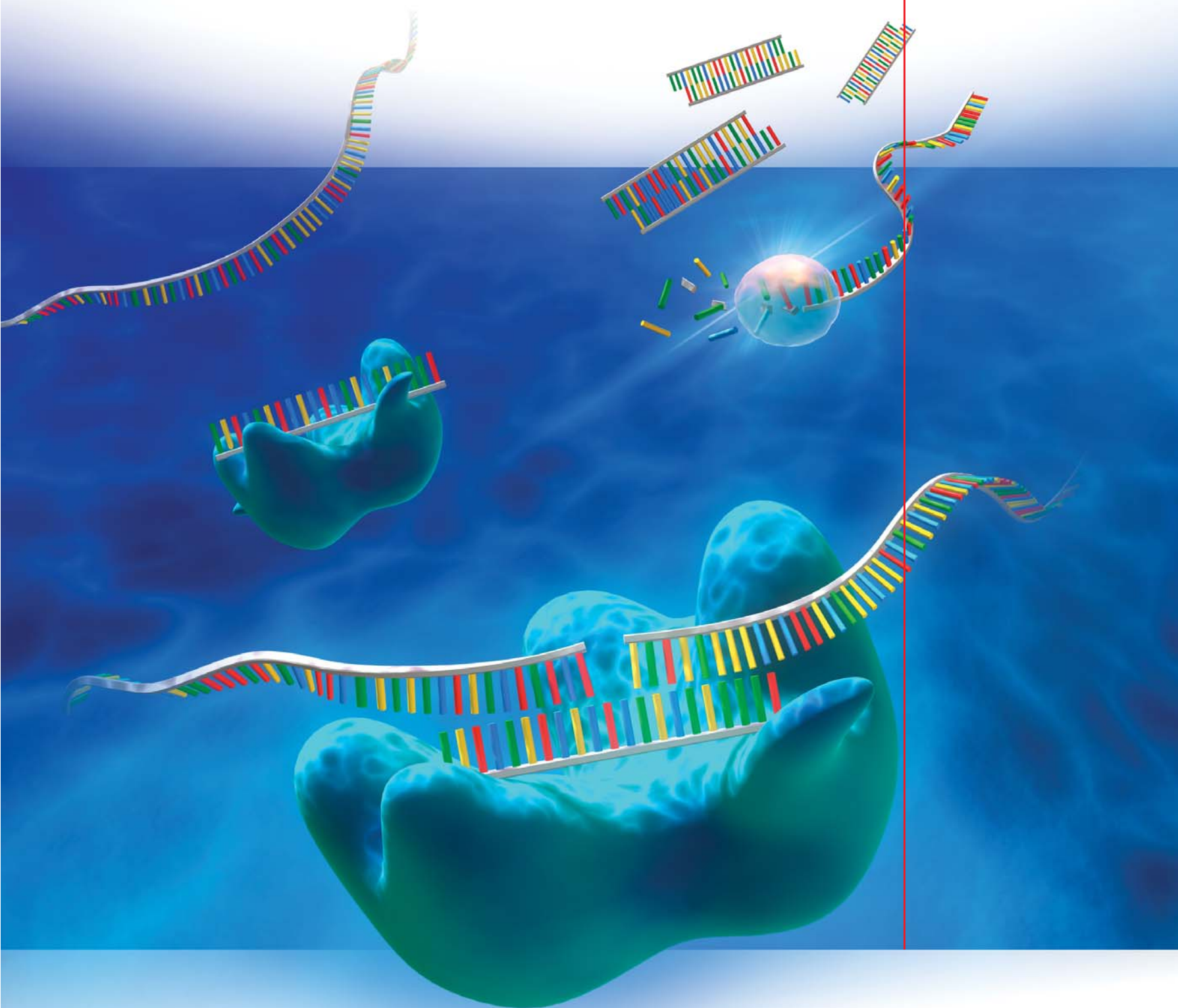


# *siRNA for RNA Interference*



**SIGMA**<sup>®</sup>  
**PROLIGO**<sup>®</sup>

Bringing Together Innovation, Experience, and Quality

**SIGMA**<sup>®</sup>  
**GENOSYS**

# siRNA Oligos

Through the powerful science of RNA interference successful gene silencing can be achieved with the use of synthetic small interfering RNA (siRNA). By targeting these small synthetic oligos, typically 19-23 bases in length against a specific gene of interest researchers are identifying gene function, elucidating pathways, and screening for potential new drug targets.

## Features

- Deprotected, desalted and ready-to-use
- µg to multi-gram capacity
- Available in duplex or single-stranded form
- Purified by PAGE or RP-HPLC upon request
- Comprehensive QC and technical data sheet provided with each siRNA
- Rapid turn-around time and high throughput capacity

*Manufactured under license from Massachusetts Institute of Technology*

## Guaranteed Yields, Labels and Transfections for siRNA Oligos

Yields	Desalted				PAGE	RP-HPLC		
	2	5	10	50		1	5	10
Guaranteed yield (OD)	2	5	10	50	1	5	10	50
Approx. yield (nmols*)	10	25	50	250	5	25	50	250
<b>Labels and modifications</b>								
Fluorescein	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆
Biotin	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆
Phosphate	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆	◆◆
<b>Transfections (approx.)</b>								
24-well plate format	150 wells	375 wells	750 wells	3750 wells	75 wells	375 wells	750 wells	3750 wells

Please inquire for alternative quantities, purification grades and labels. Labels and modifications apply to either the 3' or 5' end of the sense or antisense strand.

◆ 3' end ● 5' end

## Turn-Around Time for siRNA Oligos

Yields	Desalted				PAGE	RP-HPLC		
	2	5	10	50		1	5	10
Guaranteed yield (OD)	2	5	10	50	1	5	10	50
Approx. yield (nmols*)	10	25	50	250	5	25	50	250
<b>Turn-around time (TAT)</b>								
<b>Single-strand, unlabeled</b>								
No. of days	4	4	5	5	6	8	8	8
<b>Single-strand, labeled</b>								
No. of days	5	5	6	6	7	9	9	9
<b>Guaranteed duplex, unlabeled</b>								
No. of days	5	5	6	6	7	9	9	9
<b>Guaranteed duplex, labeled</b>								
No. of days	6	6	7	7	8	10	10	10

**Note:** Turn-around time is dependent upon successful QC validation, and does not include delivery time. Please check with your local sales representative for local turn-around times.

\*Estimate 1 OD = 5 nmols = 30 µg for a 20 mer oligo

Scientists at Sigma-Proligo have identified key factors related to the synthesis of siRNA that are important for effective knockdown and have developed an RNA synthesis platform that delivers consistent high-quality siRNA.

Our RNA synthesis relies on the use of fast deprotection ribonucleoside phosphoramidites protected at the 2' position by a tert-butyldimethylsilyl (TBDMS) group and, at the 3' position, by a phosphoramidite. Optimized, proprietary platforms built around this allows for higher coupling efficiency and faster deprotection, resulting in higher quality synthesis and faster turn-around times.

The resulting siRNA in fact has been proven to provide successful gene silencing without the need for additional costly and time-consuming purifications.

With worldwide manufacturing capabilities and a capacity to synthesize over one million siRNA oligos annually, Sigma-Proligo offers reliable delivery to researchers globally.

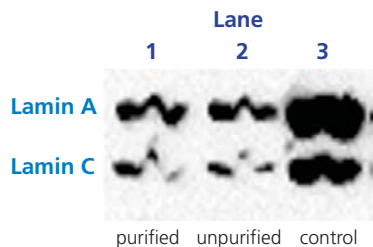
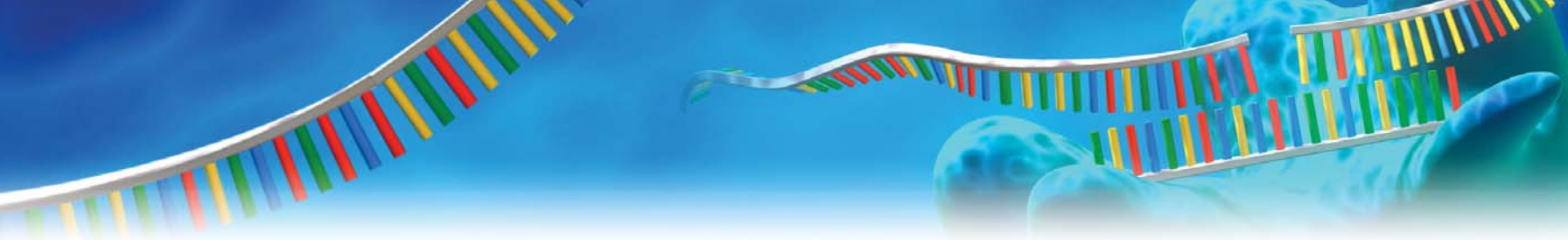
Regardless of your need, µg to multi-gram quantities, desalted or purified, labeled or modified Sigma-Proligo produces high-quality ready-to-use siRNA all manufactured under license from the Massachusetts Institute of Technology.

## Selected Technical References

### Unpurified siRNA Oligos are Effective in Reducing Gene Expression

Recent evidence demonstrates that unpurified (yet deprotected and desalted) siRNA oligos, manufactured by Sigma-Proligo are as effective as purified siRNA oligos in reducing gene expression<sup>†</sup>.

A study was performed using purified and unpurified siRNA oligos from Sigma-Proligo to induce Lamin A/C gene silencing in HeLa SS6 cells. The reduction in Lamin A/C proteins was **more than 90%** complete, as quantified by Western blotting, for both purified and unpurified siRNA oligos. This study demonstrates that unpurified siRNA oligos from Sigma-Proligo work equally as well as purified siRNA oligos.



### Both purified and unpurified siRNA silence gene expression efficiently

HeLa cells were treated with Lamin A/C siRNA<sup>‡</sup> duplex oligos from Sigma-Proligo. Equal amounts of total protein were loaded in each lane (control by reblot with vimentin specific antibody (data not shown)). **Lane 1:** purified siRNA duplex oligos. **Lane 2:** unpurified (deprotected and desalted) siRNA duplex oligos. **Lane 3:** cells treated with GL2 siRNA duplex oligos from Sigma-Proligo (non-specific siRNA control). Cells treated with both unpurified and purified siRNA duplex oligos showed more than a 90% reduction in the expression of Lamin A/C.

Image courtesy of Dr. Jens Harborth, Max-Planck-Institute for Biophysical Chemistry, Goettingen, Germany.

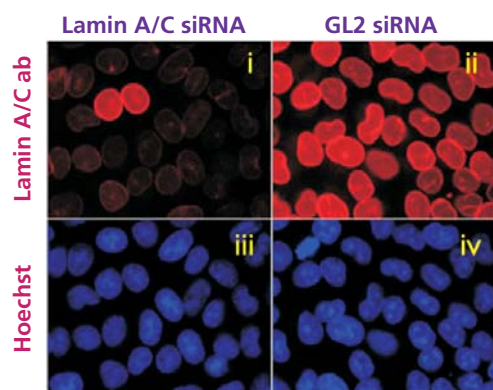
<sup>†</sup>Harborth J., *et al.*, Unpublished work.

<sup>‡</sup>siRNA sequences used in the above experiment are the ones reported in the following studies:

- Elbashir, S., J. Harborth, W. Lendeckel, A. Yalcin, K. Weber, and T. Tuschl. Duplexes of 21-nucleotide RNAs mediate RNA interference in cultured mammalian cells. *Nature*. 411:494-498, 2001.
- Harborth, J., S. Elbashir, K. Bechert, T. Tuschl, and K. Weber. Identification of essential genes in cultured mammalian cells using small interfering RNAs. *J. Cell Sci.* 114:4557-4565, 2001.

### siRNA Duplex Oligos from Sigma-Proligo Effectively Silence Genes

A study was undertaken to demonstrate the specific and powerful reduction of expression that can be obtained using siRNA oligos from Sigma-Proligo<sup>†</sup>.



HeLa SS6 cells were transfected with Lamin A/C siRNA duplex oligos from Sigma-Proligo (i and iii) or with GL2 siRNA duplex oligos from Sigma-Proligo (non-specific siRNA control (ii and iv)). Forty-eight hours after transfection, cells were fixed and stained with an anti-Lamin A/C antibody (red: i and ii) and Hoechst staining of the nuclear chromatin (blue: iii and iv). Only two cells were still strongly expressing Lamin A/C after siRNA treatment (i), while expression of Lamin A/C was unaffected in the control (ii).

Image courtesy of Dr. Jens Harborth, Max-Planck-Institute for Biophysical Chemistry, Goettingen, Germany.

<sup>†</sup>Harborth, J., *et al.*, Unpublished work.

#### Specifications of siRNA Oligos

<b>Quality Control</b>	All siRNA oligos undergo vigorous process monitoring and strict quality control. Length and labeling are systematically controlled by PAGE or mass spectrometry analysis. Quantity is systematically validated by UV absorbance at 260 nm.
<b>Purification</b>	Fully deprotected and desalted Purified by PAGE or RP-HPLC upon request.
<b>Length</b>	19 to 23 mers
<b>Bases</b>	RNA (A, C, G or U) DNA (A, C, G or T)
<b>Backbone</b>	Phosphodiester bond
<b>Labels and modifications</b>	Fluorescein, biotin and phosphate: 3' or 5' end Other labels available upon request
<b>Format</b>	Single stranded siRNA oligos are delivered dry; duplex siRNA oligos are delivered liquid; dry delivery of duplex siRNA oligos is available on request.
<b>Storage and stability</b>	Although oligonucleotides are stable in solution at 4 °C for up to 2 weeks, Sigma-Proligo recommends storage should be at -20 °C. Repetitive freeze-thaw cycles should be avoided by storing as aliquots. For long-term storage, siRNA oligos should be dried. Oligonucleotides with fluorescent labels should be protected from light. Sigma-Proligo guarantees its oligonucleotides for six months, when stored under the above conditions.
<b>Shipment</b>	Shipped by express delivery, transparent tubes.
<b>Oligonucleotide Technical Data Sheet</b>	Oligonucleotides are delivered with an Oligonucleotide Technical Data Sheet, which includes oligonucleotide name, sequence, concentration, precise quantity in OD and nmols, T <sub>m</sub> , MW, size extinction coefficient and purification data.  Additional gel images are provided for duplex confirmation when applicable.
<b>Services available upon request</b>	Aliquoting Design support
<b>Pricing</b>	Please contact your local sales representative.
<b>Ordering</b>	Online at <a href="http://www.sigma-aldrich.com">www.sigma-aldrich.com</a> , by email or by fax.

## Ordering Information

Please order online at [www.sigma-aldrich.com](http://www.sigma-aldrich.com). Alternatively, complete an email or fax order form available from our Web site. When you order online or by email, you will receive an automatic order confirmation by email within 3 hours. When your oligonucleotides are ready to be shipped you will also receive notification by email.

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## To contact us at Sigma-Proligo

### North America

Tel: 1 888 806 5446  
Fax: 1 866 986 5446  
[oligosales-us@proligo.com](mailto:oligosales-us@proligo.com)

### Singapore

Tel: +65 6873 2271  
Fax: +65 6873 5264  
[oligosales-sg@proligo.com](mailto:oligosales-sg@proligo.com)

### Europe

Tel: +33 (0) 1 43 56 59 00  
Fax: +33 (0) 1 43 56 59 48  
[oligosales-eu@proligo.com](mailto:oligosales-eu@proligo.com)

### Australia

Tel: +61 2 66 22 8614  
Fax: +61 2 66 22 3879  
[oligosales-au@proligo.com](mailto:oligosales-au@proligo.com)

### Japan

Tel: +81 75 313 19 74  
Fax: +81 75 313 21 79  
[oligosales-jp@proligo.com](mailto:oligosales-jp@proligo.com)

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