



NittoPhase[®]HL & NittoPhase[®] UnyLinker[™] Solid Support

Superior Universal Supports for Small to Large Scale Oligonucleotide Synthesis

Product Overview

UnyLinker[™] loaded NittoPhase[®]HL & NittoPhase[®] Solid Supports for Oligonucleotide Synthesis, derived from integration of ISIS Pharmaceuticals' UnyLinker[™] technology and Kinovate's proprietary solid support, have shown a proven track record of outstanding yields and purity as universal supports from lab to commercial scale at a highly competitive cost.

- Fully compatible with standard reagents and synthesis conditions
- Standard DMT group and deprotecting conditions
- Greater than 99% coupling efficiency
- 3'-OH oligonucleotides as end-products after cleavage
- Compatible with multiple chemistries
- Highly competitive cost

Advantages

- Elimination of the need for multiple succinates
- Improved oligonucleotide quality
- Consistency in batch-to-batch quality
- Reduced cost through streamline of inventory to one solid support
- Greater simplicity of inventory management & QC
- Greatly reducing regulatory requirements – no moiety from UnyLinker integrated into API after cleavage

Applications

- Phosphodiester DNA Oligonucleotides
- Phosphorothioate DNA Oligonucleotides
- 2'-O-Alkyl Oligonucleotides
- siRNA Oligonucleotides
- LNA and other modified Oligonucleotides
- Labeled Oligonucleotides

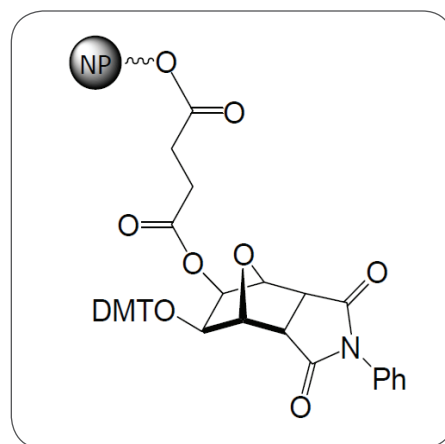


Figure 1. Structure of UnyLinker[™] loaded NittoPhase[®] Solid Support.

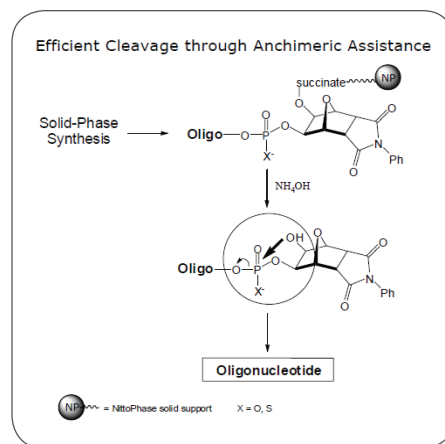


Figure 2. Proposed mechanism of cleavage reaction.

Performance

i) Comparative Syntheses at Lab Scale (1 mmol)*

UnyLinker™ on NittoPhase® Solid Support

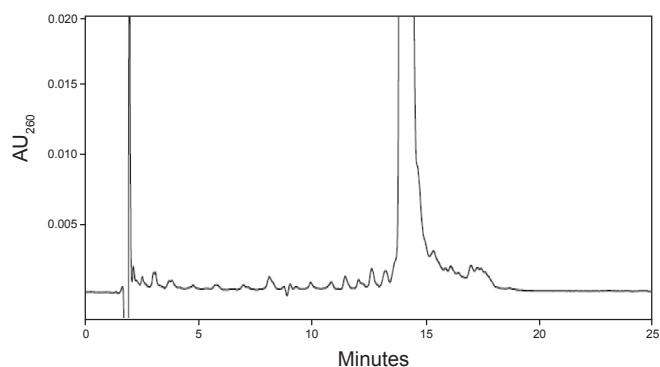


Fig 3. IP-HPLC analysis of crude oligonucleotide.

Sequence:	Isis MOE 5-10-5 Gapmer	Crude Full Length:	75%
Backbone:	Phosphorothioate diester	Purified Yield:	4.50 mg/μmol
Length:	20-mer	P=O:	1.7%
Support Loading:	207 μmol/g	N-1:	1.4%
Synthesizer:	ÅKTA™ OligoPilot™100	Shortmer:	1.6%
Column:	24 ml fixed bed column	Full Length:	95.8%
Synthesis Scale:	1 mmol	Longmer:	2.5%

MOE MeC Succinate on Support A

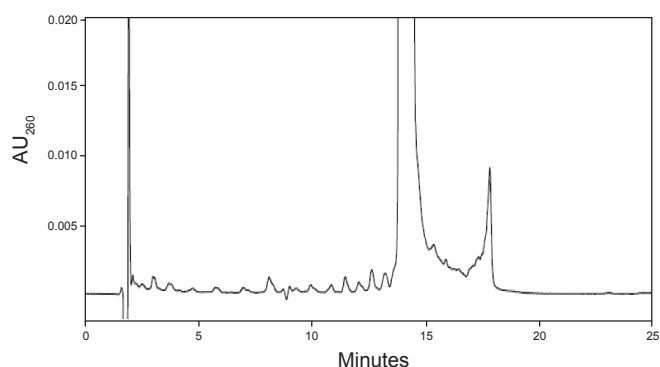


Fig 4. IP-HPLC analysis of crude oligonucleotide.

Sequence:	Isis MOE 5-10-5 Gapmer	Crude Full Length:	74%
Backbone:	Phosphorothioate diester	Purified Yield:	3.99 mg/μmol
Length:	20-mer	P=O:	2.7%
Support Loading:	201 μmol/g	N-1:	0.8%
Synthesizer:	ÅKTA™ OligoPilot™100	Shortmer:	1.5%
Column:	24 ml fixed bed column	Full Length:	94.3%
Synthesis Scale:	1 mmol	Longmer:	4.2%

ii) Commercial Scale (900 mmol)*

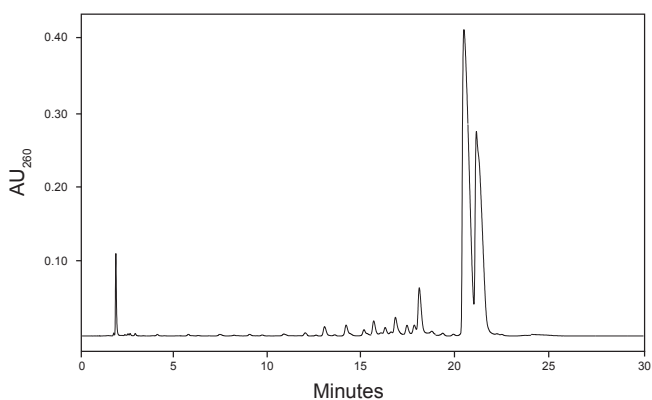


Fig 5. IPHPLC analysis of crude oligonucleotide.

Sequence:	Isis 5-10-5 MOE Gapmer	Synthesis Scale:	900 mmol
Backbone:	Phosphorothioate diester	Crude Full Length:	83%
Length:	20-mer	Crude Yield:	105 OD ₂₆₀ /μmol
Support Loading:	315 μmol/g		
Synthesizer:	ÅKTA™ OligoProcess™		
Column:	TechniKrom® 60 cm (Asahi Kasei)		

* Data Courtesy of Isis Pharmaceuticals, Inc.

Product Formats

UnyLinker™ loaded NittoPhase®HL & NittoPhase® Solid Supports are available in a wide range of loading levels to meet the full array of oligonucleotide synthesis needs.

About Kinovate Life Sciences, Inc.

Founded in 2004, Kinovate Life Sciences, Inc. has established itself as a leader in the field of solid supports for oligonucleotide synthesis. Our manufacturing quality management system has been developed to be fully compliant with ISO9001:2008. Our mission is to deliver the highest quality product at the most competitive price with the best customer service. Our commitment to these values has made us number one partner of choice for the industry's solid support needs.

For more information, please visit www.kinovate.com or contact info@kinovate.com