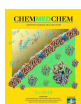


# CHEMMEDCHEM

## Supporting Information

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### **Proline-Rich Peptides with Improved Antimicrobial Activity against *E. coli*, *K. pneumoniae*, and *A. baumannii***

Mario Mardirossian, Riccardo Sola, Bertrand Beckert, Dominic W. P. Collis, Adriana Di Stasi, Federica Armas, Kai Hilpert, Daniel N. Wilson,\* and Marco Scocchi\*© 2019 The Authors. Published by Wiley-VCH Verlag GmbH & Co. KGaA. This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

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**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-1
<b>Lot No.</b>	GT31707-1-1207
<b>Sequence</b>	RRIRPRPPRLPRPRPR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	16AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2076.49
<b>Storage</b>	-20°C

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<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2079.75	Conforms
<b>Purity by HPLC</b>	>95%	95.093%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Certified by:



Quality Assurance Department

Dec/17/2018

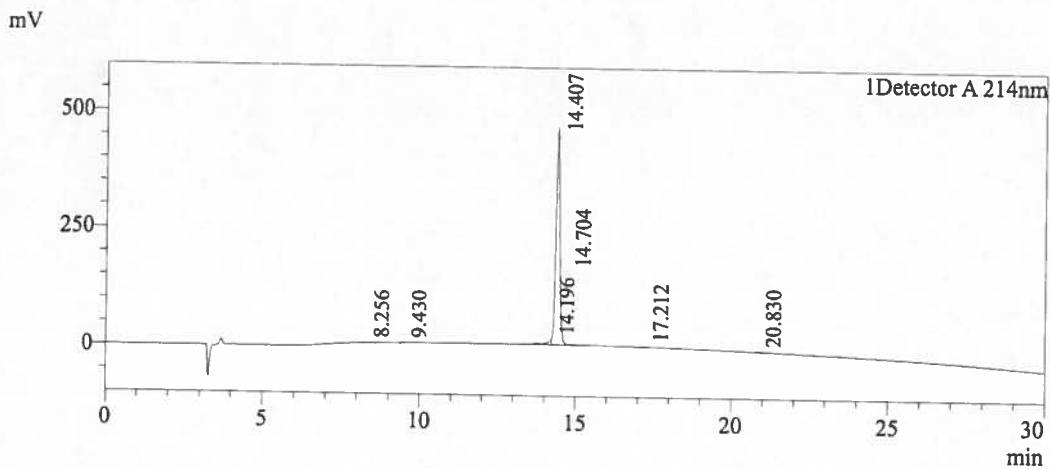


Sample Information

Order ID :GT31707-1  
 Name :7wt  
 Sequence :RRIRPRPPRLPRPRPR  
 Lot. No :GT31707-1-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 15ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram



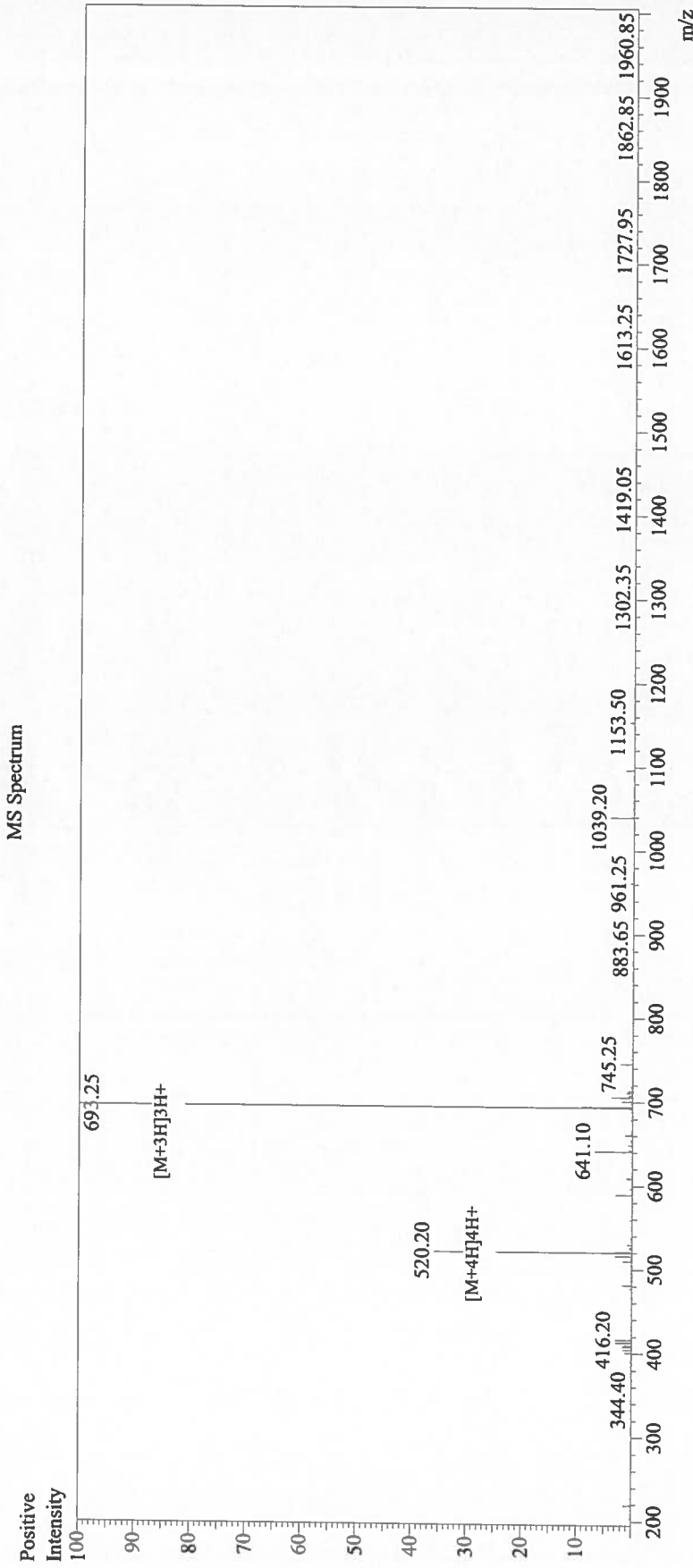
Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	8.256	3446	459	0.083
2	9.430	4244	599	0.102
3	14.196	136202	8350	3.268
4	14.407	3963790	463442	95.093
5	14.704	41038	2488	0.985
6	17.212	6074	934	0.146
7	20.830	13528	1143	0.325
Total		4168322	477414	100.000



B7 (1-16)



Sample Information

Dissolution method :5%HAC+8%ACN+87%H2O  
Date Acquired :2018/12/15 08:50:02  
Injection Volume :0.2ul  
Block Temp :200  
Interface :ESI  
Nebulizing Gas Flow :1.50L/min  
CDL Temp :250C  
CDL Volt :0v  
Prerod Bias :+4.5kv  
Detector :-0.2kv  
T.Flow :0.2ml/min  
B.conc :50%H2O/50%MEOH

Order ID :GT31707-1  
Name :7wt  
Sequence :RRIRPPRLPRRPR  
Lot.No :GT31707-1-1207  
Theoretical :2076.49  
Observed :2076.75

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-2
<b>Lot No.</b>	GT31707-2-1207
<b>Sequence</b>	WRIRPRPPRLPRRPR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	16AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2106.52
<b>Storage</b>	-20°C

<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2106.60	Conforms
<b>Purity by HPLC</b>	>95%	95.034%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Quality Assurance Department

Dec/18/2018

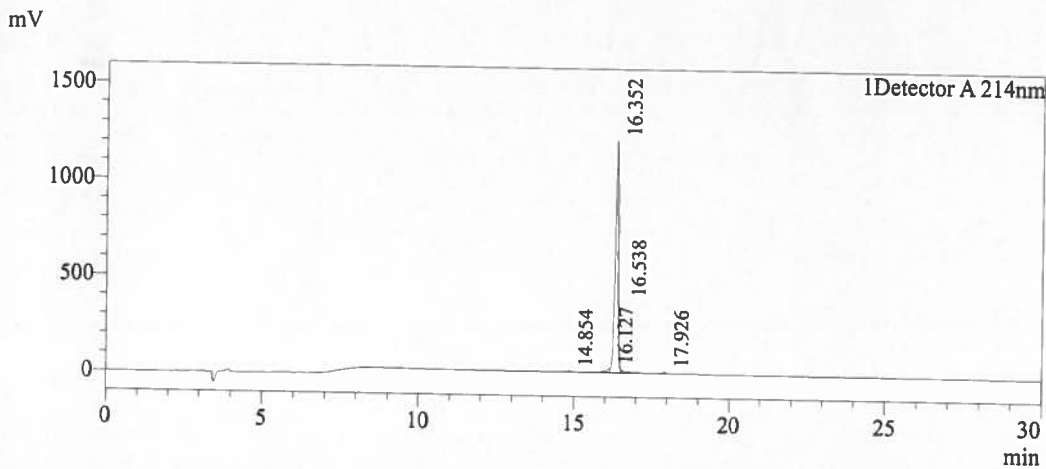


Sample Information

Order ID :GT31707-2  
 Name :242  
 Sequence :WRIRPRPPRLPRPRPR  
 Lot. No :GT31707-2-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 15ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram



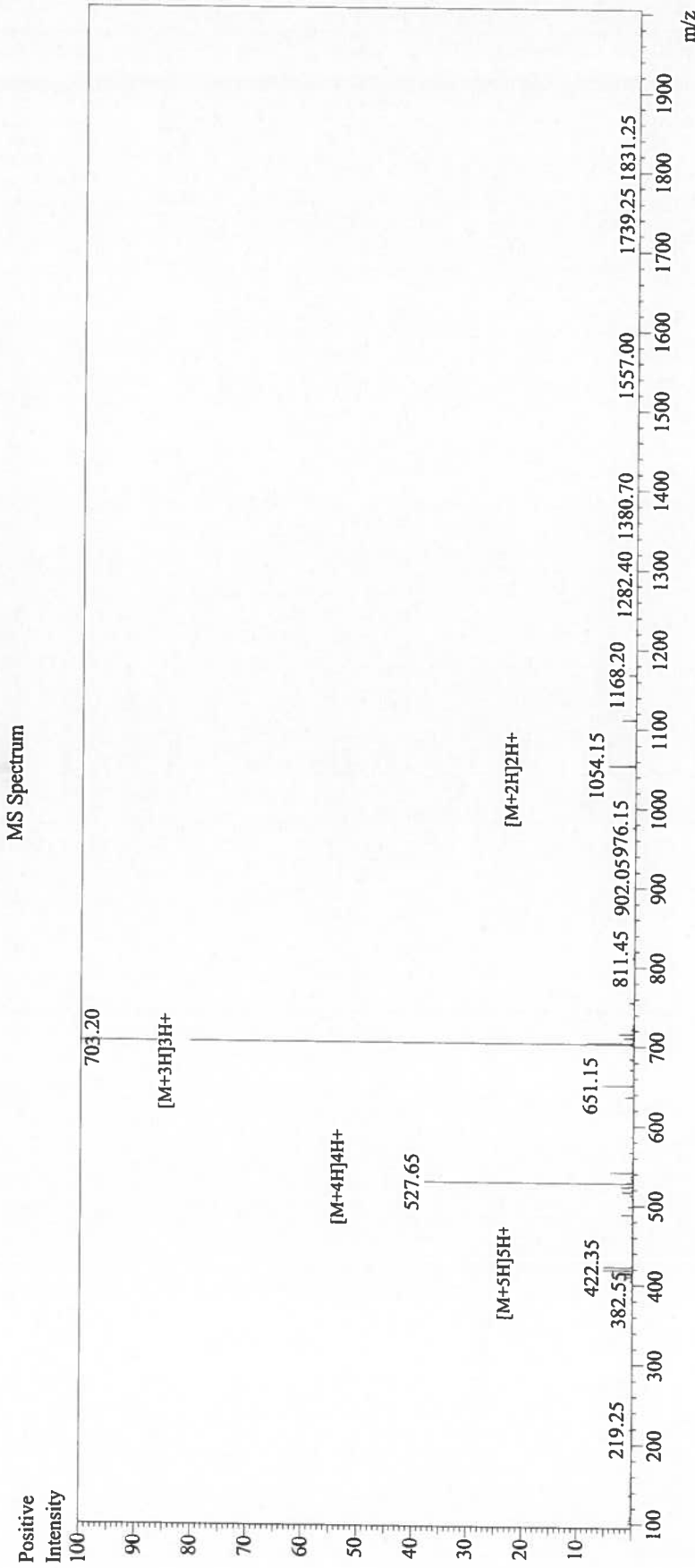
Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	14.854	23671	4689	0.277
2	16.127	200372	19148	2.343
3	16.352	8126260	1203262	95.034
4	16.538	138650	9886	1.621
5	17.926	61947	10015	0.724
Total		8550900	1246999	100.000



242



Sample Information

Dissolution method	:5%HAC+8%ACN+87%H2O	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/17 09:24:40	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50%H2O/50%MEOH

Order ID	:GT31707-2
Name	:242
Sequence	:WRIRPPRLPRPRR
Lot.No	:GT31707-2-1207
Theoretical	:2106.52
Observed	:2106.60

---

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-3
<b>Lot No.</b>	GT31707-3-1207
<b>Sequence</b>	RRIRPRPPRLPRPRWR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	16AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2165.59
<b>Storage</b>	-20°C

---

<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2165.70	Conforms
<b>Purity by HPLC</b>	>95%	95.024%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Quality Assurance Department

Dec/13/2018



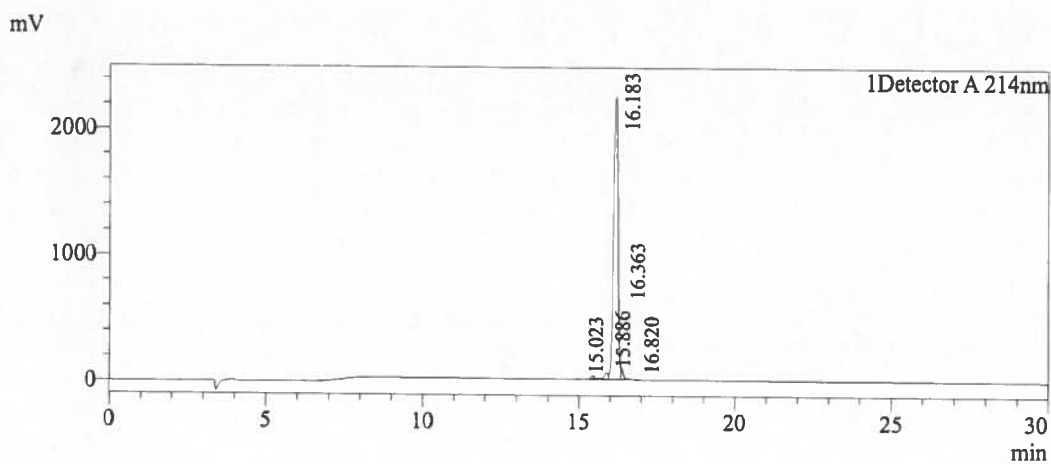


Sample Information

Order ID :GT31707-3  
 Name :244  
 Sequence :RRIRPRPPRLPRPRWR  
 Lot. No :GT31707-3-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 25ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram



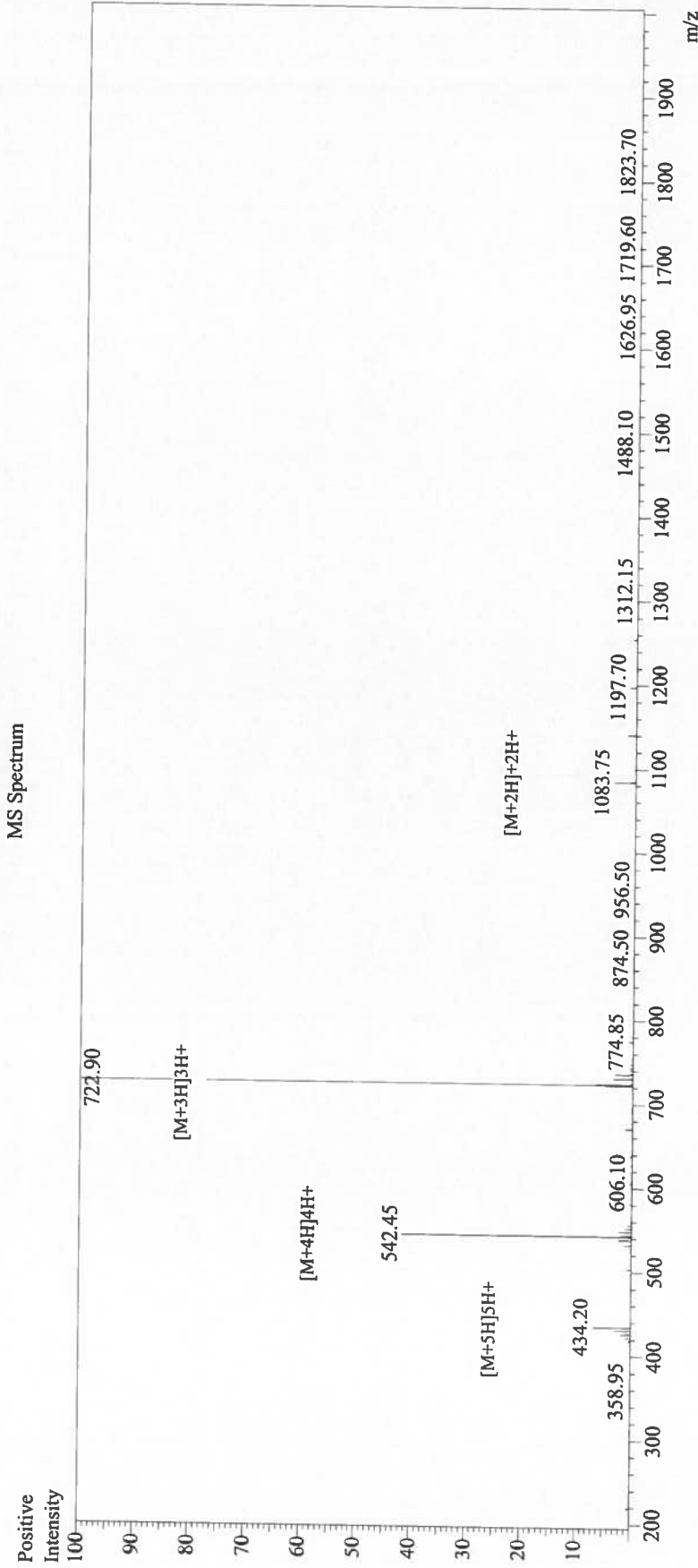
Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	15.023	7971	1151	0.035
2	15.886	698335	51578	3.068
3	16.183	21628832	2235071	95.024
4	16.363	408812	89035	1.796
5	16.820	17521	3263	0.077
Total		22761470	2380099	100.000



244



Sample Information

Dissolution method	: 5% HAC + 8% ACN + 87% H <sub>2</sub> O	Interface	: ESI	Prerod Bias	: +4.5 kv
Date Acquired	: 2018/12/15 08:54:54	Nebulizing Gas Flow	: 1.50 L/min	Detector	: -0.2 kv
Injection Volume	: 0.2 ul	CDL Temp	: 250 C	T.Flow	: 0.2 ml/min
Block Temp	: 200	CDL Volt	: 0 v	B.conc	: 50% H <sub>2</sub> O / 50% MEOH

Order ID	: GT31707-3
Name	: 244
Sequence	: RRJRRPRLPRRWR
Lot.No	: GT31707-3-1207
Theoretical	: 2165.59
Observed	: 2165.70

---

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-4
<b>Lot No.</b>	GT31707-4-1207
<b>Sequence</b>	WRIRPRPPRLPRWRPR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	16AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2195.62
<b>Storage</b>	-20°C

---

<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2195.55	Conforms
<b>Purity by HPLC</b>	>95%	95.754%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Quality Assurance Department

Dec/17/2018

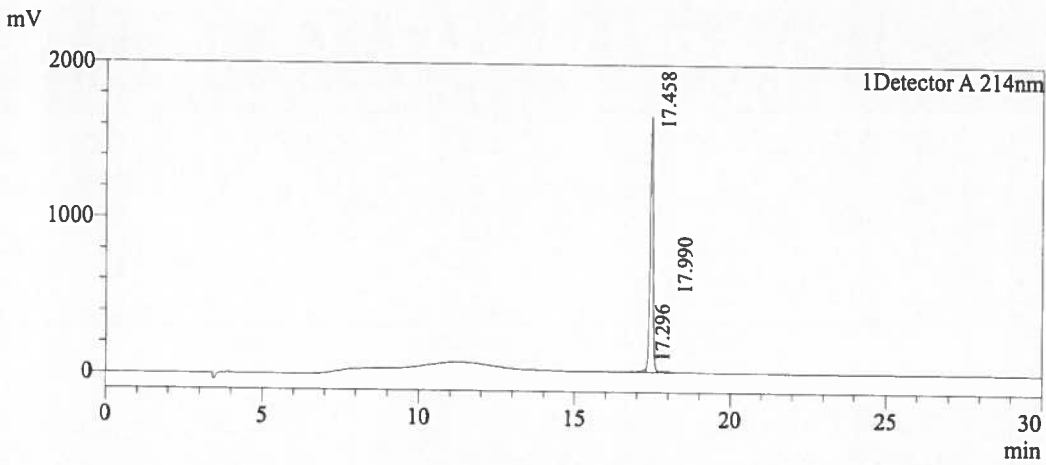


Sample Information

Order ID :GT31707-4  
 Name :245  
 Sequence :WRIRPRPPRLPRWRPR  
 Lot. No :GT31707-4-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 10ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram



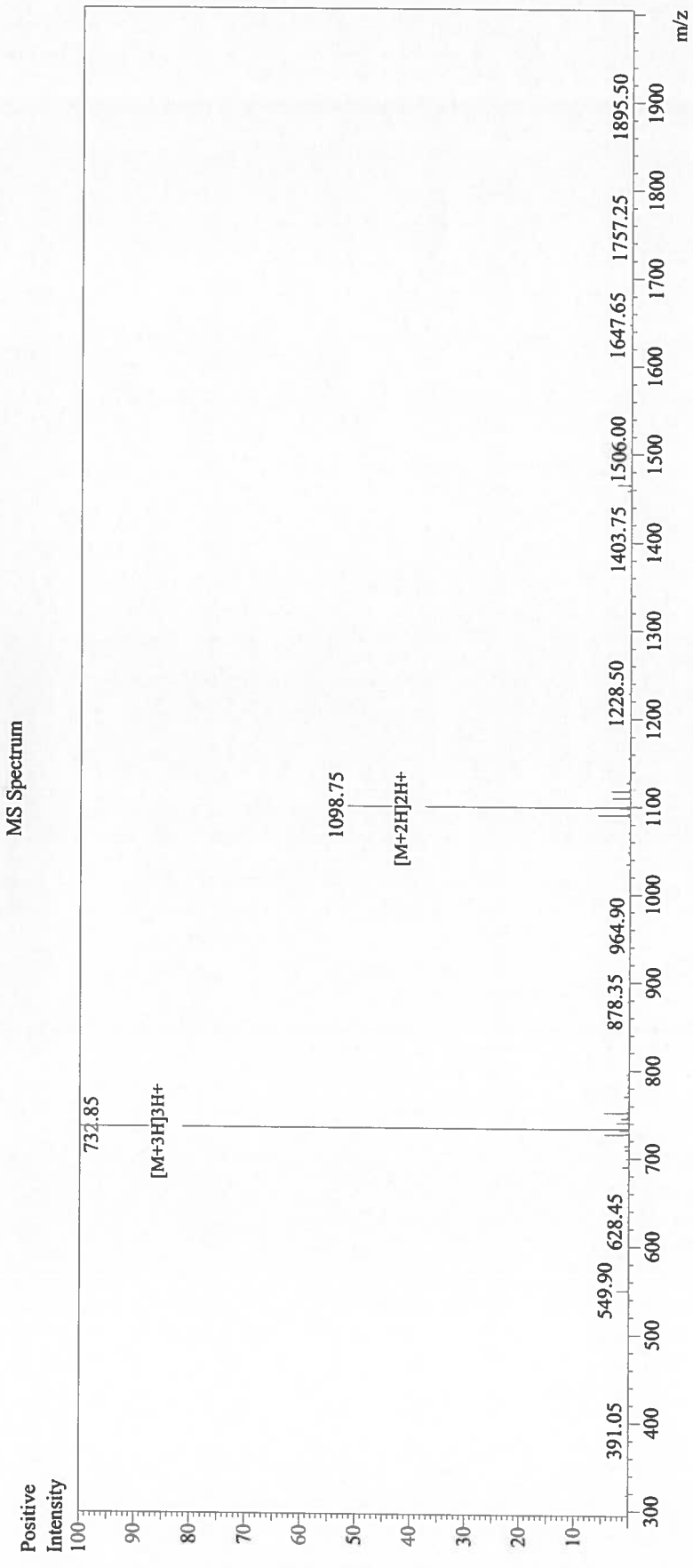
Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	17.296	297604	24647	2.783
2	17.458	10239216	1643273	95.754
3	17.990	156450	8360	1.463
Total		10693271	1676279	100.000



245



Sample Information

Dissolution method	:5%HAC+8%ACN+87%H2O	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/15 10:12:22	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50%H2O/50%MEOH
Order ID	:GT31707-4				
Name	:245				
Sequence	:WRIRPPRLPRWRPR				
Lot.No	:GT31707-4-1207				
Theoretical	:2195.62				
Observed	:2195.55				

---

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-5
<b>Lot No.</b>	GT31707-5-1207
<b>Sequence</b>	WRIRRRPRLPRRWR
<b>Dissolution condition</b>	100%H2O
<b>Length</b>	16AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2254.69
<b>Storage</b>	-20°C

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<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2255.10	Conforms
<b>Purity by HPLC</b>	>95%	95.220%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Dec/13/2018

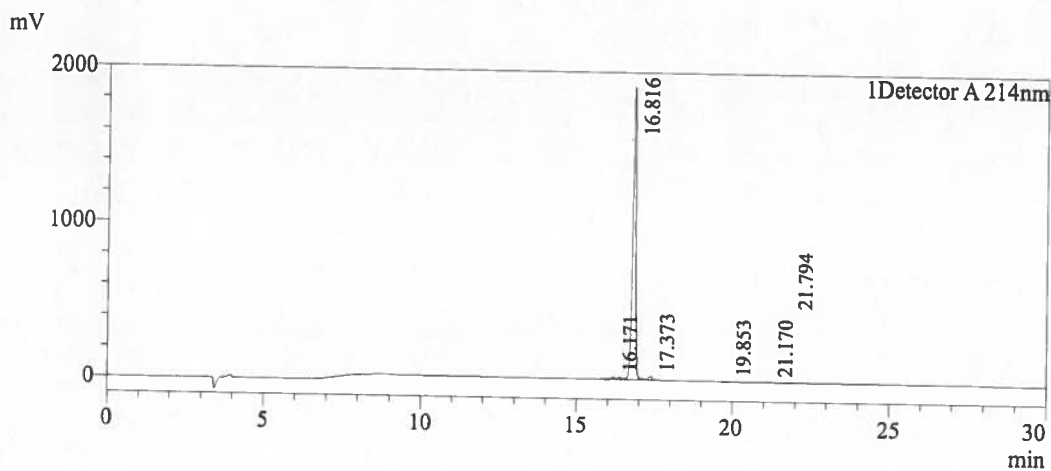


Sample Information

Order ID :GT31707-5  
 Name :250  
 Sequence :WRIRRRPPRLPRPRWR  
 Lot. No :GT31707-5-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 25ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram



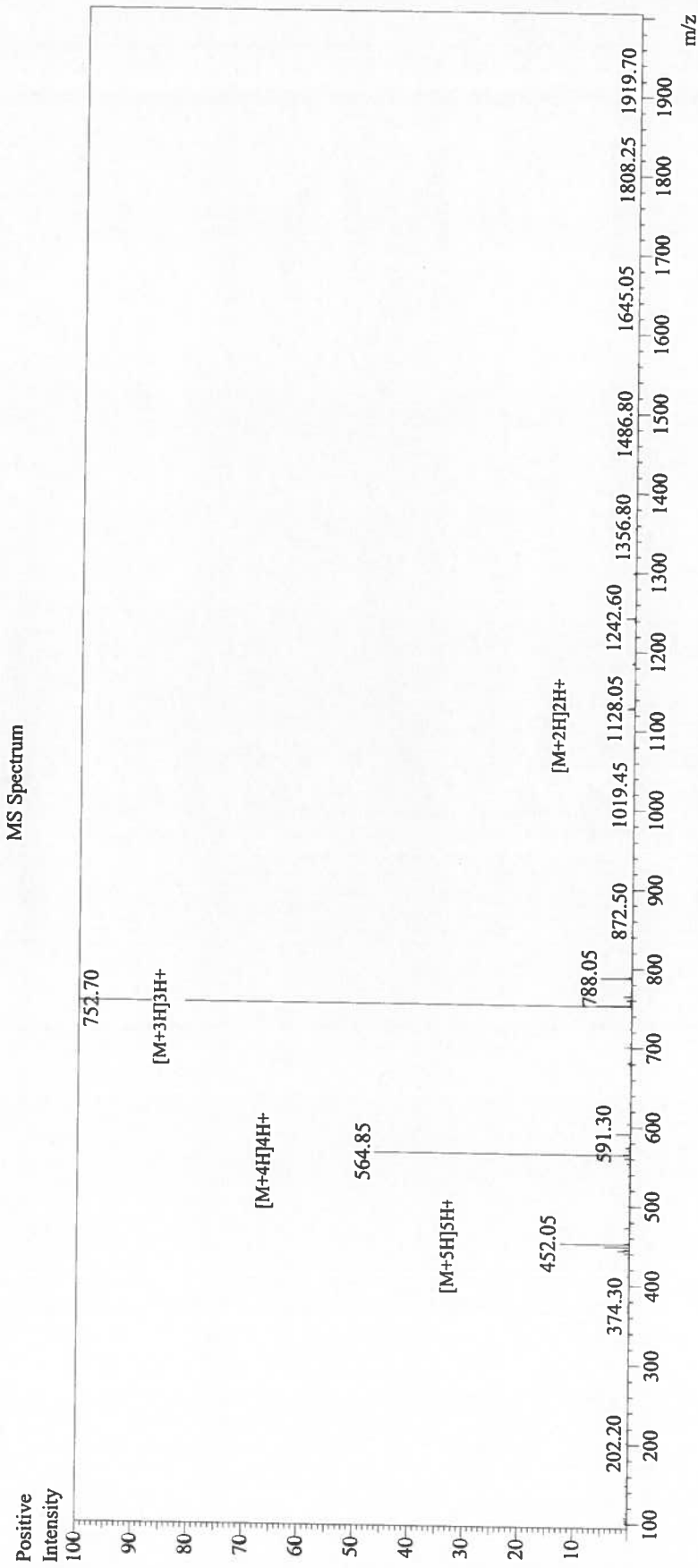
Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	16.171	305472	15438	2.266
2	16.816	12838537	1879442	95.220
3	17.373	315495	25325	2.340
4	19.853	5434	936	0.040
5	21.170	4112	609	0.030
6	21.794	13929	2214	0.103
Total		13482978	1923963	100.000



250



Sample Information

Dissolution method	:5%HAC+8%ACN+87%H2O	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/15 08:58:56	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50%H2O/50%MEOH
Order ID	:GT31707-5				
Name	:250				
Sequence	:WRRRPPRLPRRWR				
Lot.No	:GT31707-5-1207				
Theoretical	:2254.69				
Observed	:2255.10				



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**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-6
<b>Lot No.</b>	GT31707-6-1207
<b>Sequence</b>	WRIRRRWPRLPRPRWR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	16AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2343.79
<b>Storage</b>	-20°C

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<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2343.50	Conforms
<b>Purity by HPLC</b>	>95%	98.386%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Certified by:



Quality Assurance Department

Dec/18/2018





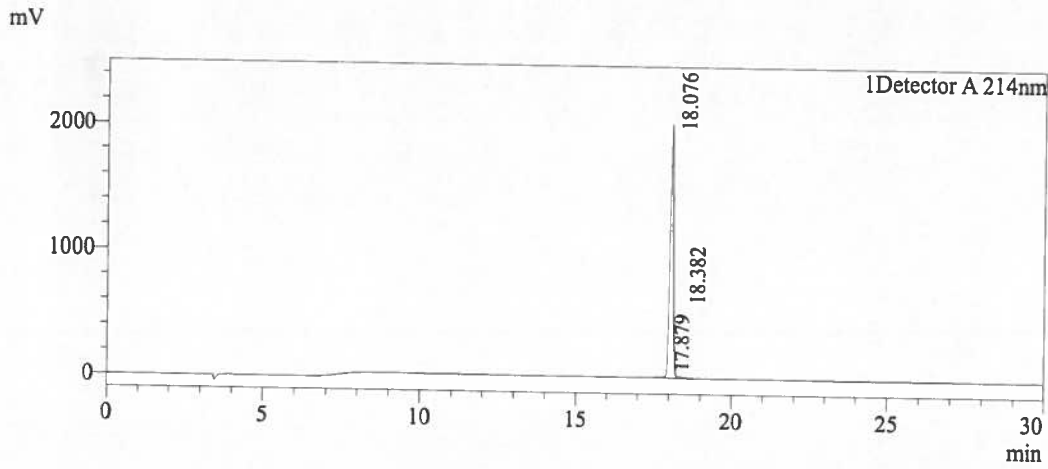
For enjoyable discovery

Sample Information

Order ID :GT31707-6  
 Name :254  
 Sequence :WRIRRRWPRLPRPRWR  
 Lot. No :GT31707-6-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 10ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram



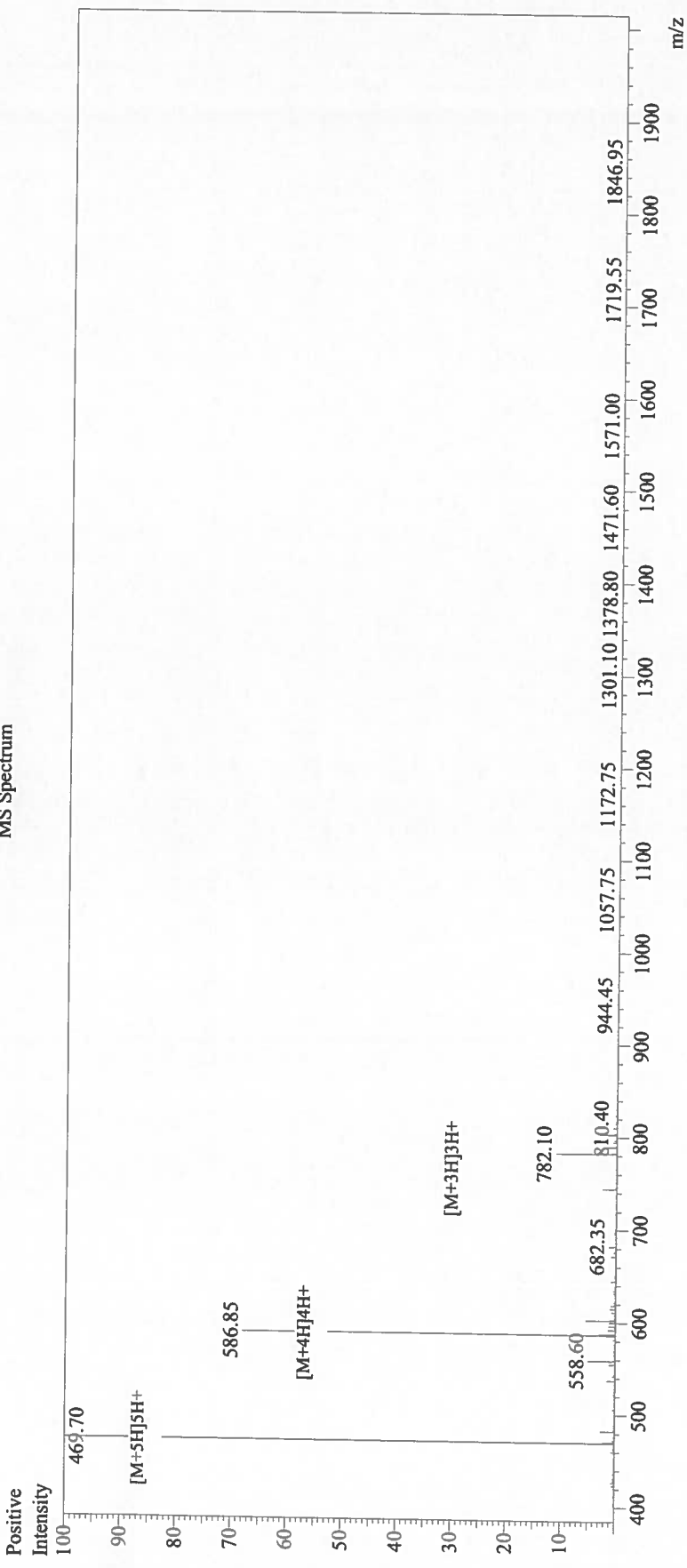
Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	17.879	128223	9487	0.887
2	18.076	14224262	2020394	98.386
3	18.382	105136	9516	0.727
Total		14457621	2039397	100.000



MS Spectrum



Sample Information

Dissolution method	:5%ACN+8%ACN+87%H2O	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/17 09:05:35	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50%H2O/50%MEOH

Order ID	:GT31707-6
Name	:254
Sequence	:WRIRRRWPRLPRRWR
Lot.No	:GT31707-6-1207
Theoretical	:2343.79
Observed	:2343.50

**CERTIFICATE OF ANALYSIS**

BAC5 (1-17)

**Product Name** GT31707-7  
**Lot No.** GT31707-7-1207  
**Sequence** RFRPPIRRPPIRPPFYF  
**Dissolution condition** 100%H<sub>2</sub>O  
**Length** 17AA  
**Modification** N/A  
**Molecular Weight (MW)** 2162.58  
**Storage** -20°C

Test Items	Specifications	Results
MW by MS	2162.25	Conforms
Purity by HPLC	>95%	95.980%
Peptide Content	N/A	N/A
Moisture content	N/A	N/A
Acetic acid content	N/A	N/A
Appearance	White to off-white lyophilized powder	Conforms
Quantity	10mg	10.0mg

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Certified by:



Quality Assurance Department

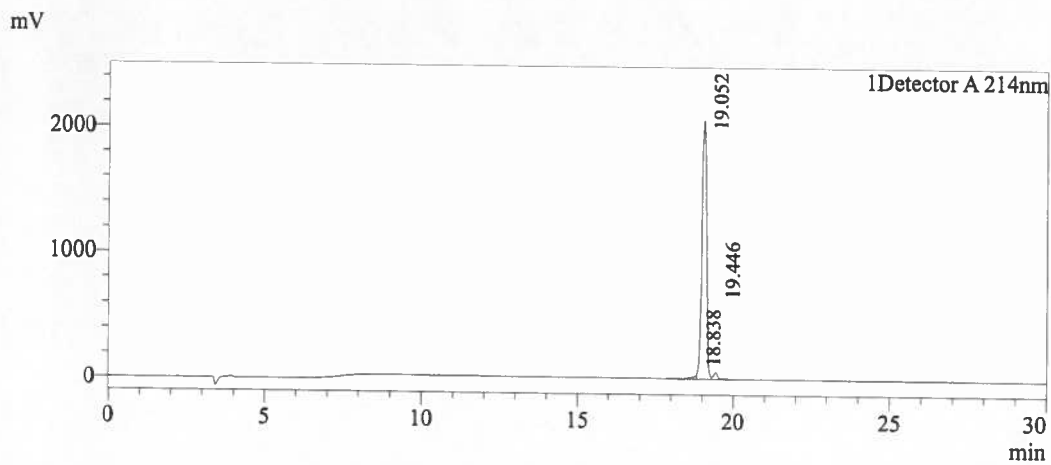
Dec/18/2018



## Sample Information

Order ID :GT31707-7  
 Name :5wt  
 Sequence :RFRPPIRRPPIRPPFYF  
 Lot. No :GT31707-7-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 20ul  
 Time Module Action Value  
 0.01 Pumps B.Conc 2  
 30.00 Pumps B.Conc 65  
 33.00 Pumps B.Conc 100  
 38.00 Pumps B.Conc 100  
 40.00 Pumps B.Conc 2  
 50.00 Controller Stop

## Chromatogram



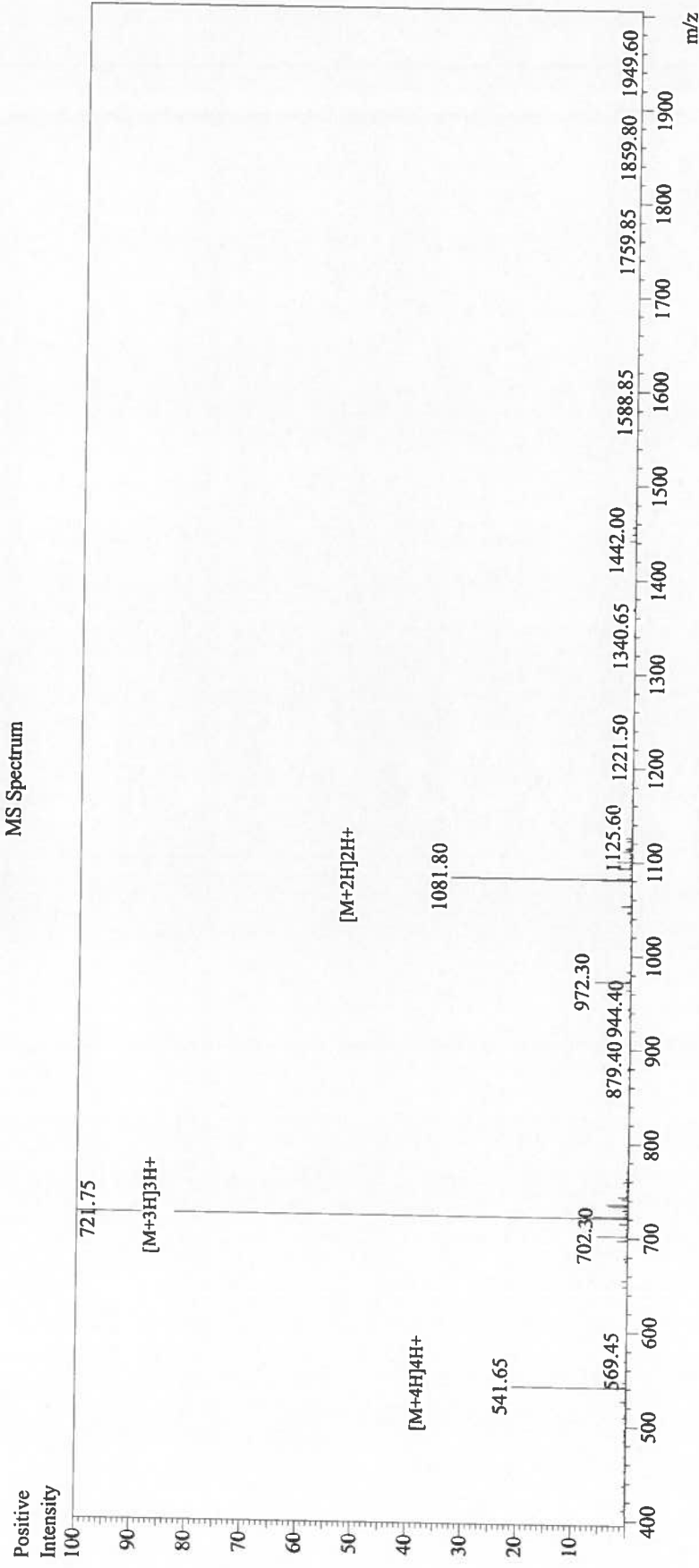
## Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	18.838	355307	34250	1.611
2	19.052	21168444	2047613	95.980
3	19.446	531209	53583	2.409
Total		22054959	2135446	100.000



PACS (1-17)



Sample Information

Dissolution method	:5% <b>HAC</b> +8% <b>ACN</b> +87% <b>H2O</b>	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/17 09:12:13	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50% <b>H2O</b> /50% <b>MEOH</b>

Order ID	:GT31707-7
Name	:5wt
Sequence	:RFRPPRRPPRRPPFP
Lot.No	:GT31707-7-1207
Theoretical	:2162.58
Observed	:2162.25

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-8
<b>Lot No.</b>	GT31707-8-1207
<b>Sequence</b>	RFRPPIRRPPIRPPFYR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	17AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2221.65
<b>Storage</b>	-20°C

Test Items	Specifications	Results
MW by MS	2221.50	Conforms
Purity by HPLC	>95%	97.577%
Peptide Content	N/A	N/A
Moisture content	N/A	N/A
Acetic acid content	N/A	N/A
Appearance	White to off-white lyophilized powder	Conforms
Quantity	10mg	10.0mg

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Dec/15/2018

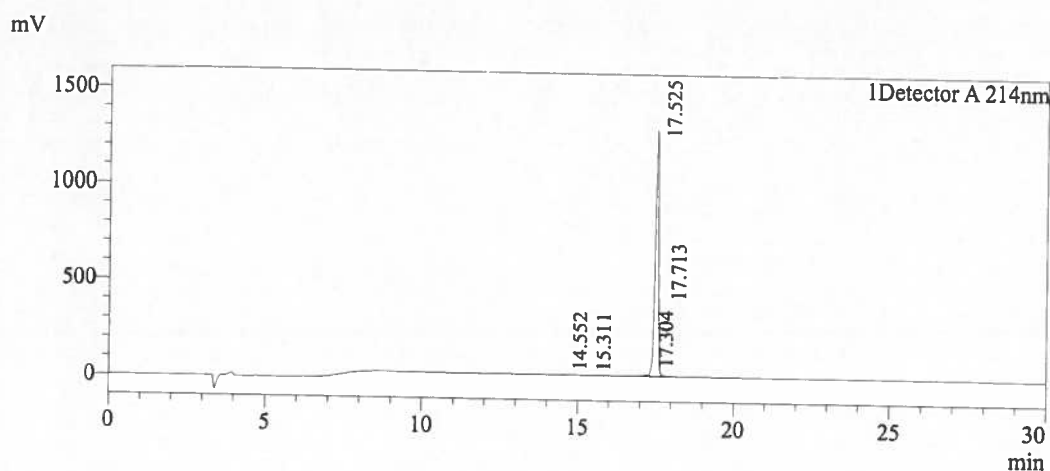


## Sample Information

Order ID :GT31707-8  
 Name :258  
 Sequence :RFRPPIRRPPIRPPFYR  
 Lot. No :GT31707-8-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 25ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

## Chromatogram



Peak Table

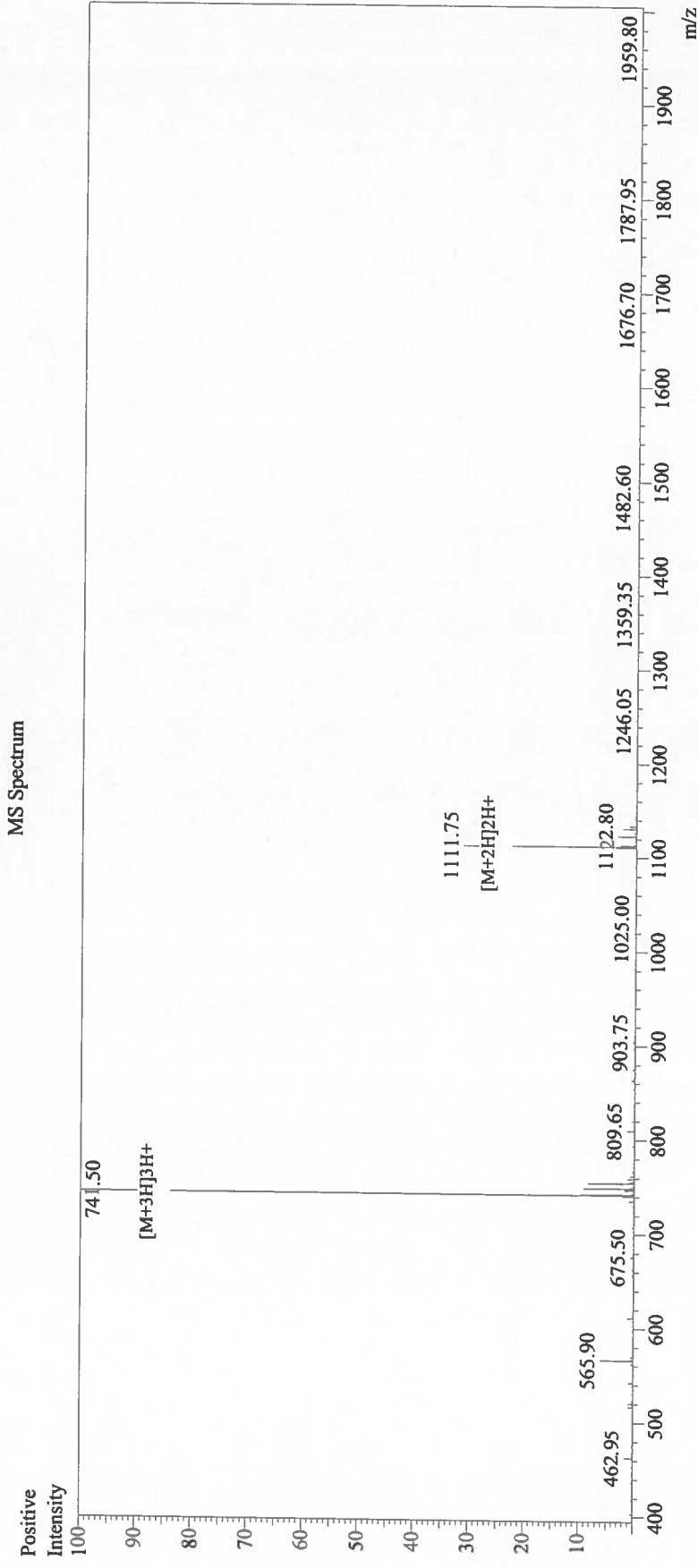
Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	14.552	17087	1152	0.181
2	15.311	5967	71	0.063
3	17.304	100451	11348	1.065
4	17.525	9203914	1279767	97.577
5	17.713	105070	8222	1.114
Total		9432489	1300560	100.000





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Sample Information

Dissolution method	:5%HAC+8%ACN+87%H2O	Prerod Bias	:-4.5kv
Date Acquired	:2018/12/10 09:20:00	Detector	:-0.2kv
Injection Volume	:0.2ul	T.Flow	:0.2ml/min
Block Temp	:200	B.conc	:50%H2O/50%MEOH
Interface	:ESI		
Nebulizing Gas Flow	:1.50L/min		
CDL Temp	:250C		
CDL Volt	:0v		

Order ID	:GT31707-8
Name	:258
Sequence	:RFRPPRRPPRRPPFYR
Lot.No	:GT31707-8-1207
Theoretical	:2221.65
Observed	:2221.50

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**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-9
<b>Lot No.</b>	GT31707-9-1207
<b>Sequence</b>	RFRWPIRRPPIRPPFYR
<b>Dissolution condition</b>	100%H2O
<b>Length</b>	17AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2310.75
<b>Storage</b>	-20°C

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<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
MW by MS	2310.75	Conforms
Purity by HPLC	>95%	95.352%
Peptide Content	N/A	N/A
Moisture content	N/A	N/A
Acetic acid content	N/A	N/A
Appearance	White to off-white lyophilized powder	Conforms
Quantity	10mg	10.0mg

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Dec/15/2018

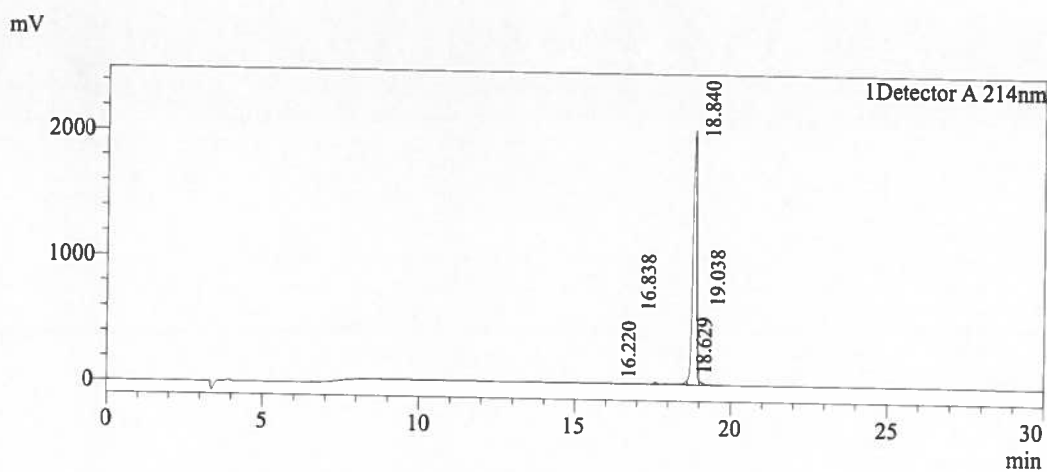


## Sample Information

Order ID :GT31707-9  
 Name :272  
 Sequence :RFRWPIRRPPIRPPFYR  
 Lot. No :GT31707-9-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 25ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

## Chromatogram



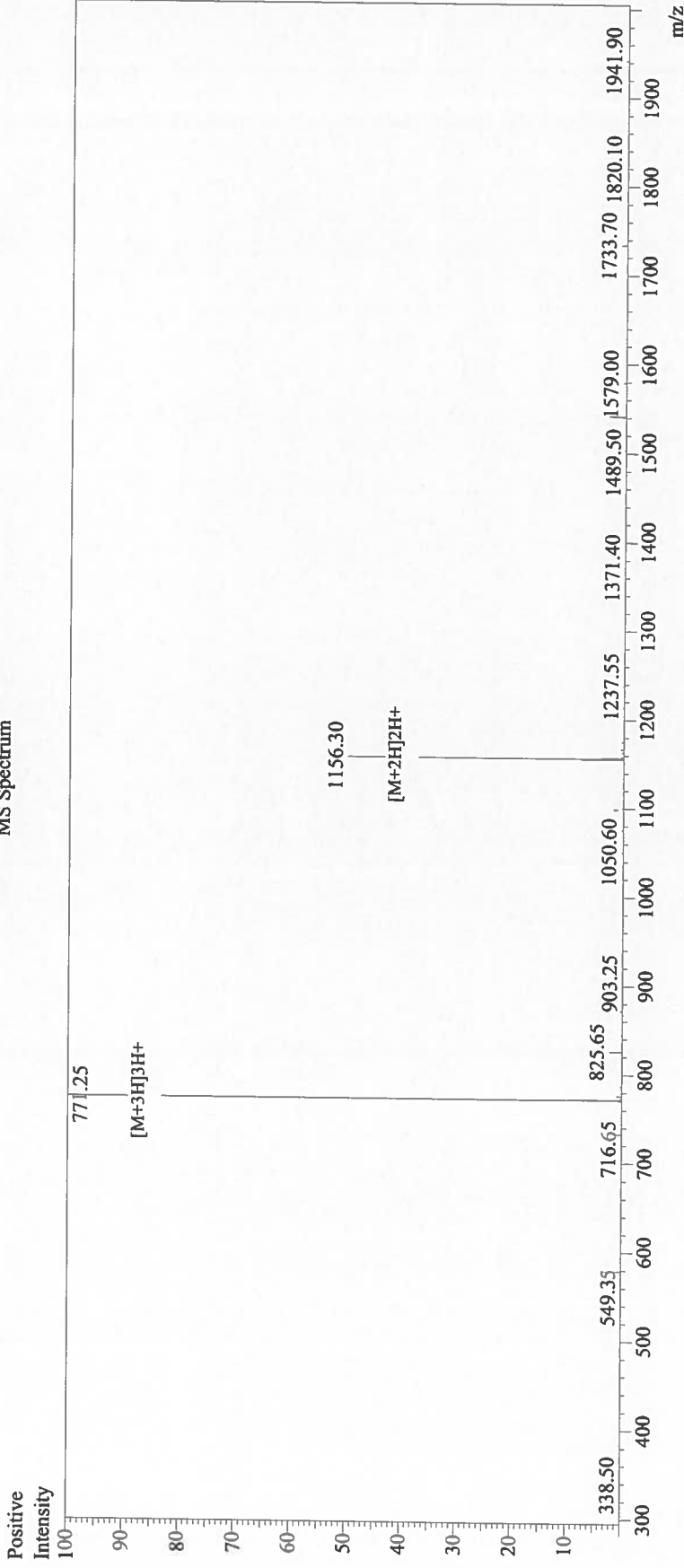
## Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	16.220	5908	888	0.035
2	16.838	29460	2056	0.173
3	18.629	512925	33951	3.009
4	18.840	16251510	2033244	95.352
5	19.038	243944	27454	1.431
Total		17043747	2097592	100.000



MS Spectrum



Sample Information

Dissolution method :5%HAC+8%ACN+87% $\text{H}_2\text{O}$   
Date Acquired :2018/12/10 09:13:23  
Injection Volume :0.2 $\mu\text{l}$   
Block Temp :200

Interface :ESI  
Nebulizing Gas Flow :1.50L/min  
CDL Temp :250C  
CDL Volt :0v

Prerod Bias :+4.5kv  
Detector :-0.2kv  
T.Flow :0.2ml/min  
B.conc :50%H $_2\text{O}$ /50%MEOH

Order ID :GT31707-9  
Name :272  
Sequence :RFRWPIRRPPPIRPPFYR  
Lot.No :GT31707-9-1207  
Theoretical :2310.75  
Observed :2310.75

272

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**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-10
<b>Lot No.</b>	GT31707-10-1207
<b>Sequence</b>	RWRWPIRRPPIRPPFYR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	17AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2349.79
<b>Storage</b>	-20°C

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<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2349.90	Conforms
<b>Purity by HPLC</b>	>95%	95.227%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Dec/17/2018

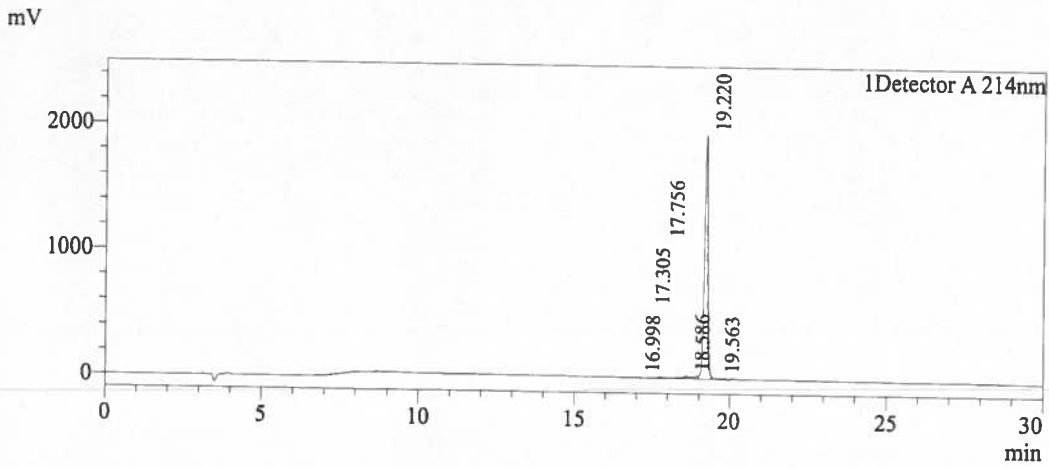


Sample Information

Order ID :GT31707-10  
 Name :278  
 Sequence :RWRWPIRRPPIRPPFYR  
 Lot. No :GT31707-10-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 15ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

Chromatogram

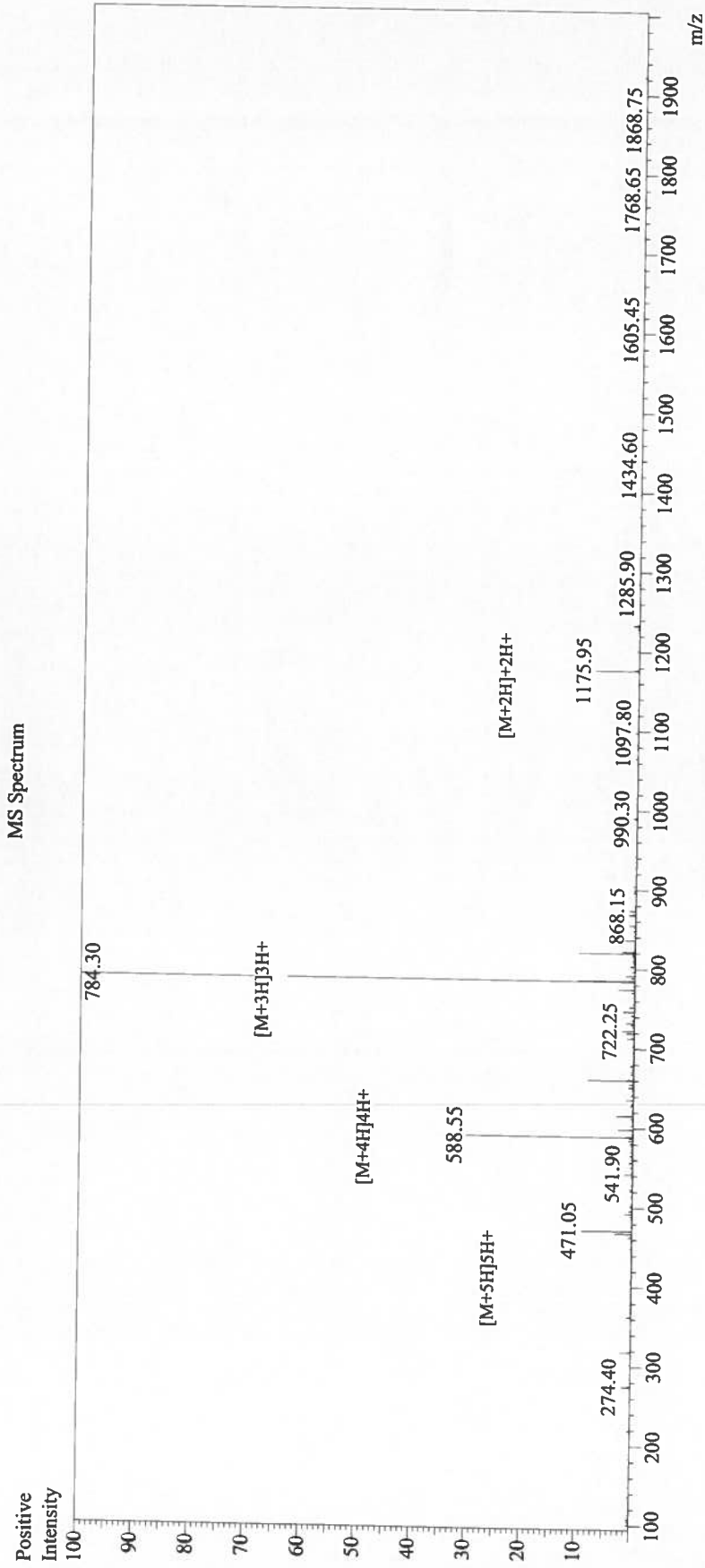


Peak Table

Peak#	Ret. Time	Area	Height	Area%
1	16.998	14963	1564	0.100
2	17.305	4697	835	0.032
3	17.756	80394	13432	0.540
4	18.586	449919	17539	3.020
5	19.220	14186680	1933942	95.227
6	19.563	161057	4050	1.081
Total		14897709	1971362	100.000



278



Sample Information

Dissolution method	:5% <b>HAC</b> +8% <b>ACN</b> +87% <b>H2O</b>	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/10 10:09:51	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50% <b>H2O</b> /50% <b>MEOH</b>
Order ID	:GT31707-10				
Name	:278				
Sequence	:RWRWPIRRPPFFYR				
Lot.No	:GT31707-10-1207				
Theoretical	:2349.79				
Observed	:2349.90				

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-11
<b>Lot No.</b>	GT31707-11-1207
<b>Sequence</b>	RWRRPIRRRPIRPPFYW
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	17AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2408.86
<b>Storage</b>	-20°C

<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2409.00	Conforms
<b>Purity by HPLC</b>	>95%	98.278%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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Dec/18/2018



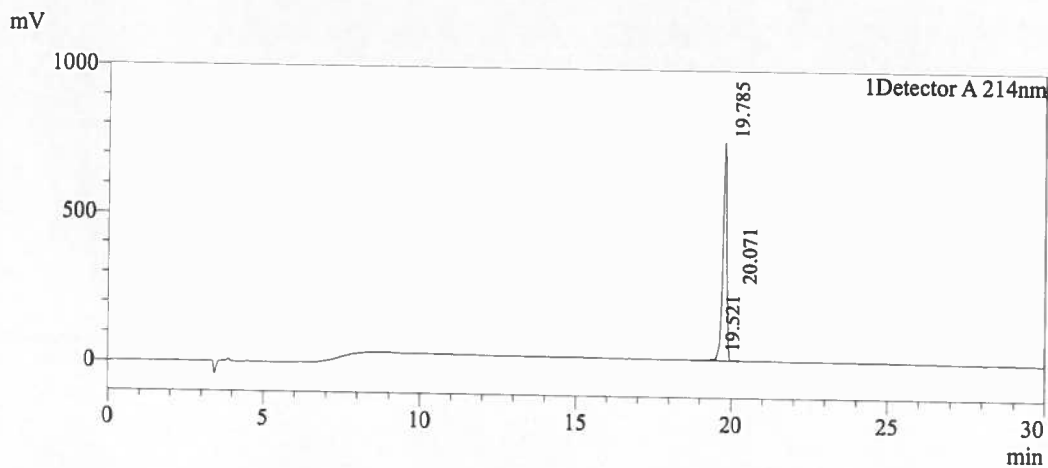


## Sample Information

Order ID :GT31707-11  
 Name :281  
 Sequence :RWRRPIRRRPIRPPFYW  
 Lot. No :GT31707-11-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume :10ul

Time	Module	Action	Value
0.01	Pumps	B.Conc	2
30.00	Pumps	B.Conc	65
33.00	Pumps	B.Conc	100
38.00	Pumps	B.Conc	100
40.00	Pumps	B.Conc	2
50.00	Controller	Stop	

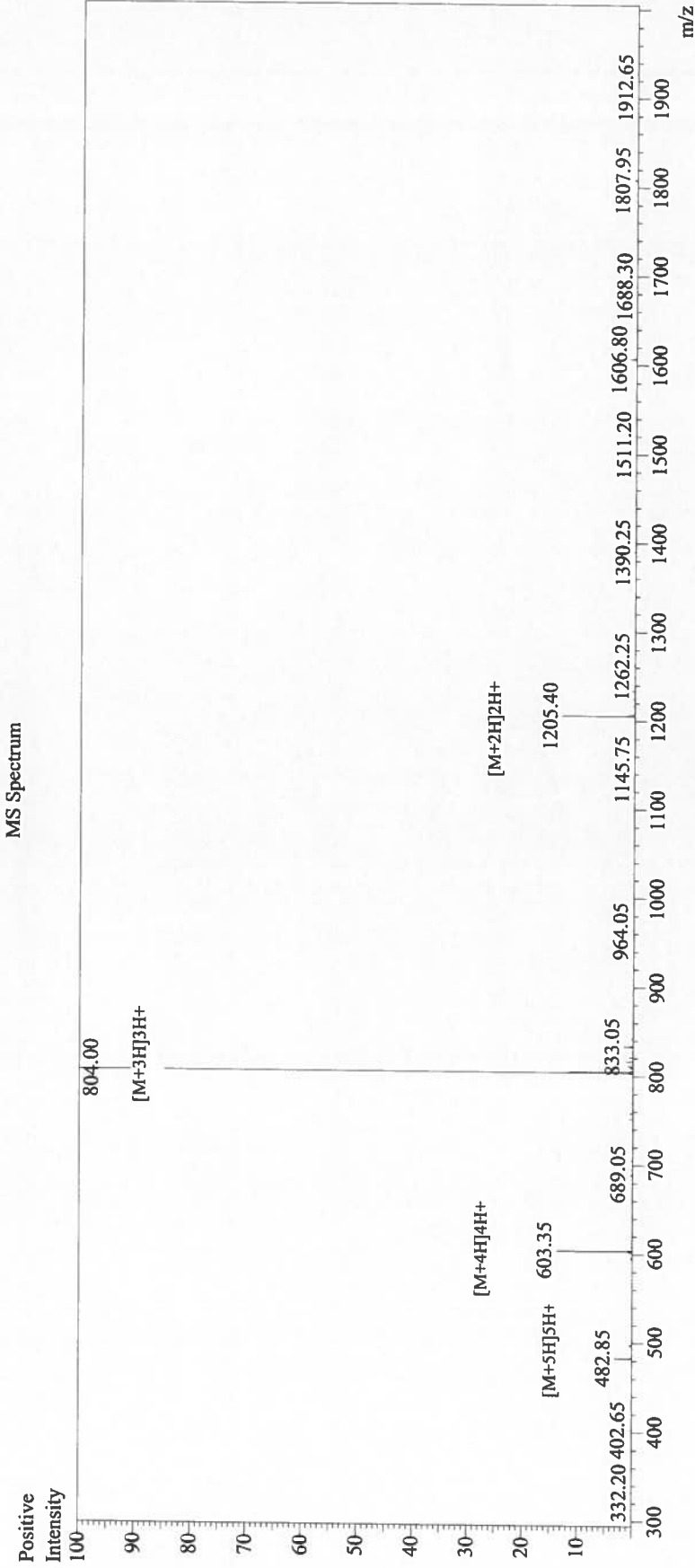
## Chromatogram



## Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	19.521	104107	7240	1.593
2	19.785	6422006	731464	98.278
3	20.071	8407	829	0.129
Total		6534521	739534	100.000



Sample Information

Dissoolution method	:5%HAC+8%ACN+87%H2O	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/18 09:38:33	Detector	:-0.2kv
Injection Volume	:0.2ul	T.Flow	:0.2ml/min
Block Temp	:200	B.conc	:50%H2O/50%MEOH
Interface	:ESI		
Nebulizing Gas Flow	:1.50L/min		
CDL Temp	:250C		
CDL Volt	:0v		

Order ID	:GT31707-11
Name	:281
Sequence	:RWRPPIRRPPIRYW
Lot.No	:GT31707-11-1207
Theoretical	:2408.86
Observed	:2409.00

281

**CERTIFICATE OF ANALYSIS**

<b>Product Name</b>	GT31707-12
<b>Lot No.</b>	GT31707-12-1207
<b>Sequence</b>	RWRRPIRRRPIRPPFWR
<b>Dissolution condition</b>	100%H <sub>2</sub> O
<b>Length</b>	17AA
<b>Modification</b>	N/A
<b>Molecular Weight (MW)</b>	2401.87
<b>Storage</b>	-20°C

<b>Test Items</b>	<b>Specifications</b>	<b>Results</b>
<b>MW by MS</b>	2401.95	Conforms
<b>Purity by HPLC</b>	>95%	98.351%
<b>Peptide Content</b>	N/A	N/A
<b>Moisture content</b>	N/A	N/A
<b>Acetic acid content</b>	N/A	N/A
<b>Appearance</b>	White to off-white lyophilized powder	Conforms
<b>Quantity</b>	10mg	10.0mg

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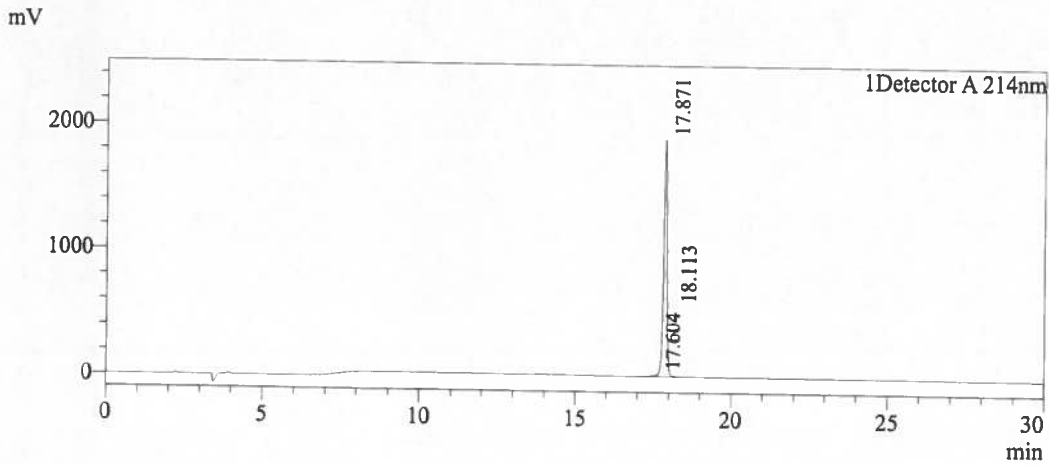
Dec/19/2018



## Sample Information

Order ID :GT31707-12  
 Name :291  
 Sequence :RWRRPIRRRPIRPPFWR  
 Lot. No :GT31707-12-1207  
 Pump A :0.1%Trifluoroacetic in 100% water  
 Pump B :0.1%Trifluoroacetic in 100% acetonitrile  
 Total Flow :1ml/min  
 Wavelength :214nm  
 Analytical column type :SHIMADZU Inertsil ODS-SP(4.6\*250mm\*5um)  
 Dissolution method :100%H2O  
 Inj. Volume : 20ul  
 Time Module Action Value  
 0.01 Pumps B.Conc 2  
 30.00 Pumps B.Conc 65  
 33.00 Pumps B.Conc 100  
 38.00 Pumps B.Conc 100  
 40.00 Pumps B.Conc 2  
 50.00 Controller Stop

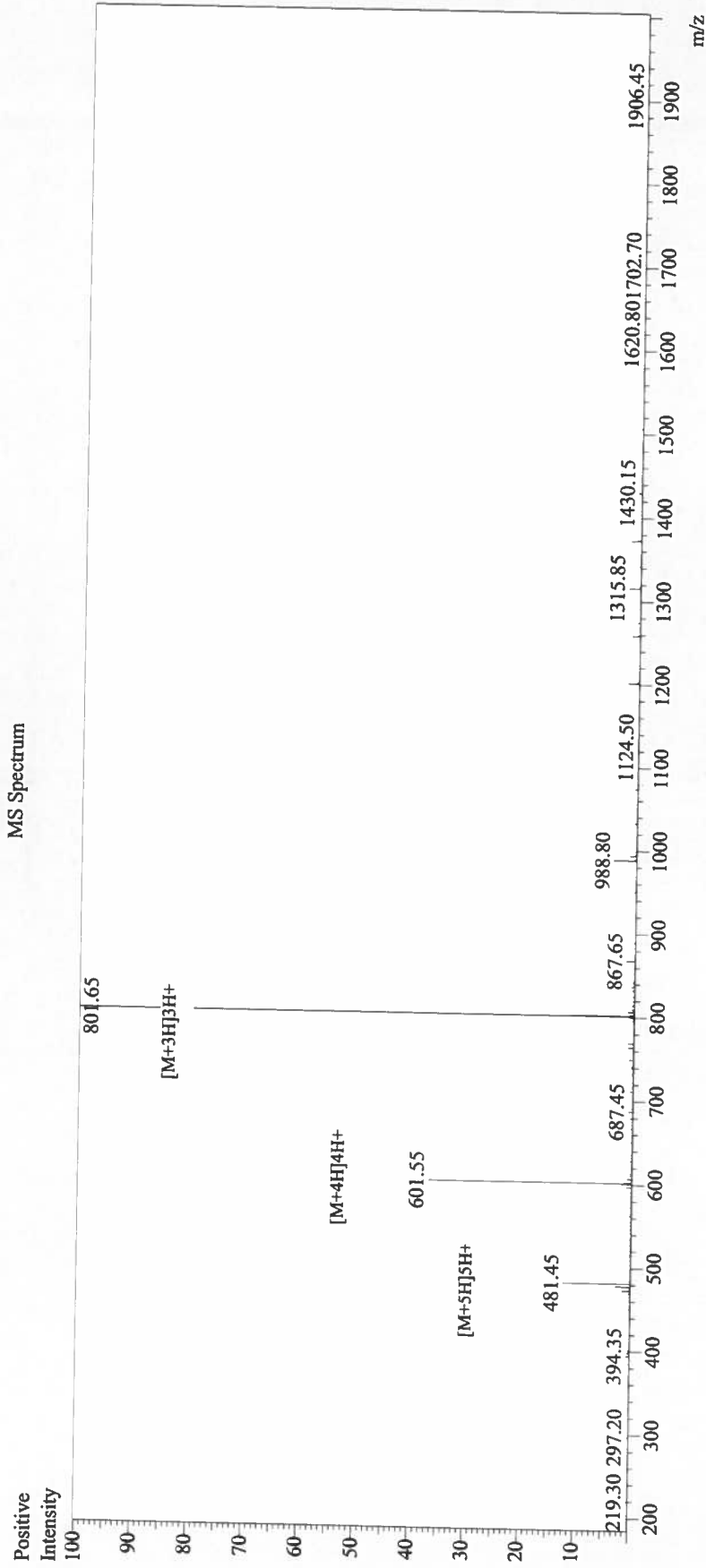
## Chromatogram



## Peak Table

Detector A 214nm

Peak#	Ret. Time	Area	Height	Area%
1	17.604	199880	13540	1.378
2	17.871	14268508	1884504	98.351
3	18.113	39291	7128	0.271
Total		14507680	1905173	100.000



Sample Information

Dissolution method	:5%HAC+8%ACN+87%H2O	Interface	:ESI	Prerod Bias	:+4.5kv
Date Acquired	:2018/12/17 10:31:52	Nebulizing Gas Flow	:1.50L/min	Detector	:-0.2kv
Injection Volume	:0.2ul	CDL Temp	:250C	T.Flow	:0.2ml/min
Block Temp	:200	CDL Volt	:0v	B.conc	:50%H2O/50%MEOH

Order ID :GT31707-12  
Name :291  
Sequence :RWRPPIRRPPIRRPFWR  
Lot.No :GT31707-12-1207  
Theoretical :2401.87  
Observed :2401.95

291