

BiOptic Product Introduction

2022, April

About BiOptic



亞洲唯一毛細管電泳專家

Stock Symbol: 6850

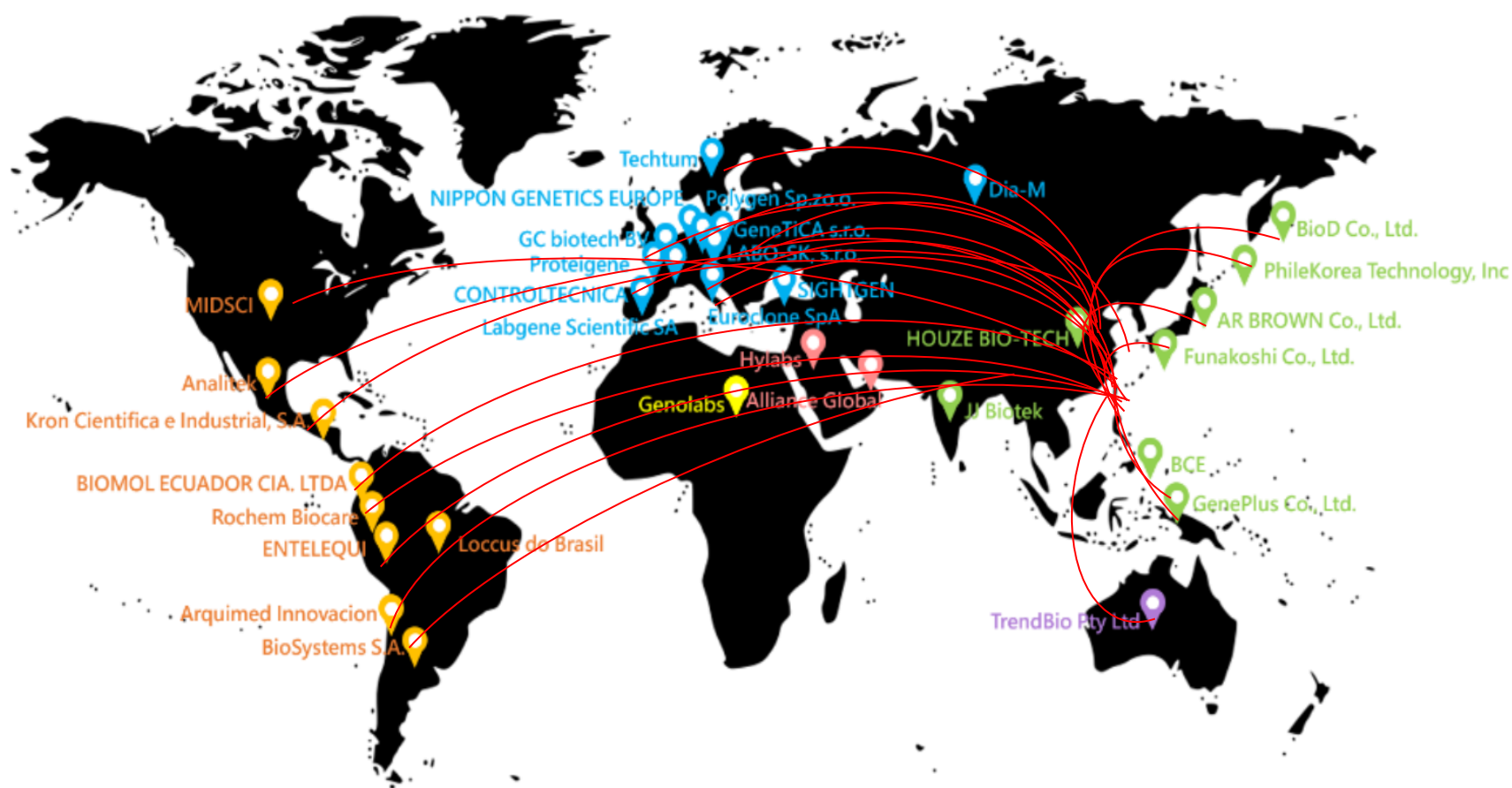
- ❑ Established in 2004
- ❑ Headquarter: Taiwan
 - Office: 5F., No. 6, Ln. 130, Minguan Rd., Xindian Dist., New Taipei City 231
 - GMP Factory: 4F., No. 108-3, Minguan Rd., Xindian Dist., New Taipei City 231
- ❑ Global Site:
 - Bioptic (Jiangsu) Inc.:
GMP factory: 2F, Building 12, No. 18, Huashan Rd., Xinbei Dist., Changzhou City, Jiangsu Prov. 213022 China
 - USA office (LA):
1409 Foothill Blvd. Unit #201
La Canada Flintridge CA 91011
 - **Bioptic (Zhejiang) Inc. -----coming soon!**

About BiOptic

1. More than 16 years experience in capillary electrophoresis
2. Patented **instruments and cartridges**
3. Provide total solution from **PCR reagent** (perfect for CE platform formula), **PCR machine** to **Bio-Fragment Analyzer**.
4. 3 models to cover different throughput of customers
5. One system can analyze **DNA, RNA and protein**

About BiOptic

Mote than 45 Distributors in Worldwide



America:

- USA
- Argentina
- Brazil
- Chile
- Mexico
- Guatemala
- Colombia
- Panama
- Bolivia
- Uruguay
- Ecuador

Asia:

- Taiwan
- China
- Japan
- South Korea
- Singapore
- Indonesia
- Thailand
- Vietnam
- Malaysia

Middle East:

- Israel
- Qatar
- Dubai
- Iran

Australia:

- Australia

Europe:

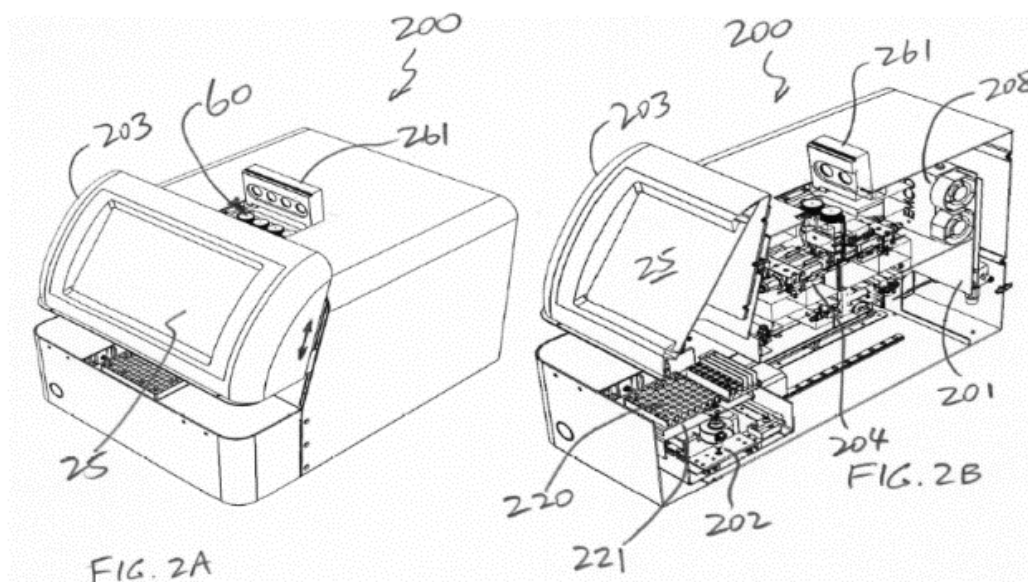
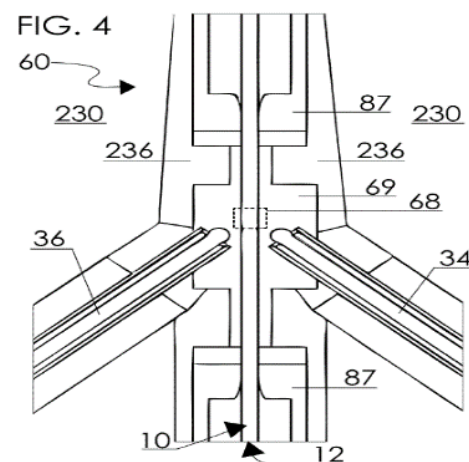
- Germany
- Greece
- France
- Italy
- Czech Republic
- Netherlands
- Poland
- Russia
- Slovakia
- Sweden
- Switzerland
- Austria

- Bulgaria
- Spain
- Portugal
- Turkey
- Finland
- Denmark
- Norway
- Croatia
- Serbia
- Belgium

About BiOptic

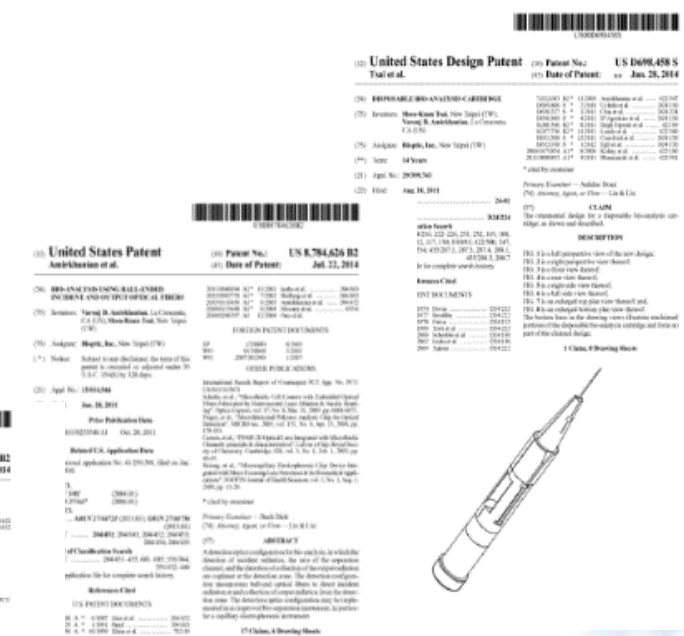
Patented instruments and cartridges

U.S. Patent Jul. 15, 2014 Sheet 11 of 23 US 8,778,155 B2

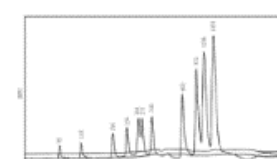
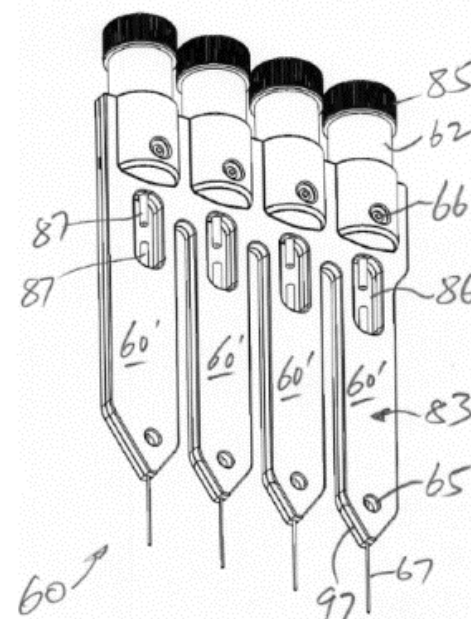
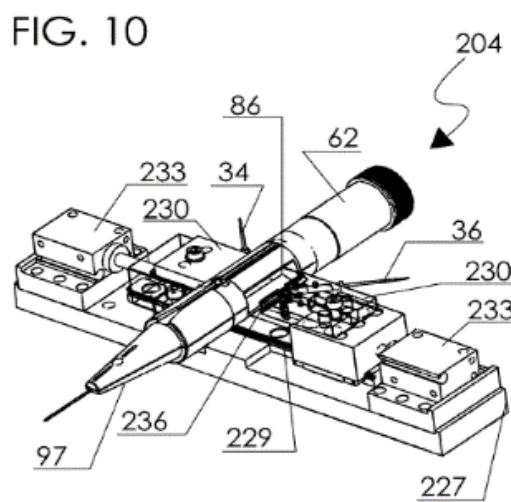
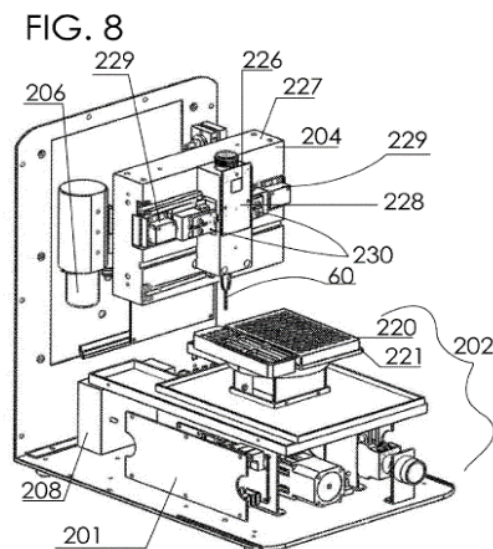


Patent (U.S. Patent No.) US 8,778,155 B2 (Date of Patent) Jul. 15, 2014

Abstract
A cartridge for use in a device for analyzing a sample. The cartridge includes a sample inlet, a sample chamber, a sample outlet, a sample detector, and a sample processor. The sample inlet is configured to receive a sample. The sample chamber is configured to hold the sample. The sample outlet is configured to discharge the sample. The sample detector is configured to detect the sample. The sample processor is configured to process the sample.



U.S. Patent Jul. 15, 2014 Sheet 18 of 23 US 8,778,155 U.S. Patent Jul. 15, 2014 Sheet 20 of 23 US 8,778,155 B2



Intellectual Property (IP)

US Utility Patents:

1. *Bio-Analysis Using Ball-Ended Incident And Output Optical Fibers*
2. *DISPOSIBLE BIO-ANALYSIS CARTRIDGE AND INSTRUMENT FOR CONDUCTING BIO-ANALYSIS USING SAME*

US Provisional Patents:

1. *Compact And Inexpensive Capillary Gel-Electrophoresis Fluorescence System for Antibody-Antigen Interactions*
2. *Glycan Analyzer*
3. *Portable CGE*
4. *Multi-channel CGE System*
5. *Multi-channel Cartridge*
6. *Field Portable Bioanalysis System*

Design Patent:

1. *Disposable Bio-Analysis Cartridge D698,458*
2. *Multi-channel Cartridge*

PCT Patent Applications:

1. *Disposable Pen-Size CE Cartridge*
2. *Bio-Analysis Using Ball-Ended Incident And Output Optical Fibers*
3. *DISPOSIBLE BIO-ANALYSIS CARTRIDGE AND INSTRUMENT FOR CONDUCTING BIO-ANALYSIS USING SAME*
4. *China 2 patents, Japan 1 patent issued*

catalogue

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Publications

01. BiOptic Product Line

Provide Total Solution

Hot Start PCR Reagent

- Optimized for CE system

□ Direct GO

Directly from unpurified sample

□ ExpressGO

Standard PCR application

□ AccuGO

Proofreading DNA polymerase

Thermal Cycler

- One click to GO

Qamp Mini Thermal Cycler

◆ Palm size- 1kg only

◆ Chip: PCR protocol setting

◆ Fast heating & cooling rate

Bio-Fragment Analyzer

□ Qsep1

Portable system-1-8 sample capacity

□ Qsep100

1-96 sample capacity

□ Qsep400

4-channel system



Sample Analysis



BiOptic PCR Reagent

The Features of PCR Reagents:

- ✓ Optimized for CE platform
- ✓ 2X Premix --- Easy for preparation
- ✓ High Specification --- Hot start design Enzyme

PCR
Solution



1. DirectGO CE:
No need to do DNA extraction and purification for raw material.

Blood/ Tissue/ Cell/ some kinds of leaves



2. ExpressGO CE:
Design for variety of standard PCR applications, and easy to PCR amplification over 5kb DNA

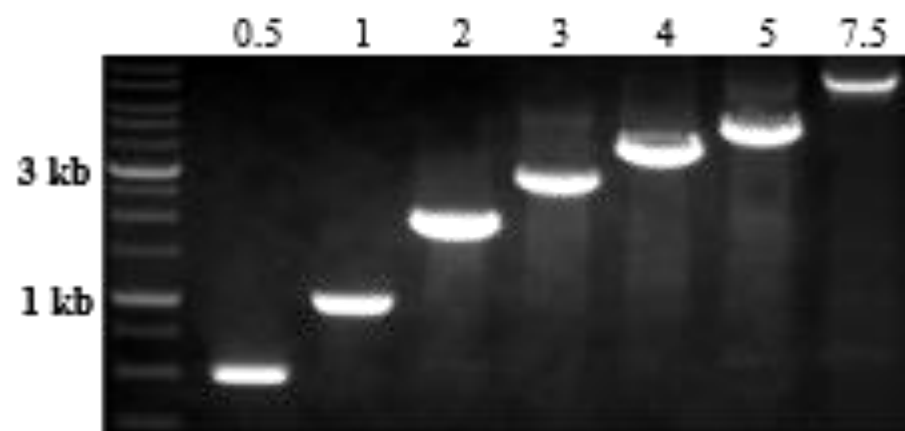


3. AccuGO:
Provide short extension time, high specification and high yield PCR product.

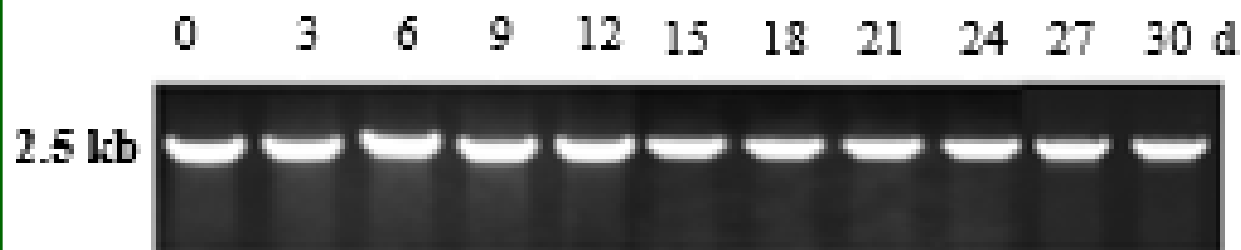
ExpressGO & AccuGO

ExpressGO - Lab screen PCR

Broad Applicability、High Stability



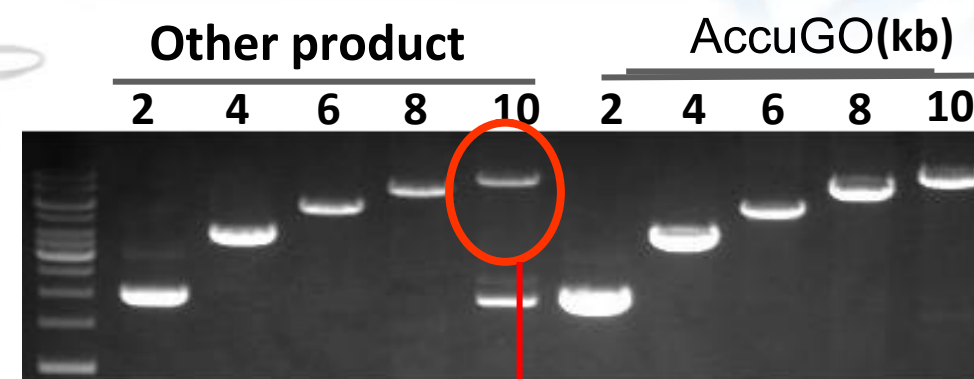
Amplify target gene up to **7.5 kb**



Keep **high activity** after 37°C incubation

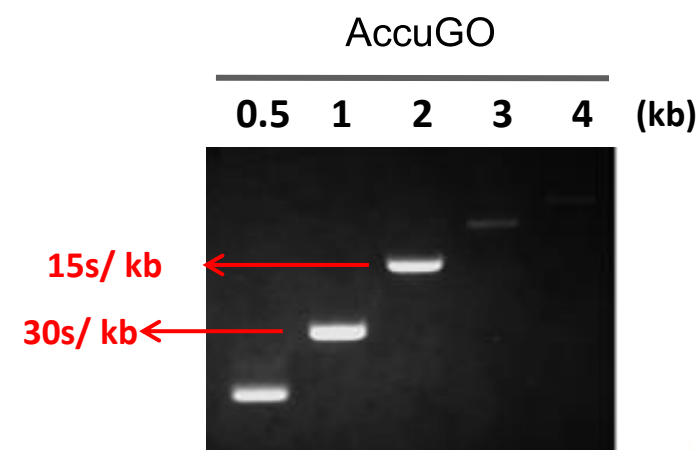
AccuGO - High Fidelity PCR

Broad Applicability、High yield



Non-specific product

High extension rate



Extension time: **15-30s/ kb**

Small, Portable Mini Thermal Cycler

*Qamp***mini**

Portable PCR Thermocycler

Thermal
Cycler

1. Palm size & only 1 kg
Portable & good for high school lab course
2. Pre-program chip
 - ✓ For research use: personal setting protocol
 - ✓ For clinical use: can bundle with reagent kit. (everyone can work for it, and no human error)
3. One button to Go
So easy to use
4. Better temperature Uniformity
One peltier only



Qsep series Bio-Fragment Analyzer



Specification

Qsep₁

Qsep_{1-plus}

Qsep₁₀₀

Qsep₁₀₀ Advance

Qsep₄₀₀

LED Light Source (Excitation)	525nm	525nm	480nm	525nm
Fluorescence Detection	590nm~	590nm~	530nm~	590nm~
Separation Voltage	1~8 KV	1~15 KV	1~15 KV	1~15 KV
Connection	Wi-Fi & Cable	USB	USB	USB
Power Source	AC 100-240V	AC 100-240V	AC 100-240V	AC 100-240V
Maximum Power	30W	30W	30W	60W
System Weight	5.5 kgs	15 kgs	15 kgs	26 kgs
Dimension	24x21x30cm	38x30x40cm	38x30x40cm	54x40x36cm
System Type	1 Channel Portable System	1 Channel Standard System	1 Channel Standard System	4 Channel System
Automated Sampling	1~8/ 1~15 samples	1~96 samples	1~96 samples	4~96 samples
Rapid Analysis	2~7 min/sample	2~7 min/sample	2~7 min/sample	2~7 min/4 samples

Provide different model to meet customers' needs

Sample capacity



Qsep₁



Single channel
1-8 sample capacity

Qsep₁₀₀



Single channel
1-96 sample capacity
96 samples in 6.4 hrs

Qsep₄₀₀



4-channel
4-96 sample capacity
96 samples in 1.5 hrs

Throughput



Qsep₁₀₀ & *Qsep₁₀₀* Advance

What's the difference between *Qsep₁₀₀* and *Qsep₁₀₀* Advance?



Qsep₁₀₀



Qsep₁₀₀ Advance

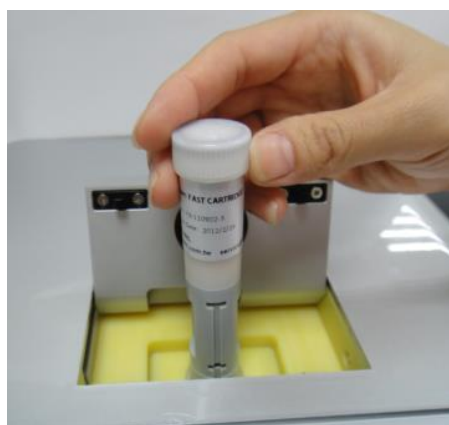
Light Source (Excitation)	525nm	480nm
Fluorescence Detection	590nm~	530nm~
Sensitivity (S serials cartridge)	Excellent	Good
Sensitivity (N serials cartridge)	Excellent	Good
*Protein Labeling Dye	Chromeo-P503	ALEXA 488/FITC

02. *Qsep* Platform Introduction

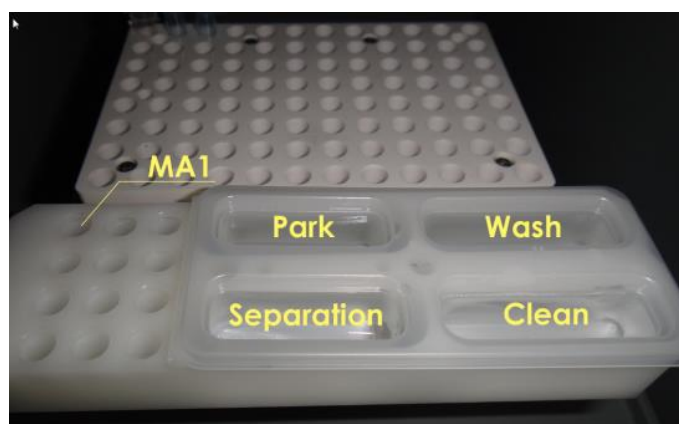
Qsep System Highlights

- No need to collect 12 samples: High flexibility. **Few samples are fine.**
- 3 mins to setup and start to run: No need for sample preparation.
- Disposable Gel-Cartridge: **No need for gel preparation.** Each cartridge can run 100-300 run (depend on cartridge type)
- Automated Sample Handling: Automated process for **96-well** capacity
- Fast Analysis: **2-7** minutes per run (below than 15kb).
- Detection Sensitivity: Detects as low as **5** pg/ μ l.
- Resolution: Up to **1-4 bp** DNA fragments (between 100-500bp)

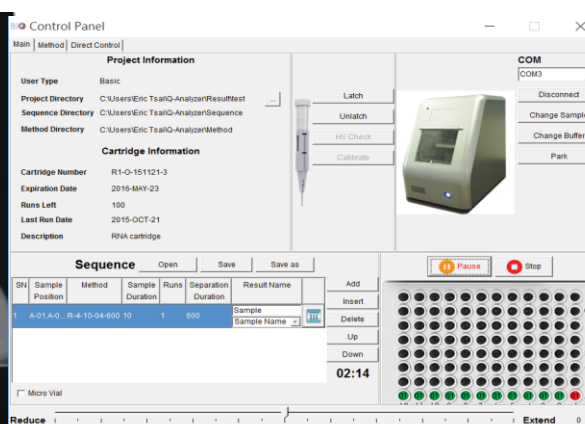
Insert Cartridge



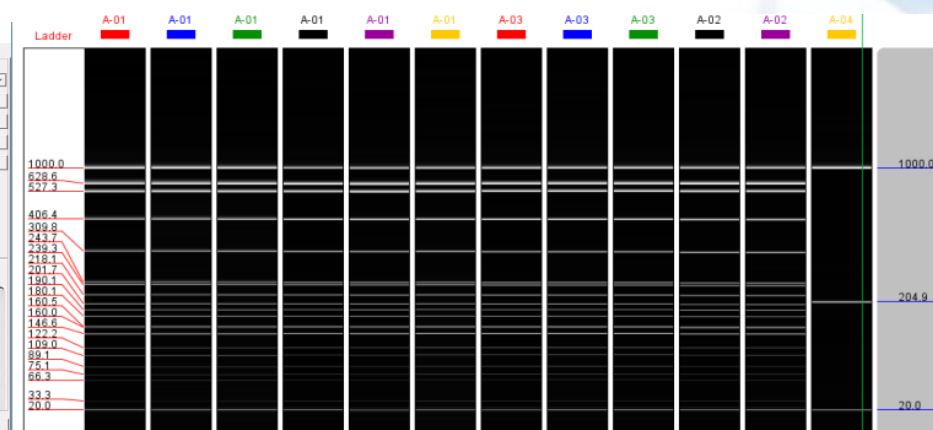
Load Sample & Buffer



Run Q-Analyzer



Automated Tests up to
96 samples



3 Steps to Start

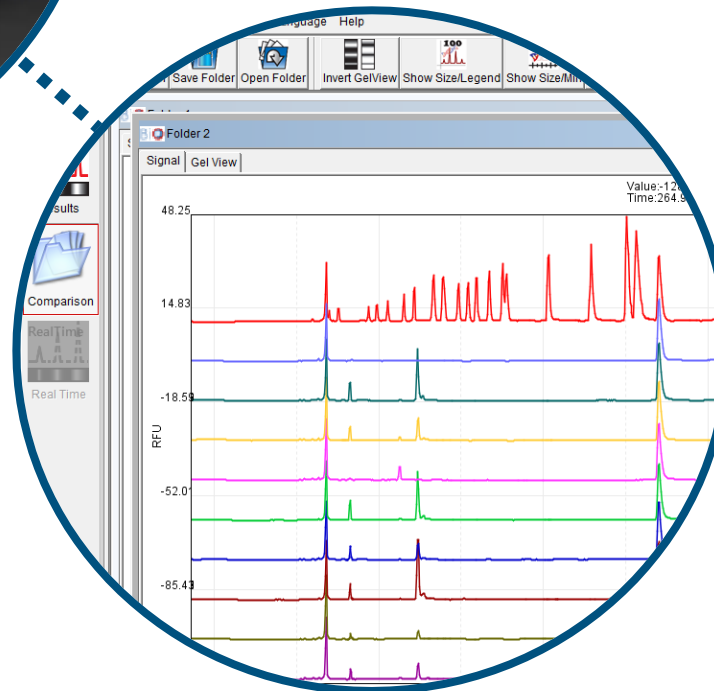


Insert the gel cartridge



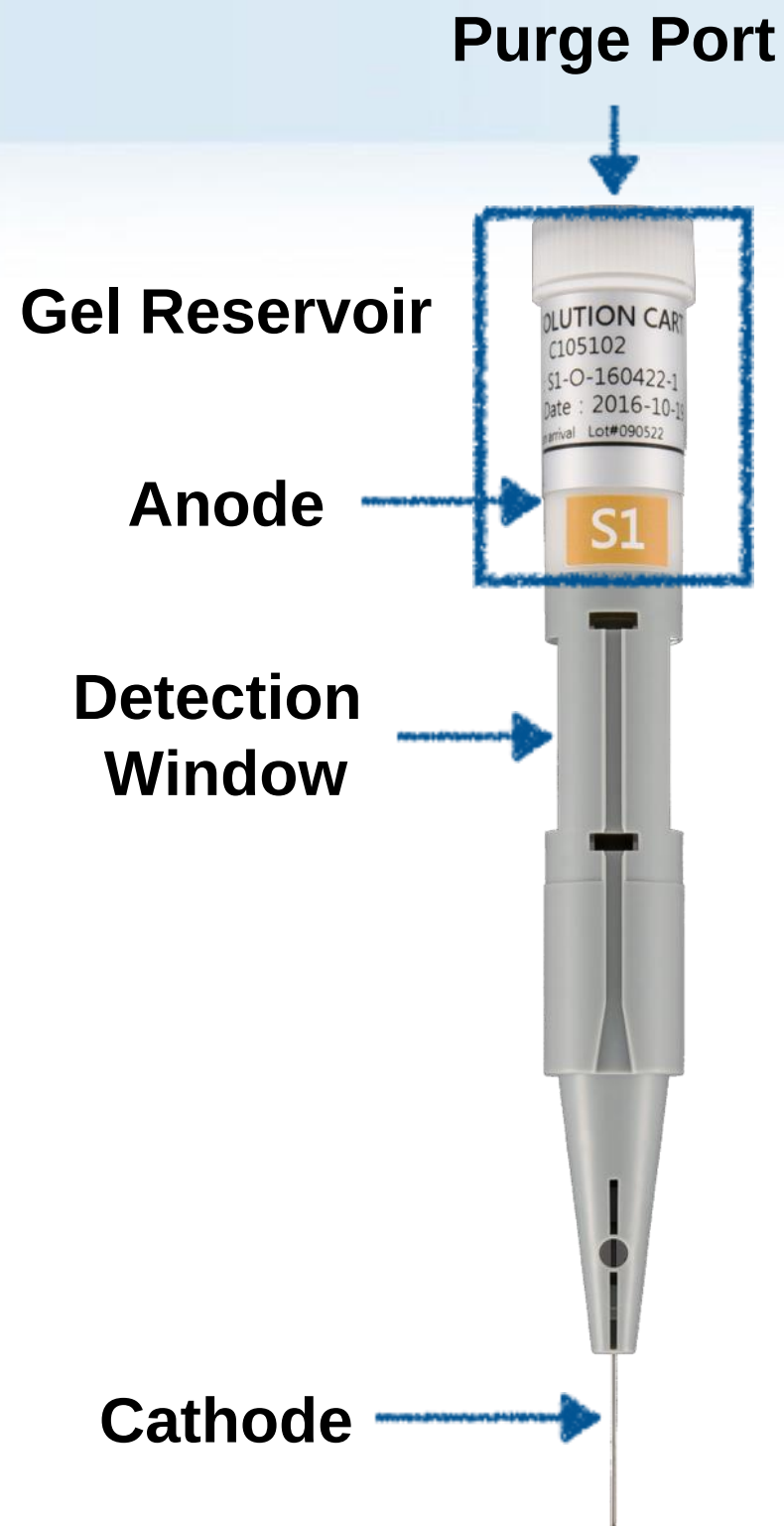
Place buffer & sample

**View the results
in around 2-7 mins**



Run Q-Analyzer

Cartridge Overview



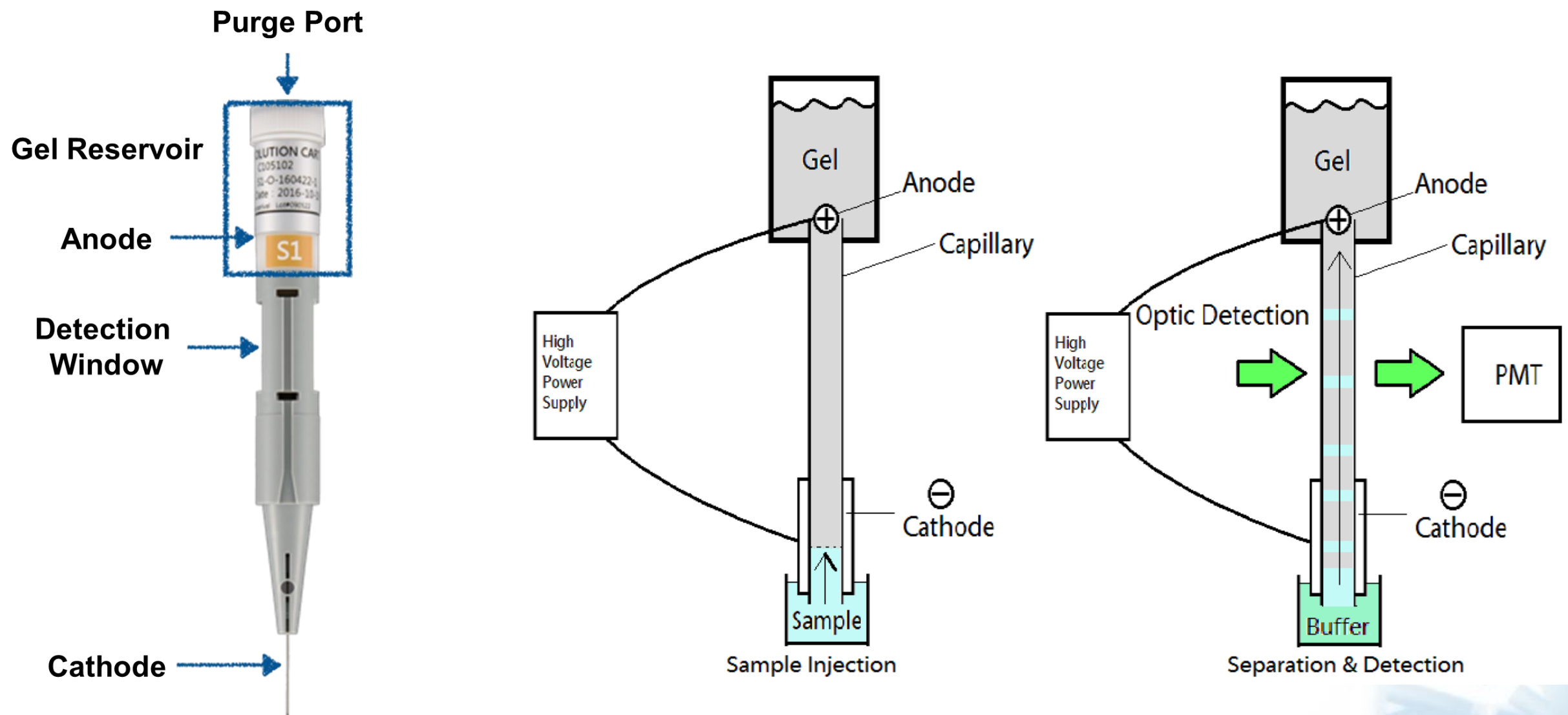
- ❖ **Pre-filled gel cartridge:** no need to do gel preparation before starting analysis. The cartridge is ready to use
- ❖ **RFID tag:** recognize the cartridge automatically. Record the information of this cartridge
- ❖ **Various type for different application:** Provide different cartridge to fit diverse applications on DNA, RNA, and protein

Principle of *Qsep* series

Capillary Gel Electrophoresis (CGE): separation mode of CE

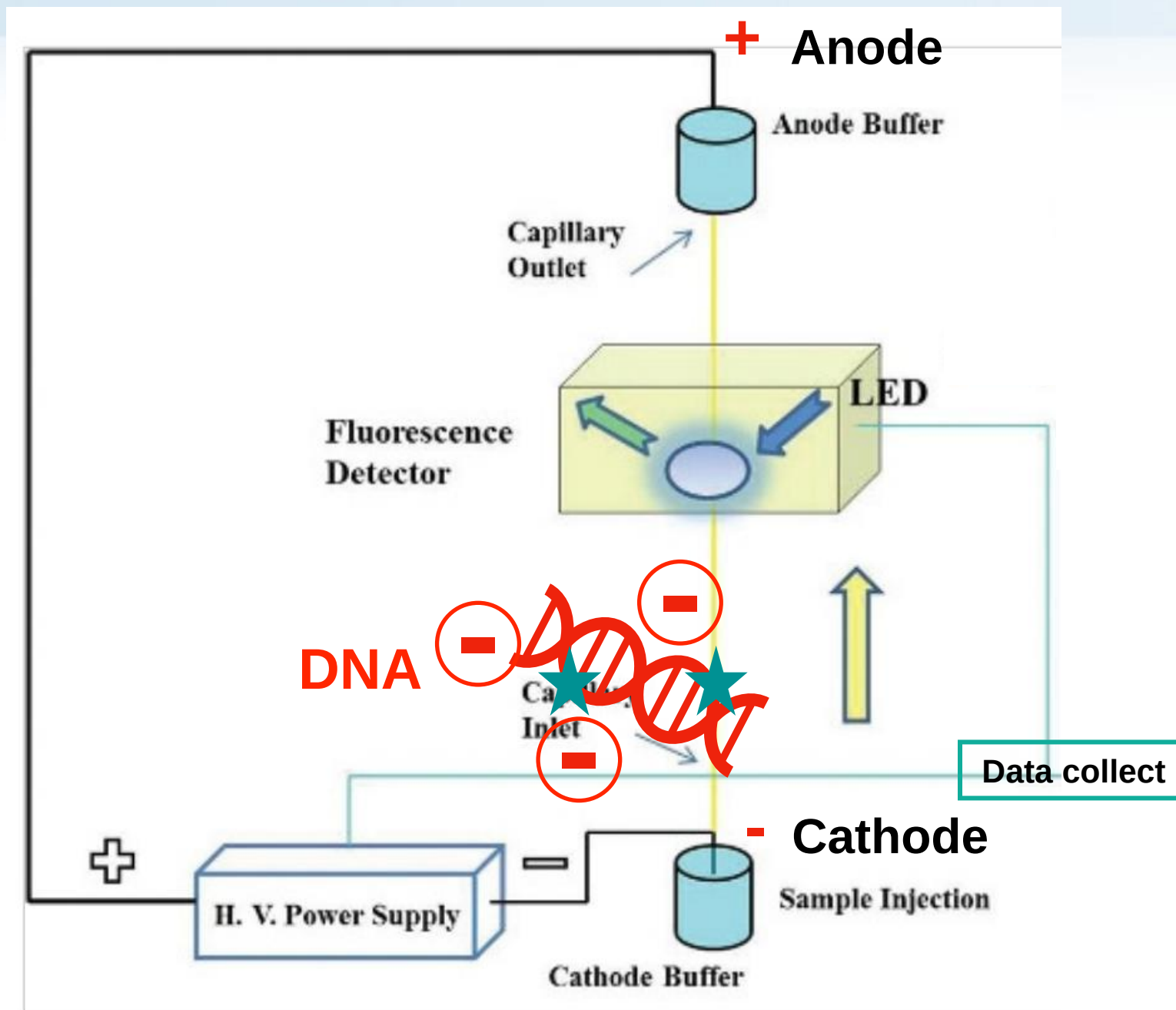
Disposable Pen-Shaped Cartridge

- **Size-based separation** in a capillary of precast gel
- **Automatically sample loading** (according to voltage and time parameters)



Principle of *Qsep* series

Schematic diagram of *Qsep* series



Set capillary in buffer with HV supply

→ The buffer solution have conductivity which facilitates the migration of charged analytes

Electrokinetically introduce the sample

Separate in capillary filled with gel

Detect the fluorescence signal

Cartridges type- DNA

Qualitative

Quantitative

	Standard Cartridge (S2)	High Resolution Cartridge (S1)	Fast Cartridge (F3)	High Sensitivity Cartridge (N1)	Kilo Base Cartridge (S3)	High Sensitivity Kilo Base Cartridge (N3)	Quantitative Standard Cartridge (S2)	Quantitative High Resolution Cartridge (S1)
Specifications								
Cat. No.	C105201 (2 pcs) C105801 (8 pcs)	C105202 (2 pcs) C105802 (8 pcs)	C105203 (2 pcs) C105803 (8 pcs)	C105105 (1 pc) C105205 (2 pcs)	C105206 (2 pcs) C105806 (8 pcs)	C105153 (1 pc) C105253 (2 pcs)	C105201-Q (2 pcs)	C105202-Q (2 pcs)
Sample size range	10-5000 bp	10-5000 bp	10-5000 bp	10-5000 bp	10-50000 bp	10-50000 bp	10-1500 bp	10-1500 bp
L.O.D.	0.1 ng/μl*	0.1 ng/μl*	0.1 ng/μl*	5 pg/μl*	0.1 ng/μl*	20 pg/μl*	0.1 ng/μl*	0.1 ng/μl*
Best Resolution	4-10 bp	1-4 bp	≥50 bp	≥10 bp	10-50 bp	10-50 bp	4-10 bp	1-4 bp
Analysis time (per sample)	2-3 mins	3-5 mins	1-2 mins	2-3 mins	5-21 mins	9-25 mins	2-3 mins	3-5 mins
Sample number (per cartridge)	200 runs	200 runs	300 runs	100 runs	200 runs	100 runs	200 runs	200 runs
Sample consumption (per run)	<0.1 μl	<0.1 μl	<0.1 μl	<0.1 μl	<0.1 μl	<0.1 μl	<0.1 μl	<0.1 μl
Recommended sample volume	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl	0.1mL tube: 10μl 0.2mL tube: 20μl
Shelf life	6 months	6 months	4 months	4 months	6 months	4 months	6 months	6 months

◆ L.O.D. : 2pg/μl (If diluted in the water)

◆*Determined by the DNA ladder (15-622 DNA size marker : C109200) as sample

Cartridges type- RNA & Protein

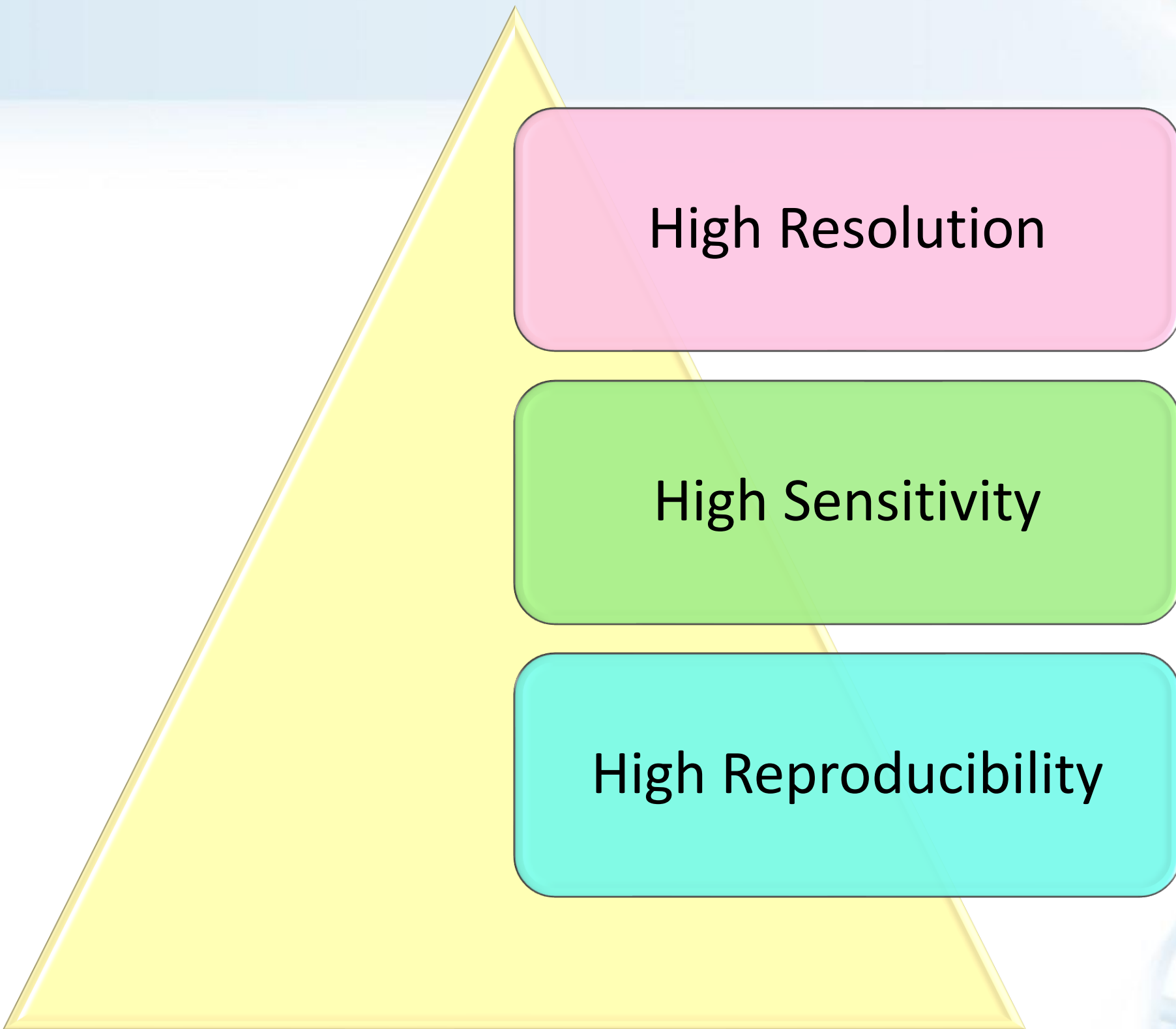
	RNA		Protein
	RNA Cartridge (R1)	High Sensitivity RNA Cartridge (NR1)	Protein Cartridge (SDS) (P2)
Specifications			
Cat. No.	C105110 (1 pc) C105210 (2 pcs) C105810 (8 pcs)	C105111 (1 pc) C105211 (2 pcs)	C105121 (1 pc) C105221 (2 pcs)
Sample size range	N/A	N/A	14-150 kDa
L.O.D.	5 ng/μl	1 ng/μl	0.5 ng/μl (BSA)
Best Resolution	N/A	N/A	N/A
Analysis time (per sample)	5-10 mins	5-10 mins	6 mins (BSA) 10 mins (IgG)
Sample number (per cartridge)	100 runs	100 runs	100 runs
Sample consumption (per run)	<0.1 μl	<0.1 μl	<0.1 μl
Recommended sample volume	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl Micro vial: 1μl (C104250)	0.1mL tube: 10μl 0.2mL tube: 20μl
Shelf life	4 months	4 months	4 months

◆ L.O.D. : 2pg/μl (If diluted in the water)

Applications of Cartridges

	Standard Cartridge (S2)	High Resolution Cartridge (S1)	Kilobase Cartridge (S3)	Fast Cartridge (F3)	High Sensitivity Cartridge (N1)	RNA Cartridge (R1)	Protein Cartridge (P2)	High sensitivity Kilobase Cartridge (N3)	High sensitivity RNA Cartridge (NR1)
PCR product screening	✓	✓		✓					
Restriction Fragment Length Polymorphism (RFLP)	✓	✓		✓					
Plasmid purification & Vector cloning analysis			✓					✓	
Next Generation Sequencing (NGS) QC	✓								
Genomic DNA analysis			✓					✓	
Cell free DNA detection					✓				
RNA Analysis						✓			✓
Low concentration sample					✓			✓	✓
CHRISPR QC & Analysis	✓	✓				✓			✓
Large size analysis (≥50kb)			✓					✓	
Replace SDS-PAGE							✓		
IgG Purity Test							✓		

Best Performance

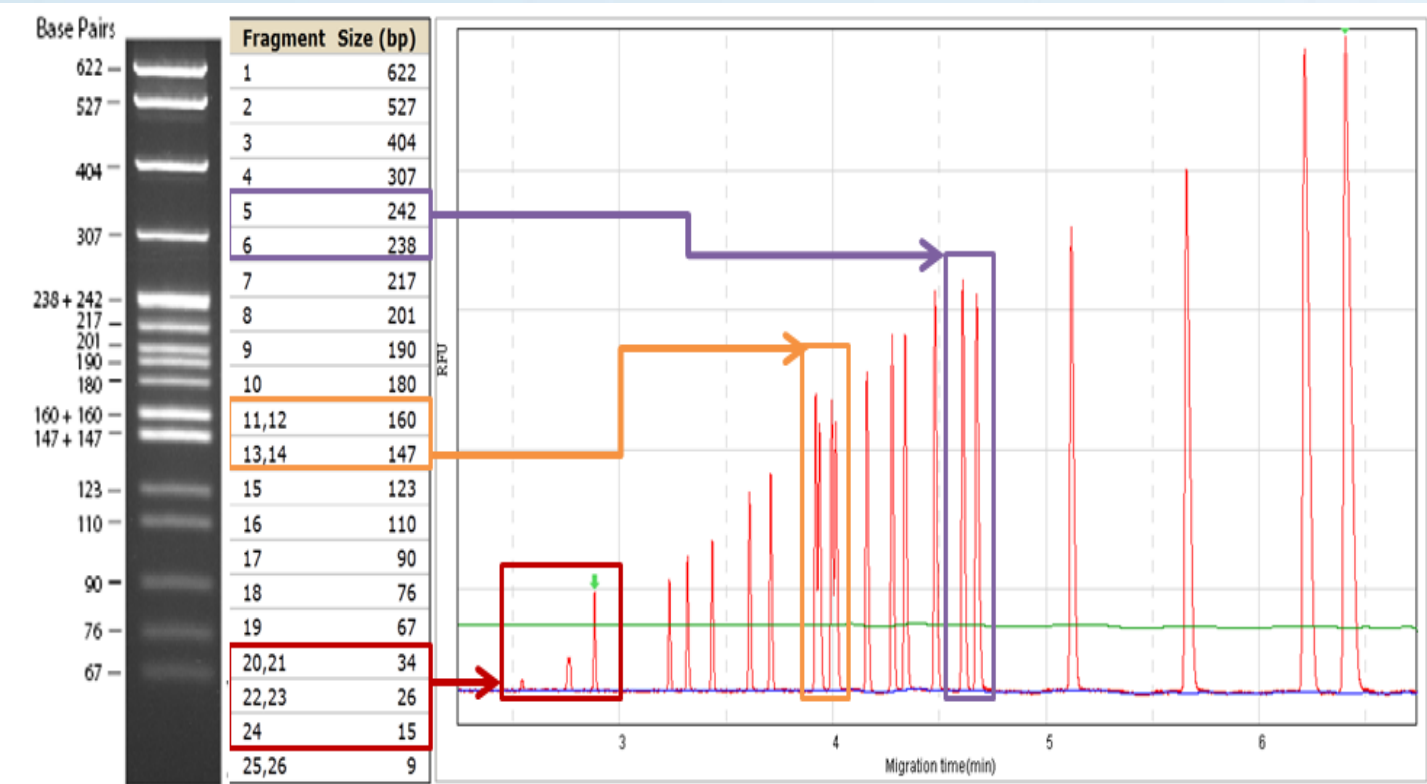


High Resolution

High Sensitivity

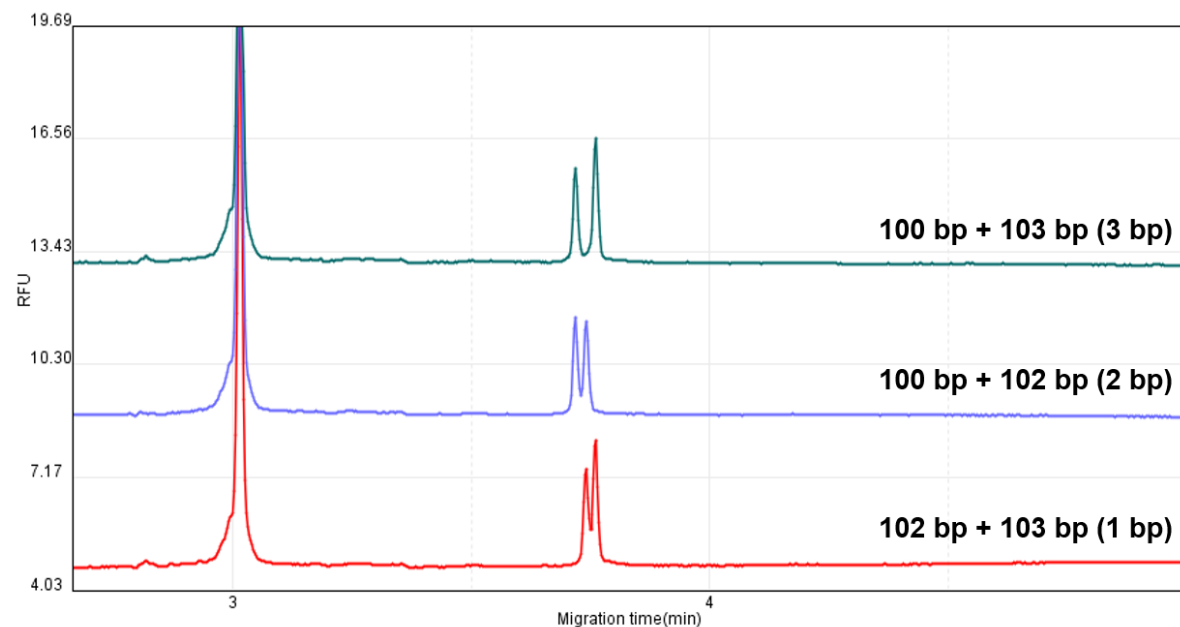
High Reproducibility

Best Resolution- 1~4bp

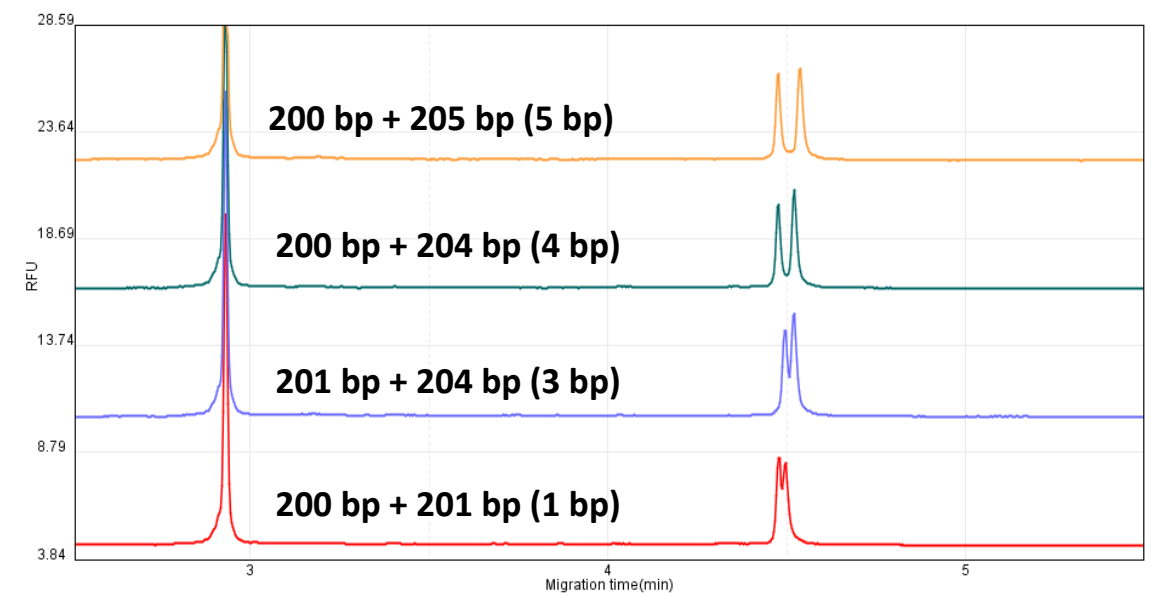


Qsep100 highlights the restriction map of pBR322-MspI digestion.

1. dsDNA with different sequence, 160/160 and 147/147, can be well resolved in two peaks.
2. DNA fragments of 238 bp, 242 bp can be separated into two isolated peaks.



Test by C1 Cartridge



Best Sensitivity- below 5pg/ μ l

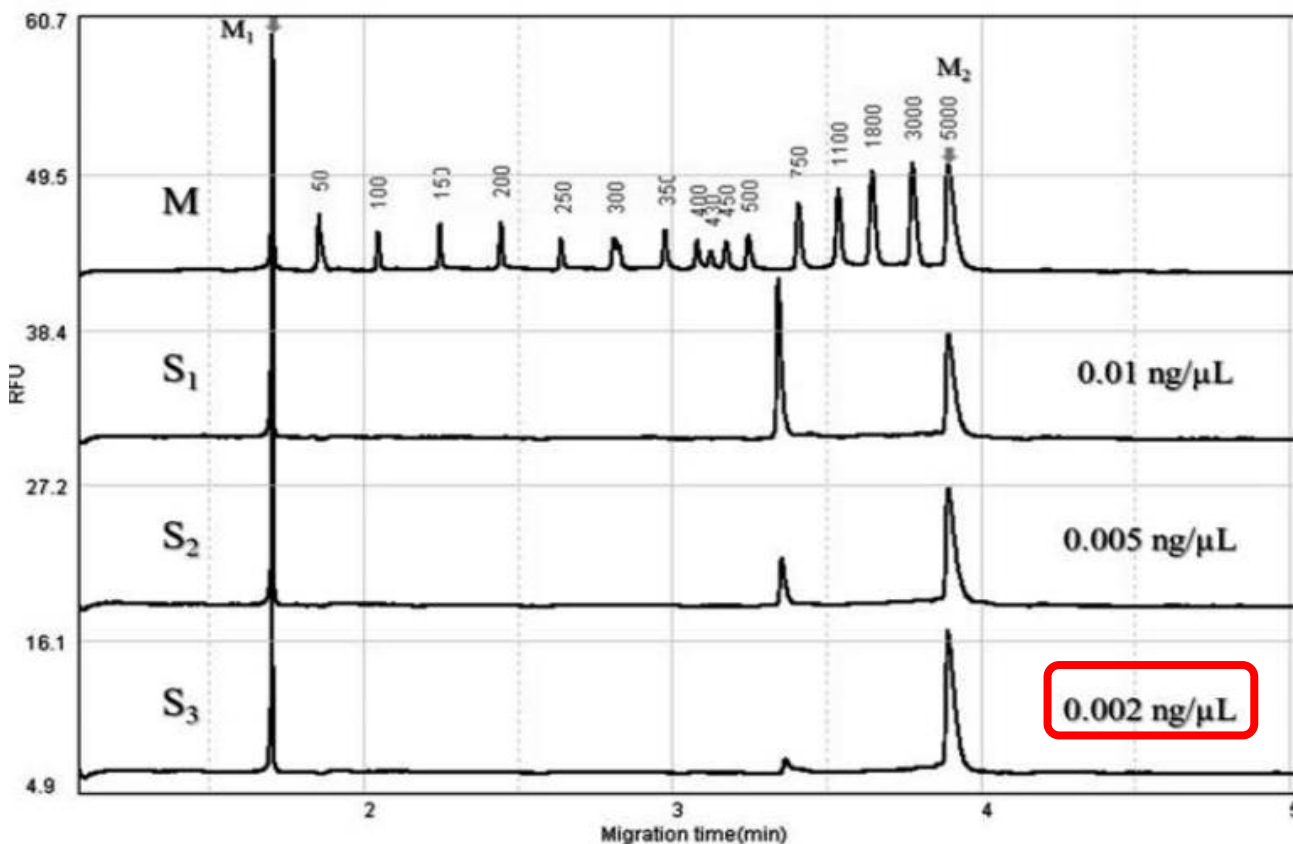
• N1 High sensitivity Cartridge

Ultrafast haplotyping of putative microRNA-binding sites in the WFS1 gene by multiplex PCR and capillary gel electrophoresis

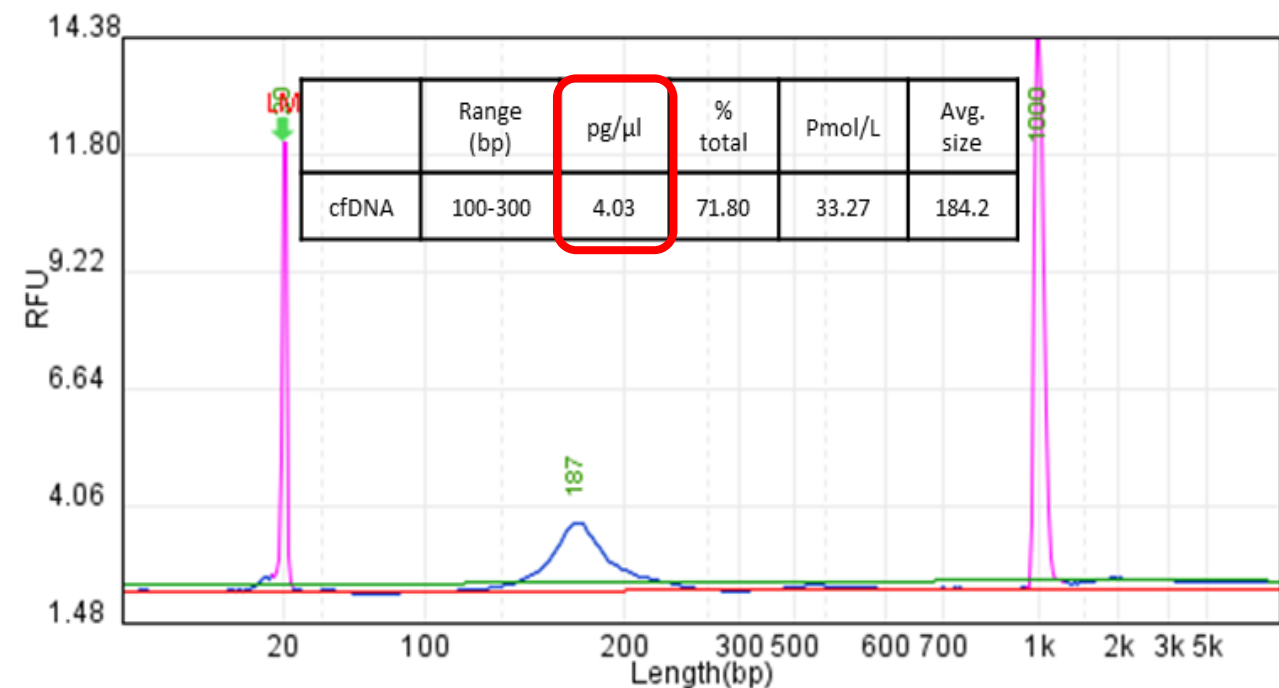
Márta Kerékgyártó^a, Nóra Németh^b, Tamás Kerekes^c, Zsolt Rónai^b and András Guttman^{a*}

^aHorváth Laboratory of Bioseparation Sciences, University of Debrecen, H-4032 Debrecen, Nagyerdei krt. 98, Hungary; ^bDepartment of Medical Chemistry, Semmelweis University, H-1094 Budapest, Tuzolto u. 37-47, Hungary; ^cCentre for Clinical Genomics and Personalized Medicine, Medical and Health Science Center, University of Debrecen, H-4032 Debrecen, Nagyerdei krt. 98, Hungary

* To whom correspondence should be addressed: Phone: +36(52) 414-717/64182; Fax: +36 (52) 414-717/55539; E-mail: guttman.andras@hlbs.org



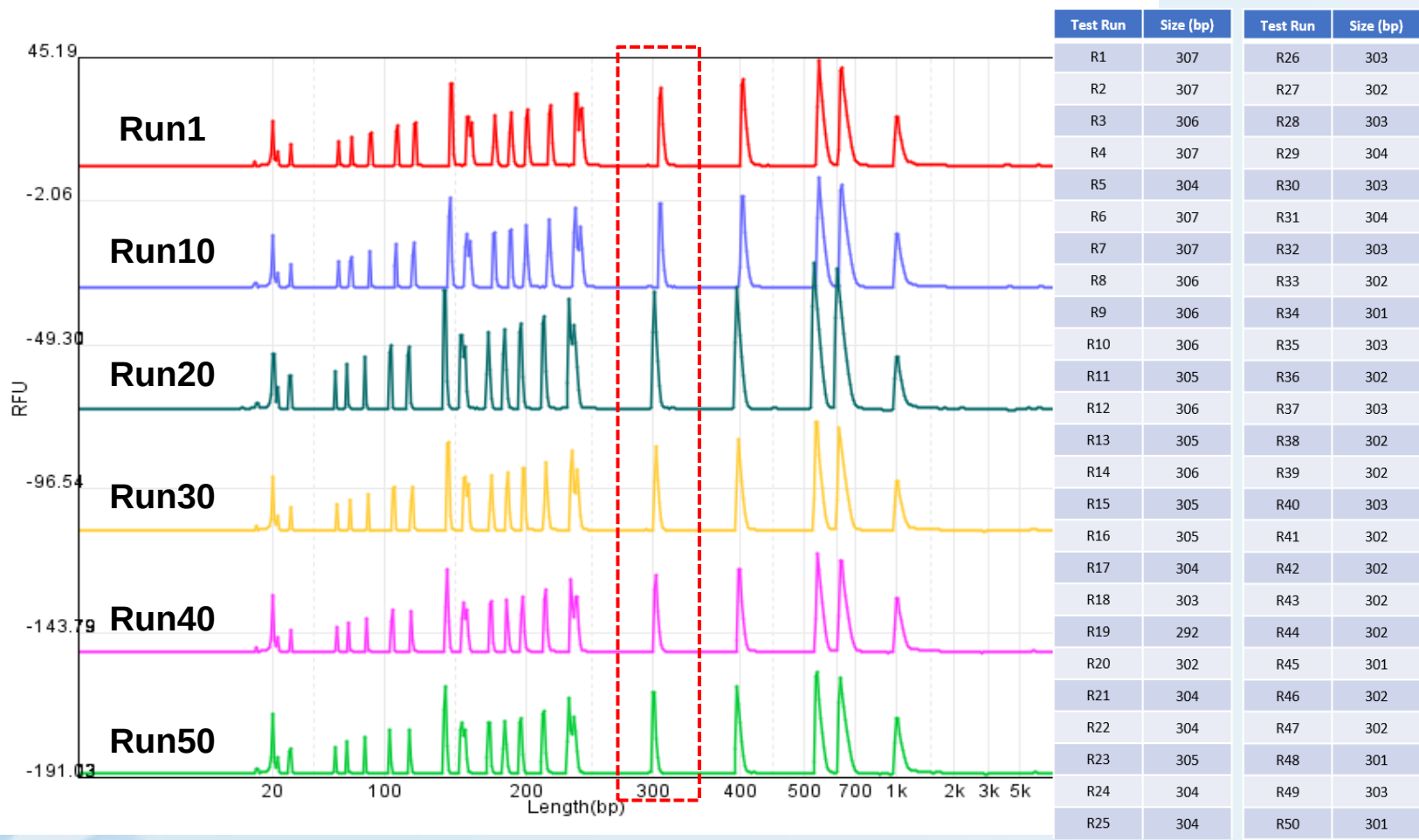
Cell free DNA application



cfDNA sample is analyzed on *Qsep* platform with high sensitivity cartridge (N1). The sample is diluted to below 5 pg/ μ l. Analysis time is about 2~3 mins.

High Reproducibility & Stability

- Reproducibility in small fragment

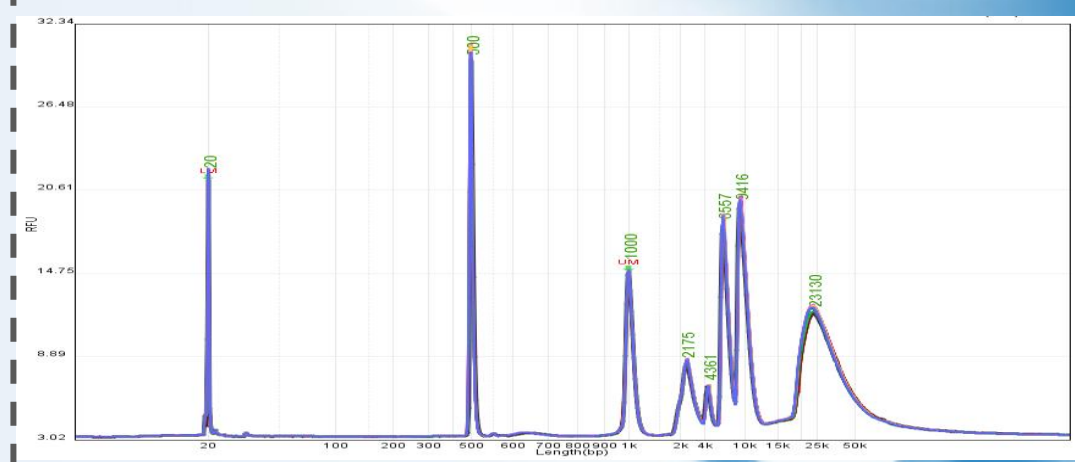


Reproducibility Test

Repeat testing size marker on *Qsep* series shows high reproducibility. The 307 bp fragment in size marker has precision value **0.8% CV** (repeat test 50 runs).

CV%= 0.8%

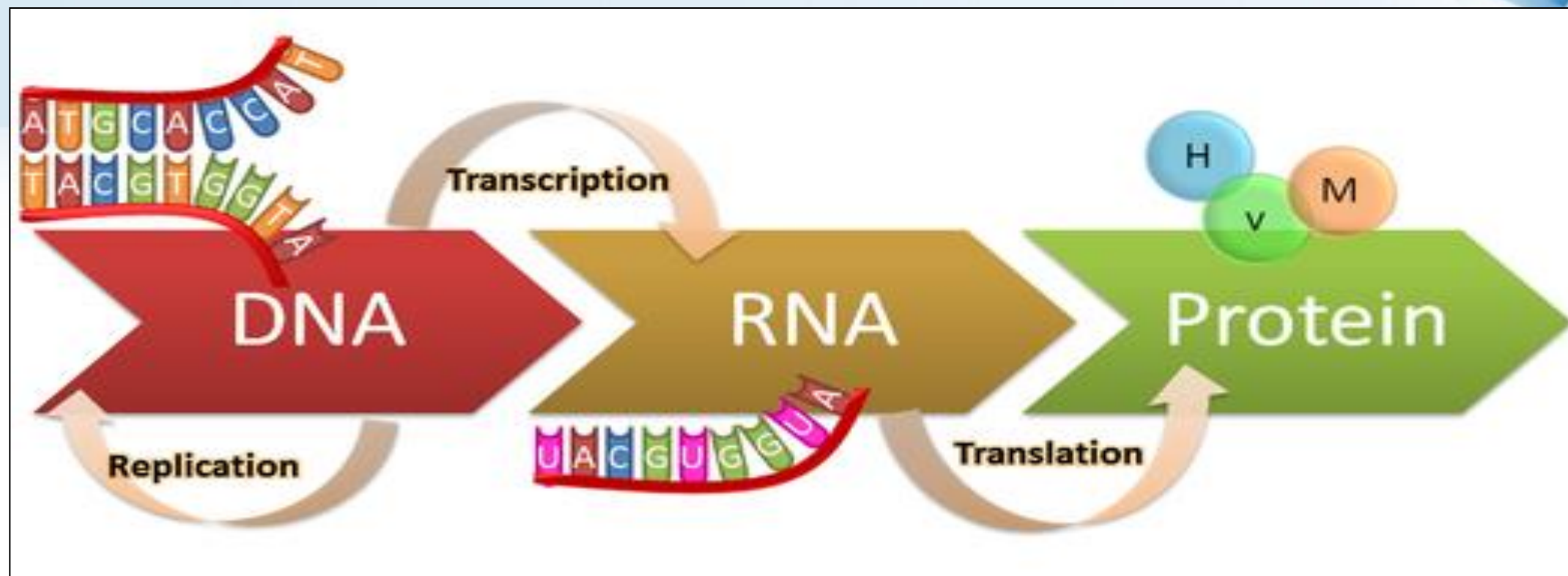
- Reproducibility in large size



	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Average	STD	CV%
Peak No.	Peak Size (bp)												
1	500	498	498	498	499	499	499	499	500	500	499	0.77	0.2%
2	2175	2209	2247	2221	2217	2203	2211	2193	2192	2175	2204.3	20.80	0.9%
3	4361	4423	4456	4480	4447	4416	4439	4376	4413	4361	4417.2	38.57	0.9%
4	6557	6559	6591	6607	6582	6524	6656	6580	6598	6557	6581.1	34.02	0.5%
5	9416	9427	9456	9487	9474	9403	9538	9431	9454	9416	9450.2	38.93	0.4%
6	23130	22934	23053	23133	23391	23208	24220	23280	23483	23130	23296.2	343.15	1.5%

The 500 bp – 23 kb size marker (C109700) is tested repeatedly by S3 cartridge on *Qsep* platform. The sizing results present high reproducibility. The coefficient of variation (CV%) is **less than 2.0% for each peak**.

Widely applications



Genomic/ plasmid DNA
NGS Library QC
Multiplex PCR
CRISPER
SNP
RFLP
MDx

Total RNA QC
RNA Fragment Analysis
Low concentration of
RNA

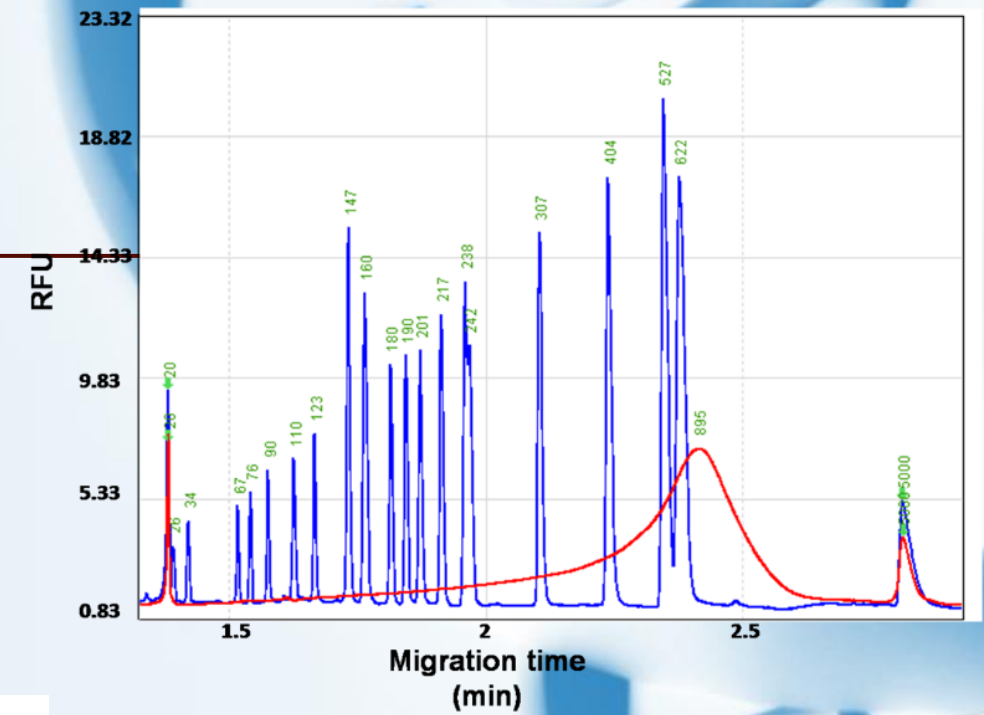
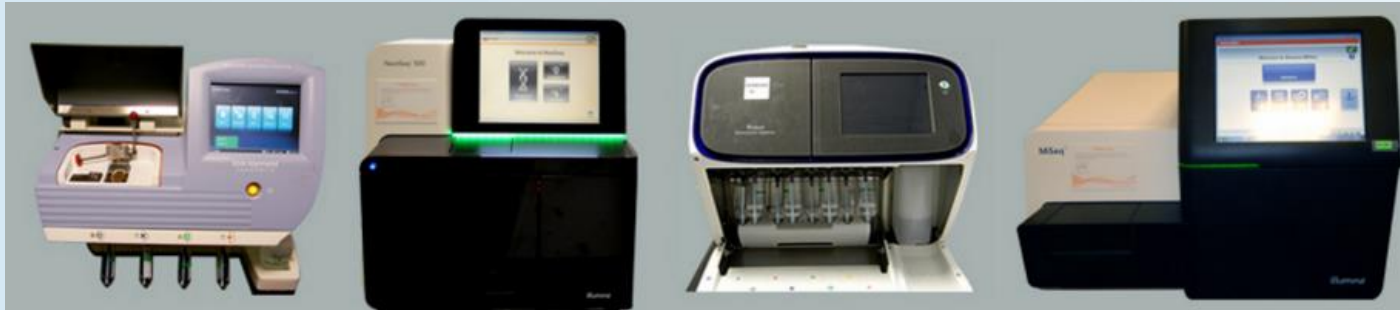
Protein Profiling
Antibody Purity
Analysis

03

NGS QC application

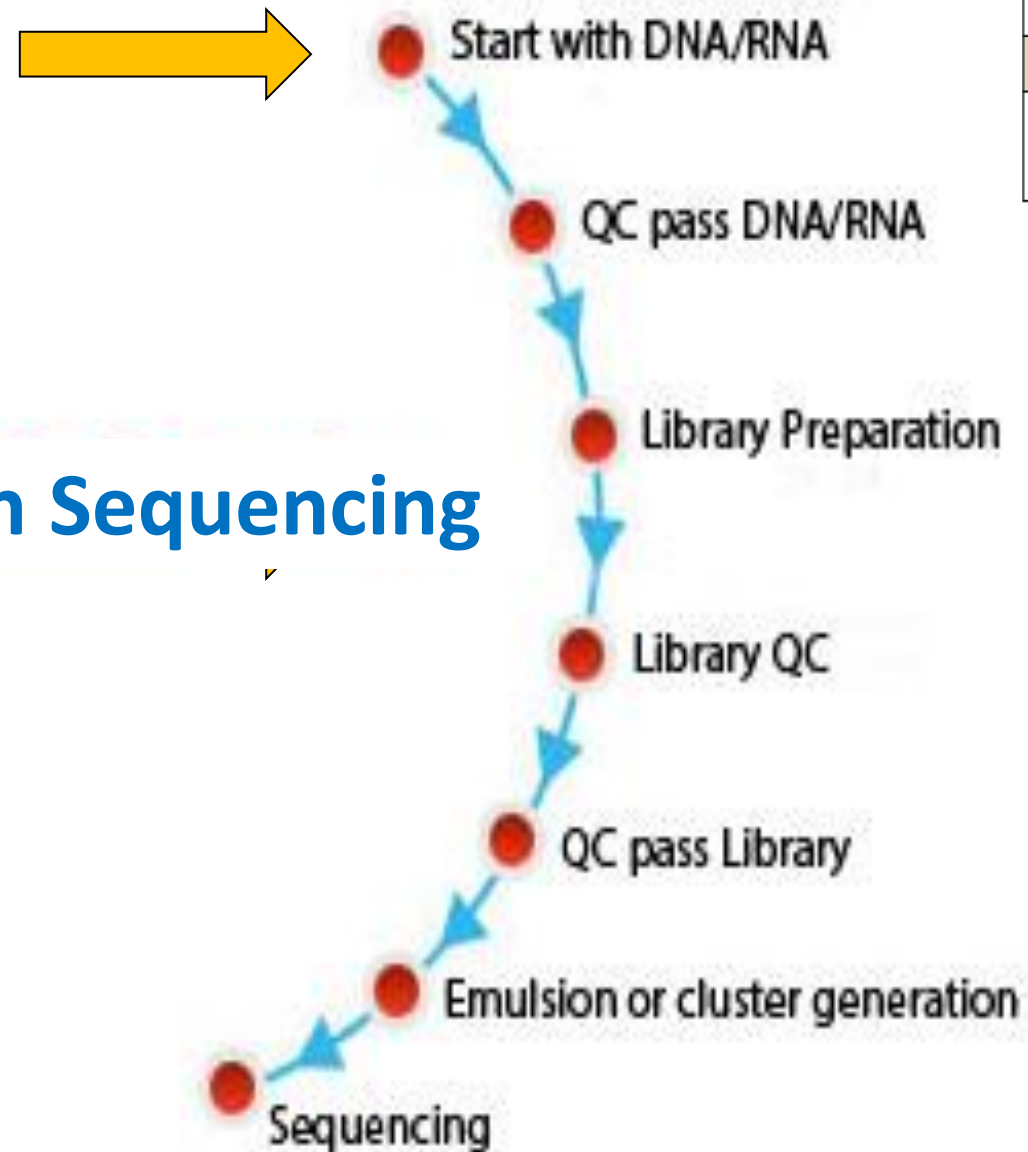
QC workflow

NGS QC applications

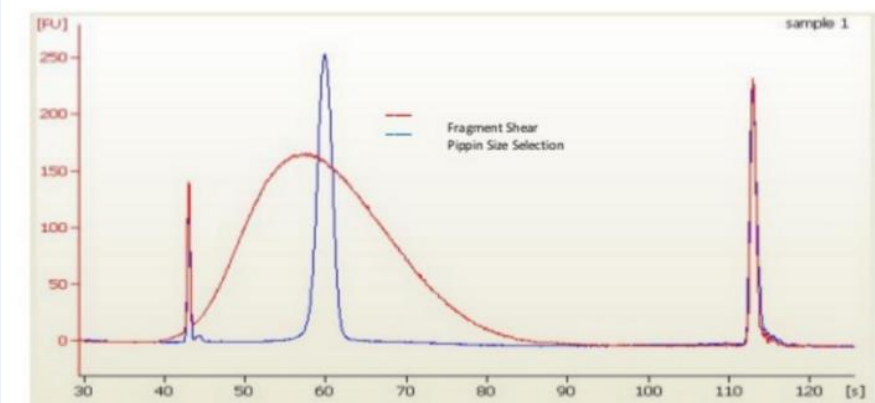


	Range (bp)	ng/ μ l	% total	nmole/L	Avg. size
Library	100-5000	55.98	99.71%	101.71	846.96
	400-600	7.63	13.62%	23.75	493.97
	600-800	7.16	15.03%	15.53	709.73
	800-1000	9.22	19.37%	15.82	896.50
	1000-1200	5.29	10.40%	7.52	1082.95

Next Generation Sequencing



Shared DNA, Library



3mins/ run

Genomic DNA quality control

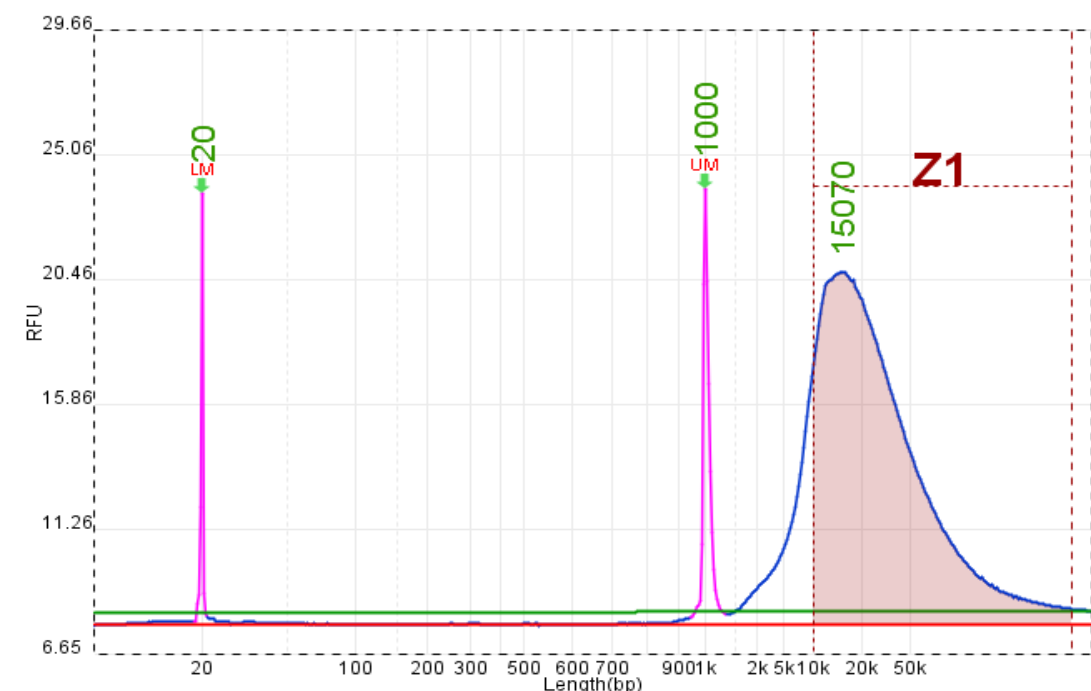
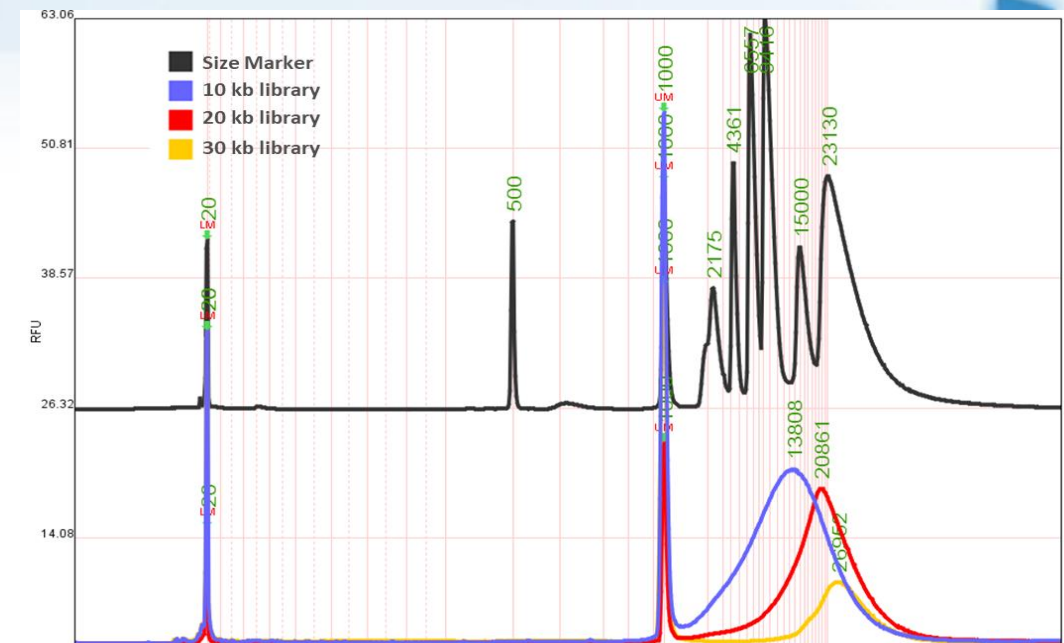
❖ **Kilobase Cartridge: for high molecular weight DNA analysis**

S3 Kilobase Cartridge

Sizing Range	up to 50 kb
Detection Limit	0.1 ng/μl
Sample volume	1-2 μl with Micro vial
Shelf Life	6 months

N3 High Sensitivity Kilobase Cartridge

Sizing Range	up to 50 kb
Detection Limit	20 pg/μl
Sample volume	1-2 μl with Micro vial
Shelf Life	4 months



Distribution:	81.5 %	Average Size:	36,854.7 bp
From:	10,007 bp	Average Molarity:	0.12 nmole/L
To:	164,996 bp	DQN:	8.5

- **Sizing range up to 50 kb**
- **Integrity check and provide DQN**

Total RNA quality control

❖ RNA Cartridge: for RNA analysis, especially total RNA QC

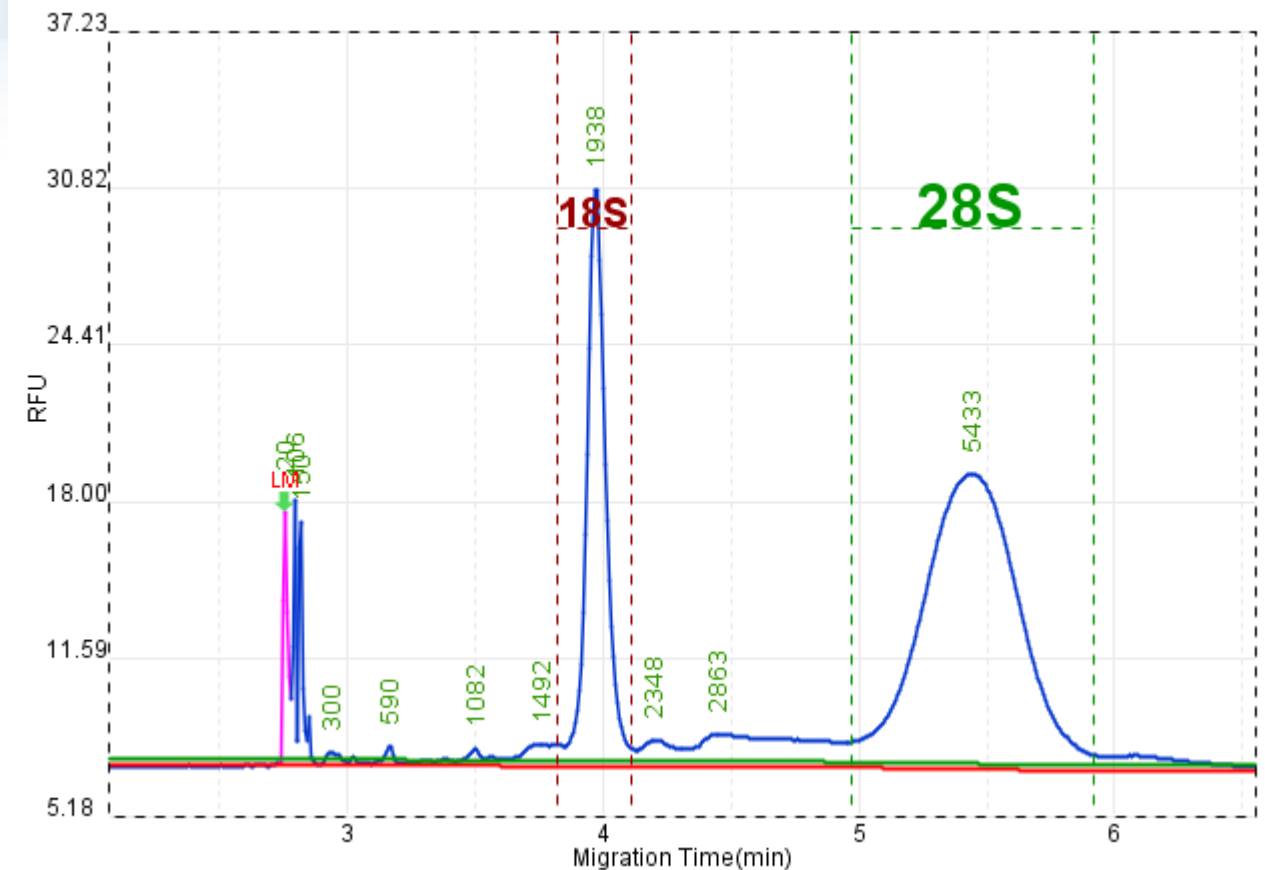
R1 RNA Cartridge

Detection Limit	5 ng/μl
Sample volume	1-2 μl with Micro vial
Shelf Life	4 months

NR1 High Sensitivity RNA Cartridge

Detection Limit	1 ng/μl
Sample volume	1-2 μl with Micro vial
Shelf Life	4 months

- Automatically assign 18S/28S
- Provide RNA Quality Number (RQN) and DV200 for quality control

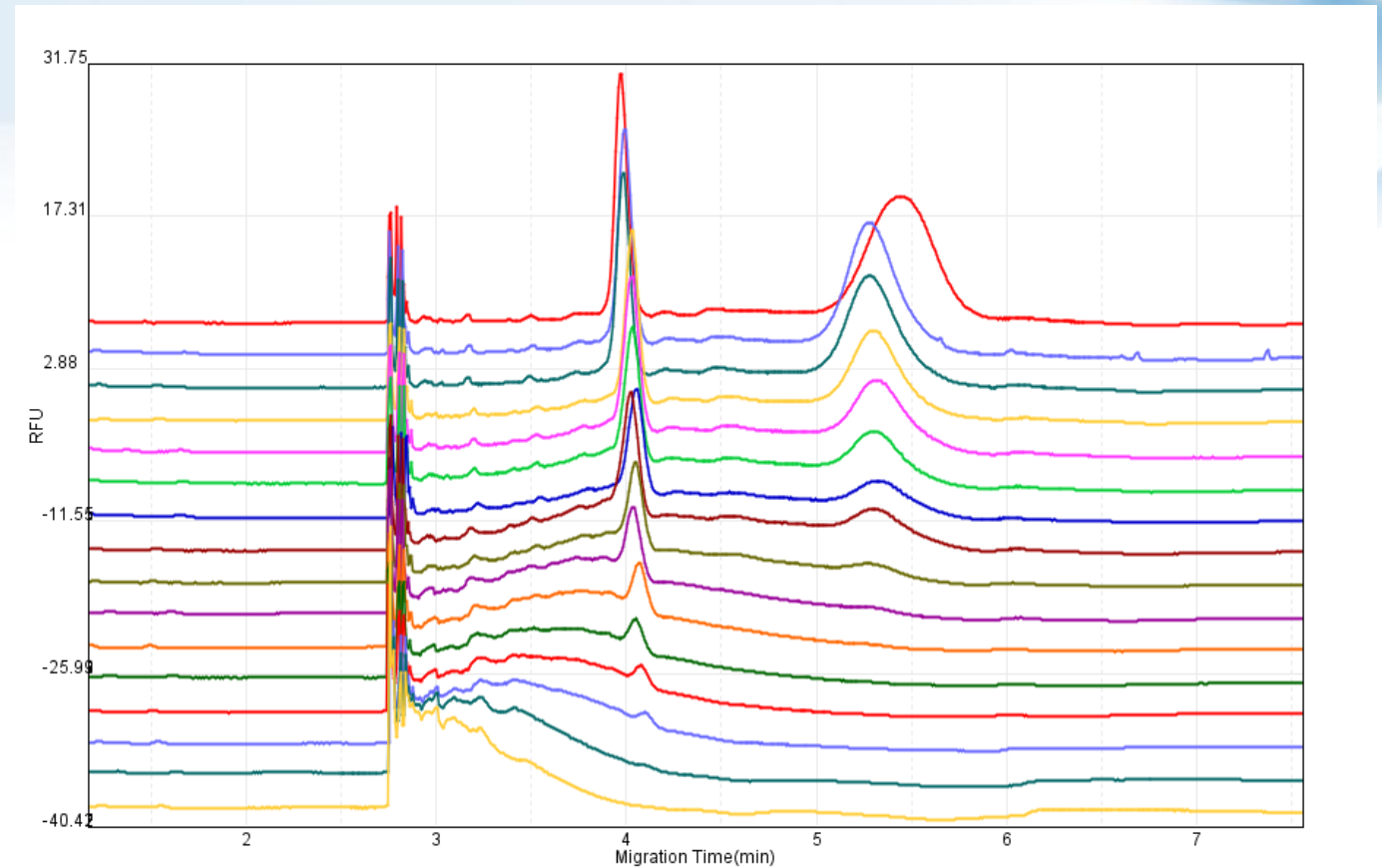


18S Start Time	227.00 sec.	
18S End Time	244.60 sec.	
28S Start Time	292.00 sec.	
28S End Time	354.60 sec.	
Total Peak Area	5,423,216	
18S Area	1,206,408	22.2 %
28S Area	3,145,641	58.0 %
Ratio (28S / 18S)	2.61	
RNA Quality Number	9.84	
DV200	98.3 %	

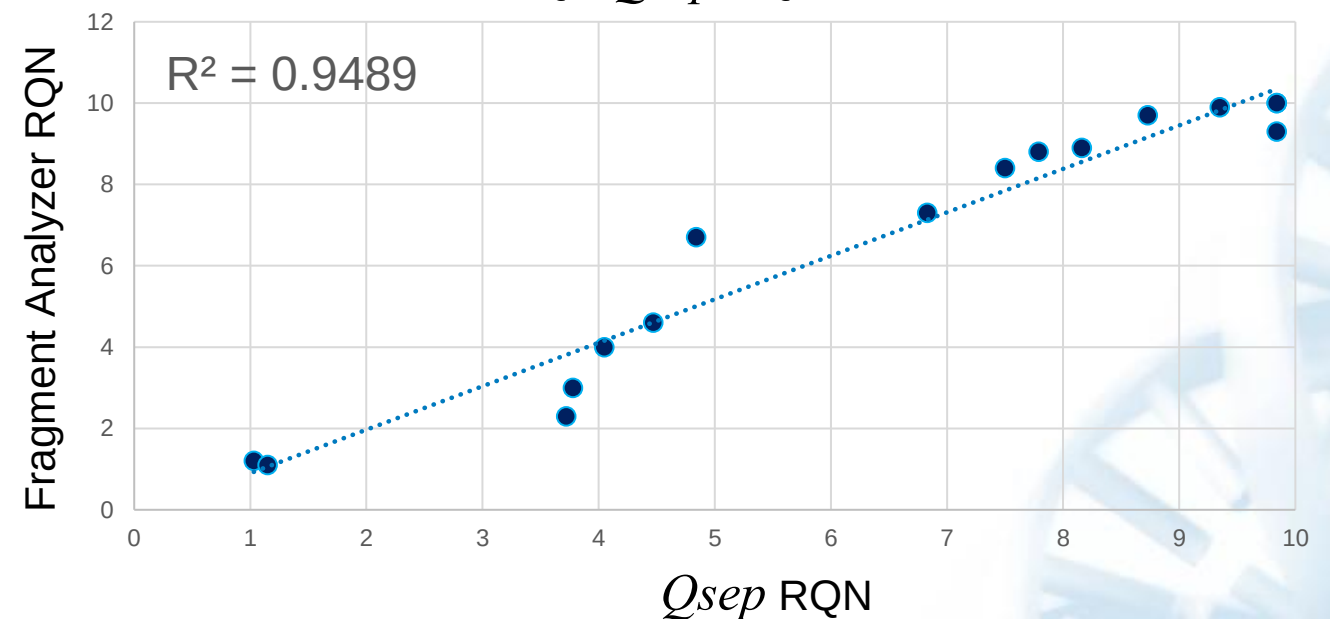
Total RNA quality control

❖ Total RNA QC: identify 18S/28S and provide **RQN** for RNA integrity assessment

90°C Heating Time	Fragment Analyzer RQN	<i>Qsep</i> RQN
0 min	10	9.84
3 mins	10	9.84
5 mins	9.3	9.84
10 mins	9.9	9.35
15 mins	9.7	8.73
20 mins	8.9	8.16
25 mins	8.8	7.79
30 mins	8.4	7.5
45 mins	7.3	6.83
60 mins	6.7	4.84
75 mins	4.6	4.47
90 mins	4	4.05
120 mins	3	3.87
150 mins	2.3	3.72
210 mins	1.2	1.03
270 mins	1.1	1.15



FA RQN/*Qsep* RQN Correlation



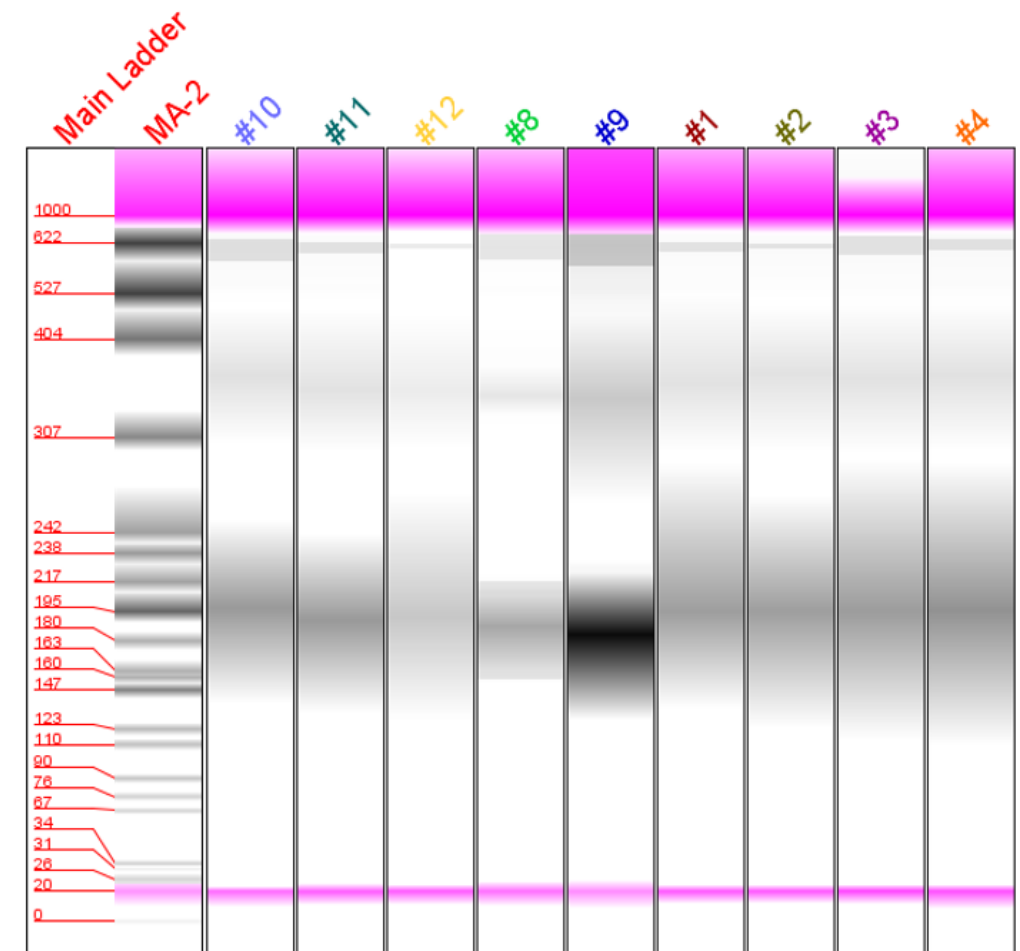
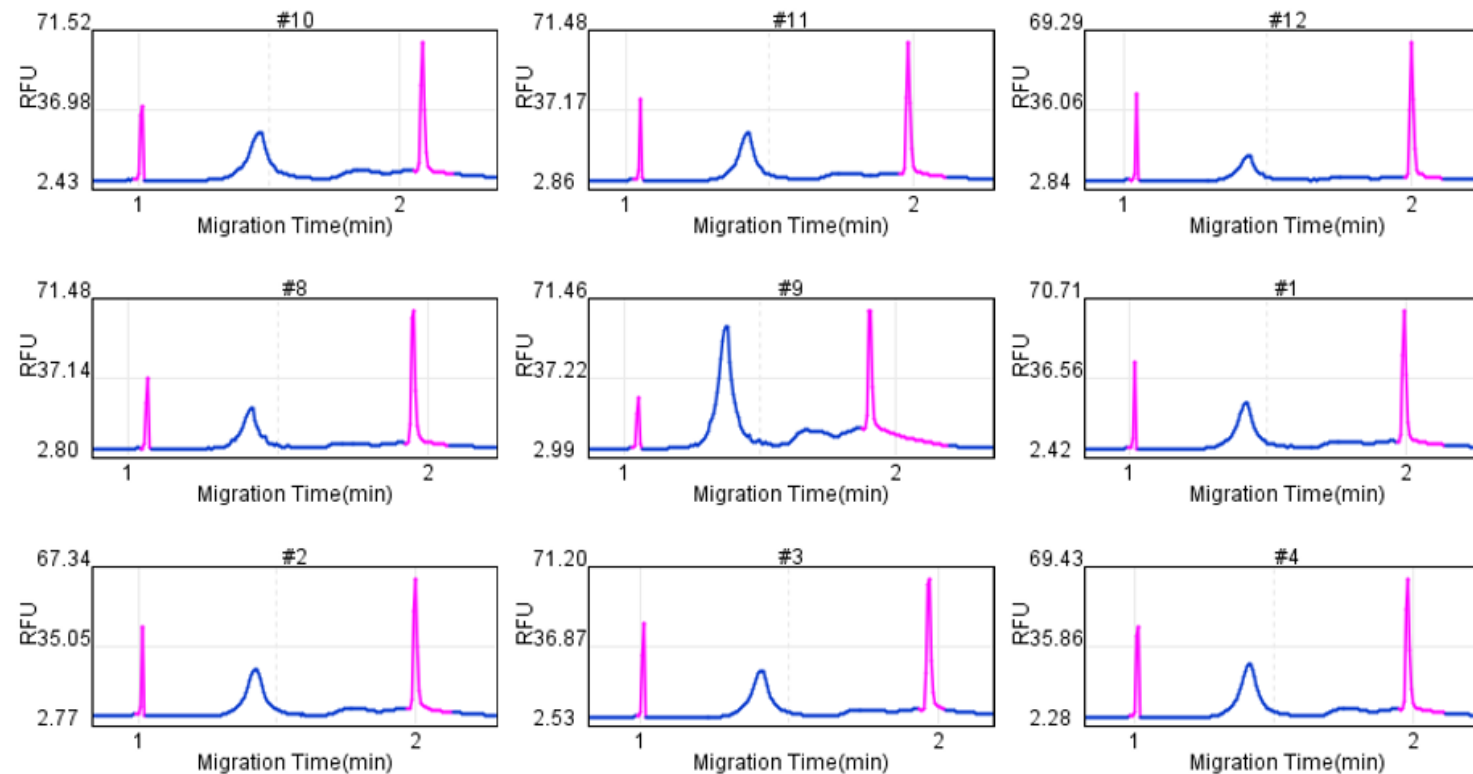
Cell-Free DNA analysis

❖ High Sensitivity Cartridge: for low concentration sample

N1 High Sensitivity Cartridge

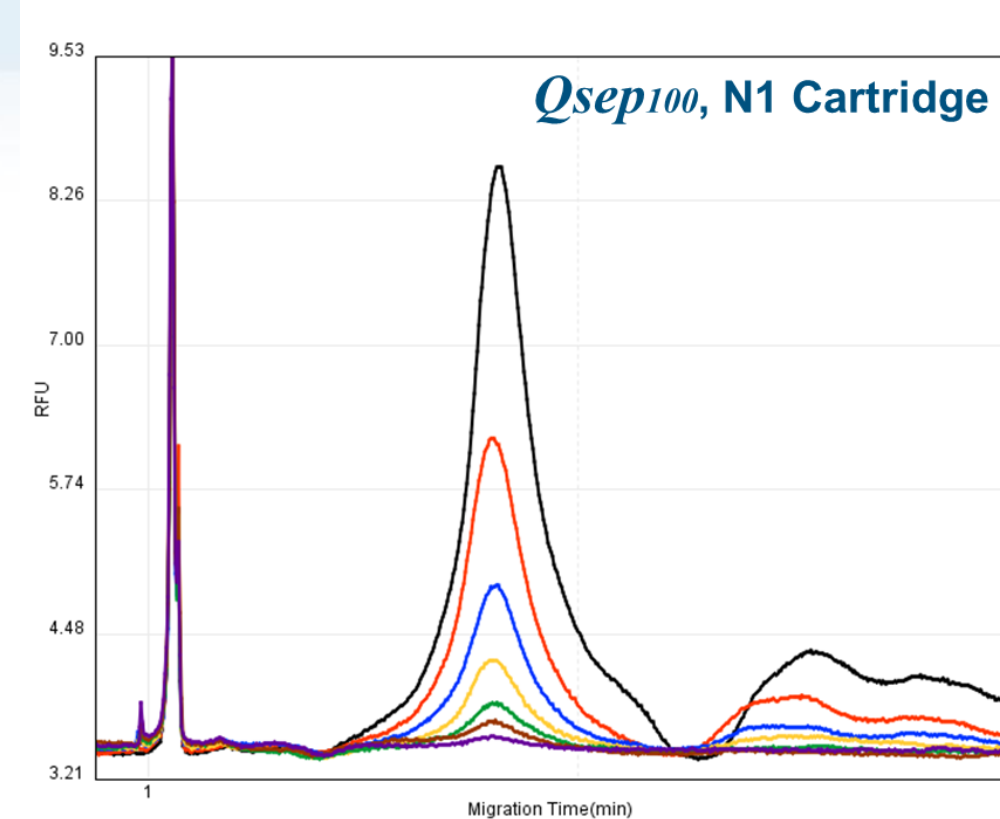
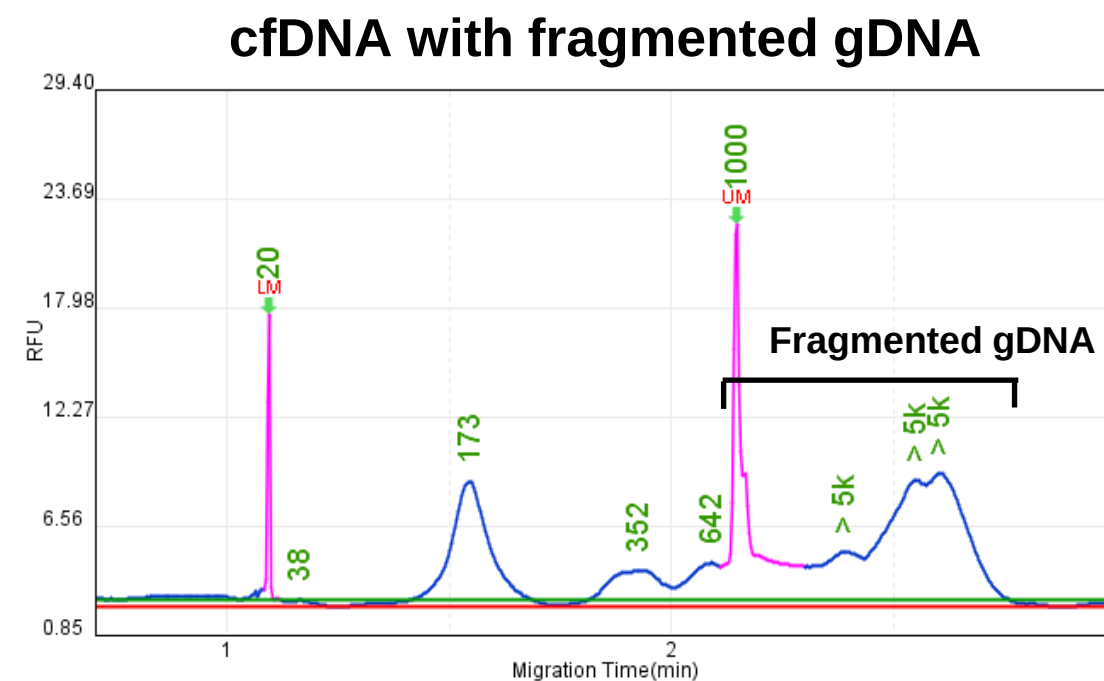
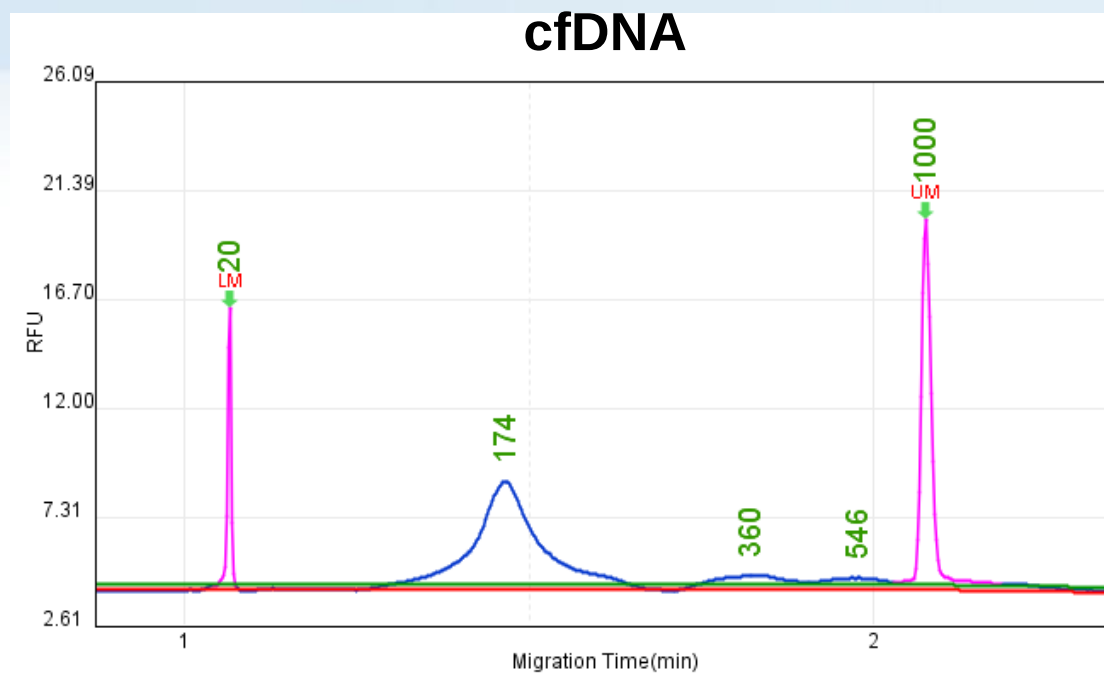
Sizing Range	10-5000 bp
Detection Limit	5 pg/ μ l
Sample volume	10 μ l with 0.1 ml tube
Shelf Life	4 months

- 2~3 mins per run
- LOD: low to 5 pg/ μ l



Cell-Free DNA analysis- quantitative function

❖ Cell-Free DNA (cfDNA): provide **size** and **purity** result of cfDNA



cfDNA_#12	S/N value	Concentration (pg/ul)
Stock	240.33	114.98
2X dilution	126.24	58.81
4X dilution	74.27	28.54
8X dilution	39.72	14.97
16X dilution	20.81	8.01
32X dilution	13.10	6.11
64X dilution	NA	NA

- Detect and distinguish cfDNA and genomic DNA contamination

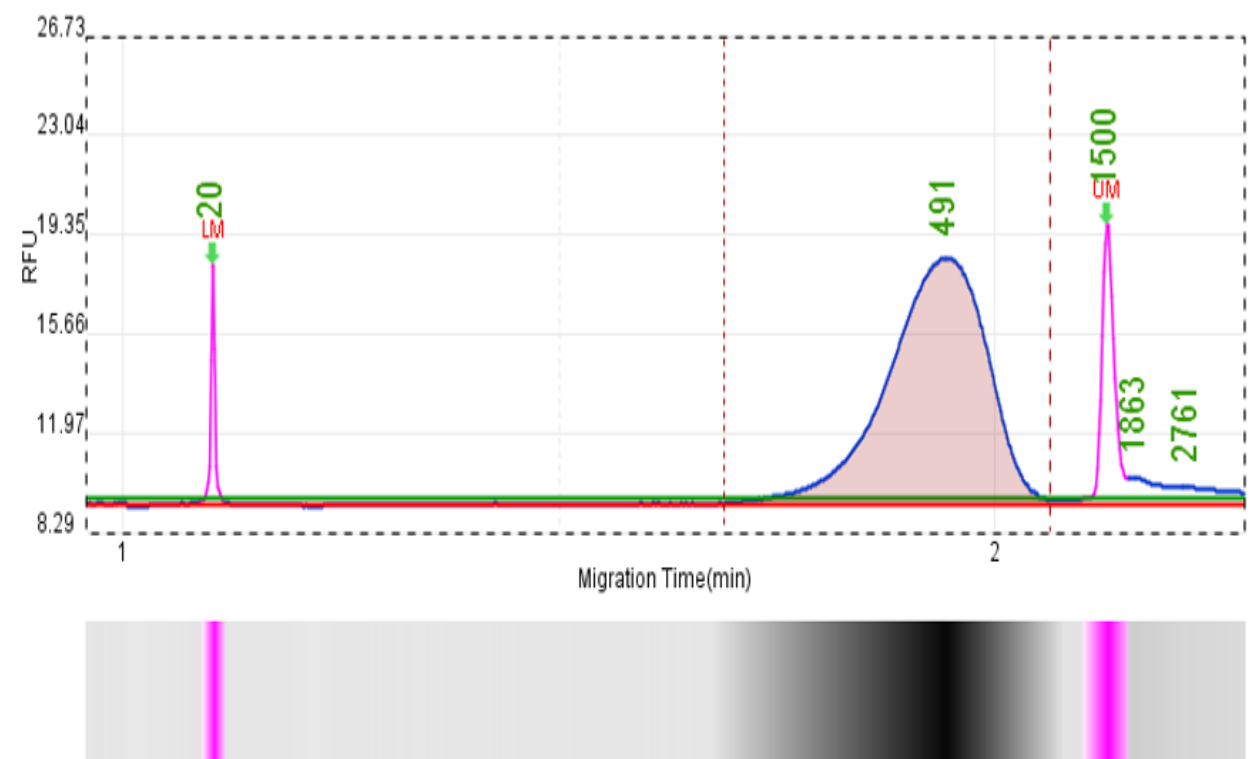
Fragmentation QC analysis

- ❖ **Standard Cartridge:** provide a suitable analysis method for fragmentation and library samples

S2 Standard Cartridge

Sizing Range	10-5000 bp
Detection Limit	0.1 ng/μl
Sample volume	1-2 μl with Micro vial
Shelf Life	6 months

- **2~3 mins per run**
- **Clear distribution information**
- **Provide Zone1 & Zone2 to do comparison**



Distribution: 98.1 %

Average Size: 488.5 bp

From: 272 bp

Average Molarity: 15.72 nmole/L

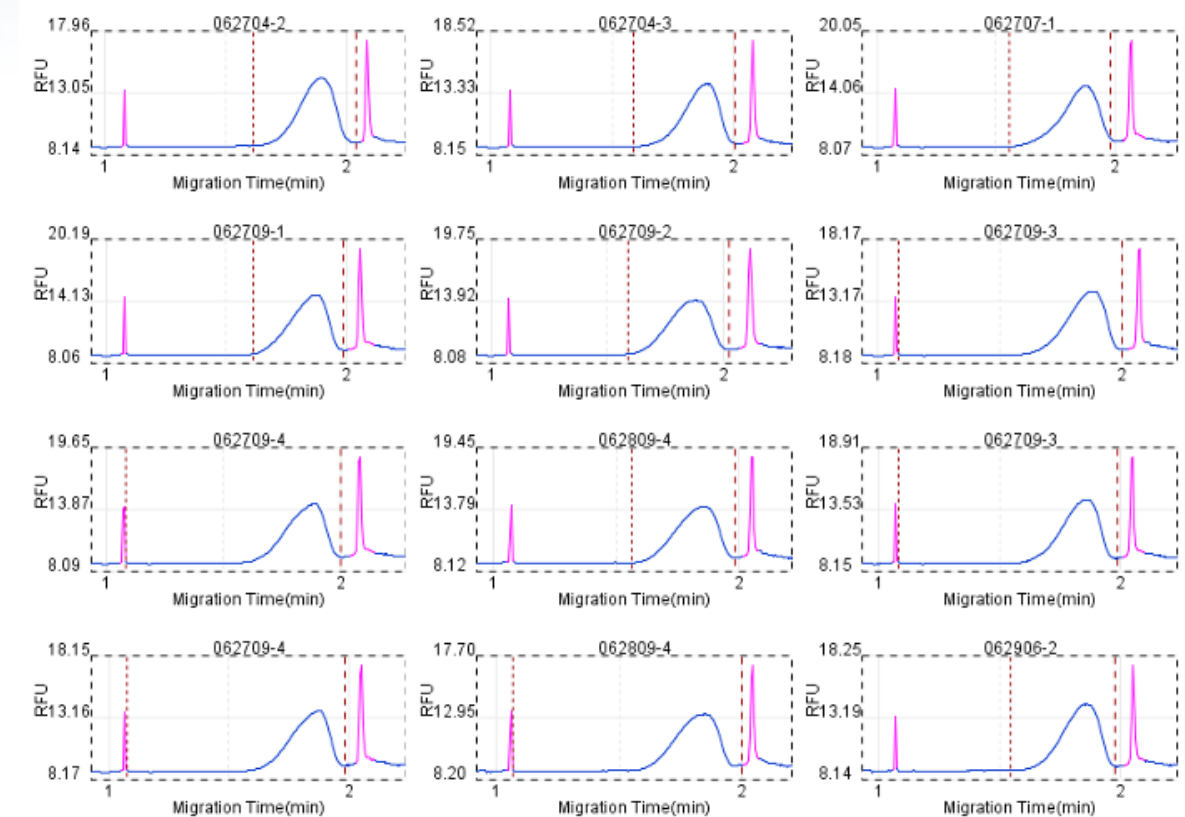
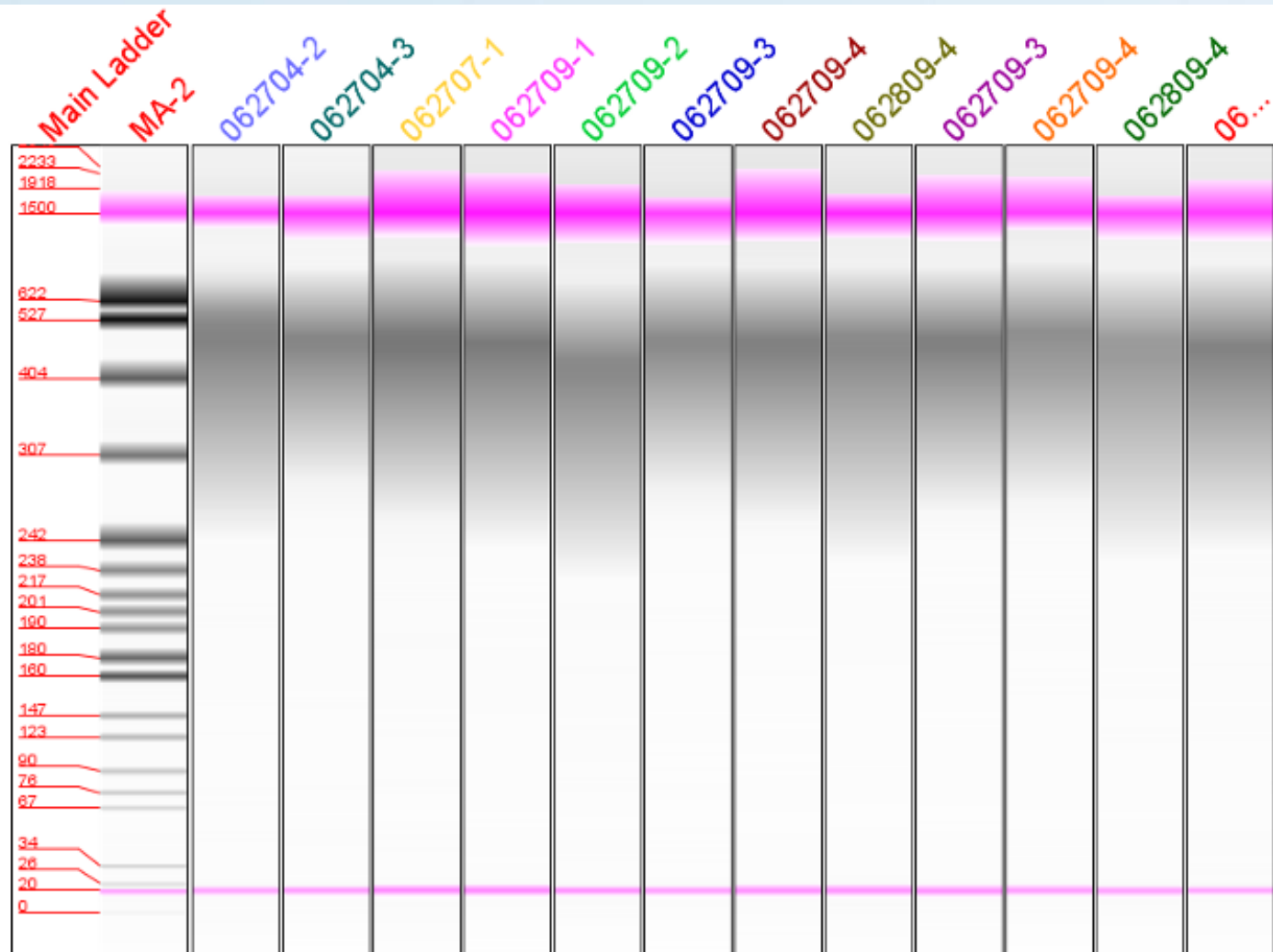
To: 977 bp

DQN: 9.9

Range	Avg. bp	ng/μl	nMole / L	Percent
272 - 400	363.0	0.87	3.69	15.4
400 - 600	483.9	3.64	11.58	71.0
600 - 800	664.2	0.45	1.04	10.8
800 - 977	861.4	0.03	0.05	1.0

Fragmentation QC analysis

❖ Fragmentation & Library QC: **size distribution & concentration**



	Tube01	062704-2	062704-3	062707-1	062709-1	062709-2	062709-3	062709-4	062809-4	062709-3	062709-4	062809-4	062906-2
Distribution (%)		97.2	97.0	95.7	97.1	96.2	98.7	97.8	97.1	99.0	97.4	99.7	97.2
Size from (bp)		249	241	239	257	240	25	26	241	26	26	26	239
Size to (bp)		1,088	910	846	917	838	919	873	930	988	924	1,117	889
Avg. size (bp)		470.7	456.1	452.7	450.7	409.3	446.9	432.1	439.5	447.3	448.3	440.7	444.9
Avg. molarity (nmol/L)		15.78	13.94	12.31	12.21	17.55	18.77	16.35	18.55	16.48	16.15	19.10	17.97
Concn. (ng/μl)		4.83	4.13	3.62	3.58	4.67	5.45	4.59	5.30	4.79	4.71	5.47	5.20

- **Provide reliable quantification and precise size in one step**

04

Protein Application

Better performance than
SDS page

Protein Cartridge (P2) Specification

Protein Cartridge (P2) Specifications	
Sizing range ¹	11-155 kDa ; up to 660 kDa
Appropriate concentration	5 ng/μl (BSA)
L.O.D.	0.5 ng/μl (BSA)
Detective range	0.5-500 ng/μl (BSA)
Resolution (R_s) ²	2.0-4.0 for adjacent two peaks of protein size ladder ³
Reproducibility (CV of migration time)	<10% (n=50)
Analysis time (per sample)	<6 minutes (BSA) ; <10 minutes (IgG)
Sample number (per cartridge)	100 runs
Sample consumption (per run)	<0.1 μl
Recommended sample volume	Above 20 μl
Shelf life	4 months (Room temperature)

¹Within the range of 11 to 155 kDa provides good resolution.

²The calculation of resolution (R_s) uses the migration time of adjacent two peaks (t_{m1} , t_{m2}) and the base width of the peaks (W_{b1} , W_{b2}). $R_s = 2(t_{m2} - t_{m1}) / (W_{b1} + W_{b2})$

³**BenchMark™ Fluorescent Protein Standard (Cat. No. LC5928)**

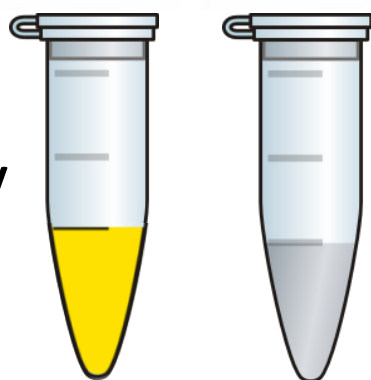


Labeling & Analysis Procedure

1

Sample Preparation

Labeling Dye
(Alexa Fluor 488/
Chromeo P503)

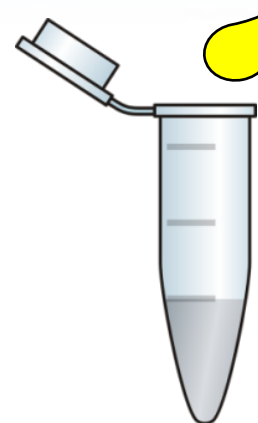


Protein sample
in labeling buffer
(2 mg/ml)

2

Protein Labeling

Add dye working solution



Alexa Fluor 488

Chromeo P503

1 hr
Incubation
at RT

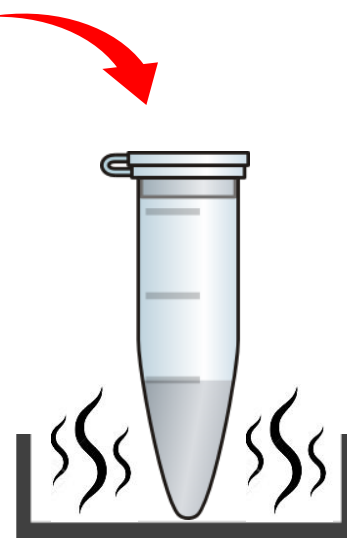
10 min
Incubation
at 60°C

3

Sample Treatment

Dilution
buffer

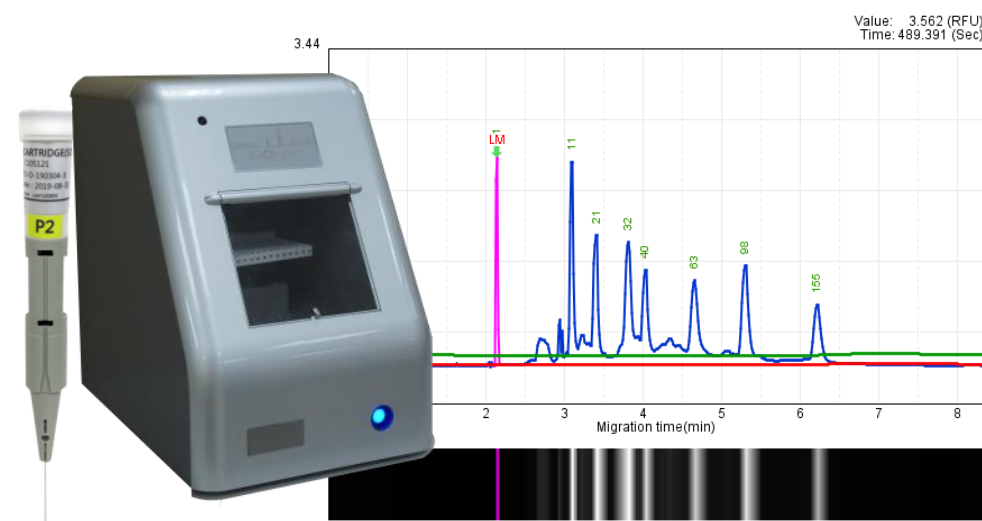
Dilute and Denature
the labeled protein



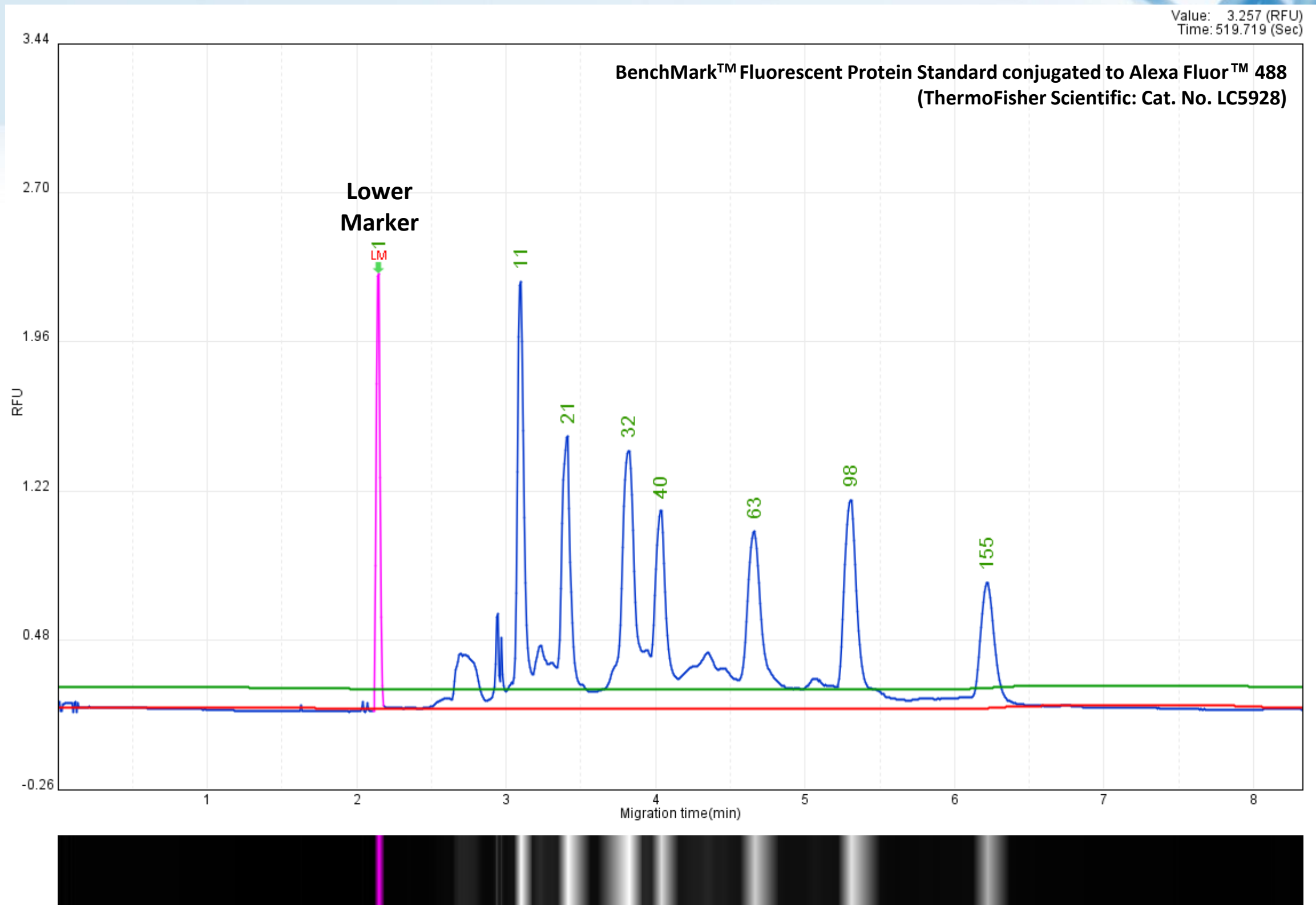
100°C 5min

4

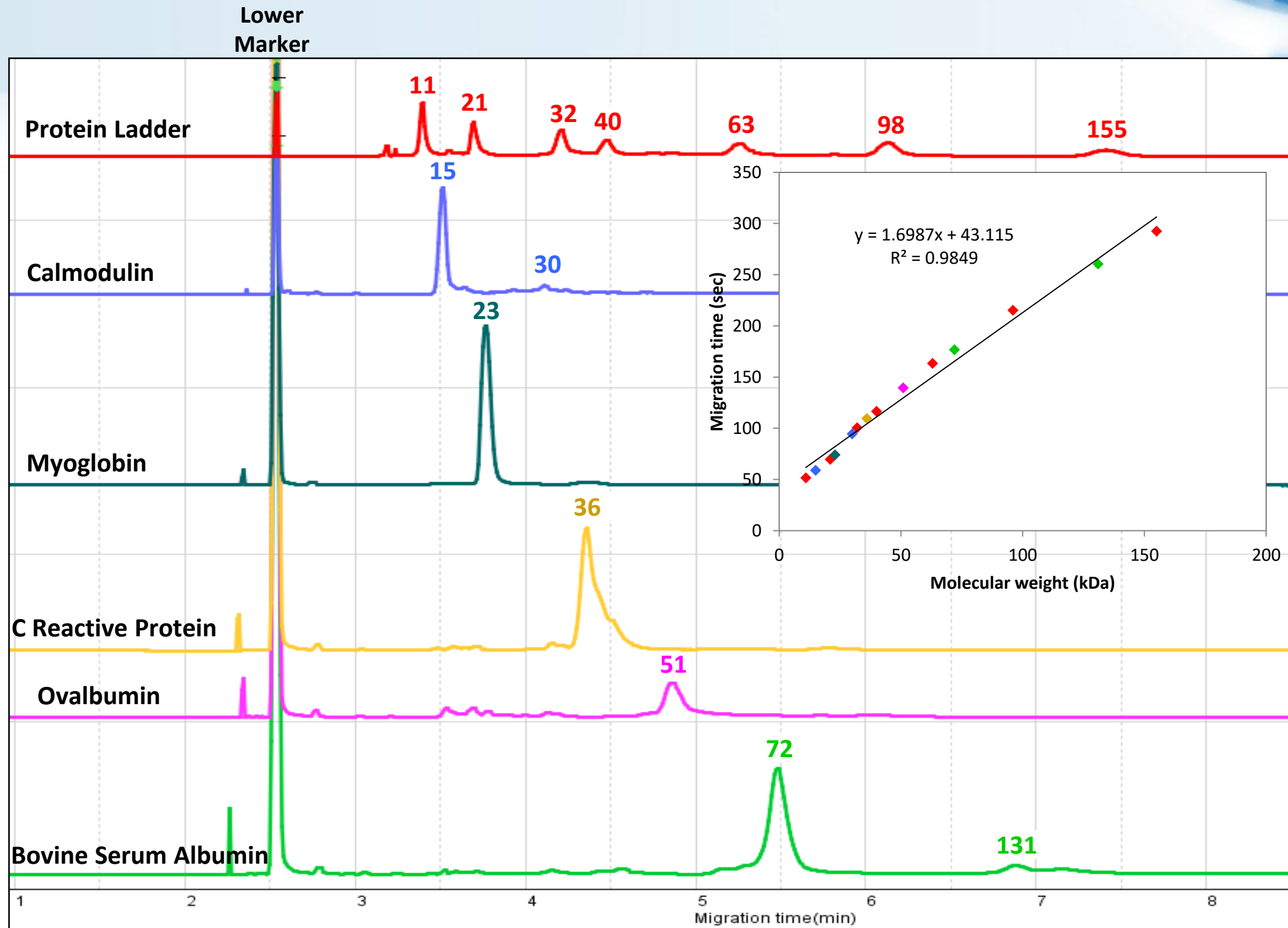
Sample Analysis



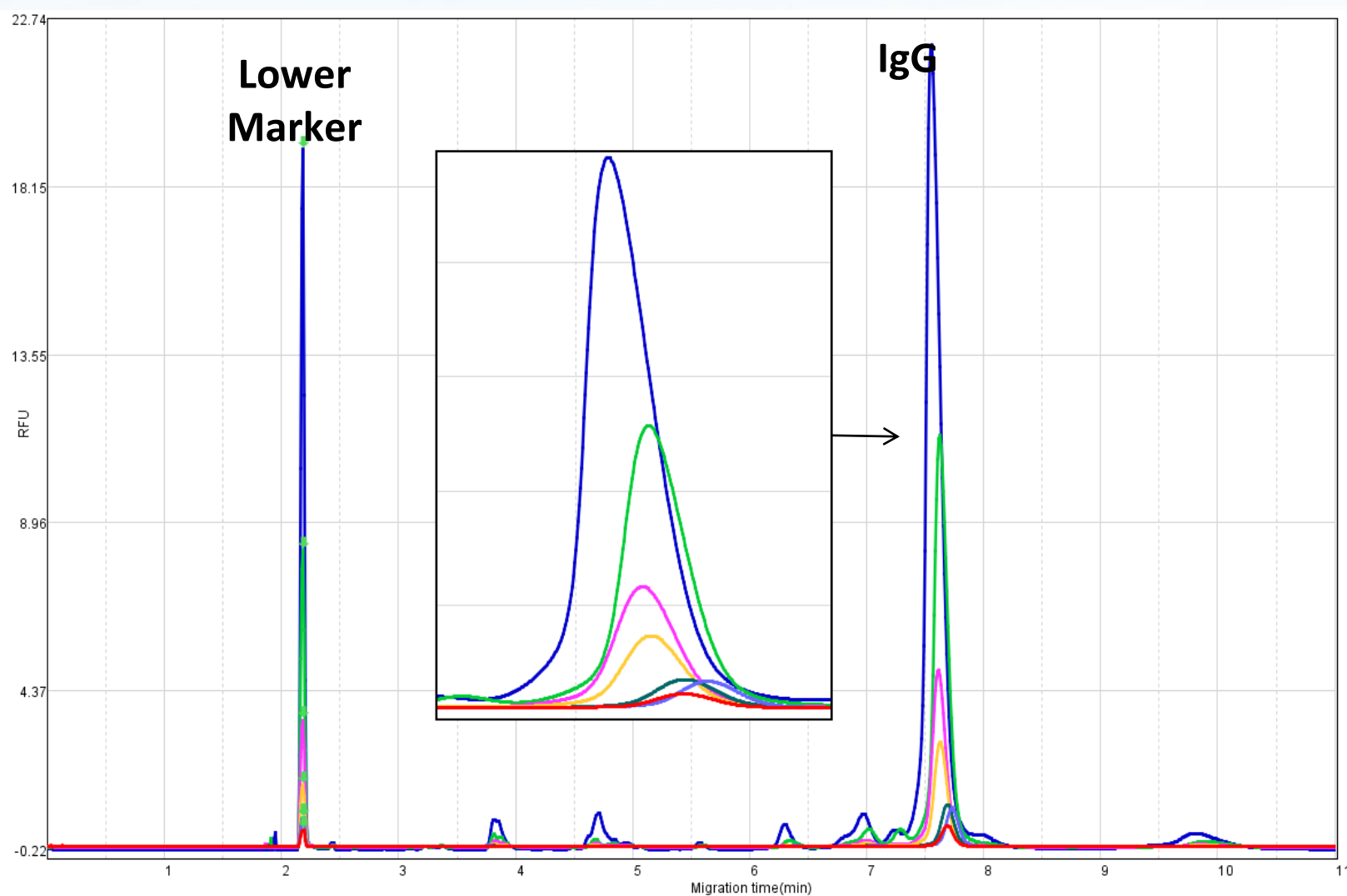
Protein sizing coverage for P2 cartridge



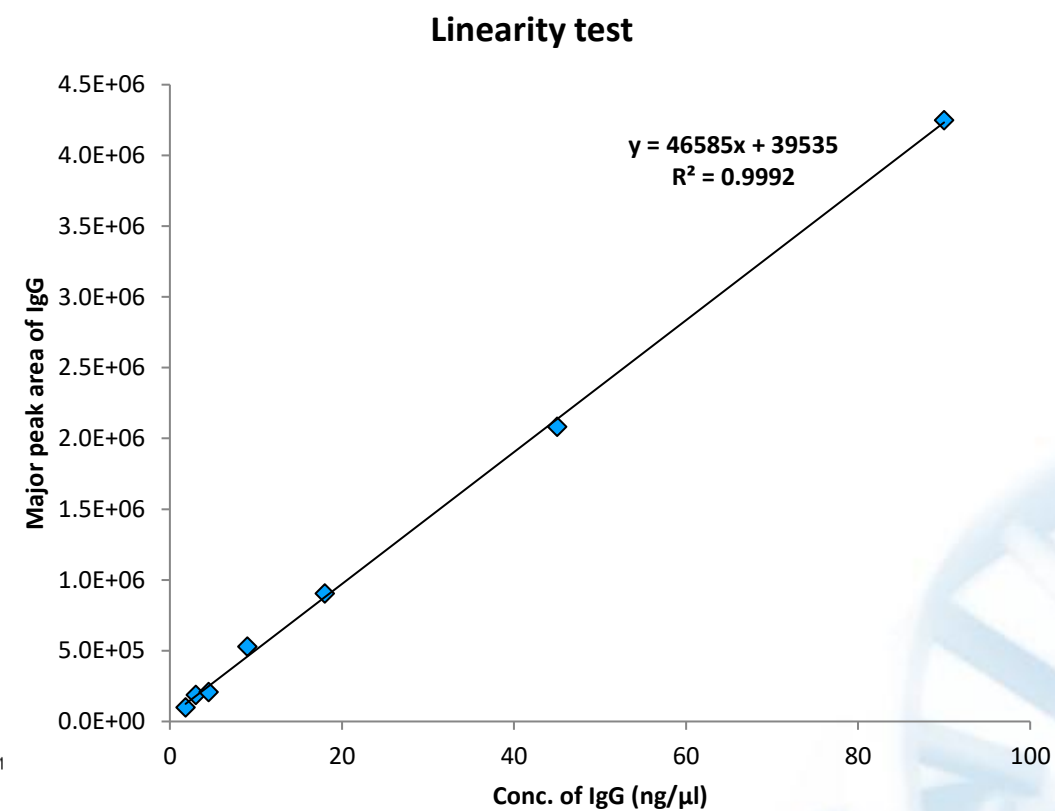
Apparent molecular weight determination for unknown proteins



Linearity test and limit of detection (LOD)



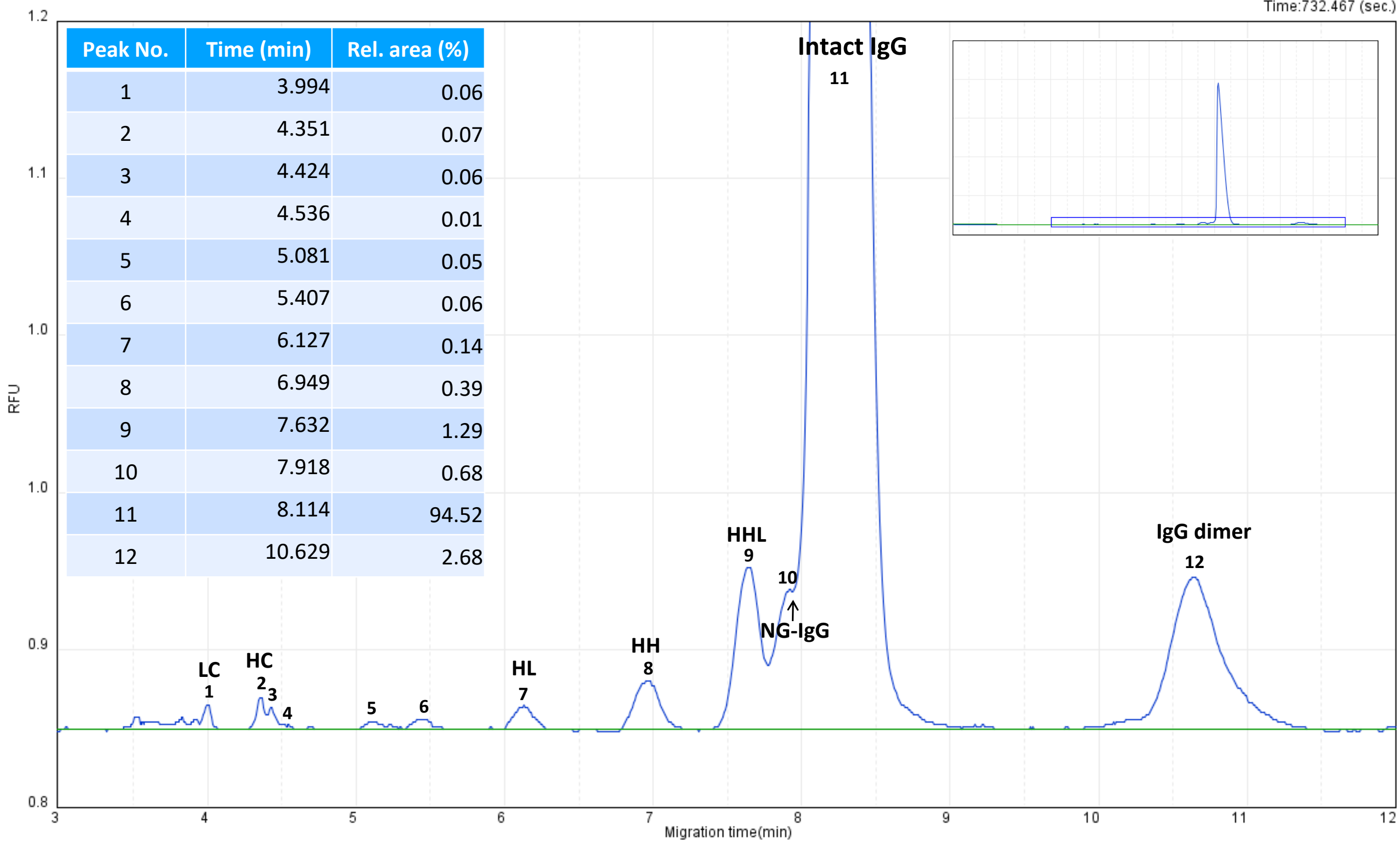
Conc. (ng/ μ l)	1.8	3	4.5	9	18	45	90
Peak area (E+06)	0.098	0.19	0.21	0.53	0.90	2.08	4.25



**LOD was estimated down to 0.5
ng/ μ l (S/N>10)**

Quality control for Biosimilars– Impurities of IgG

Value: 1.167 (RFU)
Time: 732.467 (sec.)



05

Quantitative Cartridge kit

All in One step!

Quantitative Cartridge Kit

2 μ l of sample, get Quantitative and Qualitative result in 2-7 mins

- ❖ Detection range: 0.2-50 ng/ μ l
- ❖ High reproducibility: CV $\leq$ 4%
- ❖ Provide accurate sizing and concentration result for each target without affected by other contaminations.

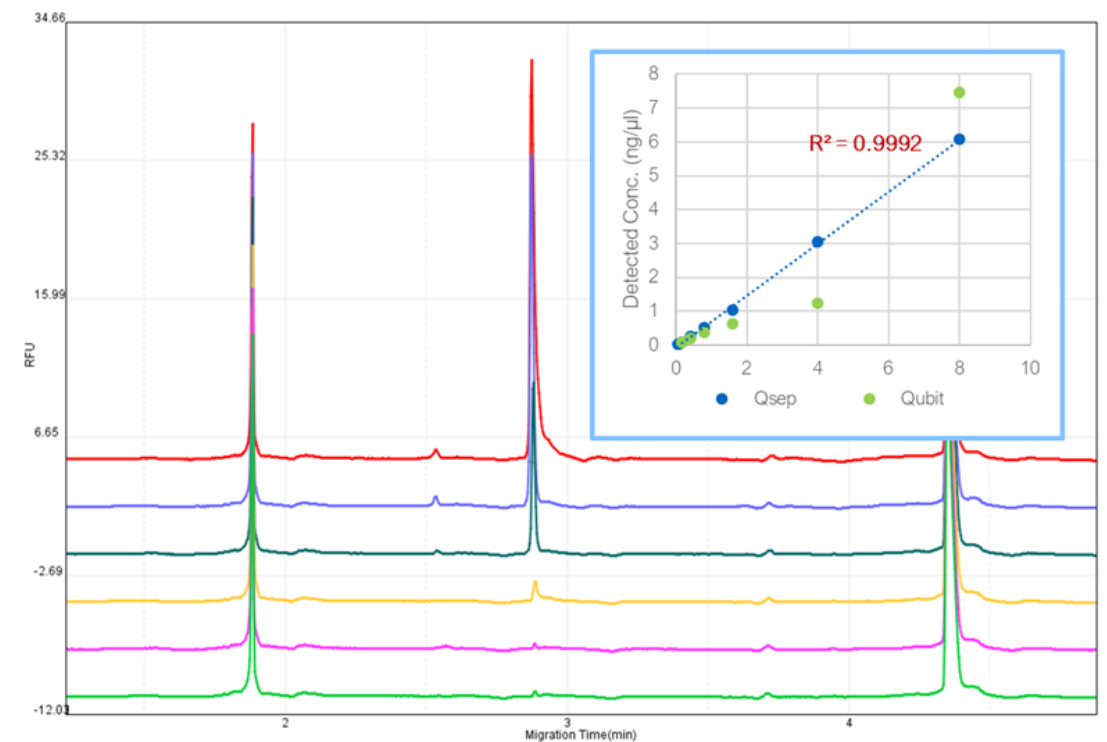


S1 High Resolution Cartridge (C105202-Q)

*Application: PCR product

S2 Standard Cartridge (C105201-Q)

*applications: NGS QC (Library, fragmented sample)



*200 bp PCR diluted in ddH₂O中 and using S1 cartridge to analyze it

	Dilution Factor	Fluorometer (ng/ μ l)	Qsep ₁₀₀ (ng/ μ l)
■	Stock	0.62	1.03
■	2X	0.37	0.51
■	4X	0.2	0.25
■	10X	0.07	0.08
■	20X	-	0.04
■	40X	-	0.02

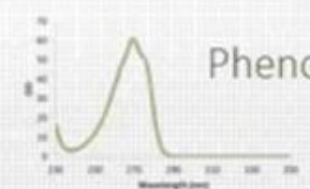
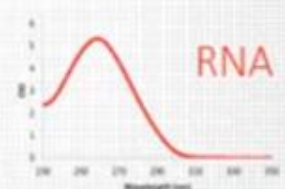
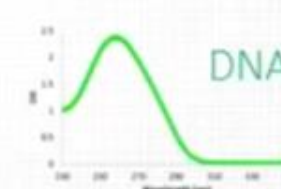
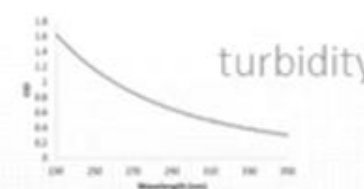
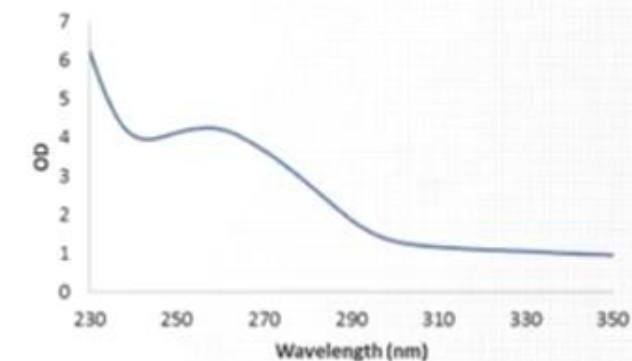
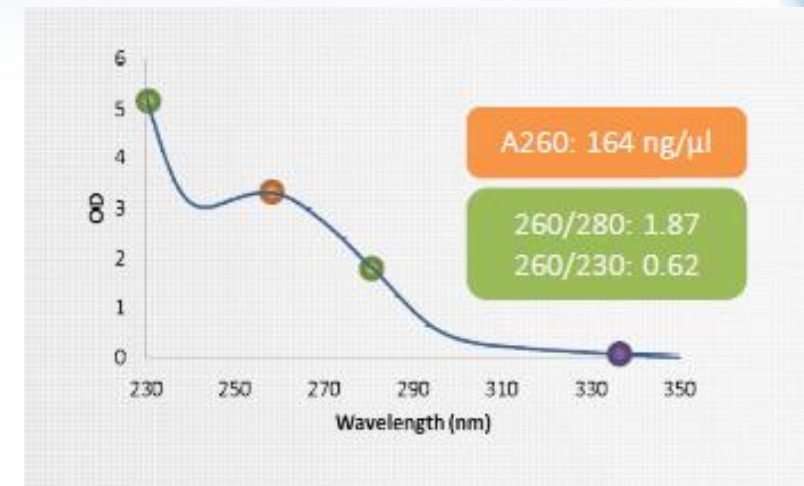
Parallel tests on different platform

PCR products will include in impurities such as dNTP, primers ...etc. before clean up.

PCR product without cleanup

Diluted Factor	Photometer (ng/μl)	fluorometer (ng/μl)	Fragment Analyzer (ng/μl)
1x	51.1	Saturated	2.871
2x	10.05	Saturated	1.165
10x	4.9	0.472	0.878
20x	1.1	0.246	0.154
100x	N/A	0.107	0.086
200x	N/A	0.049	0.010
1000x	N/A	0.022	0.006

Photometer would over-estimate concentration of samples



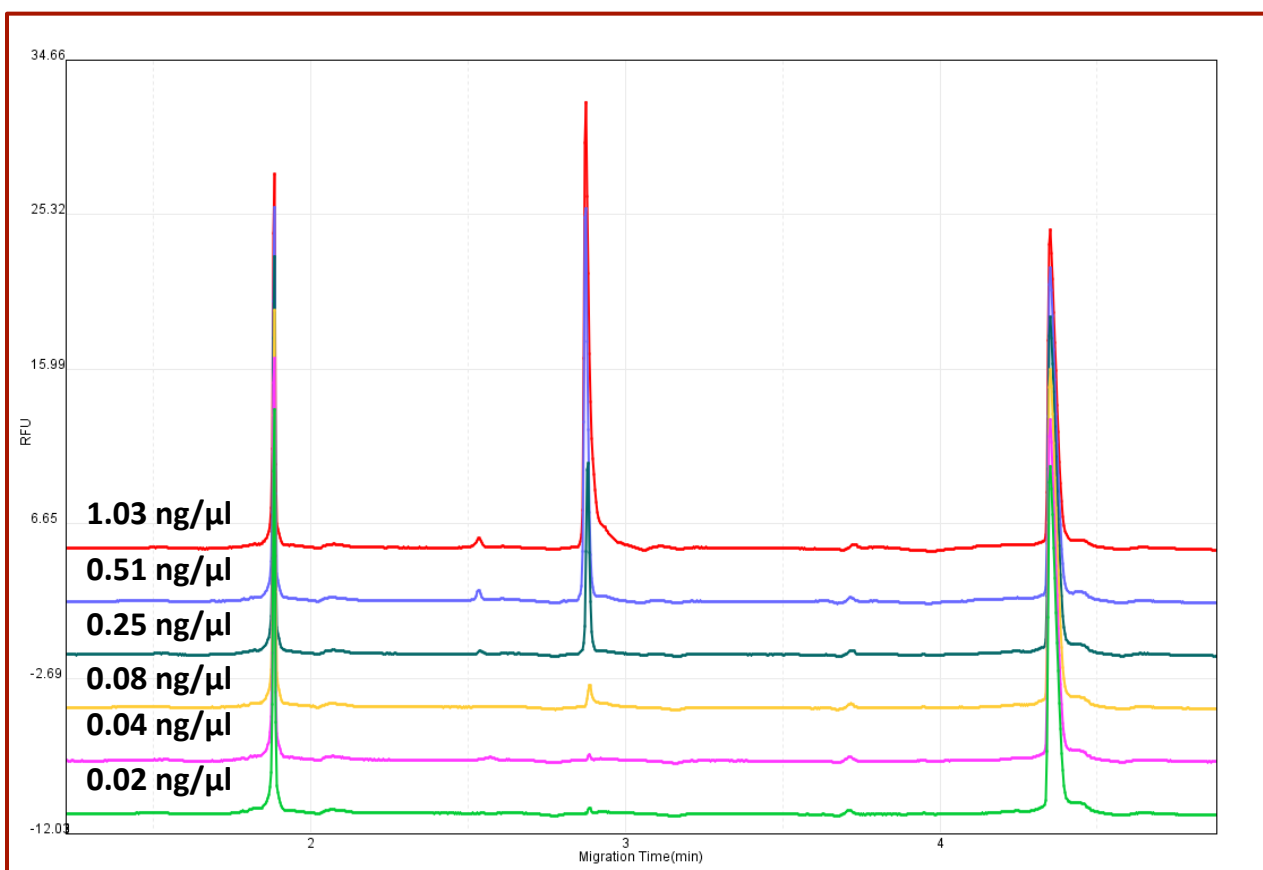
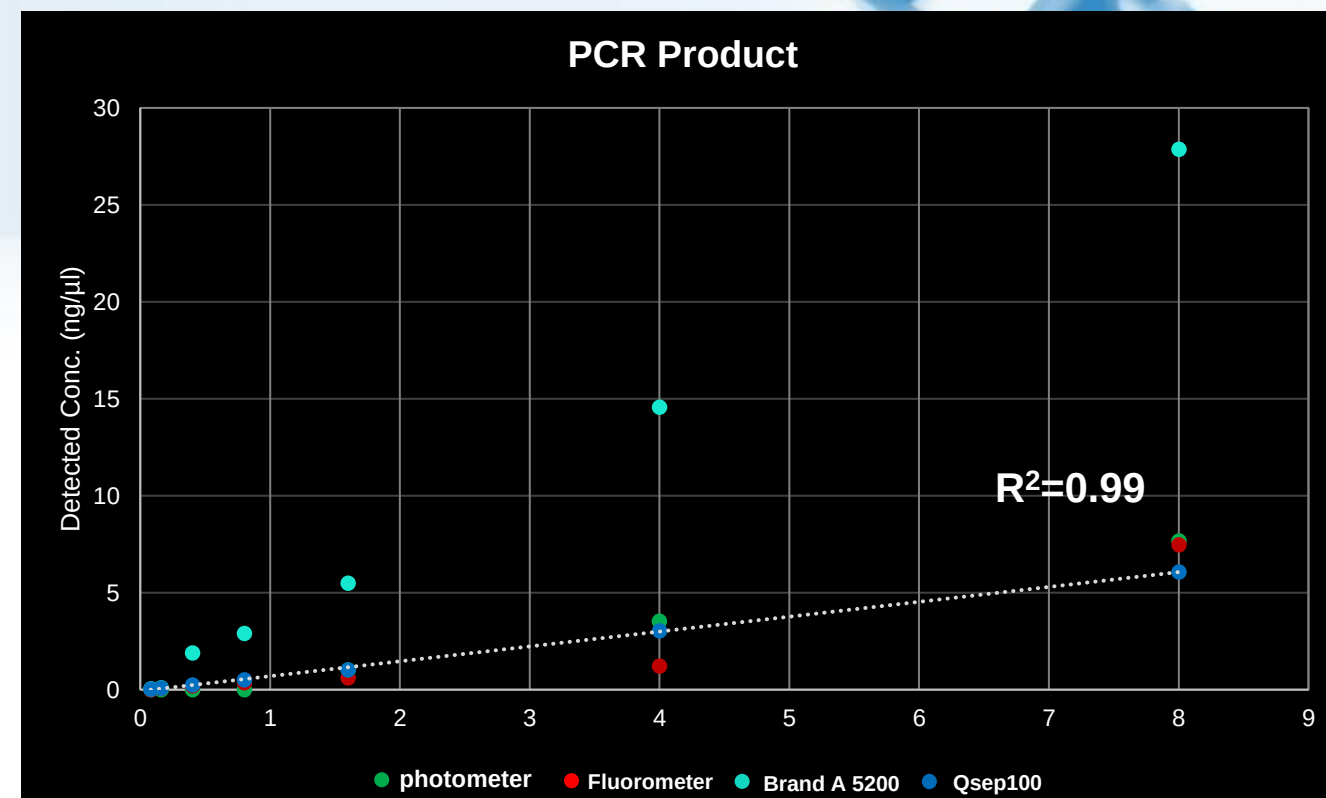
Quantitative Parallel Test- PCR Product

 **High Linear Regression**

 **High Sensitivity**

 **High Reproducibility**

 **Wide Detection Range**



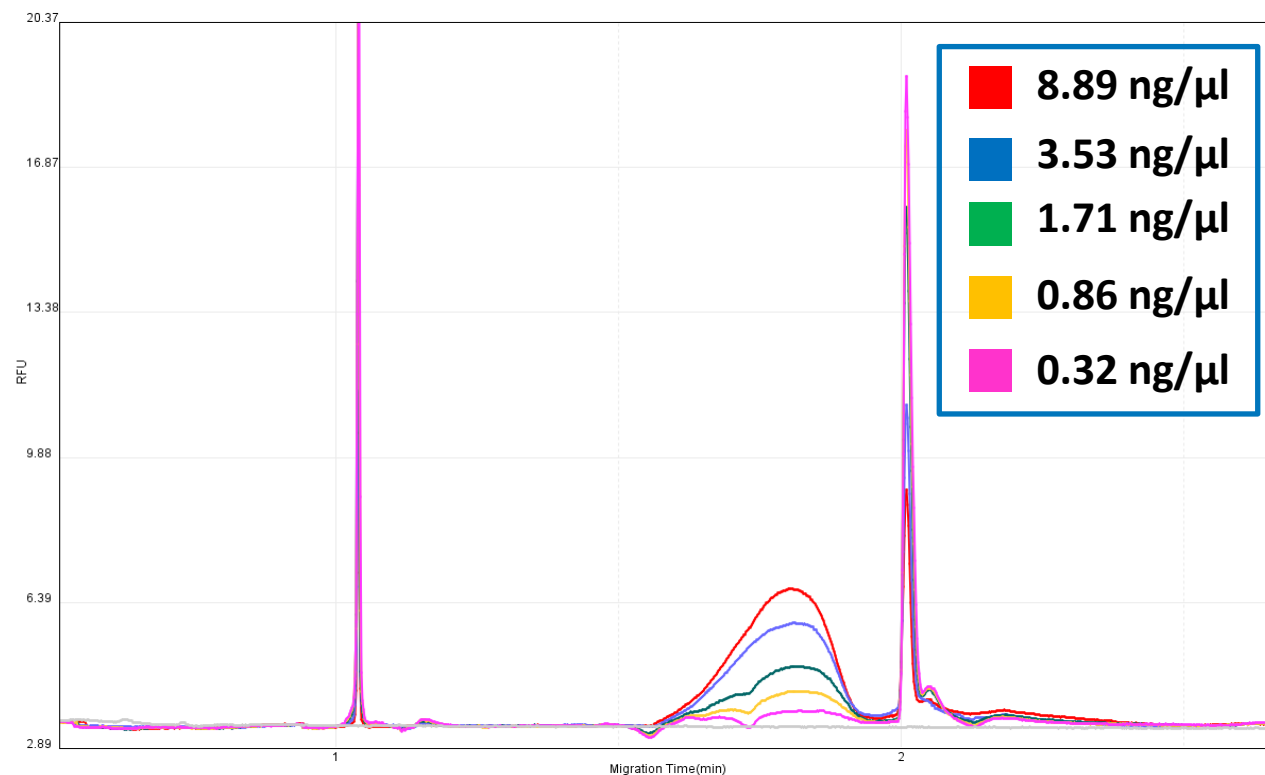
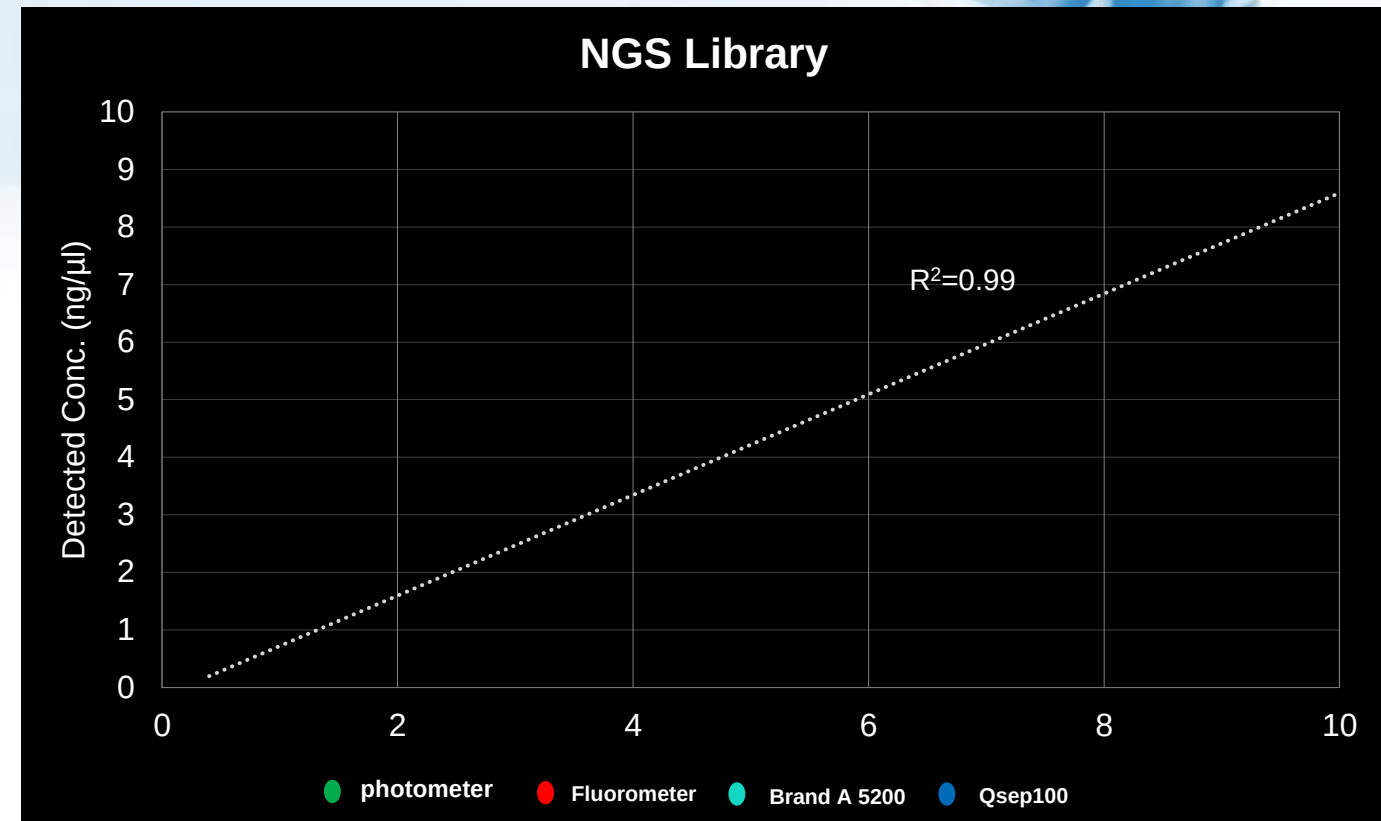
Dilution Factor	Photometer	fluorometer	Brand A 5X00	<i>Qsep</i> ₁₀₀
1x	7.67	7.48	27.87	6.07
2x	3.52	1.23	14.58	3.04
5x	1.03	0.62	5.5	1.03
10x	-	0.37	2.91	0.51
20x	-	0.2	1.9	0.25
50x	-	0.07	0.098	0.08
100x	-	-	0.049	0.04
200x	-	-	-	0.02

Unit: ng/μl

The results are analyzed by high resolution quantitative cartridge kit (C105202-Q)

Quantitative Parallel Test- NGS Library

Library samples (300-500 bp) are analyzed by standard quantitative cartridge kit. The serial diluted results display high linear regressions on *Qsep*₁₀₀.



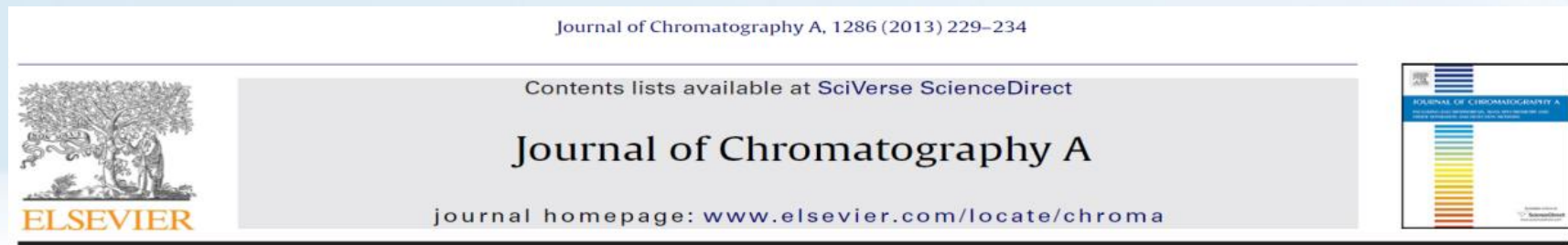
Dilution Factor	Photometer	fluorometer	Brand A 5X00	<i>Qsep</i> ₁₀₀
1x	7.03	4.17	6.99	8.89
2x	4.5	3.44	3.70	3.53
5x	1.93	0.71	0.73	1.71
10x	1.25	0.31	0.30	0.86
25x	-	0.14	0.16	0.32

Unit: ng/μl

06 Publications

- 1. Light-emitting diode induced fluorescence (LED-IF) detection design for a pen-shaped cartridge based single capillary electrophoresis system.
(DOI: 10.1002/elps.201200139)**
- 2. Ultrafast haplotyping of putative microRNA-binding sites in the WFS1 gene by multiplex polymerase chain reaction and capillary gel electrophoresis.
(DOI:10.1016/j.chroma.2013.02.062)**
- 3. P268S in NOD2 associates with susceptibility to Parkinson's disease in Chinese population. (DOI:10.1186/1744-9081-9-19)**
- 4. Rapid identification of human SNAP-25 transcript variants by a miniaturized capillary electrophoresis system. (accepted but not published yet)**

Publications- 2: Multiplex PCR application



Ultrafast haplotyping of putative microRNA-binding sites in the WFS1 gene by multiplex polymerase chain reaction and capillary gel electrophoresis[☆]



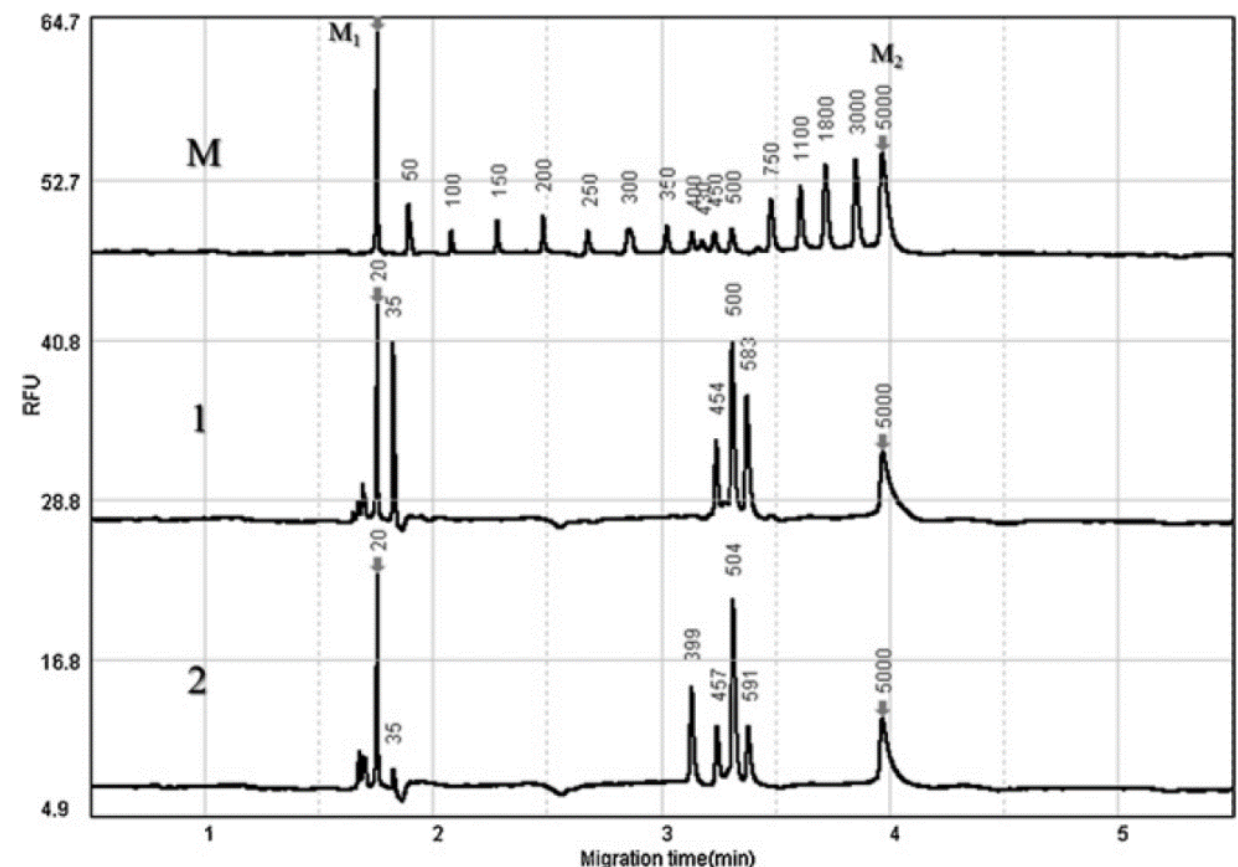
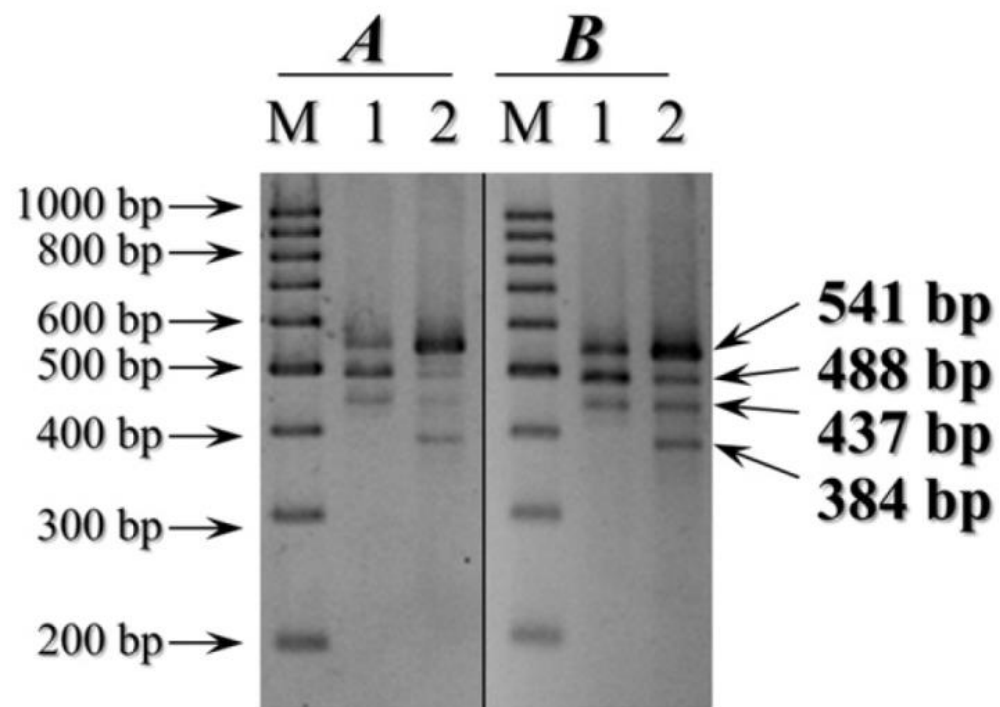
Márta Kerékgyártó^a, Nóra Németh^b, Tamás Kerekes^c, Zsolt Rónai^b, András Guttman^{a,*}

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^c Centre for Clinical Genomics and Personalized Medicine, Medical and Health Science Center, University of Debrecen, H-4032 Debrecen, Nagyerdei krt. 98, Hungary

WORKING MODEL :multiplex PCR>Qsep100



Publications- 3: RFLP application

P268S in NOD2 associates with susceptibility to Parkinson's disease in Chinese population

Behavioral and Brain Functions 2013, **9**:19 doi:10.1186/1744-9081-9-19

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Liangliang Cai (cailiangliang765@gmail.com)
Peng Hu (phu@xmu.edu.cn)
Qing Lin (linqing2005602@aliyun.com)
Chi-Meng Tzeng (cmtzeng@xmu.edu.cn)

WORKING MODEL :PCR-RFLP>Qsep100

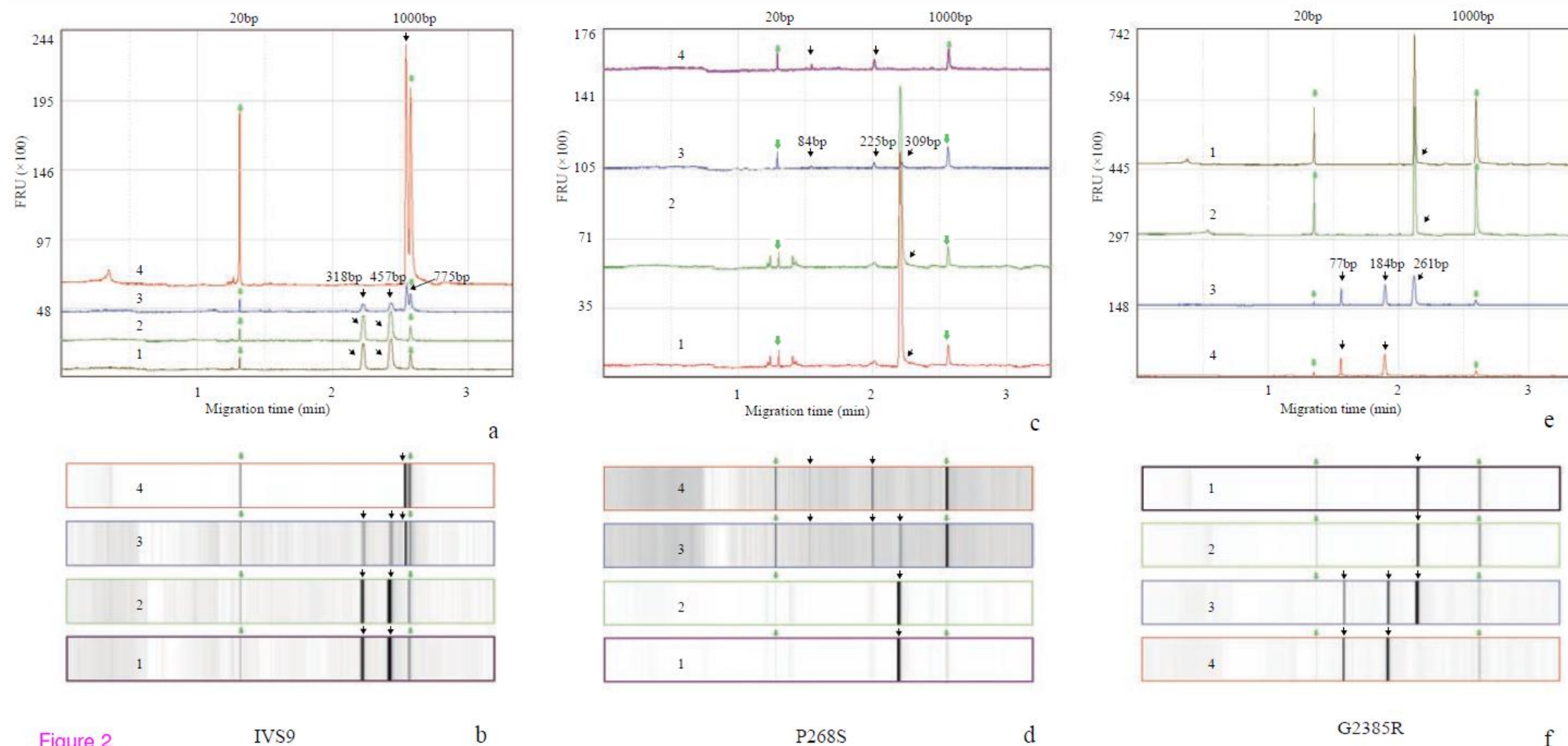


Figure 2

IVS9

b

P268S

d

G2385R

f

THANK
YOU