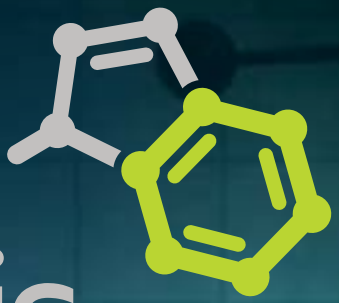
FUTURE synthesis



PRODUCT CATALOGUE

FUTURE synthesis

ABOUT US

FutureSynthesis sp. z o.o. is a biotechnological company specializing in chemical synthesis of biomolecules on customers' request, particularly the synthesis of nucleic acids, both RNA and DNA.

Our offer includes synthesis of nucleic acid molecules with numerous modifications and possibility of fluorescent labelling, as well as synthesis of nucleic acids with mixed sequences containing ribonucleotides and deoxyribonucleotides, degenerated sequences and many other synthetic possibilities.

Thanks to our analytical methods we obtain end products of high purity. Our qualified staff and specialistic diagnostic equipment guarantee the highest quality of service.

We are also an official distributor of products by Biosearch Technologies Inc., a world leader in fluorescent labels and their application in molecular biology and medical diagnostics. Our cooperation allows us to offer our customers a whole range of fluorescent dyes, including Black Hole Quencher®, CAL Fluor®, Quasar® and Pulsar® as well as fluorescence-based products, such as Stellaris® RNA FISH Probes and many other molecular tools.

We look forward to our cooperation.

BIOSEARCH TECHNOLOGIES
Advancing Nucleic Acid Technology℠

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APPLICATIONS OF RNA AND DNA OLIGONUCLEOTIDES

Oligonucleotides are now in extensive use in various scientific fields, including biotechnology, molecular biology, genetic engineering, proteomics, immunology and pharmacy.

FutureSynthesis sp. z o.o. provides high quality products to be applied to:

- study the structure and functions of RNA and siRNA,
- antisense strategies,
- Polymerase Chain Reaction (PCR),
- Förster Resonance Energy Transfer (FRET), Real-time PCR and other applications of fluorescently-labelled oligonucleotides,
- gene expression and gene therapy,
- molecular diagnostics,
- analyse DNA repair mechanisms,
- epigenetic research,
- immobilization on solid support (e.g. microarrays),
- Restriction Fragments Length Polymorphism (RFLP) analysis,
- study interactions (e.g. protein-DNA),
- hamper protein functions,
- rolling circle amplification,
- study modern therapeutic strategies,
- *in vitro* translation,
- study Toll-like receptors.

GUARANTEED AMOUNTS OF MATERIAL (OD) FOR OLIGONUCLEOTIDES OF +/- 20 nt DEPENDING ON THE SYNTHESIS SCALE AND PURIFICATION METHOD

SYNTHESIS SCALE	PURIFICATION METHOD			
	DESALTING	STANDARD RP-18	HPLC	PAGE
0,1 µmol	10 OD	8 OD	5 OD	3 OD
0,2 µmol	20 OD	11 OD	8 OD	5 OD
1,0 µmol	40 OD	25 OD	16 OD	11 OD
10,0 µmol	90 OD	70 OD	45 OD	35 OD

FUTURE synthesis

RNA OLIGONUCLEOTIDES

RIBONUCLEIC ACID (RNA)

synthesis scale: 0,1 µmol; 0,2 µmol; 1,0 µmol; 10 µmol;
length: up to 80 mers *;

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
A C G U	001A	001B	001C

DNA OLIGONUCLEOTIDES

DEOXYRIBONUCLEIC ACID (DNA)

synthesis scale: 0,1 µmol; 0,2 µmol; 1,0 µmol; 10 µmol;
length: up to 150 mers *;

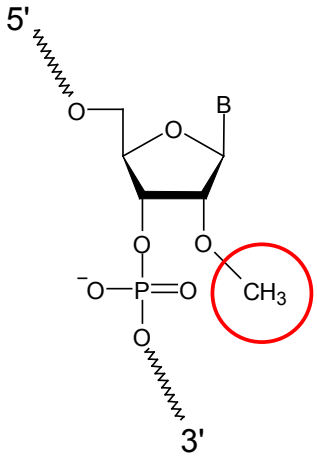
	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
dA dC dG T	002A	002B	002C

* If you are interested in longer oligonucleotides, please contact our laboratory department. On customers' request we also perform syntheses of mixed sequences (oligonucleotides containing both DNA and RNA).

INTERNAL MODIFICATIONS OF NUCLEIC ACIDS

2'-O-METHYL-RNA (2'-OMe-RNA)

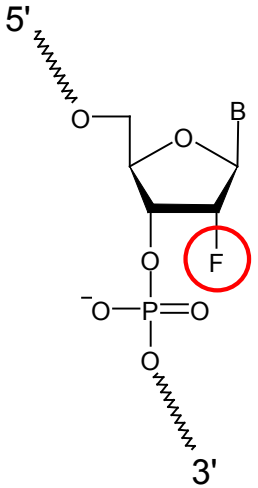
In position 2' of the ribose ring, the 2'-OMe-RNA nucleotides contain an O-methyl group (-OMe) instead of hydroxyl residue (-OH). The modification increases resistance to degradation of oligonucleotide by nuclease, simultaneously retaining properties that are typical of RNA molecules. An additional advantage of 2'-OMe-RNA oligonucleotides is forming more stable duplexes with complementary RNA sequences in comparison with the ribo- and deoxy- series. 2'-OMe-RNA oligomers are commonly applied in research on antisense therapy.



	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
2'-OMe-A 2'-OMe-C 2'-OMe-G 2'-OMe-U	003A	003B	003C

2'-FLUORO-RNA (2'-F-RNA)

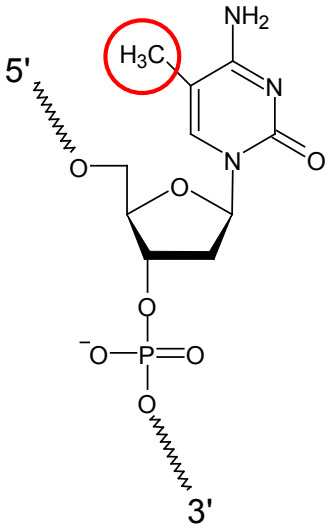
2'-F-RNA is an analogue of natural RNAs containing a fluorine atom in place of the -OH group in the 2' position of the ribose ring. Introducing a fluorine atom into the 2' position does not change substantially the conformation of the ribose ring. 2'-F-RNA oligonucleotides and typical RNAs boast many similar physicochemical properties, e.g. the possibility of forming stable duplexes 2'-F-RNA/RNA. The missing 2'-OH group makes 2'-F-RNA oligonucleotides more resistant to chemical hydrolysis and nucleases, which translates into elongating oligonucleotide stability containing the modification in the natural environment.



	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
2'-F-A 2'-F-C 2'-F-G 2'-F-U	004A	004B	004C

5-METHYL-DEOXYCYTIDINE (5-Me-dC)

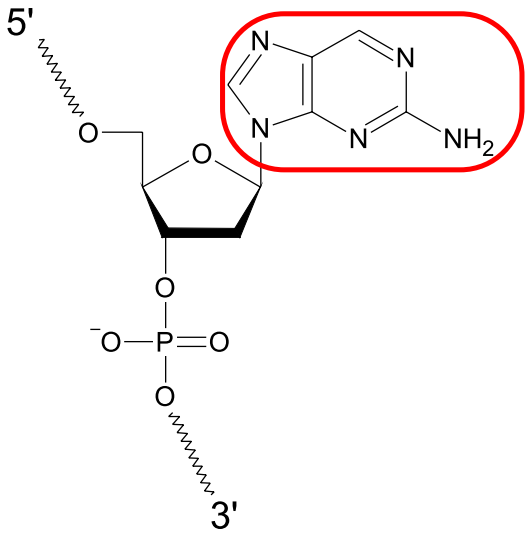
5-Methyl-deoxycytidine is a modification that contains an additional methyl group in position 5 of the cytosine ring. The modification is applied to increase efficiency of hybridization; the presence of a hydrophobic methyl group ($-CH_3$) allows to decrease the amount of complex molecules of water in the formed duplex. 5-Methyl-deoxycytidine introduced in a sequence of nucleic acid in place of dC increases the temperature of duplex melting of about 0.5 °C for a single substitute. Methylated deoxycytidine is commonly applied in epigenetic research.



	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
5-Me-dC	005A	005B	005C

2-AMINOPURINE NUCLEOSIDE

2-Aminopurine is an analogue of adenine displaying fluorescent properties (Abs_{max} = 303 nm; Em_{max} = 371 nm). Changing the fluorescence level depends on the proximity of other nucleotides.

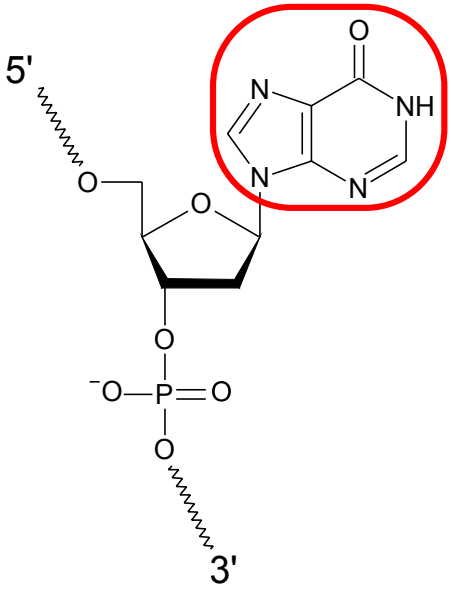


2-Aminopurine is frequently used as a fluorescent label in researching the structure and dynamics of DNA secondary structures (e.g. hairpins) and to discover layer interactions within a duplex. 2-Aminopurine destabilizes the formed duplex, which slightly decreases stability of the thermodynamic secondary structure. 2-Aminopurine forms very stable base pairs with thymidine and guanine.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
2-Aminopurine	006A	006B	006C

DEOXYINOSINE (dI)

Inosine is a purine nucleoside containing hypoxanthine as heterocyclic base. The inosine nucleotide is used as a universal base because it may form stable base pairs with any of the canonic heterocyclic bases. Therefore it is commonly used in designing starters for PCR.

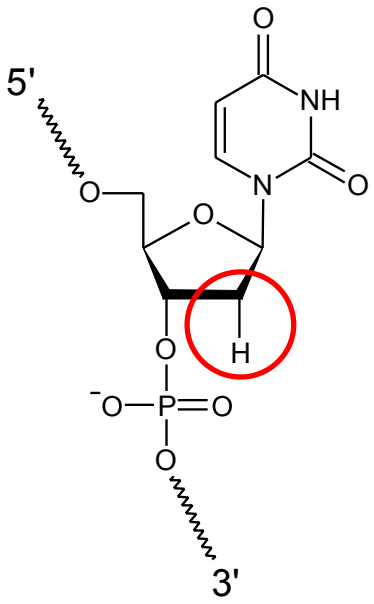


Inosine displays the following preferences in forming Watson-Crick base pairs: I-C > I-A > I-G = I-T (with significant preference of the I-C pair).

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
dI	007A	007B	007C

DEOXYURIDINE (dU)

Deoxyuridine is a naturally occurring modification of uridine; the only difference is that it does not contain the -OH group in the 2' position of the ribose ring.

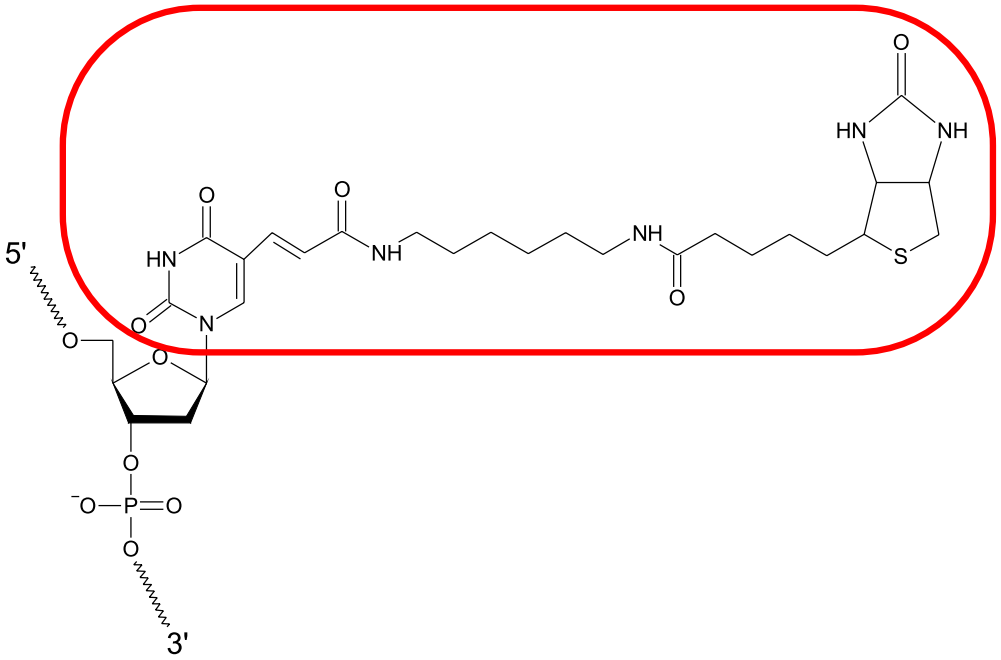


Deoxyuridine may be formed as a result of deoxycytidine deamination. It is also used to research DNA degeneration and repair mechanisms.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
dU	008A	008B	008C

BIOTINYLATED DEOXYTHYMIDINE (Biotin-dT)

Biotinylated deoxythymidine is a deoxynucleotide connected with biotin by a flexible alkyl linker.

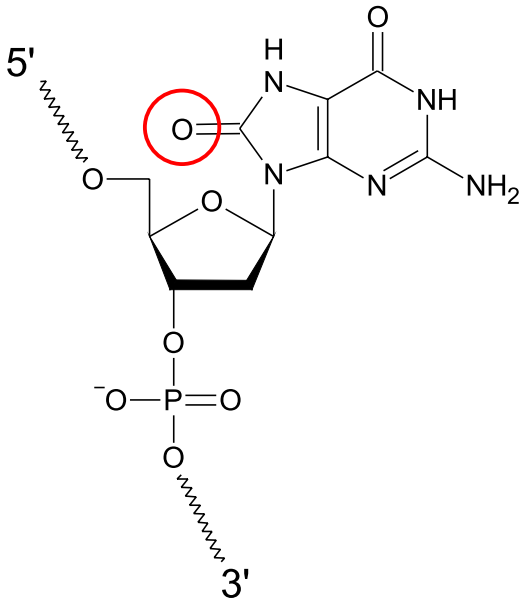


Biotin strongly interacts with streptavidin, forming a very stable complex. The property is extensively used in molecular biology, e.g. in fluorescent labelling or oligonucleotide immobilization on solid support.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
Biotin-dT	009A	009B	009C

8-OXO-2'-DEOXYGUANOSINE (8-Oxo-dG)

8-Oxo-dG is an oxidated derivative of deoxyguanosine.

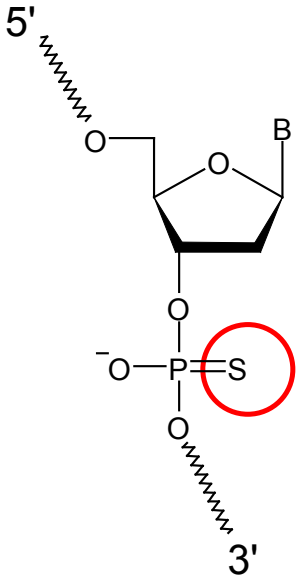


It is one of the main products of DNA oxidation in biological conditions and results from a reaction of dG with reactive forms of oxygen generated during metabolic oxidation processes. 8-Oxo-dG is used to study oxidative damages of DNA and its repair mechanisms.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
8-Oxo-dG	010A	010B	010C

PHOSPHOROTHIOATES OLIGONUCLEODIDES (PTO)

A phosphorothioate bond introduces a sulphur atom instead of one oxygen atom in the oligonucleotide phosphodiester skeleton, giving a new phosphorothioate bond. The presence of sulphur makes the PTO oligonucleotides resistant to exonucleases, and in antisense application to degradation by endonucleases. Substituting an oxygen atom with a sulphur atom results in forming a new chiral centre, and consequently a mixture of diastereoisomers.



	CATALOGUE NUMBER		
	skala 0,1 µmol	skala 0,2 µmol	skala 1,0 µmol
PTO		011 *	

* price for a single sulphurization

FUTURE synthesis

MODIFICATIONS OF OLIGONUCLEOTIDE 5' END

We offer a possibility of modification of the 5' end of the ordered oligonucleotide. The table below depicts the most commonly used modifications. The price from the table should be added to the price for the oligonucleotide.

			CATALOGUE NUMBER		
MODIFICATION OF 5' END	Abs_{max}	Em_{max}	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
FLUORESCEIN	495	520	012A	012B	012C
CAL FLIOR GOLD 540®	522	544	013A	013B	013C
CAL FLUOR ORANGE 560®	538	559	014A	014B	014C
CY3	546	563	015A	015B	015C
QUASAR 570®	548	566	016A	016B	016C
TAMRA	565	580	017A	017B	017C
CAL FLUOR RED 610®	590	610	018A	018B	018C
QUASAR 670®	647	670	019A	019B	019C
BHQ-3®	672 (620-730)*	-	020A	020B	020C
BIOTIN	-	-	021A	021B	021C
PHOSPHATE	-	-	022A	022B	022C
AMINO LINKER C6 NH_2	-	-	023A	023B	023C
THIOL LINKER C6 SH	-	-	024A	024B	024C

* absorption range

MODIFICATIONS OF OLIGONUCLEOTIDE 3' END

We offer a possibility of modification of the 3' end of the ordered oligonucleotide. The table below depicts the most commonly used modifications. The price from the table should be added to the price for the oligonucleotide.

			CATALOGUE NUMBER		
MODIFICATION OF 3' END	Abs_{max}	Em_{max}	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
FLUORESCEIN	495	520	025A	025B	025C
CAL FLUOR ORANGE 560®	538	559	026A	026B	026C
QUASAR 570®	548	566	027A	027B	027C
TAMRA	565	580	028A	028B	028C
QUASAR 670®	647	670	029A	029B	029C
DABCYL	478 (400-550)*	-	030A	030B	030C
BHQ-0®	493 (430-520)*	-	031A	031B	031C
BHQ-1®	534 (480-580)*	-	032A	032B	032C
BHQ-2®	579 (559-650)*	-	033A	033B	033C
BHQ-3®	672 (620-730)*	-	034A	034B	034C
BIOTIN	-	-	035A	035B	035C
PHOSPHATE	-	-	036A	036B	036C
AMINO LINKER C6 NH_2	-	-	037A	037B	037C
THIOL LINKER C6 SH	-	-	038A	038B	038C

* absorption range

COMBINATIONS OF FLUORESCENT LABELS ON BOTH ENDS OF OLIGONUCLEOTIDE

We offer a possibility of ordering double-labelled oligonucleotides. The table below contains model combinations. The price for a given couple of labels should be added to the price for an oligonucleotide.

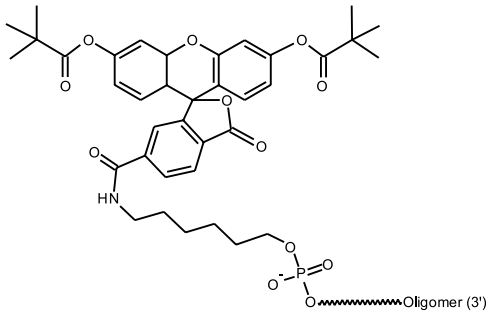
		CATALOGUE NUMBER		
5' END	**3' END**	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
FLUORESCEIN	BHQ-0®	039A	039B	039C
FLUORESCEIN	BHQ-1®	040A	040B	040C
FLUORESCEIN	DABCYL	041A	041B	041C
CAL FLUOR GOLD 540®	BHQ-1®	042A	042B	042C
CAL FLUOR ORANGE 560®	BHQ-1®	043A	043B	043C
CY3	BHQ-2®	044A	044B	044C
QUASAR 570®	BHQ-2®	045A	045B	045C
TAMRA	BHQ-2®	046A	046B	046C
CAL FLUOR RED 610®	BHQ-2®	047A	047B	047C
QUASAR 670®	BHQ-2®	048A	048B	048C
QUASAR 670®	BHQ-3®	049A	049B	049C
BHQ-3®	QUASAR 670®	050A	050B	050C

CHARACTERIZATION OF TERMINAL MODIFICATIONS

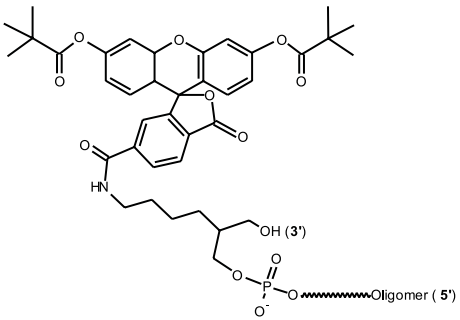
FLUORESCEIN

Fluorescein is an organic dye which displays fluorescence in yellow and green in basic environment. Absorption maximum for fluorescein is 495 nm, but after excitation it emits light whose wavelength is of 520 nm (in aqueous solution). It is commonly used to label cells and antibodies. Coupled with oligonucleotide, it may be used in hybridization, as labelled starters or molecular probes.

5' - fluoresceine

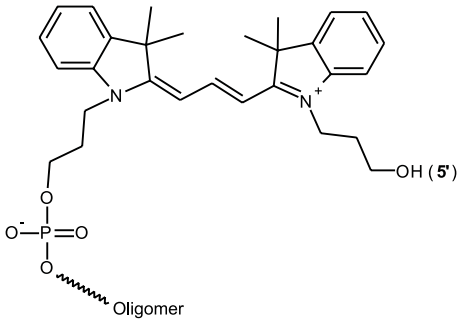


3' - fluoresceine



CYANINE 3 (Cy3)

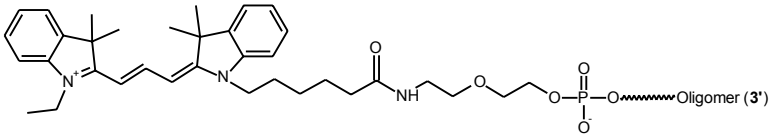
Cy3 belongs to a group of synthetic dyes called polymethines; apart from Cy5, it is one of the most commonly known label from this group. Cy3 displays yellow, or possibly green-yellow fluorescence (Abs_{max} = 546 nm, Em_{max} = 563 nm). It is broadly used as a label of nucleic acids and proteins. It is applied in analyses with microarrays, and proteomics.



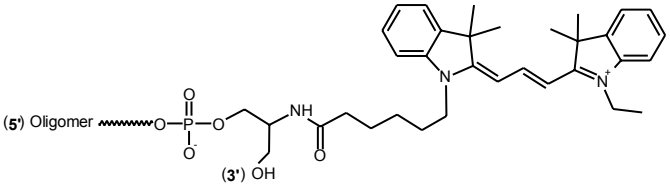
QUASAR 570®

Quasar 570® is a fluorescent label of absorption maximum of 548 nm. After induction it emits yellow-green light. As oligonucleotide modification it may be used to construct labelled starters or molecular probes. It is effectively quenched by BHQ-2®. It can be used as a cyanine 3 replacement.

5'-Quasar 570®



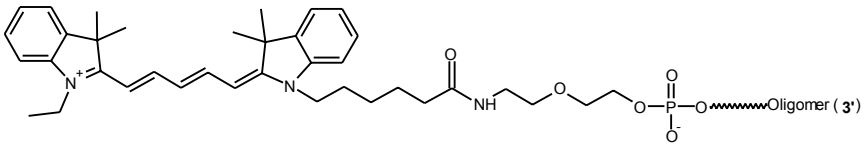
3'-Quasar 570®



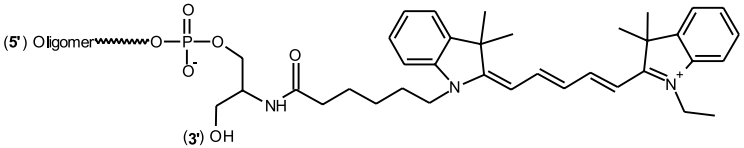
QUASAR 670®

Quasar 670® is a fluorescent label of absorbtion maximum of 647 nm. After induction it displays fluorescence in red light. It is extensively used to construct double labelled oligonucleotides. It is effectively quenched by BHQ-2®. It is frequently used as a substitute label for cyanine 5 replacement.

5'-Quasar 670®

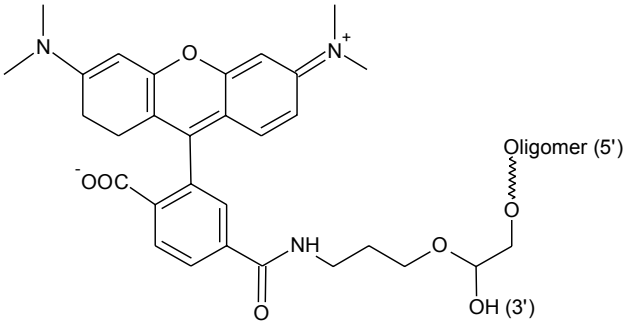


3'-Quasar 670®



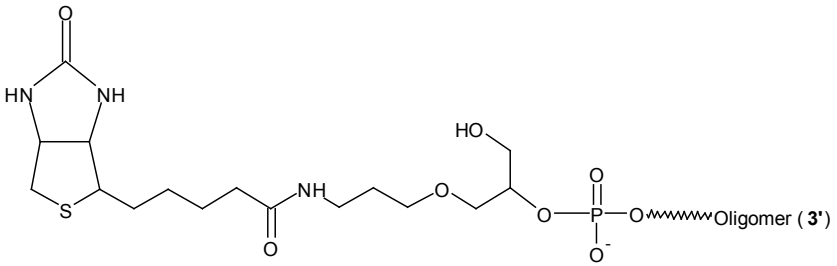
6-CARBOXYTETRAMETHYLRHODAMINE (TAMRA)

TAMRA is a fluorescent label with absorption maximum of 565 nm and emission maximum of 580 nm. Oligonucleotides that contain the label are applied in donor-acceptor interactions (FRET phenomenon) and in real time PCR. TAMRA may also be used as a quencher in such probes as TaqMan and Molecular Beacons as well as starters, e.g. Scorpion. It is widely used in diagnostic applications, *in vitro* and *in vivo* researches, analyses of the structure and functions of RNA and DNA as well as oligonucleotide-protein complexes.



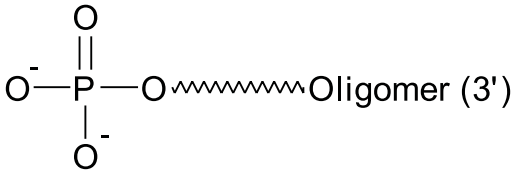
BIOTIN

Biotin is a heterocyclic organic compound that occurs naturally in living organisms (vitamin H) as coenzyme of numerous enzymes. It has been widely applied in biological research due to its high affinity with avidin and streptavidin. As an oligonucleotide label it is used to immobilize DNA on slides in PCR-ELISA reactions.



5’ PHOSPHATE

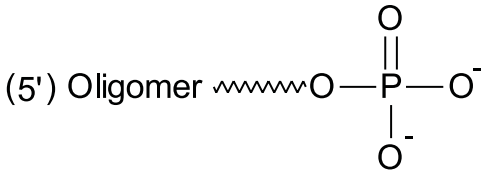
Introducing a phosphate group on the oligonucleotide 5’ end facilitates its ligation with a free 3’-OH group of another oligonucleotide in the presence of an enzyme (DNA or RNA ligase). It can also be applied to label an RNA molecule to selectively digest with exonucleases.



REMARK
As a standard, the synthetic oligonucleotides have a free hydroxyl group on the 5’ end.

3’ PHOSPHATE

Phosphate attached to the oligonucleotide 3’ end constitutes protection against forming a phosphodiester bond between one oligonucleotide and another oligonucleotide with a free phosphate group on the 5’ end.

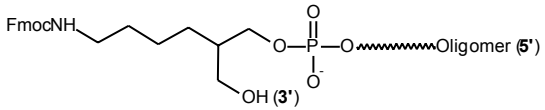


REMARK
As a standard, the synthetic oligonucleotides have a free hydroxyl group on the 3’ end.

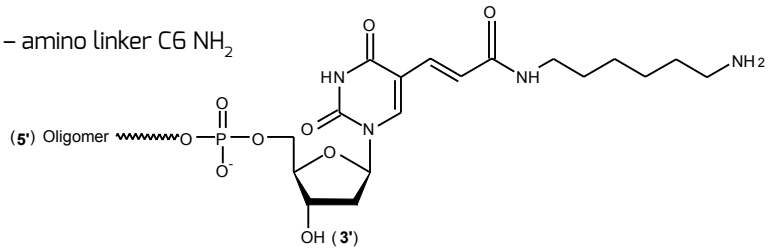
AMINE LINKER C6 NH_2

It is applied to functionalize an oligonucleotide with an amine group, which may be used to form covalent bonds with numerous other molecules. A long alkyl linker makes it possible to attach a fluorescent label whose interaction with oligonucleotide might decrease their functionality. It is often used to immobilize oligonucleotides on solid support, e.g. microarray slides.

3' – amine linker C6 NH_2



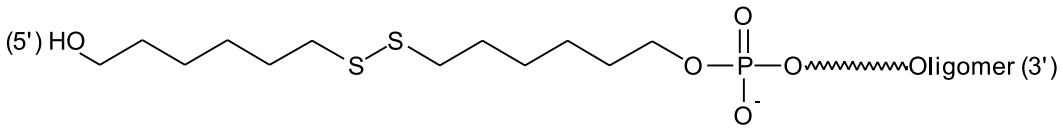
dT – amino linker C6 NH_2



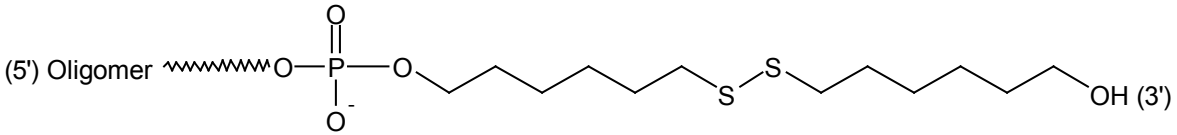
THIOL LINKER C6 SH

Thiol linker C6 SH makes it possible to introduce a thiol residue into an oliginucleotide. It facilitates connecting DNA or RNA molecule with peptide or protein structure. Modifications of oligonucleotides by introducing a thiol group are of particular importance especially in diagnostics. By means of a disulfide linker, a thiol group makes it possible to attach oligonucleotides to other organic compounds, such as dyes.

5' - thiol linker C6 SH



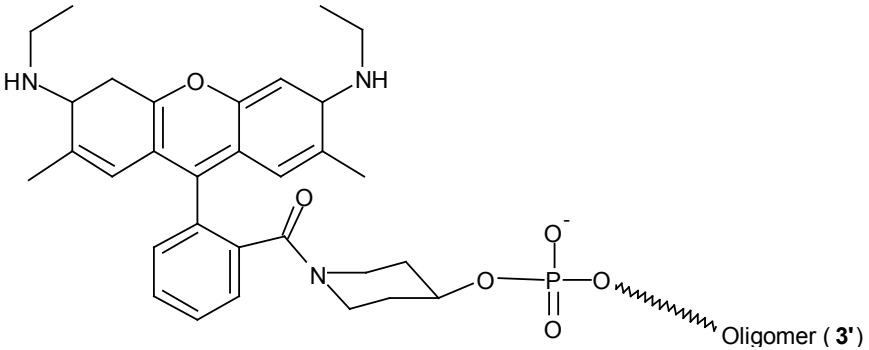
3' - thiol linker C6 SH



REMARK
An oligonucleotide with a thiol linker C6 SH is sent to the customer as a disulfide linker which must be reduced to its active form, i.e. thiol (SH).

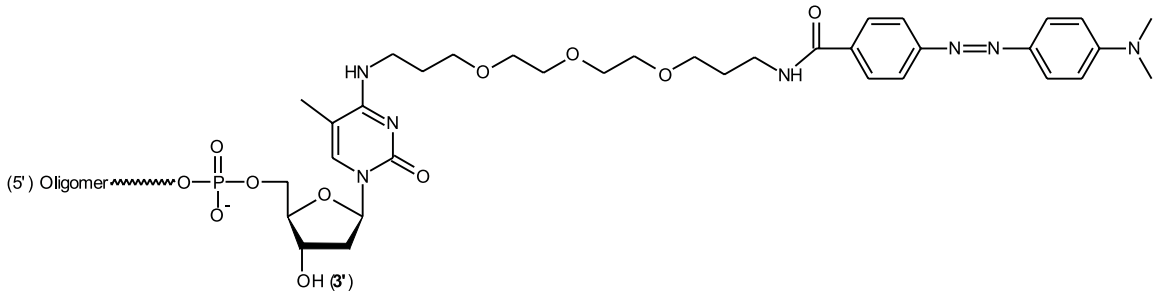
CAL FLUOR ORANGE 560®

CAL Fluor Orange 560® is a label from a group of xanthene dyes. Induced by light of wavelength of 538 nm it emits orange light (Em_{max} = 559 nm). It is effectively quenched by BHQ-1®.



DABCYL

This label displays absorption of 400 – 550 nm (Abs_{max} = 478 nm). It effectively quenches fluorophores that emit radiation in green light. It is frequently used in a couple with fluorescein.



BHQ-0®, BHQ-1®, BHQ-2®, BHQ-3®

BHQ labels display strong absorption of the following wavelengths:

BHQ-0® - from 430 nm to 520 nm,

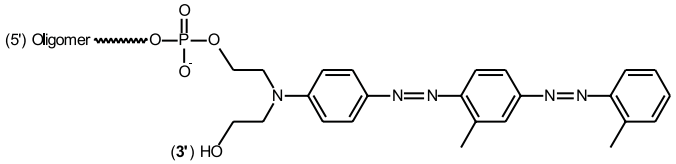
BHQ-1® - from 480 nm to 580 nm,

BHQ-2® - from 560 nm to 670 nm,

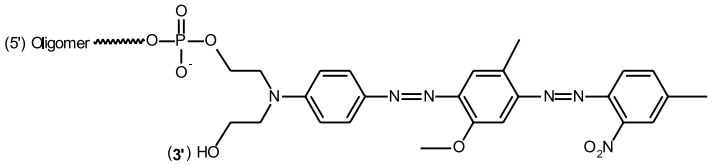
BHQ-3® - from 620 nm to 730 nm.

The property guarantees quenching the fluorophore that emits light within the given wavelength, which is commonly applied in constructing double-labelled oligonucleotides and molecular probes.

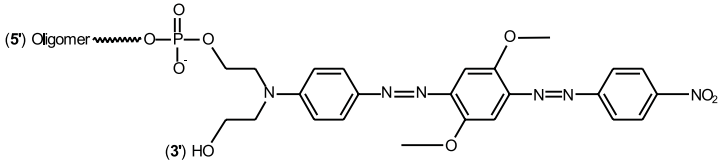
BHQ-0®



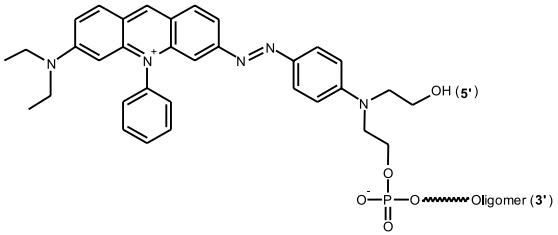
BHQ-1®



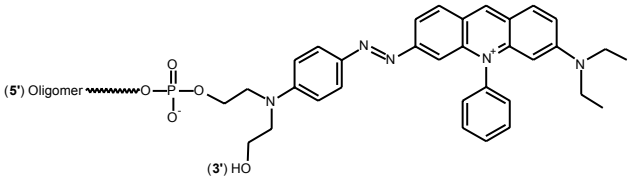
BHQ-2®



BHQ-3® (5')



BHQ-3® (3')



PURIFICATION METHODS

DESALTING

Desalting of nucleic acid consists in removing excess of salt by means of molecular filtration. The method does not result in removing shorter oligonucleotides produced during oligonucleotide synthesis. As a standard, desalting is used to purify starters for PCR.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
DESALTING		051	

STANDARD RP18 – available only for DNA oligonucleotides

The method consists in purifying an oligonucleotide on columns with selective support. It allows to remove salt and part of shorter oligonucleotides which contaminate the main synthesis product.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
Standard RP18	052A	052B	052C

HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Purification by HPLC allows to purify an oligonucleotide relatively efficiently from synthesis side products and remove excess of inorganic salts. The method cannot be applied for very long oligonucleotides.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
HPLC	053A	053B	053C

POLYACRYLAMIDE GEL ELECTROPHORESIS (PAGE)

Polyacrylamide gel electrophoresis is the most effective method for purification of synthetic oligonucleotides. It is also the only method which allows to obtain a homogeneous synthetic product, even up to 99% of purity. The method is recommended to purify aptamers and all types of oligonucleotides to be used in techniques that require high purity products.

	CATALOGUE NUMBER		
	scale 0,1 µmol	scale 0,2 µmol	scale 1,0 µmol
PAGE	054A	054B	054C

FUTURE synthesis

HOW TO ORDER FUTURE SYNTHESIS PRODUCTS ?

ONLINE ORDER FORM

For your convenience our website **www.futuresynthesis.pl** features an order form concerning synthetic fragments of nucleic acid. To place an order please select the **ORDER DNA/RNA** tab. After filling all required fields, including customer's data and final accepting the order, it is automatically sent to the laboratory department and implemented to be realized. The online form also allows you to calculate the price of the oligonucleotide that you need for information purposes (**ORDER DNA/RNA ››› ESTIMATE PRICE**).

INDIVIDUAL OFFER

In the case of complicated modifications, orders for a bigger number of oligonucleotides, combinations that have not been included in the online order form, and in all other cases please contact us at **info@futuresynthesis.pl**. Our staff will be happy to prepare an individual price offer for the molecules that are of your interest. Your order will be accepted for realization only when it is officially confirmed in accordance with the received offer by e-mail (please include the offer number).

SUPPLEMENT

COMPATIBILITY OF FLUORESCENT LABELS WITH QUENCHERS

FLUOROPHORE	ALTERNATE DYES	DYE-5'-T EX	DYE-5'-T EM	RECOMMENDED QUENCHER	BHQ Dye*
Biosearch Blue™		352	447	BHQ-1	BHQ-0 λ_{max} 495 nm QR = 430-520 nm
FAM		495	520	BHQ-1	
TET		521	536	BHQ-1	
CAL Fluor® Gold 540	*VIC/TET/JOE*	522	544	BHQ-1	
JOE		529	555	BHQ-1	
VIC		538	554		
HEX		535	556	BHQ-1	BHQ-1 λ_{max} 534 nm QR = 480-580 nm
CAL Fluor Orange 560	*VIC/HEX/JOE*	538	559	BHQ-1	
Quasar® 570	*CY3*	548	566	BHQ-2	
Cy™ 3		549	566		
NED		546	575		
TAMRA		557	583	BHQ-2	
CAL Fluor Red 590	*TAMRA*	569	591	BHQ-2	BHQ-2 λ_{max} 579 nm QR = 559-670 nm
Cy 3.5		581	596		
ROX		586	610	BHQ-2	** BHQ-2 dye is recommended for Pulsar 650, Quasar 670, and Quasar 705 dyes due to static quenching*
CAL Fluor Red 610	*TEXAS RED/ROX/ ALEXA FLUOR® 594*	590	610	BHQ-2	
Texas Red®		597	616		
CAL Fluor Red 635	*LC RED® 640*	618	637	BHQ-2	
Pulsar® 650		460	650	BHQ-2	
Cy 5		646	669		
Quasar 670	*CY5*	647	670	BHQ-2*, BHQ-3	BHQ-3 λ_{max} 672 nm QR = 620-730 nm
Cy 5.5		675	694		
Quasar 705	*CY5.5*	690	705	BHQ-2*, BHQ-3	

* QR (Quenching Range)

CALCULATING THE AMOUNT OF MATERIAL

Calculating the amount of material in nmols depending on the amount of OD and oligonucleotide sequence.

$$m\,[nmol] = \frac{100 \times n\,[OD]}{1{,}54 \times A + 1{,}17 \times G + 0{,}75 \times C + 0{,}92 \times T}$$

m [nmol] – number of nmols

n [OD] – amount of OD

A, G, C, T – number of proper bases in oligonucleotide

Calculating the amount of material in µg depending on the number of nmols and molar mass of oligonucleotide.

$$n\,[\mu g] = \frac{m\,[nmol] \times MW\,[g/mol]}{1000}$$

n [µg] – amount of µg

m [nmol] – amount of nmol

MW – molar mass

Calculating the volume of a sample in order to obtain oligonucleotide solution of defined concentration depending on the number of nmols.

$$v\,[\mu l] = \frac{n\,[nmol] \times 1000}{c\,[pmol/\mu l]}$$

v [µl] – volume of sample µl

n [nmol] – number of nmols

c [pmol/µl] – concentration pmol/µl

APPROXIMATE AMOUNTS OF MATERIAL [nmol] DEPENDING ON THE OLIGONUCLEOTIDE LENGTH AND AMOUNT OF OD

The table below allows to calculate the approximate number of nmols oligonucleotide of defined length depending on the OD value of the sample.

VALUE OF OD	OLIGONUCLEOTIDE LENGTH (nt)									
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
1	9,4	4,7	3,1	2,3	1,9	1,6	1,3	1,2	1,0	0,9
3	28,0	14,0	9,0	7,0	5,6	4,7	4,0	3,5	3,1	2,8
10	94,0	47,0	31,0	23,0	19,0	16,0	13,0	12,0	10,0	9,0
25	234,0	117,0	78,0	59,0	47,0	39,0	33,0	29,0	26,0	23,0
100	937,0	468,0	312,0	234,0	187,0	156,0	134,0	117,0	104,0	94,0

RECOMMENDED PERCENTAGE OF POLYACRYLAMIDE GEL FOR NUCLEIC ACIDS SEPARATION

GEL PERCENTAGE	DNA FRAGMENT SIZE [bp]*
3,5	100 – 2 000
5,0	80 - 500
8,0	50 - 400
12,0	35 - 200
15,0	25 - 150
20,0	5 - 100

* [bp] - base pairs

RECOMMENDED PERCENTAGE OF AGAROSE GEL FOR SEPARATION OF LINEAR DNA FRAGMENTS

GEL PERCENTAGE	DNA FRAGMENT SIZE [bp]*
0,5	1 000 – 30 000
0,7	800 - 12 000
1,0	500 - 10 000
1,2	400 - 7 000
1,5	200 - 3 000
2,0	50 - 2 000

* [bp] - base pairs

RECOMMENDED PERCENTAGE OF POLYACRYLAMIDE GEL FOR PROTEIN SEPARATION

GEL PERCENTAGE	PROTEIN SIZE [kDa]*
8,0	40 - 200
10,0	21 - 100
12,0	10 - 40

* [kDa] – kiloDaltons

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CONVERSION TABLE

PREFIX	NOTATION	MULTIPLIER
peta	P	10^{15} = 1 000 000 000 000 000
tera	T	10^{12} = 1 000 000 000 000
giga	G	10^{9} = 1 000 000 000
mega	M	10^{6} = 1 000 000
kilo	k	10^{3} = 1 000
hecto	h	10^{2} = 100
deca	da	10^{1} = 10
		10^{0} = 1
deci	d	10^{-1} = 0,1
centi	c	10^{-2} = 0,01
mili	m	10^{-3} = 0,001
micro	μ	10^{-6} = 0,000 001
nano	n	10^{-9} = 0,000 000 001
pico	p	10^{-12} = 0,000 000 000 001
femto	f	10^{-15} = 0,000 000 000 000 001

ATTENTION

The catalogue has an informative character, and does not constitute a commercial offer as defined by the Civil Code and other relevant legal regulations.

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FUTURE synthesis

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