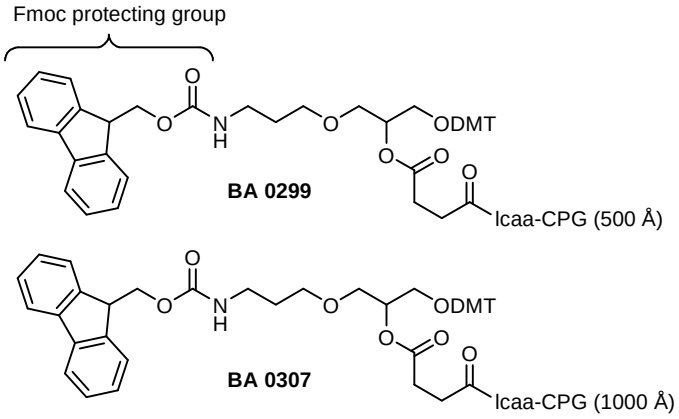
3'-Fmoc-amino-modifier CPG (500 Å and 1000 Å)

Product Nos. BA 0299 and BA 0307

Product Information



For the installation of an amino group at the 3'-terminus of an oligonucleotide, a solid-support-linked monomer with a protected amine and DMT-protected alcohol is required. The amine protecting group is typically removed and acylated with an appropriate NHS ester.

The (fluorenylmethyl)carbamoyl (Fmoc) group has been shown to be useful as such an amine protecting group for amine modification of oligonucleotides.[1] It is removed during cleavage/deprotection with ammonium hydroxide. Alternatively, *the Fmoc group can be removed before cleavage of the oligonucleotide from the solid support*,[2] simplifying the acylation process. After the acylation is complete, the labeled oligonucleotide can then be cleaved from the support and further deprotected with ammonium hydroxide.

Berry & Associates offers a version of such an Fmoc-protected amino-modifier for installation of an amino group at the 3'-terminus, i.e., 3'-Fmoc-amino-modifier CPG, in both higher- and lower-loaded versions, namely BA 0299 (ca. 70-80 μmol/g on 500 Å CPG) and BA 0307 (ca. 35-45 μmol/g on 1000 Å CPG). It features a 7-atom spacer between the amino group and the O-DMT group.

Coupling, cleavage, and deprotection: Normal synthesis protocols should be used. Cleavage of the oligonucleotide from the CPG requires ca. 2 h at room temperature with concentrated ammonium hydroxide. This also removes the Fmoc group. Completion of the deprotection of the nucleobases should be completed according to standard protocols. The amine-modified oligonucleotide can then be acylated as desired.

Alternatively, the CPG-linked oligonucleotide can be treated with piperidine to remove the Fmoc group without cleavage of the oligonucleotide from the support,[2] simplifying a subsequent acylation reaction. For example, agitating the CPG-bound oligonucleotide with a solution of 20% piperidine in dry *N,N*-dimethylformamide (DMF) (twice for 15 min or 3 x for 5-10 min) removes the Fmoc group. Acylation of the resultant amine with an appropriate carboxylic acid, carboxylic acid anhydride, or NHS ester is carried out, followed by washing the beads with DMF and acetonitrile. Finally, cleavage from the support and nucleobase deprotection is carried out using an appropriate standard protocol.

References:

1. Nelson, P. S.; Kent, M.; Muthini, S. *Nucl. Acids Res.* **1992**, *20*, 6253-6259.

2. (a) Gartner, Z. J.; Kanan, M. W.; Liu, D. R. *J. Am. Chem. Soc*. **2002**, *124*, 10304-10306; see Supporting Information, p. 3. (b) Gartner, Z. J.; Tse, B. N.; Grubina, R.; Doyon, J. B.; Snyder, T. M.; Liu, D. R. *Science 2004*, **305**, 1601-1605; see Supporting Online Material, p. 2.