



Certificate of Analysis

Customer Name: Customer
Report Date: 1/16/2009
Order #: 12345

QC Summary

Name	Oligo # Lot #	Sequence	Expected Mass	Observed Mass	Mass Error ¹	Pass/Fail
Name	6346-001	ACGTACGTACGTACGTACG	6930.2	6931.1	0.013 %	Pass
Name	6346-004	ACGTACGTACGTACGTACG	6930.2	6930.4	0.003 %	Pass

1. Observed mass should be within 0.1% of expected mass unless the sequence contains degenerate base(s)

Method Summary

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the observed mass.

Approved for Released: _____

QC Manager



Certificate of Analysis

Customer Name: Customer
Report Date: 1/15/2009
Order #: 1234567890

QC Summary

Product ID	Batch No.	Expected Mass	Observed Mass	% Difference	Tolerance	Result
Name	6708-001	9,205.8	9202.6	0.04%	+/- 0.1%	Pass

Volume (mL)	Concentration (μM)	Total nmoles	Purification method
1.0	125	125	HPLC, Reverse-phase

Method Summary

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the observed mass.

Approved for Release: _____

QC Manager

Example of Customer Specified CoA (with Mass Spec and HPLC traces)



Certificate of Analysis

Customer Name: Customer
Report Date: 1/16/2009
Order #: 1234567890

QC Summary

DNA Name	Expected Mass	Observed Mass	Mass Error ¹	HPLC Spec	HPLC Purity ²	Amount Shipped	Amount Shipped	Amount Shipped
Name	6430.0	6426.5	0.05%	>85%	88%	1001 OD	34.5 mg	5.15 µmol

2. Observed mass should be within 0.1% of expected mass
3. HPLC purity determined using RP-HPLC

Method Summary

HPLC – Analytical HPLC analysis was carried out using reverse-phase chromatography under the following conditions:

Column: Waters Xbridge OST C18 (4.6 x 50 mm, 2.5 µm)
Wavelength: 260 nm
Flow: 1.0 mL/min.

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the observed mass.

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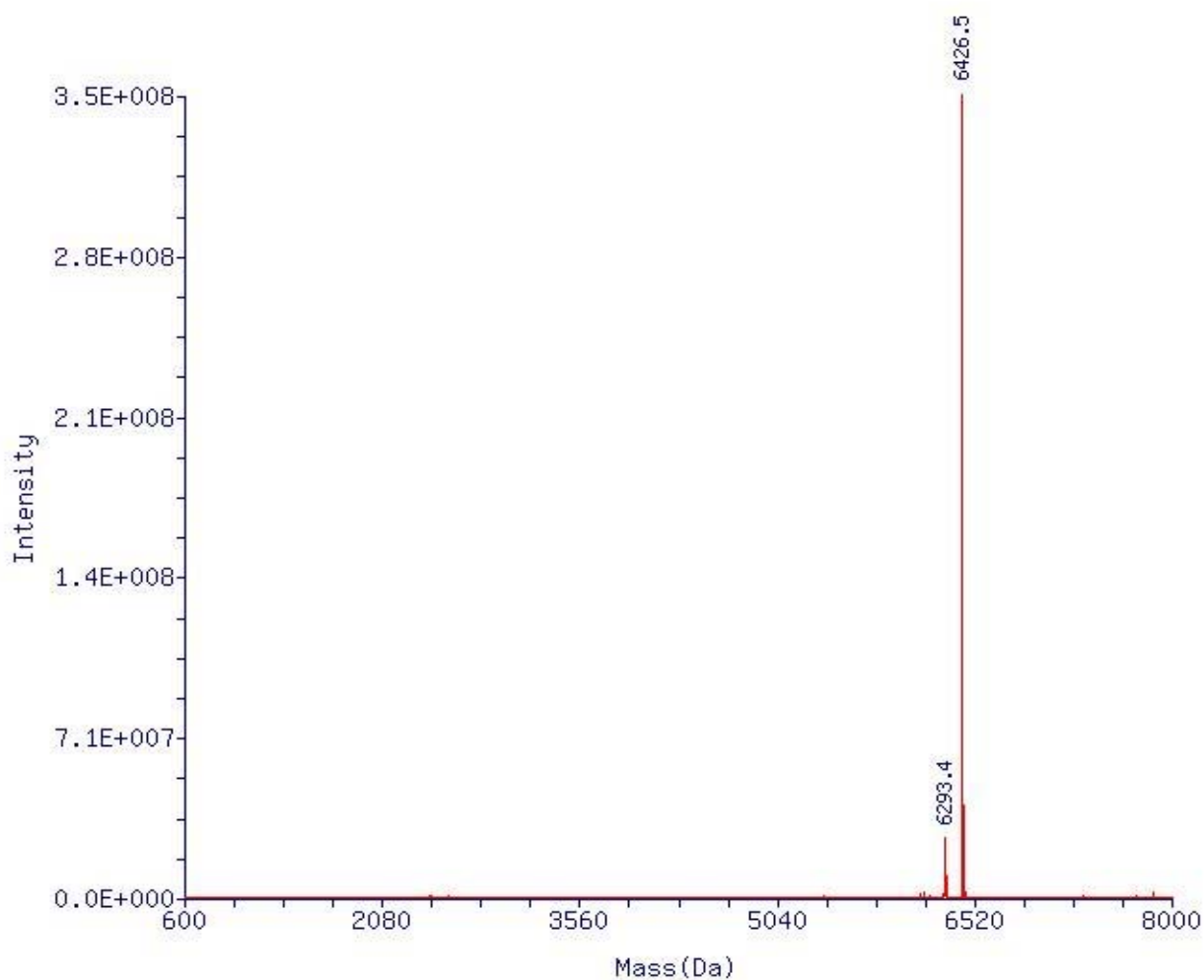
QC Manager

Mass Spec Data:

Comments: MOD ACGTACGTACGTACGTACGT
Sample ID: Name

Target Mass Summary

Target Mass (Da)	Observed Mass (Da)	Mass Error	Intensity	%Purity (Estimate)	Result Code
6430.0	6426.5	-3.5 Da (-0.054 %)	3.54E+008	93.37	

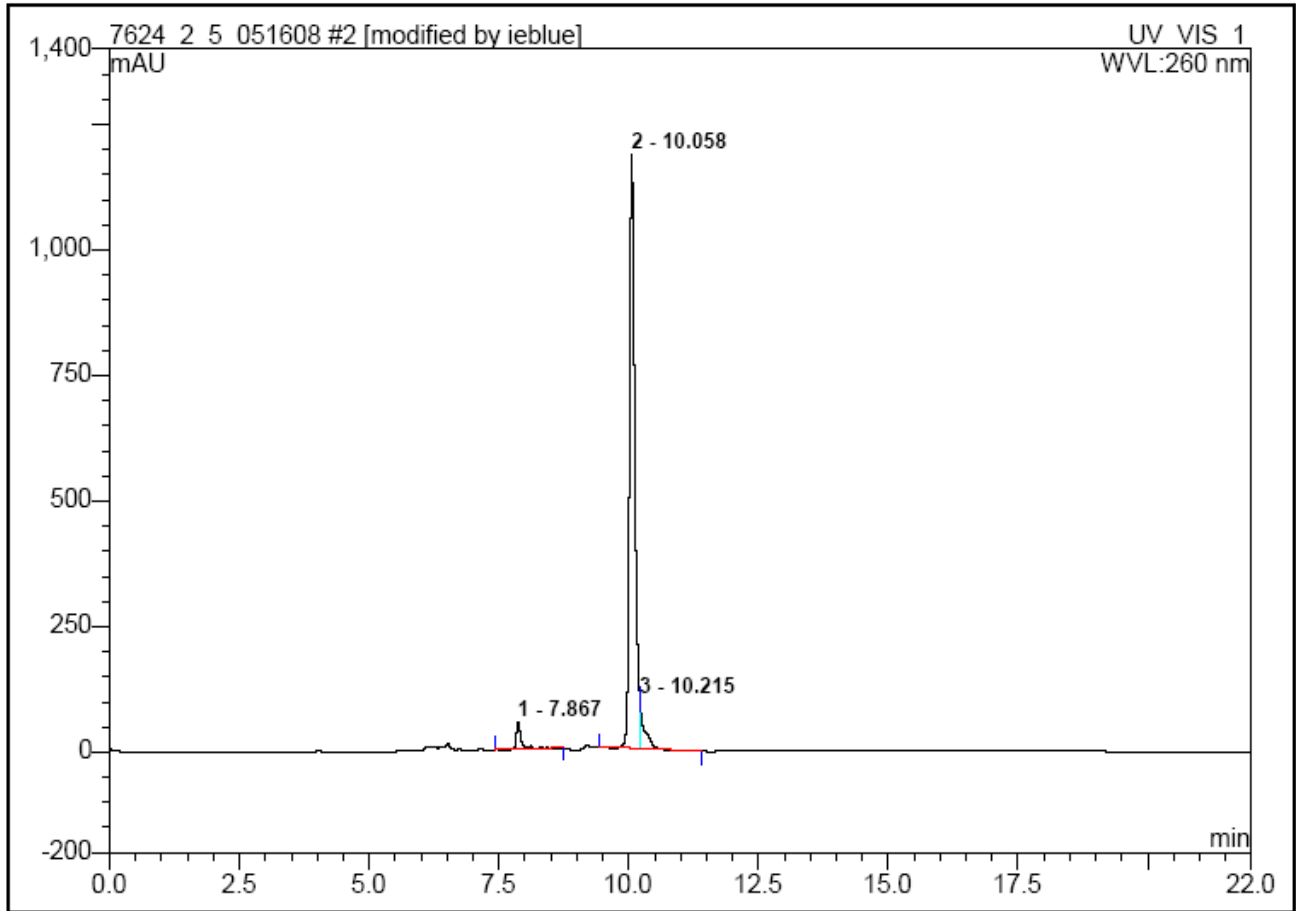


Mass (Da)	Intensity	DeltaMass	%Relative	%Total	Presumed Identity
6426.5	3.54E+008	0.0	100.00	93.37	Target Mass: 6430.0
6293.4	2.52E+007	-133.1	7.10	6.63	6430.0 (A depurination)

HPLC Data:

2 7624-002

Sample Name:	7624-002	Injection Volume:	20.0
Vial Number:	BB1	Channel:	UV_VIS_1
Sample Type:	unknown	Wavelength:	260
Control Program:	Thiol_RP Method_260	Bandwidth:	n.a.
Quantif. Method:	RP Method	Dilution Factor:	1.0000
Recording Time:	5/16/2008 13:47	Sample Weight:	1.0000
Run Time (min):	22.00	Sample Amount:	1.0000



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.87	n.a.	53.165	4.961	3.20	n.a.	BMB*
2	10.06	n.a.	1181.854	141.151	91.07	n.a.	BM *
3	10.22	n.a.	97.985	8.877	5.73	n.a.	MB*
Total:			1333.004	154.990	100.00	0.000	



Certificate of Analysis

Customer Name: Name
Report Date: 1/16/2009
Order #: 1234567890

QC Summary

DNA Name	Oligo #	Expected Mass	Observed Mass	Mass Error ¹	HPLC Spec	HPLC Purity	Amount Shipped
Name	7624-002	12629.81	12632.9	0.024 %	>65%	91.1%	12,243 ug
Name	7624-005	12415.88	12421.1	0.042 %	>65%	91.0%	10,909 ug

1. Observed mass should be within 0.1% of expected mass

Method Summary

HPLC – Analytical HPLC analysis was carried out using reverse-phase chromatography under the following conditions:

Column: Chromolith RP-18e (4.6 x 150 mm)
Wavelength: 260nm and 490nm
Flow: 1.0 mL/min.

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the observed mass.

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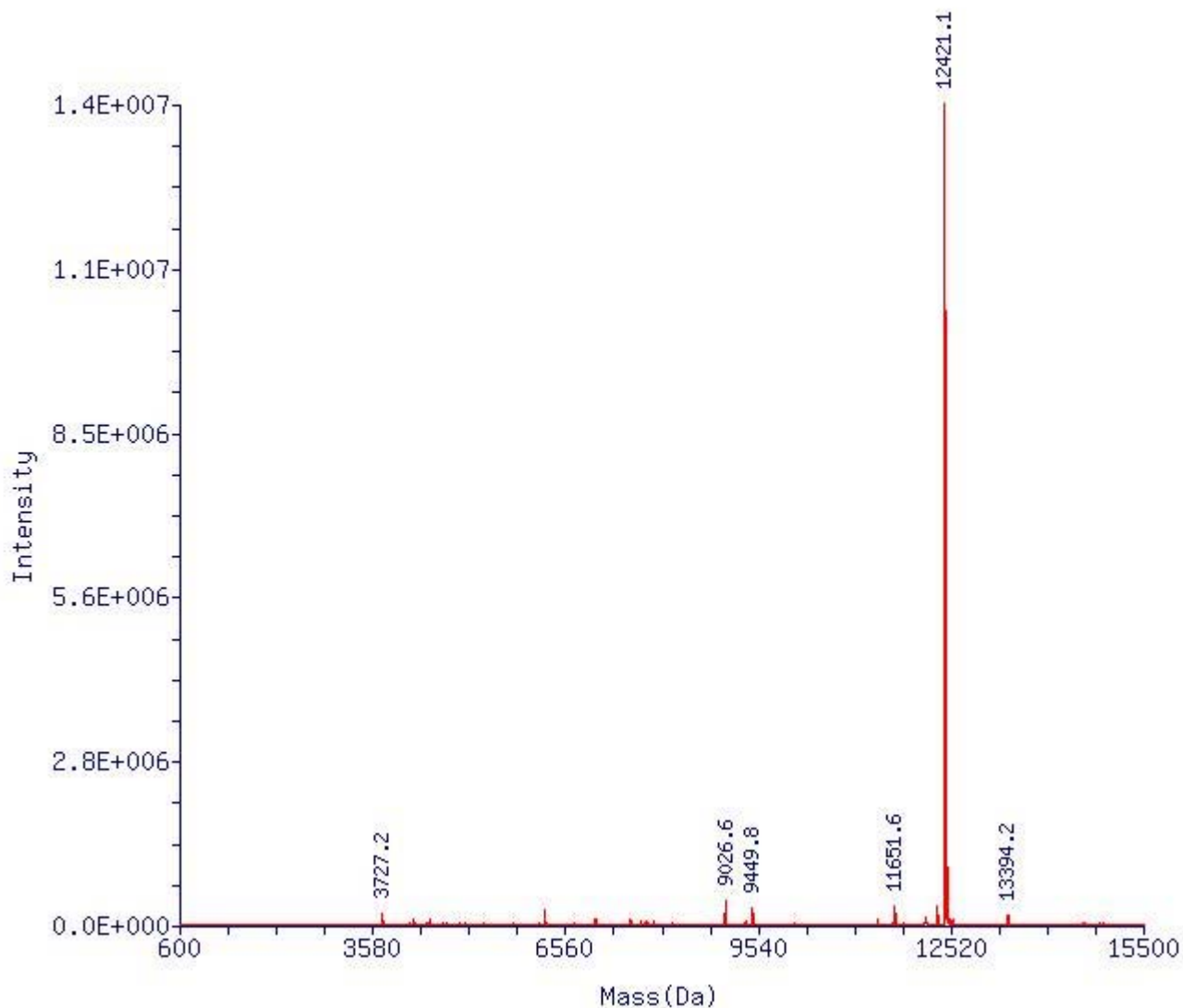
Mass Spec Data:

Sequence: 4ACGTACGTACGTACGTACGTACGTACGT

Sample ID: Name



Target Mass (Da)	Observed Mass (Da)	Mass Error	Intensity	%Purity (Estimate)	Result Code
12415.9	12421.1	5.2 Da (0.042 %)	1.41E+007	89.21	

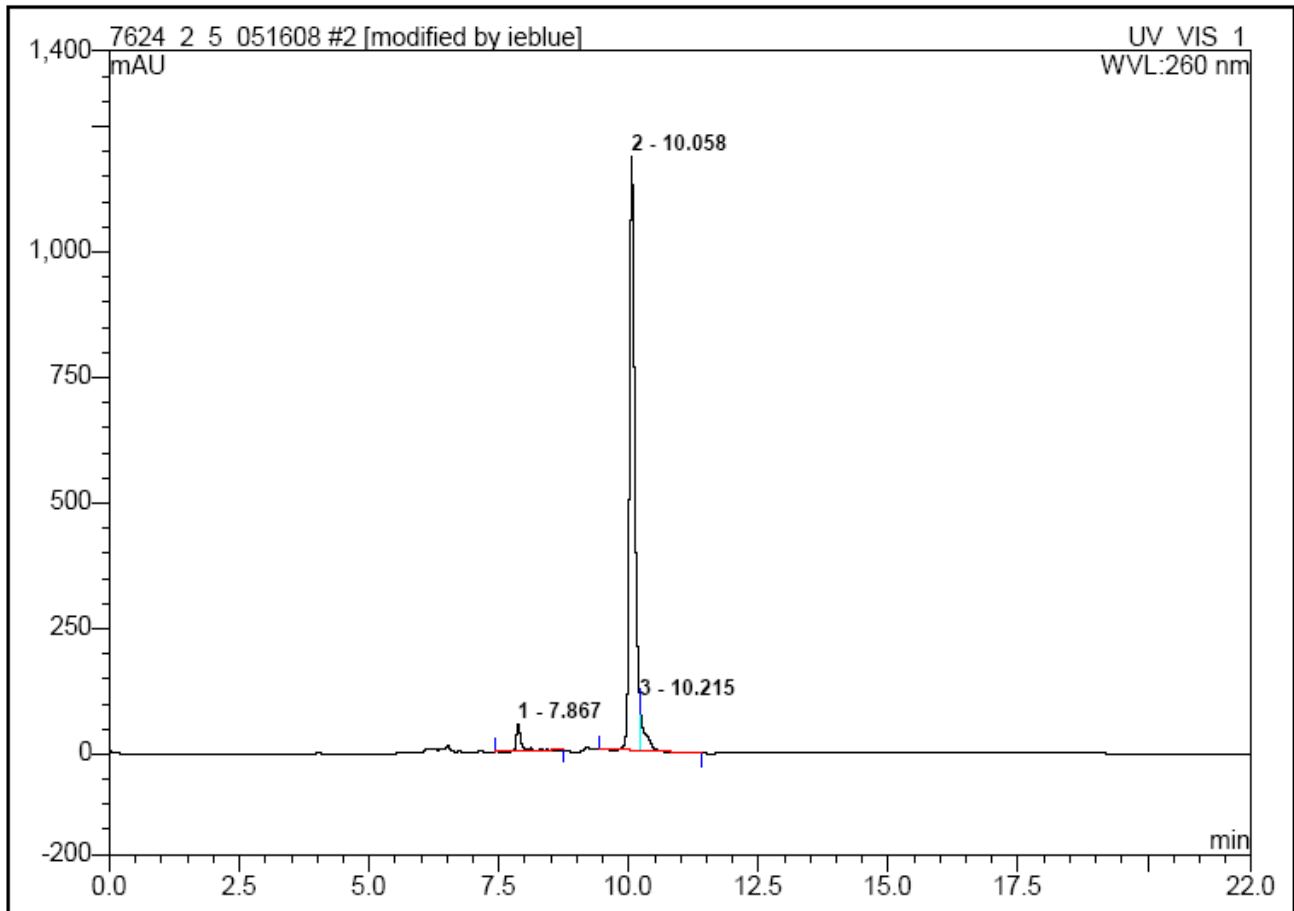


Mass (Da)	Intensity	DeltaMass	%Relative	%Total	PresumedIdentity
12421.1	1.41E+007	0.0	100.00	80.53	Target Mass: 12415.9
12447.9	1.52E+006	26.8	10.77	8.67	12415.9 (*K adduct)

HPLC Data:

2 7624-002

Sample Name:	7624-002	Injection Volume:	20.0
Vial Number:	BB1	Channel:	UV_VIS_1
Sample Type:	unknown	Wavelength:	260
Control Program:	Thiol_RP Method_260	Bandwidth:	n.a.
Quantif. Method:	RP Method	Dilution Factor:	1.0000
Recording Time:	5/16/2008 13:47	Sample Weight:	1.0000
Run Time (min):	22.00	Sample Amount:	1.0000



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.87	n.a.	53.165	4.961	3.20	n.a.	BMB*
2	10.06	n.a.	1181.854	141.151	91.07	n.a.	BM *
3	10.22	n.a.	97.985	8.877	5.73	n.a.	MB*
Total:			1333.004	154.990	100.00	0.000	



Certificate of Analysis

Customer Name: OEM
Report Date: 8/13/2008
Order #: 3000402902

QC Summary

DNA Name	Expected Mass	Observed Mass	Mass Error ¹	HPLC Spec	HPLC Purity ²	Amount Shipped
Name	6737.0	6739.8	0.042%	>= 85%	94.6%	79.3 mgs
Name	6641.0	6640.3	0.011%	>= 85%	95.0%	79.7 mgs
Name	6650.0	6651.7	0.026%	>= 85%	92.3%	80.2 mgs

1. Observed mass should be within 0.1% of expected mass
2. HPLC purity determined using RP-HPLC

Method Summary

HPLC – Analytical HPLC analysis was carried out using the reverse-phase chromatography under the following conditions:

Column: Chromolith RP-18e (4.6 x 150 mm)
Wavelength: 260nm
Flow: 1.0 mL/min.

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the observed mass.

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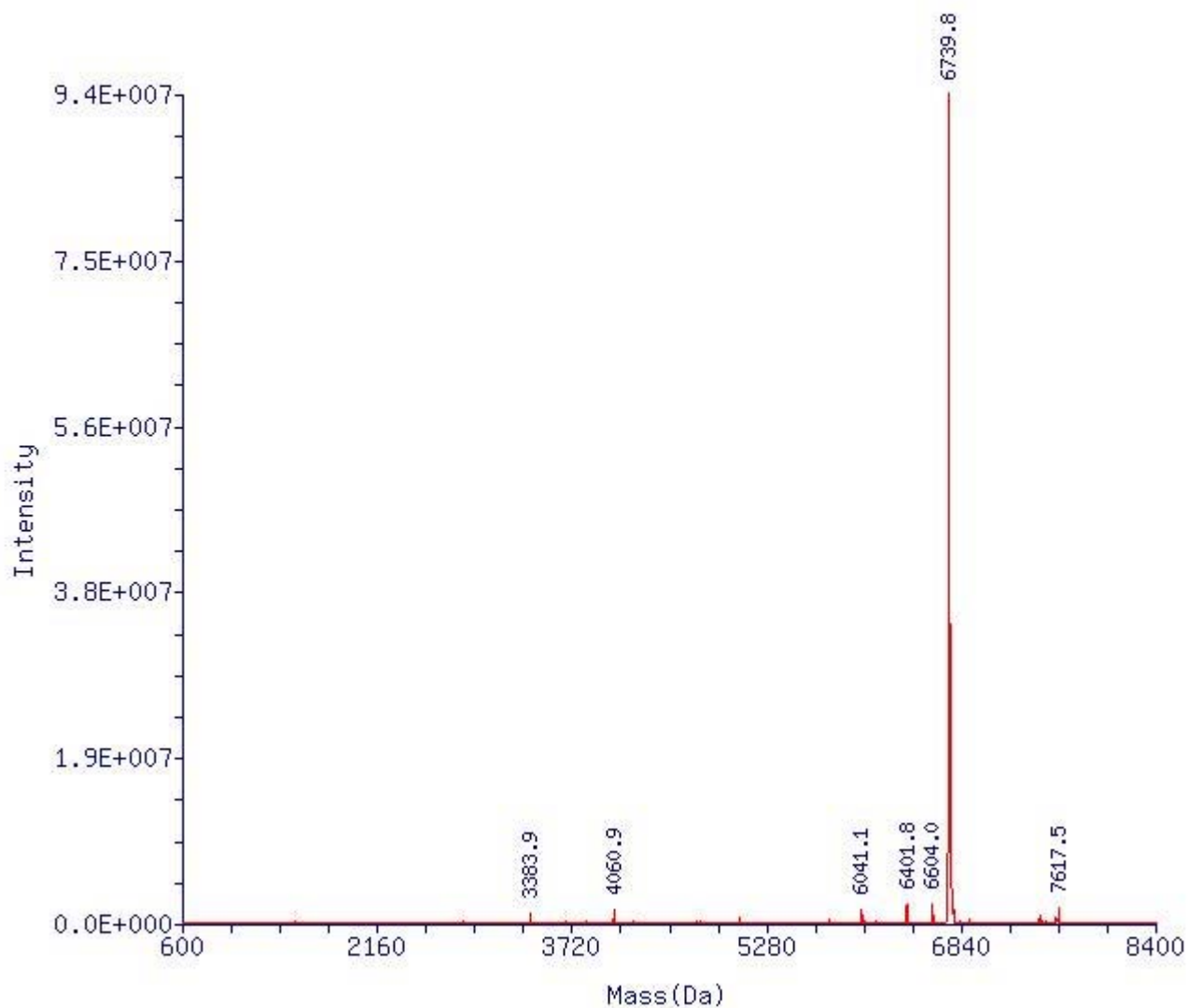
QC Manager

Mass Spec Data

Sample Name: Name

Sequence: ACGTACGTACGTACGTACGTACGTACGT

Target Mass (Da)	Observed Mass (Da)	Mass Error	Intensity	%Purity (Estimate)	Result Code
6737.0	6739.8	2.8 Da (0.042 %)	9.37E+007	73.66	

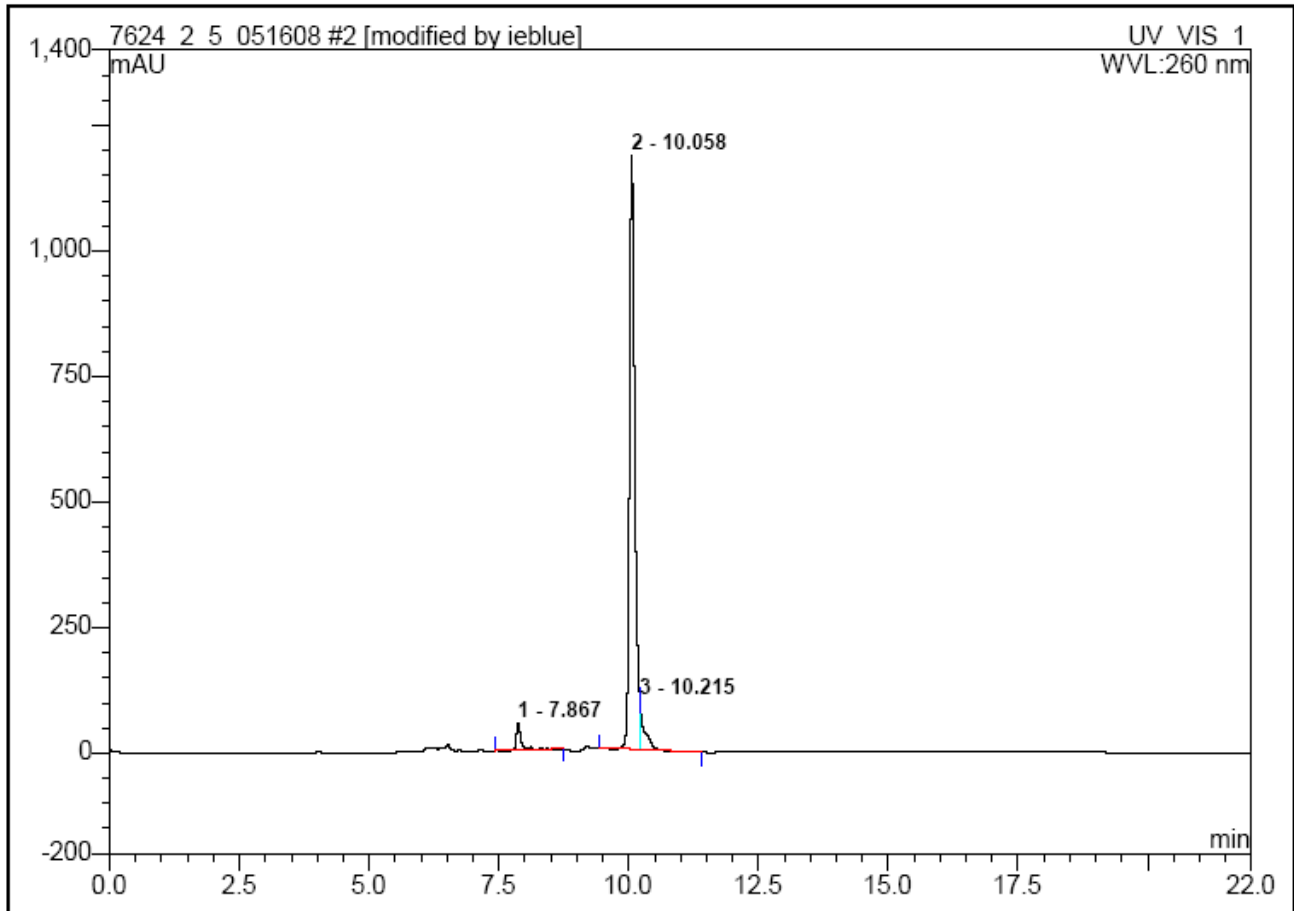


Mass (Da)	Intensity	DeltaMass	%Relative	%Total	Presumed Identity
6739.8	9.37E+007	0.0	100.00	73.66	Target Mass: 6737.0
6754.4	1.50E+007	14.6	16.00	11.79	?
6604.0	2.06E+006	-135.8	2.20	1.62	6737.0 (A depurination)

IE-HPLC Data

2 7624-002

Sample Name:	7624-002	Injection Volume:	20.0
Vial Number:	BB1	Channel:	UV_VIS_1
Sample Type:	unknown	Wavelength:	260
Control Program:	Thiol_RP Method_260	Bandwidth:	n.a.
Quantif. Method:	RP Method	Dilution Factor:	1.0000
Recording Time:	5/16/2008 13:47	Sample Weight:	1.0000
Run Time (min):	22.00	Sample Amount:	1.0000



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.87	n.a.	53.165	4.961	3.20	n.a.	BMB*
2	10.06	n.a.	1181.854	141.151	91.07	n.a.	BM *
3	10.22	n.a.	97.985	8.877	5.73	n.a.	MB*
Total:			1333.004	154.990	100.00	0.000	

Example of an Internal Customer CoA (without Mass Spec and HPLC traces)



Certificate of Analysis

Customer Name: Internal Customer
Report Date: 1/19/2009
Order #: 12345

QC Summary

Name	Oligo # Lot #	Sequence	Expected Mass	Observed Mass	Mass Error ¹	Pass/Fail
Z6214	6413-003	ACGTACGTACGTACGTKNNNKNNK	9741.7	9737.3	0.05 %	Pass
Z6214	6339-016	ACGTACGTACGTACGTKNNNKNNK	9741.7	9737.5	0.04 %	Pass

1. Observed mass should be within 0.1% of expected mass. For sequences containing degenerate base(s), the expected mass should be within 0.5% of the expected MW.
2. These oligos contain degenerate bases.

Method Summary

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the observed mass.

Approved for Released: _____

QC Manager

Example of a Customer Specified CoA (with water specification included)

Certificate of Analysis

Customer: **Name**
Report Date: **1/16/2009**
Order #: **1234567890**

QC Summary

DNA Name	Oligo #	Expected Mass	Observed Mass	Mass Error ¹	HPLC Spec	HPLC Purity ²	Sequence	Amount Shipped
Name	4020-004	6443.0	6444.5	0.02%	>= 85%	94.6%	4ACGTACGTACGTACGTACGT	150µM x 200µL
Name	3942-018	6439.0	6440.6	0.03%	>= 85%	86.2%	4ACGTACGTACGTACGTACGT	150µM x 200µL

1 Observed mass should be within 0.1% of the expected mass.

2 HPLC purity was determined by RP-HPLC.

Analytical Method Summary

HPLC – Analytical RP-HPLC analysis was carried out under the following conditions:

Column: Chromolith RP-18e (4.6 x 150 mm)

Wavelength: 260nm

Flow: 1.0 mL/min.

Mass Spec – Samples were desalted using RP-guard column prior to mass spec analysis by ESI-MS. M/Z (mass/charge) ranging from 150 – 2000 Dalton was obtained and the m/z data was deconvoluted to determine the mass.

Approved for Release: _____

QC Manager



SIGMA-ALDRICH

Specification Sheet

Product Name	Water, Molecular Biology Reagent
Product Number	W4502
Product Brand	Sigma
CAS Number	7732-18-5
Molecular Formula	H ₂ O
Molecular Weight	18.02

TEST

APPEARANCE
DNASE BY AGAROSE GEL
RNASE BY PAGE
NICKASE AGAROSE GEL
PROTEASE
BIOBURDEN
DOCUMENT #

SPECIFICATION

CLEAR COLORLESS LIQUID
NONE DETECTED
NONE DETECTED
NONE DETECTED
NONE DETECTED
<= 10CFU/ML
W4502/08/18/06/4