



GLEN RESEARCH

22825 DAVIS DRIVE
STERLING, VIRGINIA
20164

PHONE

703-437-6191

800-327-GLEN

FAX

703-435-9774

INTERNET

WWW.GLENRES.COM

5'-ALDEHYDE-MODIFIER C2 PHOSPHoramidite

Introduction

Aldehyde modifiers are attractive electrophilic substitutions in oligonucleotides since they are able to react with amino groups to form a Schiff's base, with hydrazino groups to form hydrazones, and with semicarbazides to form semi-carbazones. The Schiff's base is unstable and must be reduced with sodium borohydride to form a stable linkage but hydrazones and semicarbazides are very stable linkages. Similarly to activated carboxylic acids, aldehydes are generally unstable to oligonucleotide deprotection conditions. In collaboration with Epoch Biosciences, we offer the protected benzaldehyde derivative (1) as a 5'-aldehyde modifier.¹ The acetal protecting group is sufficiently hydrophobic for use in RP HPLC and cartridge purification and is readily removed after oligonucleotide synthesis under standard oligonucleotide detritylation conditions with 80% acetic acid or 2% aqueous trifluoroacetic acid (TFA) after cartridge purification.

Synthesis

Use regular coupling time and synthesize the oligonucleotide DMT-On.

Oligonucleotide Deprotection

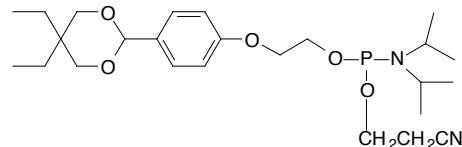
Deprotect the oligonucleotide as required by nucleobases in 30% ammonium hydroxide. At this point, the oligo may be purified by a reverse phase. The 5'-Aldehyde-Modifier C2 is about as hydrophobic as a dimethoxytrityl group when protected as the acetal. A Poly-Pak purification protocol is listed below.

Aldehyde Deprotection

The aldehyde is released by treatment with 80% acetic acid for 1 hour at room temperature.

Intellectual Property

These Products are for research purposes only, and may not be used for commercial, clinical, diagnostic or any other use. The Products are subject to proprietary rights of Epoch Biosciences, Inc. and are made and sold under license from Epoch Biosciences, Inc. There is no implied license for commercial use with respect to the Products and a license must be obtained directly from Epoch Biosciences, Inc. with respect to any proposed commercial use of the Products. "Commercial use" includes but is not limited to the sale, lease, license or other transfer of the Products or any material derived or produced from them, the sale, lease, license or other grant of rights to use the Products or any material derived or produced from them, or the use of the Products to perform services for a fee for third parties (including contract research).



(1) Epoch 5'-Aldehyde-Modifier C2

Poly-Pak Purification

Materials

Poly-Pak II cartridge	1
Acetonitrile (ACN)	4 mL
2 M TEAA pH 7.0	4 mL
8% ACN in 0.1 M TEAA	6 mL
0.1 M TEAA, pH 7.0	6 mL
2% TFA/H ₂ O	5 mL
20% ACN/H ₂ O	1 mL

Procedure

Prep Poly-Pak II cartridge by flushing the cartridge with 4 mL of ACN, followed by 4 mL of 2 M TEAA.

Dissolve the oligo in 3 mL of 0.1 M TEAA and load onto the cartridge dropwise.

Flush the cartridge with 6 mL 8% ACN in 0.1 M TEAA to remove failure sequences.

Load 5 mL 2% TFA onto cartridge, pushing the first 4 mL through quickly. Let last milliliter sit over cartridge for 20 minutes at room temperature. This will remove the acetal protecting group of the aldehyde.

Rinse the cartridge with 3 mL 0.1 M TEAA and then elute oligo with 1 mL 20% ACN.

Reference

(1) M.A. Podyminogin, E.A. Lukhtanov, and M.W. Reed, *Nucleic Acids Res.*, 2001, **29**, 5090-8.