O_{10}P_2$; MW 497.3 (free acid); λ_{max} 268 nm; ϵ 17000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i>, 276, 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. M 027). Detailed technical information available. Reference: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i>, 94, 3565 - 3570 (1997). Vial containing 500 μl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 μmol / ~2.5 mg € 272.- (M 026 - 05)</p>	<p>5 x 5 μmol € 1,116.- (M 026 - 25)</p>

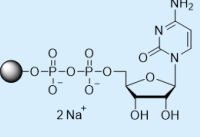


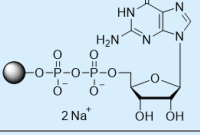
<p>M 028 ❄️</p> 	<p>N⁶-(2-Methylbutyl)adenosine- 5'- O- diphosphate (6-(2-MeBu)-ADP) [681175-77-9]; C₁₅H₂₅N₅O₁₀P₂; MW 497.3 (free acid); λ_{max} 268 nm; ε 17000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i>, 276, 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. M 029). Detailed technical information available. References: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i>, 94, 3565 - 3570 (1997); Gillespie et al., <i>J. Biol. Chem.</i>, 274, 31373 - 31381 (1999); Provance et al., <i>Proc. Natl. Acad. Sci. USA</i>, 101, 1868 - 1873 (2004). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 µmol / ~2.5 mg € 272.- (M 028 - 05)</p>	<p>5 x 5 µmol € 1,116.- (M 028 - 25)</p>
<p>M 020 ❄️</p> 	<p>2-Methylthioadenosine- 5'- O- diphosphate (2-MeS-ADP) [34983-48-7]; C₁₁H₁₇N₅O₁₀P₂S; MW 473.3 (free acid); λ_{max} 277 nm; ε 14700 (pH 11); sodium salt; purity > 95% HPLC. For other salt forms please inquire. Agonist of P2Y₁, P2Y₁₂ and P2Y₁₃ receptors. The corresponding triphosphate is offered as well (Cat. No. M 021). Detailed technical information available. References: Cusack et al., <i>Br. J. Pharmacol.</i>, 77, 329 - 333 (1982); Boyer et al., <i>J. Pharmacol. Exp. Ther.</i>, 267, 1140 - 1146 (1993). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 µmol / ~2.4 mg € 90.- (M 020 - 05)</p>	<p>5 x 5 µmol € 279.- (M 020 - 25)</p>
<p>P 014 ❄️</p> 	<p>N⁶- Phenyladenosine- 5'- O- diphosphate (6-Phe-ADP) [105701-92-6]; C₁₆H₁₉N₅O₁₀P₂; MW 503.3 (free acid); λ_{max} 288 nm; ε 20800; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i>, 276, 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. P 015). Detailed technical information available. References: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i>, 94, 3565 - 3570 (1997); Gillespie et al., <i>J. Biol. Chem.</i>, 274, 31373 - 31381 (1999). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 µmol / ~2.5 mg € 180.- (P 014 - 05)</p>	<p>5 x 5 µmol € 767.- (P 014 - 25)</p>
<p>P 013 ❄️</p> 	<p>N⁶-(2- Phenylethyl)adenosine- 5'- O- diphosphate (6-PhEt-ADP) [681175-76-8]; C₁₈H₂₃N₅O₁₀P₂; MW 531.4 (free acid); λ_{max} 269 nm; ε 20500; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Precursor for the preparation of the corresponding radio-labelled triphosphate to be used in the chemical genetics approach (compare: Habelhah et al., <i>J. Biol. Chem.</i>, 276, 18090 - 18095 (2001)). The corresponding cold triphosphate is offered as well (Cat. No. P 012). Detailed technical information available. References: Shah et al., <i>Proc. Natl. Acad. Sci. USA</i>, 94, 3565 - 3570 (1997); Gillespie et al., <i>J. Biol. Chem.</i>, 274, 31373 - 31381 (1999); Provance et al., <i>Proc. Natl. Acad. Sci. USA</i>, 101, 1868 - 1873 (2004). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 µmol / ~2.7 mg € 180.- (P 013 - 05)</p>	<p>5 x 5 µmol € 767.- (P 013 - 25)</p>
<p>T 015 ❄️</p> 	<p>6- Thioguanosine- 5'- O- diphosphate (6-T-GDP) [16541-19-8]; C₁₀H₁₅N₅O₁₀P₂S; MW 459.3 (free acid); λ_{max} 340 nm; ε 26000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. 6-T-GDP is a metabolite of azathioprine, an immunosuppressive drug. Detailed technical information available. Reference: Hawwa et al., <i>Br. J. Clin. Pharmacol.</i>, 66, 517 - 528 (2008). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6. ❄️ Shipment on dry ice is recommended to maintain original quality.</p>
<p>5 µmol / ~2.3 mg € 196.- (T 015 - 05)</p>	<p>5 x 5 µmol € 831.- (T 015 - 25)</p>
<p>T 008</p> 	<p>Thymidine- 5'- O- (α, β- methylene)diphosphate (TMP-CP) [55065-40-2]; C₁₁H₁₈N₂O₁₀P₂; MW 400.2 (free acid); λ_{max} 267 nm; ε 9600; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Hydrolytically stable analogue of thymidine-5'-diphosphate and starting structure for synthesis of α/β hydrolysis-resistant tri- and polyphosphates. Inhibitor of thymidine kinase. Detailed technical information available. Reference: Toide et al., <i>Gann.</i>, 68, 159 - 163 (1977). Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.</p>
<p>5 µmol / ~2 mg € 135.- (T 008 - 05)</p>	<p>5 x 5 µmol € 572.- (T 008 - 25)</p>
<p>U 009</p> 	<p>Uridine- 5'- O- (α, β- methylene)diphosphate (UMP-CP) [732921-73-2]; C₁₀H₁₆N₂O₁₁P₂; MW 402.2 (free acid); λ_{max} 262 nm; ε 10000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Hydrolytically stable analogue of UDP and starting structure for synthesis of α/β hydrolysis-resistant tri- and polyphosphates. Detailed technical information available. Vial containing 500 µl of 10 mM aqueous solution of pH 7.6.</p>
<p>5 µmol / ~2 mg € 135.- (U 009 - 05)</p>	<p>5 x 5 µmol € 572.- (U 009 - 25)</p>

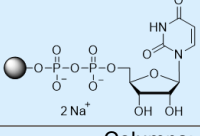


U 011  	Uridine- 5'- O- (2- thiodiphosphate) (UDP-β-S) [221010-51-1]; C ₉ H ₁₄ N ₂ O ₁₁ P ₂ S; MW 420.2 (free acid); λ _{max} 262 nm; ε 10000; sodium salt; purity > 95% HPLC. For other salt forms please inquire. Selective agonist of the P2Y ₆ receptor with increased metabolic stability; suitable for labelling with thio-reactive reporter groups. Other β-S-diphosphates are offered as well (Cat. Nos. A 121, p. 5, C 079, p. 8 and G 023, p. 9). Detailed technical information available. References: Malmjö et al., <i>J. Pharmacol. Exp. Ther.</i> , 293 , 755 - 760 (2000); Malmjö et al., <i>Eur. J. Pharmacol.</i> , 458 , 305 - 311 (2003). Vial containing 500 µl of 10 mM aqueous solution of pH 8.5.  Shipment on dry ice is recommended to maintain original quality.
5 µmol / ~2.1 mg € 311.- (U 011 - 05)	5 x 5 µmol € 1,275.- (U 011 - 25)

Affinity Gels with immobilized diphosphates / Glycosyltransferase Affinity Gels

C 128 	Cytidine- 5'- O- diphosphate, immobilized on a polymeric matrix (CDP-Gel) CDP coupled to a polymeric gel via the terminal phosphate. Suitable for the affinity purification of sialyltransferases. References: Paulson et al., <i>J. Biol. Chem.</i> , 252 , 2356 - 2362 (1977); Sadler et al., <i>Methods Enzymol.</i> , 83 , 458 - 514 (1982).		
Columns:	0.6 ml € 67.- (C 128 - 06)	2.5 ml € 210.- (C 128 - 25)	6 ml € 424.- (C 128 - 60)

G 028 	Guanosine- 5'- O- diphosphate, immobilized on a polymeric matrix (GDP-Gel) GDP coupled to a polymeric gel via the terminal phosphate. Suitable for the affinity purification of fucosyltransferases. Reference: Costa et al., <i>J. Biol. Chem.</i> , 272 , 11613 - 11621 (1997).		
Columns:	0.6 ml € 67.- (G 028 - 06)	2.5 ml € 210.- (G 028 - 25)	6 ml € 424.- (G 028 - 60)

U 017 	Uridine- 5'- O- diphosphate, immobilized on a polymeric matrix (UDP-Gel) UDP coupled to a polymeric gel via the terminal phosphate. Suitable for the affinity purification of galactosyltransferases. Reference: Sadler et al., <i>Methods Enzymol.</i> , 83 , 458 - 514 (1982).		
Columns:	0.6 ml € 67.- (U 017 - 06)	2.5 ml € 210.- (U 017 - 25)	6 ml € 424.- (U 017 - 60)

Inquire Updated diphosphate speciality list on the web !	Special 5'- diphosphates, - phosphorothioates and boranophosphates not listed as regular products <ul style="list-style-type: none"> • 5'-O-Diphosphates of most nucleosides and nucleobase modifications listed in this catalogue • Additional 1, N⁶-etheno modifications of many diphosphate analogues listed • Fluorescent methylantraniloyl (MANT) modification of 2'/3'-ribose hydroxyl groups • 5'-O-Diphosphates with spacers attached to positions 2, 6, 8, 2'/3' and reactive terminal group for immobilization as affinity ligands and for labelling • 5'-O-Diphosphates with attached fluorescent dyes <p>Please inquire regarding special structures not listed here or visit our website (www.biolog.de). Custom syntheses and purifications are offered.</p>		
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Alphabetical listing of products and abbreviations

Product Name	Page	Product Name	Page
A		E	
6-AB-ADP	5	ϵ -ADP	9
Adenosine-		EDA-ADP	6
- 5'-O-(α,β -methylenediphosphate) (AMP-CP)	5	1,N ⁶ -Ethenoadenosine-5'-O-diphosphate (ϵ -ADP)	9
- 5'-O-(1-thiodiphosphate), Rp-isomer (Rp-ADP- α -S)	5	F	
- 5'-O-(1-thiodiphosphate), Sp-isomer (Sp-ADP- α -S)	5	6-Fu-ADP	9
- 5'-O-(2-thiodiphosphate) (ADP- β -S)	5	N ⁶ -Furfuryl-adenosine-5'-O-diphosphate (6-Fu-ADP)	9
2'-/3'-AEC-ADP / EDA-ADP	6	G	
ϵ -ADP	9	GDP-Gel	12
ADP- β -S	5	GDP- β -S	9
Affinity chromatography gels	11	GMP-CP	9
Agarose gels	11	Guanosine-	
2'-/3'-AHC-GDP	8	- 5'-O-diphosphate, immobilized on a polymeric gel (GDP-Gel)	12
8- Amino-adenosine- 5'- O- diphosphate (8-NH ₂ -ADP)	5	- 5'-O-(α,β -methylene)diphosphate (GMP-CP)	9
N ⁶ -(4-Aminobutyl)adenosine-5'-diphosphate (6-AB-ADP)	5	- 5'-O-(1-thiodiphosphate), Rp-isomer (Rp-GDP- α -S)	9
2'-Amino-2'-deoxyadenosine-5'-O-diphosphate (2'-NH ₂ -ADP)	5	- 5'-O-(1-thiodiphosphate), Sp-isomer (Sp-GDP- α -S)	9
3'-Amino-2'-deoxyadenosine-5'-O-diphosphate (3'-NH ₂ -ADP)	6	- 5'-O-(2-thiodiphosphate) (GDP- β -S)	9
2'-/3'-O-(2-Aminoethylcarbamoyl)adenosine-5'-O-diphosphate	6	I	
2'-/3'-O-(6-Aminohexylcarbamoyl)guanosine-5'-O-diphosphate	8	Isoguanosine-5'-O-diphosphate (isoGDP)	10
AMP-CP	5	M	
8-Azido-adenosine-5'-O-diphosphate (8-N ₃ -ADP)	6	MANT-ADP	10
8-Azido-1,N ⁶ -ethenoadenosine-5'-O-diphosphate (8-N ₃ - ϵ -ADP)	7	MANT-dADP	8
B		MANT-dGDP	9
N ⁶ -Benzyladenosine-5'-O-diphosphate (6-Bn-ADP)	6	MANT-GDP	10
N ⁶ -(3-[Biotinyl]aminopropyl)adenosine-5'-O-diphosphate	6	6-(3-MeBn)-ADP	10
N ⁶ -(3-[(Biotinyl)-3-aminopropoxy(ethoxy) ₃ ethoxypropyl]-ADP)	7	6-(1-MeBu)-ADP	10
6-[Biotin]-APrO-(EO)4-Pr-ADP	7	6-(2-MeBu)-ADP	11
6-[Biotin]-APr-ADP	6	2-MeS-ADP	10
6-Bn-ADP	6	2'-/3'-O-(N'-Methylanthraniloyl)adenosine-5'-O-diphosphate (MANT-ADP)	10
8-Br-ADP	7	2'-/3'-O-(N'-Methylanthraniloyl)guanosine-5'-O-diphosphate (MANT-GDP)	10
8-Bromo-adenosine-5'-O-diphosphate (8-Br-ADP)	7	N ⁶ -(3-Methylbenzyl)adenosine-5'-O-diphosphate (6-(3-MeBn)-ADP)	10
C		N ⁶ -(1-Methylbutyl)adenosine-5'-O-diphosphate (6-(1-MeBu)-ADP)	10
CDP-Gel	11	N ⁶ -(2-Methylbutyl)adenosine-5'-O-diphosphate (6-(2-MeBu)-ADP)	11
CDP- β -S	8	2-Methylthioadenosine-5'-O-diphosphate (2-MeS-ADP)	10
7-CH-ADP	8	N	
7-CH-dADP	8	8-N ₃ -ADP	6
6-cHe-ADP	7	8-N ₃ - ϵ -ADP	7
2-Chloro-adenosine-5'-O-diphosphate (2-Cl-ADP)	7	2'-NH ₂ -ADP	5
8-Chloro-adenosine-5'-O-diphosphate (8-Cl-ADP)	7	3'-NH ₂ -ADP	6
6-Chloropurine riboside-5'-diphosphate (6-Cl-PuDP)	7	8-NH ₂ -ADP	5
2-Cl-ADP	7	P	
8-Cl-ADP	7	6-Phe-ADP	11
6-Cl-PuDP	7	N ⁶ -Phenyladenosine-5'-O-diphosphate (6-Phe-ADP)	11
CMP-CP	8	N ⁶ -(2-Phenylethyl)adenosine-5'-O-diphosphate (6-PhEt-ADP)	11
6-cPe-ADP / cpADP	7	6-PhEt-ADP	11
N ⁶ -Cyclohexyladenosine-5'-O-diphosphate (6-cHe-ADP)	7	R	
N ⁶ -Cyclopentyladenosine-5'-O-diphosphate (6-cPe-ADP/ cpADP)	7	Rp-ADP- α -S	5
Cytidine-5'-O-diphosphate, immobilized on a polymeric gel (CDP-Gel)	11	Rp-dADP- α -S	8
Cytidine-5'-O-(α,β -methylene)diphosphate (CMP-CP)	8	Rp-GDP- α -S	9
Cytidine-5'-O-(2-thiodiphosphate) (CDP- β -S)	8	S	
D		Sp-ADP- α -S	5
7-Deaza-adenosine-5'-O-diphosphate (7-CH-ADP / 5'-TuDP)	8	Sp-dADP- α -S	8
7-Deaza-2'-deoxyadenosine-5'-O-diphosphate (7-CH-dADP)	8	Sp-GDP- α -S	9
2'-Deoxy-		S	
- adenosine-5'-O-(1-thiodiphosphate), Rp-isomer (Rp-dADP- α -S)	8		
- adenosine-5'-O-(1-thiodiphosphate), Sp-isomer (Sp-dADP- α -S)	8		
- 3'-O-(N'-methylanthraniloyl)adenosine-5'-O-diphosphate	8		
- 3'-O-(N'-methylanthraniloyl)guanosine-5'-O-diphosphate	9		



Product Name	Page	Product Name	Page
T		U	
6-T-GDP	11		
6-Thioguanosine-5'-O-diphosphate (6-T-GDP)	11	UDP-Gel	12
Thymidine- 5'-O-(α,β -methylene)diphosphate (TMP-CP)	11	UDP- β -S	11
TMP-CP	11	UMP-CP	11
Tubercidine-5'-O-diphosphate	8	Uridine-	
5'-TuDP	8	- 5'-O-diphosphate, immobilized on a polymeric gel (UDP-Gel)	12
		- 5'-O-(α,β -methylene)diphosphate (UMP-CP)	11
		- 5'-O-(2-thiodiphosphate) (UDP- β -S)	11



We appreciate your interest in our product line. Please take a moment to review the following notes:

- **Orders** can be placed at our online shop, but are welcome by phone, e-mail, fax or regular mail as well, of course. Customers from EC countries are requested to submit the European tax registration number of their institution along with their order.
- **Shipping** of your order will be prepared as soon as possible. Unless otherwise instructed, items requiring refrigeration may not be shipped on Thursday or Friday to avoid weekend storage under unsuitable conditions.
- **Prices** are shown in Euro and do not include taxes or foreign duties (if applicable). There are no packing or transport costs for air mail delivery, however, courier service and dry ice shipments (recommended for e.g. all triphosphates & diphosphates) will be extra charged. We reserve the right to change prices without prior written notice, however, products will not be shipped at an increased price without authorization from the customer.
- **Courier** costs depend on destination: approx. € 35.- for customers in Germany, € 50.- – € 150.- within Europe, and € 100.- – € 350.- for the rest of the world. Please check every arriving parcel for any obvious damage before signing the receipt, otherwise compensation for broken vials is not possible.
- **Invoices** are payable net 30 days by bank transfer; no deductions accepted. European customers are urged to use the SEPA payment system. Corresponding bank details (BIC and IBAN) are shown on all our paper work.
- **Bulk:** Many of our products can be supplied in larger sizes. Favourable quotations for bulk quantities or discounts on purchase of multiple vials are available upon request.
- **Discounts** can be granted for amounts exceeding catalogue sizes, and for customers identified as permanent buyers. Standing orders with favourable conditions are possible upon request.
- **Support** for our products is provided in form of corresponding technical information that accompanies every product. Additional and updated data can be found on our website (www.biolog.de), especially regarding published references, lipophilicity and specificity. We try hard to support you with all background knowledge available to us, so please contact us by e-mail (service@biolog.de) in case you have special questions, or if you would like to suggest a new product.
- **Feed-back** on performance of our products is very much appreciated, be it positive or negative. It encourages us, helps us to improve, and leads to better and more qualified service for our customers. Also, we would like to hear about your new papers with our products, in order to have the citation included in the corresponding technical information.
- **Custom syntheses** of many structures not listed in this catalogue are offered. Please contact us with your research needs, and be sure to specify purity, salt form and amounts necessary.
- **Quality:** If you are not satisfied with our product, please contact us. Products may not be returned or an invoice annulled without prior written approval from BIOLOG. We cannot be held responsible for damage to material because of improper storage or handling after receipt.
- **Safety:** All products in this catalogue are sold for research purposes only and are **not** intended for human, drug, food additive, clinical, or household use. Only qualified professionals and trained laboratory staff familiar with their potential hazards and trained in good laboratory practices should handle them. Some of the products could be toxic or hazardous compounds. When available, information pertaining to the potential hazards is provided. However, the absence of a warning must **not** be interpreted as an indicator of safety. Material Safety Data Sheets (MSDS) are available upon request.



Terms and Conditions of Sale and Synthesis

Last updated: May 20, 2017

I. Conclusion of Contract

1. The following conditions apply and become an integral part of all purchase or other orders for synthesis of products confirmed by us, Biolog Life Science Institute, and apply to all our quotations. They are deemed accepted and acknowledged by our clients in placing an order with us or in taking possession of the delivery. Divergent conditions of our clients whose application is not explicitly confirmed in writing by us are not binding even if there was no expressed contradiction.
2. All our quotations are subject to change. The conclusion of the contract can be regarded final only after the client has received our order confirmation. Oral agreements, amendments or additions to the contract are binding only if confirmed by us in writing.
3. We retain ownership, copyright and inventor's rights in all quotations, cost estimates, compound lists, structures and other documents. Quotations and connected documentation must not be disclosed to third parties unless our prior authorization has been obtained.
4. The client accepts that personal data are recorded by us within the scope of the provisions of the BDSG (German Federal Data Protection Law).

II. Prices and Payment

1. Prices shown on the web and in the printed catalogue are in Euro. For price information and our acceptance of other currencies such as US Dollar, please inquire.
2. Prices shall be understood without value added tax. Shipping costs are extra charged (approx. Euro 30.00 within Germany; approx. Euro 40.00 - 100.00 within Europe, and for the rest of the world according to destination). Please note, that some products, e.g. all triphosphates, require courier transport with blue or dry ice in order to maintain their original high quality and purity. This will lead to extra costs, please inquire for details. Airmail postal service may be available for some destinations without any additional costs.
3. We are entitled to charge our clients additionally to the contract price all increases in expenses accrued in connection with the supply or service provided such increases become effective after conclusion of the contract. This right is independent from the cause of increase as there are legal regulations or other regulations or factual reasons. Expenses which we debit to our clients are especially export and import charges as custom duties, price-adjustment levies and taxes, storage charges, insurance premiums and similar costs which are out of the scope of our direct influence.
4. Along with the products ordered you will receive our invoice which is due net 30 days. Payment becomes overdue on the 31st day after invoice date. Invoices should be paid by bank transfer free of expenses for us. Bank details are given on the invoice.
5. Without prejudice to any more extensive rights we are entitled in case of default of payment to demand interest on arrears of 8 % above the current discount rate published by the Deutsche Bundesbank.
6. A set-off or other retention of payment in view of counter claims of the client is admissible only if the counter-claims have been acknowledged by us or the claims have been finally determined by court order.
7. We are entitled to demand, in our choice, the provision of security through letter of credit or other securities such as prepayment. Should the client not comply with this demand within ten days, we have the rights, after expiry of an additional term of 5 days to repudiate the contract.

III. Terms of Delivery

1. We are not obliged to comply with the agreed delivery term until the client has fulfilled his contractual obligations or duties imposed on him in particular the stipulated financial commitments. The term of delivery shall be complied with if the products to be delivered have left our premises or readiness for despatch has been announced.
2. The term of delivery shall be adequately extended if the completion or delivery of the products is delayed by strikes, lockouts or other obstacles beyond our control (force majeure). We shall notify the client about such circumstances without undue delay.
3. Delivery of products which are not produced by us is subject to obtaining punctual and complete supply ourselves.
4. Goods may not be returned to us except with our prior permission. Goods can only be accepted for return if they are unopened and in good condition. Transport costs for returned goods are for the purchaser's account. Any returned items may be subject to a processing fee.

IV. Transition of Risk

1. We despatch products on account and risk of our clients. The risk shall pass to the client, even with freight prepaid shipments, at the time the products are handed over to the carrier or with commencement of transit by ourselves or by acceptance by the persons instructed by the client. We undertake to assign existing rights and remedies against the carrier on first simple demand and unconditional payment of the contract price by the client.
2. By unconditional acceptance of the products by the carrier or by the person instructed by the client all subsequent claims regarding the external condition (packing, leakage etc.) are precluded.
3. Even if the delivered products show considerable faults, they have to be accepted by the client, however, without prejudice for subsequent guaranty claims concerning the product. The client must, however, examine the delivery in every respect for any lack of conformity with the contract and shall give notice of any lack of conformity with the contract or will be excluded with all subsequent claims.
4. In the event the client defaults in the acceptance of the products or providing security, we are entitled, without prejudice to our rights for repudiation of the contract, to demand a lump sum indemnity of 5 % of the total delivery value. We as well as the client are not precluded from claiming and proving a higher or lower damage.

V. Retention of Title

1. We retain the right of property in the products delivered until all our present or accessory claims against the client, irrespective of their cause, are settled. In acceptance of drafts or of bills of exchange or in assuming the liability under a bill of exchange by acceptance or issue of a bill of exchange the title in the products does not pass to the client before the draft or bill of exchange has been finally honoured and it has been ascertained that no claims can be lodged against us based upon the documentary credits. Inserting claims in a current account as well as acknowledgment of a balance does not affect the retention of title.
2. The client is authorized to use the products supplied for research purposes only if not otherwise confirmed in writing. He is also entitled to mix or synthesize with the products at his own risk. The title in our products is extended to new products synthesized by our client. In case our title in the products is extinguished by combination, mixture up or incorporation of other products the client herewith transfers title in the new synthesized products to us which is held as security for all claims as per para. 1 above. The products we obtained title in are stored free of charge by the client without giving any cause of action against us in view of the mixing up, the synthesis or the storage of the products.
3. In any case, the client agrees that any and all intellectual property or other rights, know-how, and methods relating to the synthesis or purchase contract remain our sole property.

VI. Guaranty and Liability


1. We do not assume liability for oral advices of any kind - which are non-binding in any event - to the client. Any advice, oral or written, regarding the area of application of our products does not dispense the client from a self-responsible examination regarding the qualification of the products for the intended purposes or methods as well as of any infringement with issued or pending intellectual property rights belonging to third parties.
2. Our products are for laboratory research use only if not otherwise confirmed in writing. They must not be used with human subjects or for clinical diagnosis or therapeutic use in humans or animals, including, but not limited to, commercial purposes, *in vitro* diagnostic purposes, ex vivo or in vivo therapeutic purposes, investigational use, in foods, drugs, devices or cosmetics of any kind, or for consumption by or use in connection with or administration or application to humans or animals.
3. Our products are not sterile and are not regularly checked for endotoxins. Products carrying a charge are essentially desalted by common standard techniques for nucleotides. Please be aware, that efficacy of all known desalting methods is limited and dependent on properties of the particular product. Final preparations of products may therefore contain a minor residual salt content.
4. The product descriptions on our web site and in our catalogue are accurate to the best of our knowledge. Since research applications are subjected to variable influences beyond our control, the products are offered without performance warranty, expressed or implied. In any case we reserve the right, from time to time, to modify composition and purity, in response to changes in the market conditions, raw material supply or other factors. Many products are new and experimental and have not been tested for toxicity. PLEASE NOTE THAT THE ABSENCE OF A WARNING STATEMENT DOES NOT IMPLY THAT THE PRODUCT IS NOT HAZARDOUS. Research products should be used only by qualified investigators or by technically trained personnel working under the direct supervision of such investigators. It is the investigator's responsibility to ensure the safe handling of all products.
5. If any research product fails to meet the physical criteria ascribed to it on the catalogue, our web site or by any other analysis or description issued by us in writing, we will, after validating the deficiency, at the option of the client, either replace the deficient product in kind or will issue a Euro credit equivalent to the purchase price of the deficient product.
6. We will not be liable under any legal theory (including but not limited to contract, negligence, strict liability in tort or warranty of any kind) for any indirect, special, incidental, consequential or exemplary damages (including but not limited to lost profits), even if we had notice of the possibility of such damages. We shall not be liable for any loss, damage or penalty as a result of any delay in or failure to deliver or otherwise perform hereunder. In any event the extent of our liability is restricted to the damage to the product itself.
7. If the fault or omission of the ascribed quality is caused by the delivery or performance of a sub-supplier our liability is restricted to an assignment of our rights and remedies we have against the sub-supplier. We undertake to assign these rights and remedies on first simple demand. If the client is not able to recover from the sub-supplier, he is entitled to keep us liable according para. VI. 4. in a subsidiary way.
8. Refund, replacement or any other claims is conditioned on client giving written notice to us within thirty (30) days after arrival of the products at its destination. Failure of client to give said notice within said thirty (30) days shall constitute a waiver by the client of all claims hereunder with respect to said material. Our liability under VI. 9. below remains unaffected.
9. In any event, any claim of the client against us for, but not limited to refund, replacement, remuneration for consequential damages or otherwise is excluded under the statute of limitations after one year after arrival of the products at its destination. Our liability under VI. 9. below remains unaffected.
10. Our liability for intention or gross negligence, for an expressed warranty, for the violation of an obligation which was of absolute material importance for the intended purpose of the contract, under the statute for the liability for defect products, and for personal injury or death remains unaffected. In cases of gross negligence and in cases of our failure to fulfil an obligation which was of absolute material importance for the intended purpose of the contract we are liable only for the immediate and foreseeable damage.
11. As our products are delivered to the clients for research purposes only, the client shall indemnify us, without prejudice to our continuing legal rights and waiving any defence of limitation, without limit against any and all claims of third parties which are brought against us on the grounds of product liability, to the extent the claim is based on circumstances which were caused after risk passed to the client.

VII. Legal Clauses

1. The sole and exclusive place of performance for all contractual or other obligations under the contract as well as the sole and exclusive place of jurisdiction shall be Bremen for both parties.
2. Any dispute between the parties shall be governed by German law.
3. In case one of the above stipulations has been proved invalid the validity of the remaining provisions remain unaffected.

**BIOLOG**


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