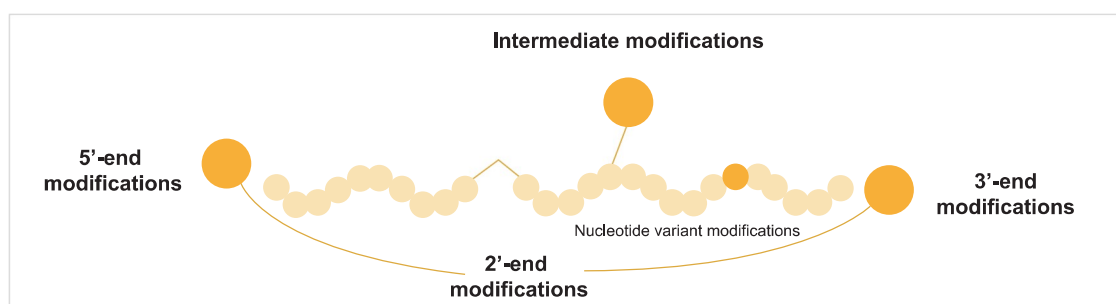


DNA/RNA Oligo Modifications

Modification Groups Position

The addition of modification groups with various functions during oligo synthesis can support molecular biology studies for a variety of different purposes, e.g:

- Addition of modifications such as Inverted dT to the 3' end of oligos can act as a blocking agent and prevent PCR extension;
- Addition of a fluorescent group at the 3' end and a quenched groups at the 5' end of the oligo allows the preparation of TaqMan probes to test target sequences;
- Addition of modifications such as thio in the middle of the oligo can serve to avoid degradation by exogenous nucleases;
- Addition of modifications such as dl in the middle of the oligo can mimic the bases present in nature.



DNA Modification Group Information

Here is a list of DNA modifications and modification positions that GenScript can provide. Other modifications can be evaluated based on the availability of raw materials.

★ Linker Modifications

Modification category	Modification name	Modification position
Biotin modifications	Biotin	5'-end / 3'-end
	Biotin dT	5'-end / 3'-end / intermediate modifications
	Biotin-TEG	5'-end / 3'-end / intermediate modifications
	Dual Biotin	5'-end
	Desthiobiotin-TEG	5'-end / 3'-end / intermediate modifications
	PC Biotin	5'-end
Amino modifications	Amino Modifier C3	5'-end
	Amino Modifier C6	5'-end / intermediate modifications

Modification category	Modification name	Modification position
Amino modifications	Amino Modifier C6 dT	5'-end / 3'-end / intermediate modifications
	Amino Modifier C7	3'-end
	Amino Modifier C12	5'-end
	5'-Amino-dT-CE Phosphoramidite	5'-end / 3'-end / intermediate modifications
	iUniAmM	5'-end / 3'-end / intermediate modifications
	AOP-iUniAmM	5'-end / 3'-end / intermediate modifications
Mercaptan modifications	Thiol Modifier C3 S-S	3'-end

Modification category	Modification name	Modification position
Mercaptan modifications	Thiol Modifier C6 S-S	5'-end / 3'-end / intermediate modifications
	Thiol Modifier C6 S-S dT	5'-end / 3'-end / intermediate modifications
	Dithiol Serinol	5'-end / 3'-end / intermediate modifications
Digoxin	Digoxigenin	5'-end / 3'-end
Cholesterol	Cholesteryl	3'-end
	Cholesteryl-TEG	5'-end / 3'-end
Methacrylate	Acrydite	5'-end
Click reaction related modifications	Hexynyl	5'-end
Diphenylcyclooctyne	DBCO	5'-end

★ Spacers Modifications

Modification category	Modification name	Modification position
Spacers modifications	Spacer 18	5'-end / 3'-end / intermediate modifications
	Spacer 9	5'-end / 3'-end / intermediate modifications
	Spacer C6	5'-end / 3'-end / intermediate modifications
	Spacer C3	5'-end / 3'-end / intermediate modifications
	dSpacer	5'-end / 3'-end / intermediate modifications
	PC Spacer9	5'-end / intermediate modifications

★ Quenching Group

Modification category	Modification name	Modification position
Quenching group	BHQ-1	5'-end / 3'-end
	BHQ1-dT	5'-end / 3'-end / intermediate modifications
	BHQ2	3'-end
	BHQ2-dT	5'-end / 3'-end / intermediate modifications
	BHQ3	3'-end
	BlackBerry Quencher 650	5'-end / 3'-end
	BlackBerry Quencher 650 dT	5'-end / 3'-end / intermediate modifications
	Dabcyl	3'-end
	Dabcyl-dT	5'-end / 3'-end / intermediate modifications
	MGB	3'-end

★ Fluorophore

Modification category	Modification name	Modification position
Fluorophore	6-FAM	5'-end / 3'-end
	6-FAM dT	5'-end / 3'-end / intermediate modifications
	6-TET	5'-end
	6-JOE	5'-end
	6-VIC	5'-end
	6-HEX	5'-end
	6-HEX dT	5'-end / 3'-end / intermediate modifications
	Quasar 570	5'-end / 3'-end
	Quasar 670	5'-end / 3'-end
	CY3	5'-end / 3'-end
	CY5	5'-end / 3'-end
	CY5.5	5'-end / 3'-end
	CY7	5'-end / 3'-end / intermediate modifications
	CY3 dT	Intermediate modifications
	CY5 dT	Intermediate modifications
	NED	5'-end
	6-TAMRA	5'-end / 3'-end
	6-ROX	5'-end / 3'-end
	Texas Red-X	5'-end / 3'-end / intermediate modifications
	Methylene Blue	5'-end
	CAL FLOUR RED 610	5'-end

★ Stable Modifications

Modification category	Modification name	Modification position
Thiosubstitution	Phosphorothioate	Intermediate modifications
Pentasaccharide 2 and 4 positions	Locked Nucleic Acid	5'-end / 3'-end / intermediate modifications
	5-methyl dC	5'-end / 3'-end / intermediate modifications

★ Blocking Modifications

Modification category	Modification name	Modification position
Nucleotide inversion	inverted dT	5'-end / 3'-end / intermediate modifications
	Inverted abasic	5'-end / 3'-end / intermediate modifications
Pentasaccharide 2 and 3 positions	Dideoxy-bases	3'-end
Phosphorylation modifications	Phosphorylation	5'-end / 3'-end
	Adenylation	5'-end

★ Other Modification Groups

Modification category	Modification name	Modification position
/	Peptide-oligo conjugates	5'-end / 3'-end
	Aminobutylethyl isoluminol	5'-end
	Thymidine Glycol	5'-end / 3'-end / intermediate modifications
	Palmitate acid	5'-end / 3'-end
	puromycin	3'-end
	Symmetric Doubler	5'-end / 3'-end
	DMT ON	5'-end
	TCO	5'-end / 3'-end / intermediate modifications
	Nitroindole	5'-end / intermediate modifications

★ Special Bases

Modification category	Modification name	Modification position
Base modifications	Ferrocene dT	5'-end / 3'-end / intermediate modifications
	Ferrocene dI	5'-end / intermediate modifications
	2-Aminopurine	5'-end / 3'-end / intermediate modifications
	5-Fluoro dU	5'-end / 3'-end / intermediate modifications
	U	5'-end / 3'-end / intermediate modifications
	I	5'-end / 3'-end / intermediate modifications
	2'-O-Methyl-5-Methyl C	5'-end / 3'-end / intermediate modifications
	5-Hydroxymethyl dC	5'-end / 3'-end / intermediate modifications
	5-Carboxy dC	5'-end / 3'-end / intermediate modifications
	5-Formyl dC	5'-end / 3'-end / intermediate modifications
	5-Iodo dC	5'-end / 3'-end / intermediate modifications
	Bromodomain	5'-end / 3'-end / intermediate modifications
	iso deoxy bases	5'-end / 3'-end / intermediate modifications
	5-methyl isodeoxycyto sine	5'-end / 3'-end / intermediate modifications
	7-deaza-2'-dG	5'-end / 3'-end / intermediate modifications
	N6-Methyl dA	5'-end / 3'-end / intermediate modifications
	N1-Methyl-dC	5'-end / 3'-end / intermediate modifications
	N3-Methyl-dC	5'-end / 3'-end / intermediate modifications
	O4 Triazolyl dU	5'-end / 3'-end / intermediate modifications
	8-oxo-dG	5'-end / 3'-end / intermediate modifications

RNA Oligo Modifications Group Information

Please check the types of RNA modifications and modification positions that GenScript can provide. Here is the list of RNA modifications and modification positions that GenScript can provide. Other modifications can be evaluated based on the availability of raw materials.

★ Linker Modifications

Modification category	Modification name	Modification position
Biotin modifications	Biotin	5'-end / 3'-end
	Biotin-TEG	5'-end / 3'-end
	Biotin dT	5'-end / 3'-end / intermediate modifications

Modification category	Modification name	Modification position
Biotin modifications	Dual Biotin	5'-end
	Desthiobiotin-TEG	3'-end
	PC Biotin	5'-end

Modification category	Modification name	Modification position
Amino modifications	Amino Modifier C3	5'-end
	Amino Modifier C6	5'-end
	Amino Modifier C6 dT	5'-end / 3'-end / intermediate modifications
	Amino Modifier C6 rU	5'-end / 3'-end / intermediate modifications
	Amino Modifier C7	3'-end
	Amino Modifier C12	5'-end
	iUniAmM	Intermediate modifications
	5-Amino dT	5'-end
Digoxin	Digoxigenin	5'-end / 3'-end
Cholesterol	Cholesteryl	3'-end
	Cholesteryl-TEG	5'-end / 3'-end

★ Spacers Modifications

Modification category	Modification name	Modification position
Spacers modifications	Spacer 18	5'-end / 3'-end / intermediate modifications
	Spacer 9	5'-end / 3'-end / intermediate modifications
	Spacer C6	5'-end / 3'-end / intermediate modifications
	Spacer C3	5'-end / 3'-end / intermediate modifications
	dSpacer	5'-end / 3'-end / intermediate modifications

★ Quenching Group

Modification category	Modification name	Modification position
Quenching group	BHQ-1	3'-end
	BHQ1-dT	5'-end / 3'-end / intermediate modifications
	BHQ2	3'-end
	BHQ2-dT	5'-end / 3'-end / intermediate modifications
	BHQ3	3'-end
	BlackBerry Quencher 650	5'-end / 3'-end
	BlackBerry Quencher 650 dT	5'-end / 3'-end / intermediate modifications
	Dabcyl	3'-end
	Dabcyl-dT	5'-end / 3'-end / intermediate modifications
	MGB	3'-end

★ Fluorophore

Modification category	Modification name	Modification position
Fluorophore	6-FAM	5'-end / 3'-end
	6-FAM dT	5'-end / 3'-end / intermediate modifications
	CY3	5'-end / 3'-end / intermediate modifications
	CY5	5'-end / 3'-end
	CY5.5	5'-end / 3'-end
	CY7	5'-end / 3'-end / intermediate modifications
	Quasar 570	5'-end / 3'-end
	Quasar 670	5'-end / 3'-end
	6-TAMRA	5'-end / 3'-end
	6-ROX	5'-end / 3'-end
	6-VIC	5'-end
	Texas Red-X	5'-end / 3'-end / intermediate modifications
	Methylene Blue	5'-end

★ Stable Modifications

Modification category	Modification name	Modification position
Phosphorothioate bond modifications	Phosphorothioate	Intermediate modifications
Pentasaccharide 2 position	2'-O methyl A	5'-end / 3'-end / intermediate modifications
	2'-O methyl G	5'-end / 3'-end / intermediate modifications
	2'-O methyl C	5'-end / 3'-end / intermediate modifications
	2'-O methyl U	5'-end / 3'-end / intermediate modifications
	2'-MethoxyEthoxy A	5'-end / 3'-end / intermediate modifications
	2'-MethoxyEthoxy G	5'-end / 3'-end / intermediate modifications
	2'-MethoxyEthoxy MeC	5'-end / 3'-end / intermediate modifications
	2'-MethoxyEthoxy T	5'-end / 3'-end / intermediate modifications
	2'-Fluoro C	5'-end / 3'-end / intermediate modifications
	2'-Fluoro U	5'-end / 3'-end / intermediate modifications
	2'-Fluoro A	5'-end / 3'-end / intermediate modifications
	2'-Fluoro G	5'-end / 3'-end / intermediate modifications
	2'-Fluoro-Arabinonucleic Acid	5'-end / 3'-end / intermediate modifications

Modification category	Modification name	Modification position
Pentasaccharide 2 and 4 positions	Locked Nucleic Acid	5'-end / 3'-end / intermediate modifications
	5-Methyl dC	5'-end / 3'-end / intermediate modifications
	5-Methyl rC	5'-end / 3'-end / intermediate modifications

★ Blocking Modifications

Modification category	Modification name	Modification position
Nucleotide inversion	inverted dT	5'-end / 3'-end / intermediate modifications
	Inverted abasic	5'-end / 3'-end / intermediate modifications
Pentasaccharide 2 and 3 positions	Dideoxy bases	3'-end
Phosphorylation Modifications	Phosphorylation	5'-end / 3'-end
	Adenylation	5'-end

★ Other Modification Groups

Modification category	Modification name	Modification position
/	TCO	5'-end / 3'-end
	puromycin	3'-end
	Thymidine Glycol	Intermediate modifications
	Symmetric Doubler	5'-end / 3'-end / intermediate modifications

★ Special Bases

Modification category	Modification name	Modification position
/	2-Aminopurine	5'-end / 3'-end / intermediate modifications
	5-Fluoro dU	5'-end / 3'-end / intermediate modifications
	2-Fluoro I	Intermediate modifications
	2-methyl I	Intermediate modifications
	Chimeric DNA base	5'-end / 3'-end / intermediate modifications
	ri	5'-end / 3'-end / intermediate modifications
	2'-O-Methyl MeC	5'-end / 3'-end / intermediate modifications
	5-Carboxy dC	5'-end / 3'-end / intermediate modifications
	5-Formyl dC	5'-end / 3'-end / intermediate modifications
	Bromodomain	5'-end / 3'-end / intermediate modifications
	N6-Methyl dA	5'-end / 3'-end / intermediate modifications
	N6-Methyl rA	5'-end / 3'-end / intermediate modifications
	1-Methyl-PseudoUridine	5'-end / 3'-end / intermediate modifications