BIONEER

INSTRUMENTS & DEVICES

Bioneer Corporation is Korea's leading biotech company.
Bioneer is the first Korean biotechnology company when it was established in 1992.

Innovation
Value
Discovery

Since our establishment in 1992, BIONEER has been the first in Korea to supply many of laboratory essentials for genetic researches such chemicals and instruments developed through our endless endeavors and challenges.

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High-Throughput Real-Time Quantitative PCR System

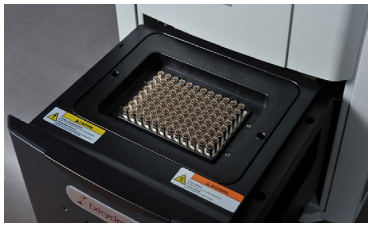
Exicycler™ 96 (Normal/Fast)

Exicycler™ 96 is a quantitative real-time PCR instrument which uses our patented technologies, Light Tunnel, an imaging technology based on light excitation, and 2-D sensor, a fluorescence detection technique using polarization of light, to enhance sensitivity and minimize well-to-well variations.

Application

Gene Expression Analysis / MicroRNA Studies / Copy Number Variation Analysis
Pathogen Detection / Mutational Analysis/ Quantitative & Qualitative GMO Analysis

1. Simultaneous analysis of 96 samples
2. Excellent uniformity and accuracy of temperature with ±0.3℃ deviation
3. Detect even a small amount of DNA with a built-in Arc lamp
4. 5-multiplex qPCR without the use of reference dyes
5. Shortened experiment time with faster ramp rate being maximum of 5℃/sec (*Exicycler*™ Fast only)
6. Wide dynamic range of more than 9 log



Increased sensitivity & accuracy using our patented reflected light blocking technology

We have applied the fluorescence filtration technology (Korean Patent Number 10-1089045, US patent number 842764) using polarization of light. By applying our patented polarizing beam filter, we were able to eliminate the reflected light from an optical component, which interferes with the fluorescence generated from the samples. Comparing with the conventional instruments, our *Exicycler*™ 96 had greatly increased its sensitivity and accuracy.

Experimental Data

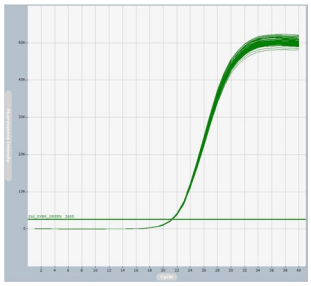


Figure 1. Excellent Uniformity
Fluorescence data using 10^6 copies of IRF3 gene (FAM labeled) in each of 96 well positions. The average Ct of 96 well is 21.8 and the Ct variation range is 0.19.

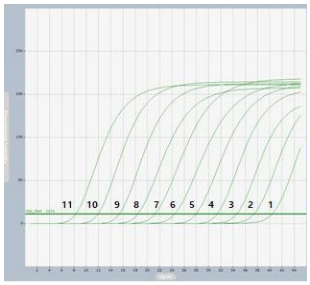


Figure 2. Wide dynamic range
Graph shows standard curve of tenfold serial dilutions of 10 copies to 10^{11} copies MMP9 gene (FAM labeled). The PCR efficiency generated by the standard curve is 103%.

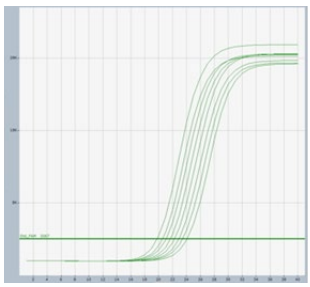


Figure 3. Precise discrimination
Fluorescence data from a series of 1.33-fold dilutions of TMV gene (10^6 copies) amplified using reporter dyes to check one target: FAM/TMV. The PCR efficiency generated by the standard curve is 101%.

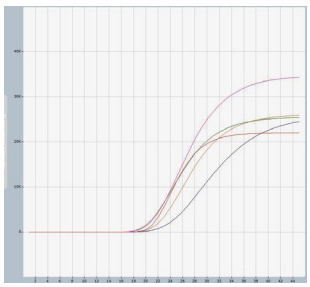


Figure 4. Real 5-color Multiplexing
5 target genes can be detected in a single tube(FAM:T. vaginalis, TET: M. Hominis, TAMRA: TMV, Texas Red: HSV type1, Cyanine5: HSV type2).

A-2060-1	*Exicycler*™ 96 V4 Real-Time Quantitative Thermal Block		
Dimension(cm)	35.5(W) x 54(D) x 47(H)	Weight	39 kg
Power Consumption	100 - 240 VAC, 50/60 Hz, Max 800 VA	Operating Temperature	15~35℃
		Operating Humidity	20~80%, no condensation
Method of Heating/Cooling	Peltier element	Temperature Range	4.0~99.9℃
Ramp Rate Control	1~100%	Gradient Operation Range	20~95℃
Lid Temperature	90~120℃	Temperature Accuracy/Uniformity	± 0.3℃/± 0.3℃
Optical Specifications	Light source	Sensor	Excitation/Emission filter
	Short Arc lamp (120W)	16 bit 2D CCD	5 sets

Block Type	Fast Block	Normal Block
Sample Capacity/ Size	Opaque White 96-well Low Profile PCR Plate / 0.1 ml Opaque White 8-strip Low Profile PCR Tube	Opaque White 96-well PCR Plate /0.2 ml Opaque White 8-strip PCR Tube
Sample Volume	10~50 µl	20~100 µl (recommended 50 µl)
Max. Ramp Rate	5.0 ℃/sec	4.5℃/sec

High-Throughput Real-Time Quantitative PCR System

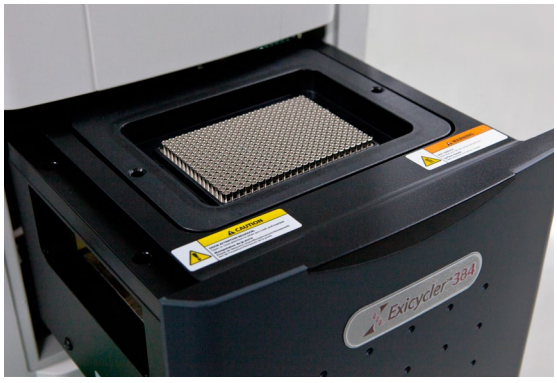
Exicycler™ 384

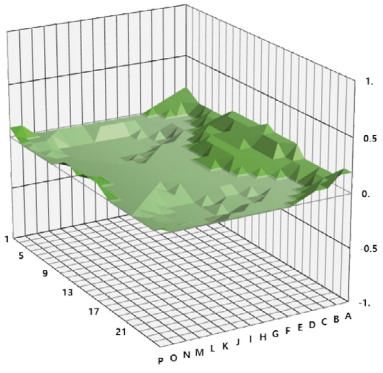
Exicycler™ 384 is the most competitive real-time PCR instrument for mass sample analysis. By using only 5 µl, 384 samples can be analyzed at once. With our patented LT(Light tunnel) technology and fluorescence detection technique, *Exicycler*™ 384 has the least number of well-to-well Ct variation compared with other 384-well real-time PCR instruments.

Application

Gene Expression Analysis / MicroRNA Studies / Copy Number Variation Analysis
Pathogen Detection / Mutational Analysis/ Quantitative & Qualitative GMO Analysis

1. Mass analysis with cheaper cost
2. Simultaneous analysis of 384 samples
3. Excellent uniformity and accuracy of temperature with ±0.3℃ deviation
4. Detect even a small amount of DNA with a built-in Arc lamp
5. Reduced sample cost requiring only the total volume of 5~20 µl of PCR products
6. Shortened experimental time with faster ramp rate being maximum of 4.5℃/sec
7. 5-multiplex qPCR without the use of reference dyes





Reduced well-well deviation with simultaneous 384 well measurements

By applying our patented technology Light Tunnel*, allowing to measure uniformed excited light, fluorescence filtration technology**, using polarized light to block reflected light, and 2-D sensor, *Exicycler*™ 384 utilizes 384-well simultaneous measurement technology to minimize well-to-well deviation and fluorescence noise signals, lowering well-to-well deviation and producing reproducible, accurate results.

* Korean Patent Number KR 0794703, US Patent Number US 8139210, Japanese Patent Number JP 4751821, Chinese Patent Number CN 1798969)
** Korean Patent Number 10-1089045, US Patent Number US 8427643

Experimental Data

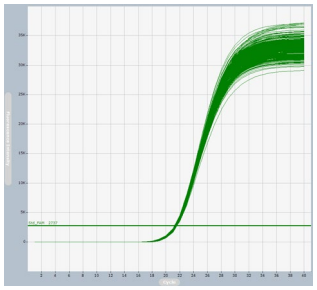


Figure 1. Excellent Uniformity
qPCR result using $1x10^6$ copies of Lambda DNA(FAM labeled) in each of 384 well positions. The average Ct of 384 well is 21.6 and the Ct variation range is 0.43.

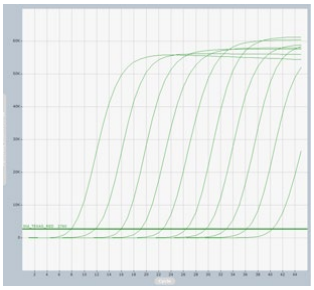


Figure 2. Wide dynamic range
Ct values of 10-fold diluted samples show a wide dynamic range of quantifiction. Fluorescence data from a series of 10-fold dilution of PGK1 DNA (10^{10} copies) amplified using reporter dyes to check on target: FAM/PGK1.

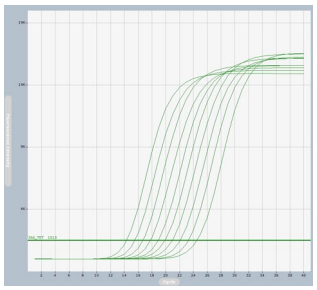


Figure 3. Precise discrimination
Exicycler™ 384 provide sensitive detection and precise target discrimination down to 2-fold differences Fluorescence data from a series of 2-fold dilution of CSF2 DNA(10^8 copies) amplified using reporter dyes to check one target: TET/CSF2.

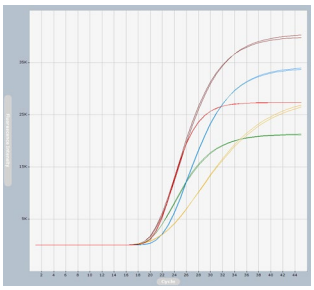


Figure 4. Real 5-color Multiplexing
5 target genes can be detected in a single tube with a minimum volume of 5 μl (FAM:T. vaginlis, TET: M. Hominis, TAMRA: TMV, Texas Red: HSV type1, Cyanine5: HSV type2).

A-2061	*Exicycler*™ 384 Real-Time Quantitative Thermal Block		
Dimension(cm)	35.5(W) x 54(D) x 47(H)	Weight	41 kg
Sample Capacity/ Size	384 well	Sample Volume	5~20 μl (10 μl recommended)
Power Consumption	100 - 240 VAC, 50/60 Hz, 800 VA Max	Operating Temperature	15~35℃
Method of Heating/Cooling	Peltier element	Operating Humidity	20~80%, no condensation
Ramp Rate Control	1~100%	Temperature Range	4.0~99.9℃
Max Ramp Rate	4.5℃/sec	Gradient Range	20~95℃ (between 1~20℃)
Lid Temperature	90~120℃	Temperature Accuracy/Uniformity	± 0.3℃/ ± 0.3℃
Optical Specifications	Light source	Sensor	Excitation/Emission filter
	Short Arc lamp (120W)	16 bit 2D CCD	5 sets

Ultimate Multiplex Real-Time PCR Platform

Exicycler™ HD

A real-time PCR instrument of next generation capable of running with miniscule amount of samples

Application

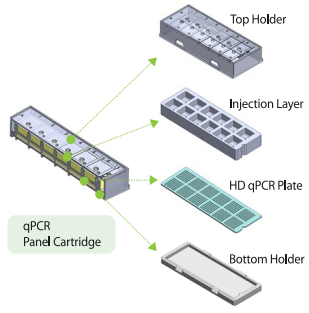
Cancer mutation & expression study / Pathogen studies / Genotyping drug-resistance study for Infectious diseases / Forensic science / Personalized medicine / Precision medicine / Food safety and bio-defense

1 Mass Real-Time PCR Platform

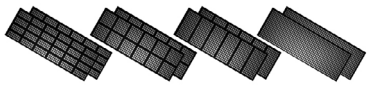
Maximum of 5 color multiplex is possible for 1,536 reactions in a run. Accurate results can be gained with small volume of 2 µl, and short hands-on time minimized user errors, also reducing the operation time (1.5 hours).

2 Wide variety of qPCR panels and Increased User-friendliness

Various panels can be selected depending on the types and number of wells the users need.
Primers and probes has been already distributed.



HD qPCR plate format



Well	21	49	105	768
Samples	48	24	12	2
Total	1,008	1,176	1,260	1,536

3 Use of automatic sample distributor & sealing process for increased accuracy

Errors and inaccuracies from the handwork systems are minimized with the use of automatic sample distributor and sealing machines.

Experimental Data

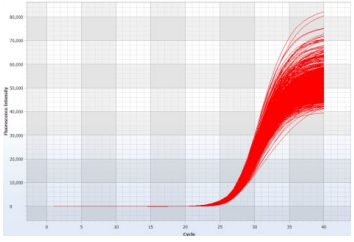


Figure 1. Excellent Uniformity
qPCR result using $1x10^6$ copies of HPRT1(LC Green dye) in each of 1,176 well positions. The average Ct of 1,176 well is 26.9 and the Ct variation range is 1.28.

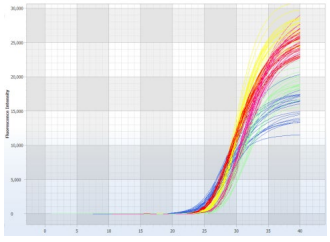
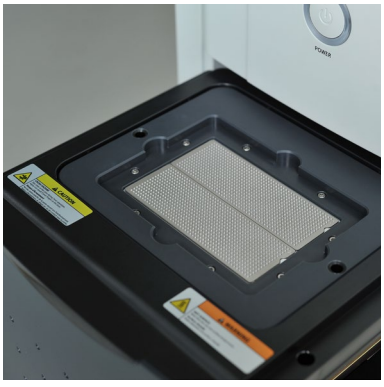


Figure 2. Real 5-color multiplexing
5 target genes can be detected in a single tube with a minimum volume of 2 µl(FAM:T. vaginalis, TET: M. Hominis, TAMRA: TMV, Texas Red: HSV type1, Cyanine5: HSV type2).



A-2070	*Exicycler*™ HD Real-Time Quantitative PCR System		
Dimension(cm)	35.5(W)x54(D)x47(H)	Temperature Accuracy	± 0.3℃
Sample Capacity/ Size	HD-qPCR panel (max 1,536 well)	Temperature Uniformity	± 0.3℃
Power Consumption	100-240 VAC, 50/60 Hz, 800 VA Max	Operating Temperature	15~35℃
Temperature Range	4.0~99.9℃	Operating Humidity	20~80%, no condensation
Ramping Rate	Max 4.5℃ /sec	Optical Specifications	Light source
Lid Temperature	90~120℃		Short Arc lamp (120W)
Ramp rate control range	1~100%		Sensor
Weight	41 kg		16 bit 2D CCD
Sample Volume	2 µl		Excitation/Emission filter
Method of Heating / Cooling	Peltier element		5 sets

Sample Injection System

Injector™

An essential instrument when using *Exicycler*™ HD, which adds the samples in the HD plates

Sample distribution optimized for HD plates

HD plate has smaller reaction volume of 2 µl compared with other conventional plates. If samples are divided manually, small inaccuracies may occur, severely affecting the results. This instrument can distribute the samples automatically to minimize such errors. As the options are already optimized for the HD plates, no additional setup is needed.

A-2070-9	*Injector*™ Sample Injection System		
Dimension(cm)	39(W) x 59.7(D) x 49.1(H)	Weight	53 kg
Power Consumption	1900 VA Max (Fuse: 250V, 10A, 2 ea)	Voltage/Frequency	220-230 V~, 50/60 Hz
Servo Motor	0~3,000 RPM	Pressure Sensor	-101~0 kPa
Oil-less Rocking Piston Pump	Max Vacuum: 750 mmHg, Flow Rate: 70 lpm	Operating Temperature	15~35℃
Operating System	Built-in	Operating Humidity	20~80%, no condensation
User Interface Display	4.3 inch 480 x 272 TFT LCD With Touch Screen		

Multi-Purpose PCR

AllInOneCycler™

A PCR machine with ultra-fast ramp rate developed with thermal blocks, manufactured with our self-developed materials and applied with our own temperature maintenance algorithms

1 Reduced reaction time with fast ramp rate

While the conventional thermal blocks have ramp rate of 6.5℃/sec, ours are made with our self-developed special alloys with 30% less thermal capacity, have faster ramp rate of maximum 9.5℃/sec to reduce the overall experimental time.

Various Interchangeable Thermal Blocks


96-well 0.2 ml tube


384-well 0.02 ml tube

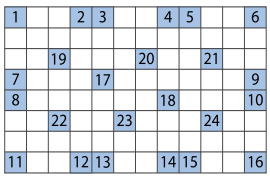

Slide PCR 96.2 x 25.4 mm glass


Digital PCR HD plate

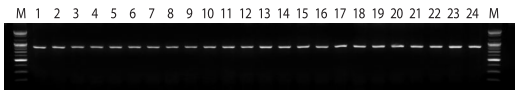
2 Excellent temperature accuracy and uniformity

Reproducible results can be gained with precise temperature control ability, increasing thermal accuracy and uniformity.

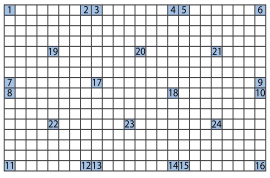
96 well/384 well – PCR results for 24 samples



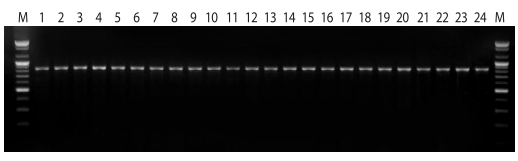
96 Well - normal block



96 Well - fast block



384 Well - normal block



Interchangeable Thermal Blocks

A total 8 types of thermal blocks (Normal/Fast type, 96/384 wells, slide PCR, digital PCR block) are provided to be used selectively depending on the experiment purposes.

Accuracy, Reproducibility and Uniformity

The problem of conventional instruments is that the center and the side of thermal blocks are hotter than the other regions. This has been solved, as ours provide uniformed heat no matter where the samples are, capable of providing reproducible results.

Thermal Gradient Function

The thermal gradient function can be used to find optimal conditions easily without wasting additional resources.

Simple User Interface

Our 7 inch LCD touch screen provides user-friendly UI to be used easily.
Eight different basic protocols can be selected to save time to set them up.

A-2041	*AllInOneCycler*™ PCR System		
Dimension(cm)	24.6(W) x 36.9(D) x 23.2(H)	Weight	8.4 kg
Power Consumption	100-240 VAC, Max 8.5 A, 50/60 Hz, 630VA	Operating Temperature	15~35℃
Port	2 USB ports for data storage	Operating Humidity	20~80%, no condensation
Method of Heating/Cooling	Peltier element	Temperature Range	4.0~99.9℃
Ramp Rate Control	1~100%	Gradient Range	20~95℃
Lid Temperature	90~110℃	Temperature Accuracy/Uniformity	± 0.3℃/≤ 0.3℃

Block Type	Fast Block	Normal Block
Max. Heating Ramp Rate	9.5℃/sec	6.5℃/sec
Max. Cooling Ramp Rate	7.7℃/sec	4.5℃/sec

Fully Automated Nucleic Acid Extraction System

ExiPrep™ 16 Plus

An instrument to extract nucleic acids from maximum of 16 samples

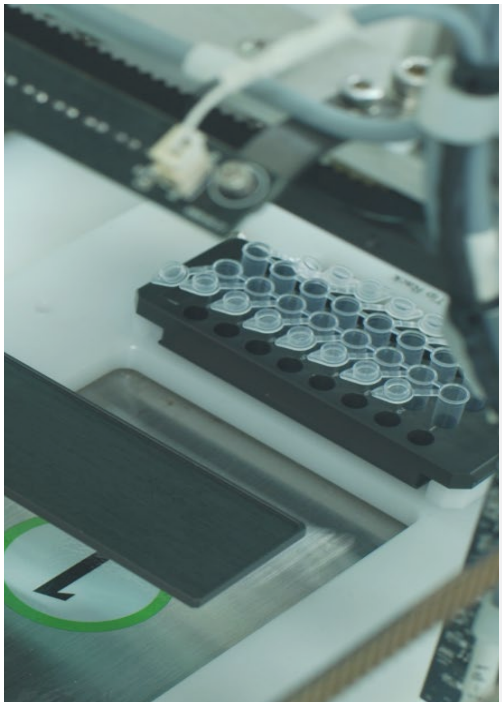
Application

Gene Expression Study / Genetic Engineering /
GMP & Food poisoning test / Biological terror detection

Main Functions

1 Extract DNA/RNA from 16 samples at once
2 Provide high quality of nucleic acids

1 Convenient usage with touch screen
2 Automatic sterilization with UV
3 Prevention of contamination



1 Simultaneous **nucleic acid extraction from maximum of 16 samples**

Implemented syringe motor capable of controlling 0.1 mm digit to minimize inaccuracies

2 **High quality nucleic acid extraction** using magnets

Extract nucleic acids with high quality and efficiency using the magnetic blocks and beads

3 Optimized **Protocols Implemented**

Various protocols optimized for many different samples for the convenient usage and reproducible results

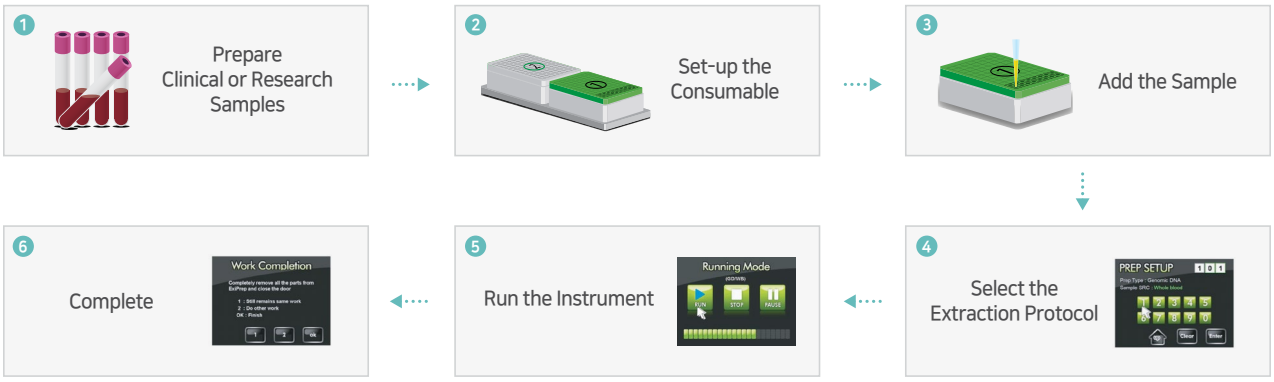
4 Contamination prevention function and **Automatic UV Sterilization**

Prevent cross contamination and user infection

5 **3.5-inch touch screen** on the front of the instrument

Check the progress of the experiment in real-time

Workflow



Experimental Data

Genomic DNA extraction from cultured mammalian cell (HeLa)

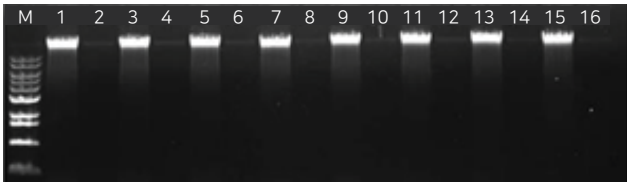


Figure 1. Lanes 1, 3, 5, 7, 9, 11, 13, 15 were extracted with 1X10^6 cells of cultured HeLa cell and lanes 2, 4, 6, 8, 10, 12, 14, 16 were extracted with ddH_2O as a negative control in DNA extraction. Note that all the samples have similar yields.
[**Sample volume:** 1x10^6 cells, **Average yield:** 4-8 µg]

Genomic DNA extraction from bacteria (*E.coli*)

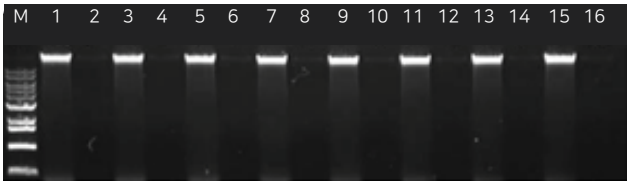


Figure 2. Lanes 1, 3, 5, 7, 9, 11, 13, 15 were extracted with 1X10^9 cells of *E.coli* cells and lanes 2, 4, 6, 8, 10, 12, 14, 16 were extracted with ddH_2O as a negative control in DNA extraction. Note that all the samples have similar yields.
[**Sample volume:** 1x10^9 cells, **Average yield:** 8-12 µg]

RNA extraction

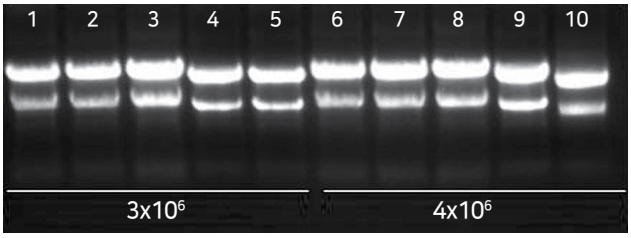


Figure 3. Comparison of Total RNA extracted from HeLa cell (~ 4 x 10^6) using *ExiPrep*™ Plus Total RNA Kit (Bioneer, automatic) and a competitor's kit (Competitor Q, manual/single column). DNase was not treated.
1-3: Bioneer *ExiPrep*™ Plus Total RNA Kit, mean yield; 38.6 µg, mean purity; 2.06
4-5: Competitor Q Total RNA Extraction Kit, mean yield; 39.7 µg, mean purity; 2.05
6-8: Bioneer *ExiPrep*™ Plus Total RNA Kit, mean yield; 46.1 µg, mean purity; 2.03
9-10: Competitor Q Total RNA Extraction Kit, mean yield; 49.7 µg, mean purity; 2.06

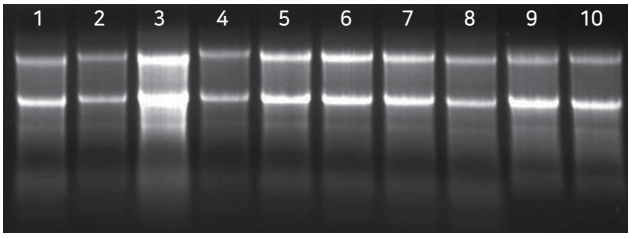


Figure 4. Comparison of Total RNA extracted from Kidney (10 mg) using *ExiPrep*™ Plus Total RNA Kit (Bioneer, automatic) and a competitor's kit (Competitor Q, manual/single column). DNase was treated.
1-8: Bioneer *ExiPrep*™ Plus Total RNA Kit, mean yield; 26.7 µg, mean purity; 2.06
9-10: Competitor Q Total RNA Extraction Kit, mean yield; 24.7 µg, mean purity; 2.05

A-5030	*ExiPrep*™16 Plus		
Dimension(cm)	32(W) x 53.5(D) x 48.7(H)	Humidity Range	20~80%, no condensation
Weight	22 kg	Operating System	Stand alone
Voltage/Frequency	100~240 VAC, 50/60 Hz	Communications	TCP/IP
Heating Block	40~90°C	User Interface Display	320 x 240 touch screen graphic LCD
Temperature Range	15~35°C	UV Sterilization	15 minute cycle

Fully Automated Nucleic Acid Extraction System

ExiPrep™ 48

An instrument that can extract nucleic acids and dispense the extracted solutions from 8 ~ 48 samples automatically

A-5150-1	*ExiPrep*™48		
Dimension(cm)	76(W) x 62(D) x 75(H)	Voltage / Frequency	100~240 VAC, 50/60 Hz
Weight	87 kg	Power Consumption	500 VA Max (Fuse: 250V, F6.3AL, 2 ea)
Magnet & Heating Block	30~90℃	Operating Temperature	15~35℃
Temperature Control Block	4~90℃	Operating Humidity	20~80%, no condensation
Communication	TCP/IP	Operating System	Built-in
User Interface Display	13.3 inch Full HD (1920 x 1080), Touch Screen	Data Storage	USB 3.0 (Front x2), USB 2.0 (Rear x2)
Output Display	HDMI Port (x1)		

1
High quality nucleic acid extraction

Extraction of highly pure nucleic acids by attaching magnetic particles to the bottom of each well equally and rapidly by magnetic blocks attached to the instrument.

2
Minimum waste of solutions

While the instrument is running, the 8~48 samples can undergo nucleic acid extraction in 8 units. This allows not only to select various amounts of samples for the protocol, but also to reduce the amount solutions wasted.

3
Optimized protocols for nucleic acid extraction

Protocols include those optimized for various sample types (such as whole blood, tissues, bacteria, plants, etc.), allowing a convenient usage.

4
Optimized for highly sensitive test

Our patented techniques are applied in the instruments to prevent false positives caused by the miniscule aerosols while extracting the nucleic acids. UV lamp is also used for sterilizing the internal part of the instrument to stop contamination during the protocols.

5
User-centered UI

A 13.3-inch touch screen is installed in front of the instruments with user-centered UI. PC is also not needed.

6
Automatic punching

Punching can be done automatically in the instrument during the protcols to increase the convenience and prevent the external air contamination.

High-Throughput Automated Nucleic Acid Extraction System

ExiPrep™ 96 Lite

An instrument that can extract nucleic acids automatically from maximum of 96 samples using magnetic rods. Nucleic acids can be extracted from diverse sample volumes from small-scales of 0.4 ml to large-scales of 4 ml in a single run.

1 Extraction of nucleic acids / Purification of protein from 8 to 96 samples

Magnetic rods can be selected from 8, 32 units to minimize waste of solutions while the extraction can be done simultaneously from maximum of 96 samples in one run.

2 Large-scale extraction from maximum of 4 ml

Nucleic acid extraction can be done from large scale samples such as cell-free DNAs

3 Rapid nucleic acid extraction / protein purification

Nucleic acid extraction can be done within 40 minutes, while protein can be done within 60 minutes.

4 Compatible with various types of samples

Types of samples that can be used for nucleic acid extraction includes blood, bacteria, tissues, cells, and plants.

5 Optimized protocols

Kits that are optimized for extracting nucleic acids or purifying proteins from various samples are available while the protocols for each of them are installed the machine, allowing to simply select the correct one without the need of setting them from the start. If needed, protocols can be customized depending on their samples and experiments.

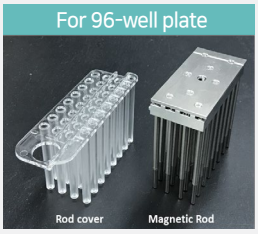
6 Contamination Prevention

A UV lamp and a contamination prevention shield are installed.

7 Efficient Spatial Usage

The compact size of the instrument allows users to install it in their labs without worrying about the space capacity.

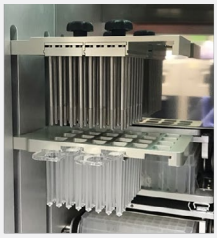
Sample Type

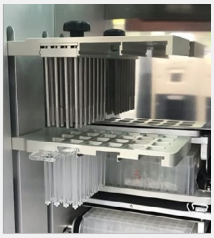


Mini-scale nucleic acid extraction

Midi-scale nucleic acid extraction


Three sets of rods and covers for 96 samples


Two sets of rods and covers for 64 samples

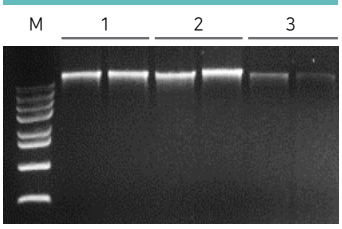

One sets of rod and a cover for 32 samples

Experimental Data

◦ Genomic DNA Extraction

Lane 1: *MagListo*™ (manual type, Bioneer), Lane 2: *ExiPrep*™96 Lite, Lane 3: Company Q, M: 1 kb DNA Ladder (Cat. No. D-1040, Bioneer)

Animal tissue (Beef)

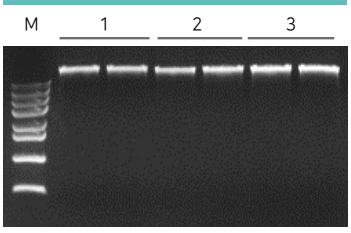


	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	30.28	1.78	1.18
	29.41	1.71	1.14
2	36.88	1.83	1.06
	34.96	1.82	1.07
3	26.70	1.97	1.16
	21.66	1.98	1.77

* Elution Volume: 100 μl

Figure 1. Animal tissue genomic DNA extraction using *MagListo*™ Genomic DNA Extraction Kit. DNA extraction from 30 mg of Beef.

Human Whole blood

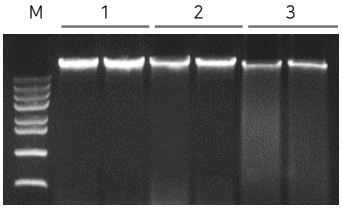


	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	22.49	1.77	0.97
	22.17	1.83	0.96
2	23.03	1.78	0.67
	29.95	1.71	0.52
3	30.34	1.84	1.60
	32.34	1.71	0.93

* Elution Volume: 100 μl

Figure 2. Blood genomic DNA extraction using *MagListo*™ Genomic DNA Extraction Kit. DNA extraction from 200 μl of human whole blood.

Cultured cell (HeLa)



	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	119.34	1.95	2.16
	113.04	1.96	2.17
2	149.77	1.99	2.01
	121.03	1.98	1.95
3	194.18	2.07	2.20
	179.81	2.03	2.04

* Elution Volume: 100 μl

Figure 3. Cultured cell genomic DNA extraction using *MagListo*™ Genomic DNA Extraction Kit. DNA extraction from 1×10^6 of HeLa cell.

◦ Plasmid DNA Extraction

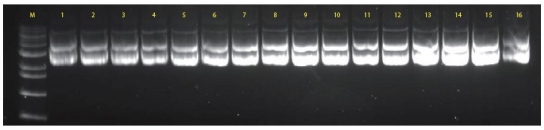


Figure 4. Plasmid DNA extraction using *ExiPrep*™96 Lite
Lane 1-12: *MagListo*™ 5M Plasmid DNA Extraction Kit with *ExiPrep*™96 Lite
Lane 13-14: *AccuPrep*® Plasmid Extraction Kit
Lane 15-16: Competitor's kit
Average yield: 8 μg of pBlueScript plasmid in DH5α (OD_{600}=2.7) using *ExiPrep*™96 Lite

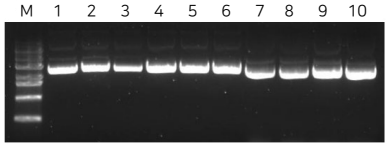


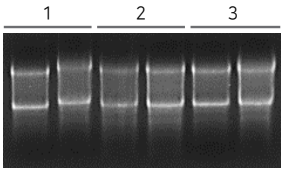
Figure 5. Comparison of plasmid purified with *ExiPrep*™96 Lite, *MagListo*™ and *AccuPrep*®
The plasmid DNA concentration is equal when extracted with an automatic *ExiPrep*™96 Lite, *MagListo*™ 5M Plasmid Extraction Kit(Magnetic Bead type) and *AccuPrep*® Plasmid Mini Extraction Kit (Spin Column type).
ExiPrep™96 Lite allows rapid extraction of plasmid with high purity and yield.

Kit	No.	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
ExiPrep™96 Lite	1	136.1	1.85	1.83
	2	133.6	1.93	1.86
	3	98.1	1.93	1.88
	4	124.7	1.84	1.93
	5	121.0	1.93	1.98
	6	124.1	1.84	1.80
MagListo™	7	112.3	1.84	1.79
	8	134.7	1.85	1.39
AccuPrep®	9	152.9	1.84	1.49
	10	145.4	1.85	1.83

RNA Extraction

Lane 1: *MagListo*™ (manual type, Bioneer), Lane 2: *ExiPrep*™96 Lite, Lane 3: Company Q, M: 1 kb DNA Ladder (Cat. No. D-1040, Bioneer)

Mouse kidney

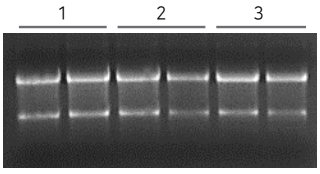


	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	511.0	2.08	2.26
	510.9	2.05	2.24
2	690.2	2.03	2.41
	694.4	2.07	1.91
3	461.7	2.12	1.89
	490.1	2.10	2.01

* Elution Volume: 100 μl

Figure 6. Animal tissue RNA extraction using *MagListo*™ Universal RNA Extraction Kit. RNA extraction from 20mg of *Mus musculus* liver. DNase was not treated.

Cultured Cell (HeLa)

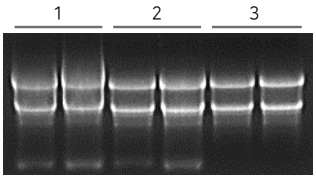


	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	249.9	2.08	2.19
	282.8	2.05	2.24
2	188.2	2.04	1.86
	250.8	2.03	1.98
3	228.6	2.07	2.17
	205.2	2.08	1.54

* Elution Volume: 100 μl

Figure 7. Cultured cell RNA extraction using *MagListo*™ Universal RNA Extraction Kit. RNA extraction from 1×10^6 of HeLa cell. DNase was not treated.

Plant Tissue (*Brassica oleracea*)



	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	753.8	2.20	2.23
	703.8	2.15	1.76
2	704.2	2.16	2.40
	823.1	2.17	2.43
3	635.4	2.19	2.00
	642.8	2.18	1.01

* Elution Volume: 100 μl

Figure 8. Plant RNA extraction using *MagListo*™ Universal RNA Extraction Kit. RNA extraction from 100 mg of *Brassica oleracea var. italica*. DNase was not treated.

Application on cfDNA Extraction (*MagListo*™ cfDNA Extraction Kit)

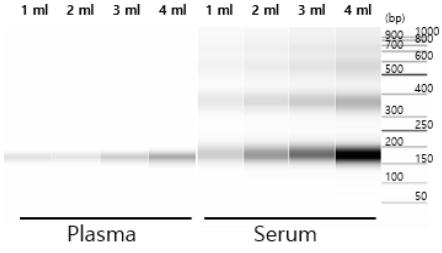
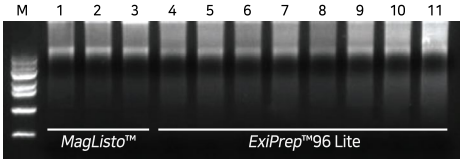


Figure 9. Cell-free DNA extracted using *MagListo*™ cfDNA Extraction kit and *ExiPrep*™96 Lite.

Cell-free DNA was isolated from various volume of plasma and serum using *ExiPrep*™96 LiteDNA was visualized using Agilent 5200 Fragment Analyzer System.

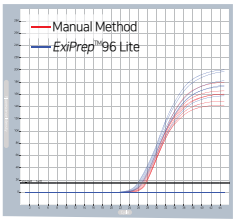
Application on FFPE DNA Extraction

A



#	Sample	Conc. (ng/μl)	260/280	260/230
1	M-1	38.9	1.84	1.83
2	M-2	38.9	1.82	1.84
3	M-3	38.1	1.84	1.82
4	96-1	31.1	1.94	1.63
5	96-2	35.7	1.82	1.77
6	96-3	36.3	1.86	1.53
7	96-4	39.0	1.81	1.63
8	96-5	36.9	1.88	1.73
9	96-6	39.9	1.83	1.66
10	96-7	47.2	1.83	1.72
11	96-8	53.3	1.84	1.83

B



	Sample #1		Sample #2		Sample #3	
	M	96	M	96	M	96
Ct	28.33	27.11	27.61	25.77	27.82	27.51
	27.91	26.76	28.07	26.38	26.46	26.74
	27.77	25.87	27.87	27.09	26.37	26.95
Average	28	26.58	27.85	26.41	26.88	27.07
CV(%)	1.04	2.41	0.83	2.5	3.02	1.47

*M: Manual Method (*MagListo*™) *96: *ExiPrep*™96 Lite

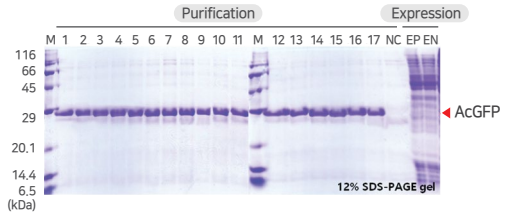
Figure 10. FFPE DNA extracted by using Manual method and *ExiPrep*™96 Lite.

(A) Gel electrophoresis and NanoDrop measurement of FFPE DNA. FFPE DNA was isolated with *MagListo*™ Genomic DNA Extraction kit by manual method (lane 1-3) and *ExiPrep*™96 Lite (lane 4-11).

(B) qPCR quantification of FFPE DNA extracted by manual method and *ExiPrep*™96 Lite. Mouse housekeeping gene *Cox6* primers and probe were used for qPCR.

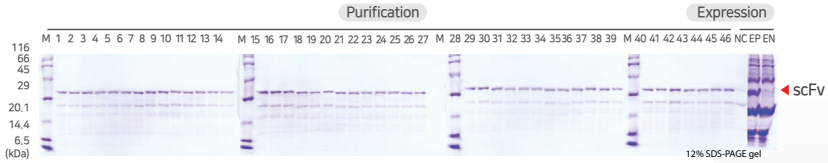
Protein Purification

A Purification of AcGFP using Ni-NTA magnetic beads



M: Protein Size Marker (Cat. No. D-2010, Bioneer)
Lane 1-17: Purification samples with DNA
Lane NC: Purification sample without DNA
Lane EP: Expression sample with DNA
Lane EN: Expression sample without DNA

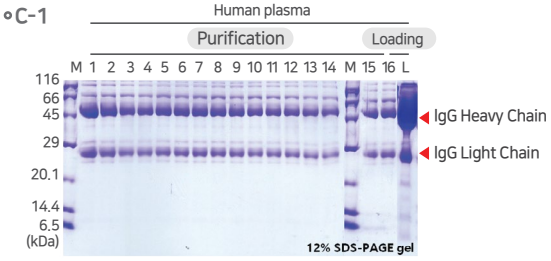
B Purification of scFv using Protein L magnetic beads



M: Protein Size Marker (Cat. No. D-2010, Bioneer)
Lane 1-46: Purification samples with DNA
Lane NC: Purification sample without DNA
Lane EP: Expression sample with DNA
Lane EN: Expression sample without DNA

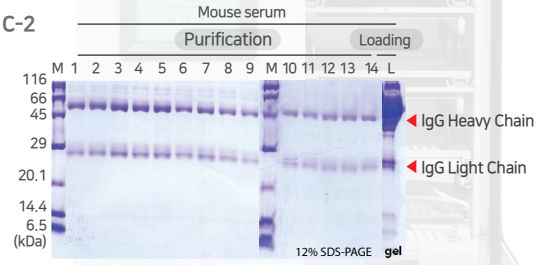
C Purification of IgG using Protein G magnetic beads

C-1



M: Protein Size Marker (Cat. No. D-2010, Bioneer)
Lane 1-16: Purification samples
Lane L: Loading sample

C-2



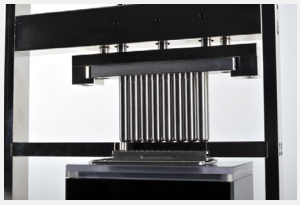
M: Protein Size Marker (Cat. No. D-2010, Bioneer)
Lane 1-14: Purification samples
Lane L: Loading sample

Figure 11. SDS-PAGE analysis of purified protein
After purification, various proteins were loaded onto a 12% SDS-PAGE and stained with Coomassie Brilliant Blue. Average concentration of purified proteins; **(A)** AcGFP: 18 µg/rxn, **(B)** scFv: 15 µg/rxn, **(C-1)** IgG: 62 µg/rxn, **(C-2)** IgG: 30 µg/rxn

A-5250	*ExiPrep*™96 Lite		
Dimension(cm)	40(W) x 57.5(D) x 54.6(H)	Weight	46 kg
Voltage/Frequency	100-240V~, 50/60 Hz	Power Consumption	500 VA Max (Fuse: 250V, F6.3AL, 2 ea)
Heating Block	30~90℃	Temperature Controlled Block	4~90℃
Operating Temperature	15~35℃	Operating Humidity	20~80%, no condensation
Operating System	Built-in	Communication	TCP/IP
User Interface Display	7 inch Touch Screen	Data Storage	USB 2.0 (x2)

ExiCraker™

An instrument that can crush samples such as plants or solid tissues like seeds, leaves, roots. 16 samples can be crushed simultaneously with minimized loss, making it a better choice for sample preparation then conventional mortars and pestles in terms of time and efficiency.

1 Process 16 samples in one run

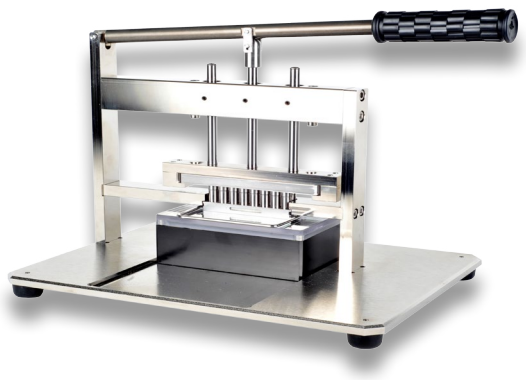
Sample racks can contain maximum of 16 samples. The handle on the upper part of the instrument can move the crushing pestle to grind them together, allowing to prepare them with quick and ease.

2 Prepare plant tissues and seeds

This instrument is capable of crushing hard seeds and leaf tissues, such as pumpkins, sunflowers, wheats, broccolis and cabbages.

3 Semi-permanent

The sample rack and the crushing pestle are constructed with alloys that have went through special treatments to not only increase durability, but also to provide more resistance to corrosions for semi-permanent use.



A-5030-A21	*ExiCraker*™
Dimension(cm)	30(W) x 23(D) x 28(H)
Weight	6.5 kg
No. of well	16 well
Diameter of wells	8 mm

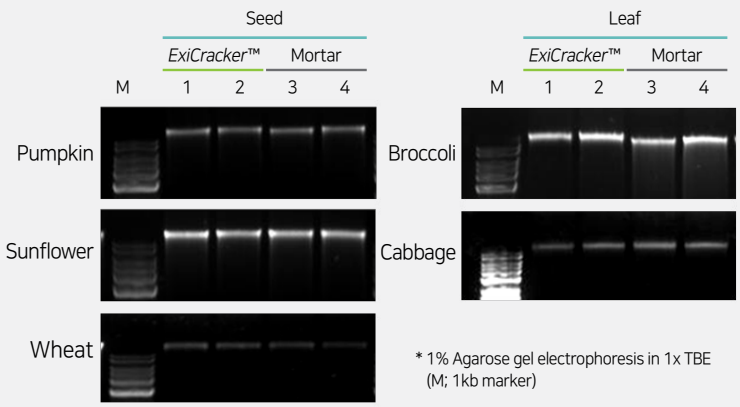
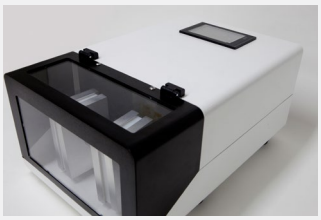
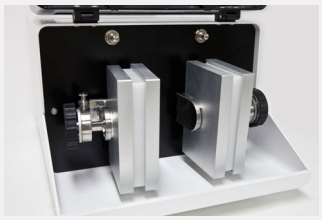


Figure 1. A comparison of sample extraction efficiency between *ExiCracker*™ and the conventional mortar & pestle

ExiBeater™

An efficient instrument which can quickly smash 192 (96 x 2) samples in a single run.
This instrument can crush those that are difficult to undergo lysis, such as plant tissues (seeds, stems, and leaves), animal tissues, cells.



1 Prepare maximum of 192 samples in a single run

Two 96 sample racks can be loaded in the instrument for fast and efficient homogenization & pulverization.

2 Crush various samples

Samples such as plant tissues, animal tissues, and cells can be crushed and homogenized. Those that are sensitive to heat can also be pulverized by freezing the rack beforehand. Both wet and dry samples can be used.

A-6040	*ExiBeater™*		
Dimension(cm)	30(W)X42(D)X18(H)	Weight	~ 20 kg
Power	400W	Number of grinding platforms	2
Voltage/Frequency	220V / 50 Hz	Grinding tank type	Milling tank with screw-on screw cap 1.5-50 ml, optional
Travel	35 mm	Grinding kit material	Hard steel, Teflon nylon 1.5 ml / 2 ml
Vibration frequency setting	10~2100 times / minute	Grinding kit size	25 ml / 50 ml (grinding tank)
Sample capacity	1~2 ml	Grinding ball material	Agate, stainless steel, zirconia, tungsten carbide, ceramic
Sample size	≤8 mm		
Output particle size	~ 3 μm	Grinding adapter	Adapter 2 × 48 holes; 5 ml adapter 2 × 24 holes
Typical crushing time	2 min	Crushing time setting	Digital display 0 seconds-9999 minutes

Protein Synthesis/Purification and Nucleic Acid Extraction System

ExiProgen™

An instrument that can synthesize and purify proteins automatically from maximum of 16 samples in a single run

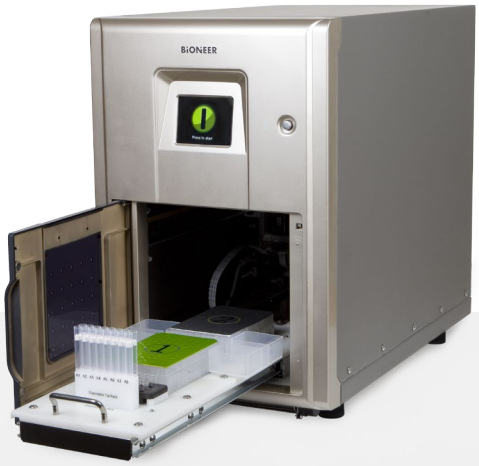
Application

Enzyme engineering / Protein structure study / Synthetic biology / Bio-energy R&D / Protein drug R&D

Main Functions

1. Simultaneous processing of 16 samples for protein synthesis and purification
2. Simultaneous processing of 16 samples for DNA/RNA extraction
3. Simultaneous processing of 16 samples for antibodies and other various types of protein purification

1. Convenient usage with touch screen
2. Cartridge contamination prevention
3. Automatic sterilization with UV
4. TCP/IP Network connection



1 Protein synthesis and purification

Simply use ExiProgen Kits and template DNAs to synthesize 16 different types proteins within 6 hours and purify the proteins with 90% purity using Ni-NTA Purification System.

2 Antibody & Protein Purification

His-tagged proteins and antibodies can be purified in a fully automated system using Ni-NTA bead, Protein A, Protein L, and microbeads.

3 DNA/RNA Extraction

DNA/RNA extraction can be done in fully automated system with a high yield and purity using AccuNano-Silica bead. Moreover, Proteinase K can be processed automatically in the instrument using the heating blocks (Korean patent number 10-1025135).

4 Optimized protocols installed

Various protocols for protein synthesis and purification optimized for many types of samples, such as whole blood, tissue, cell, bacteria, plant, etc., are installed. A touch screen is available for the users to easily start and check its process in real-time.

5 Temperature control for preventing denaturation

A cooling block is installed to keep the temperature of the elution tube rack under 10℃ to avoid denaturation through heat.

Experimental Data

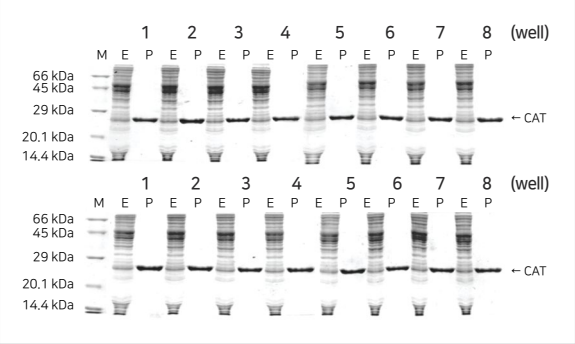


Figure 1. Simultaneous expression & purification of CAT proteins with His-Tag

16 reactions can be done in one run. No well-to-well difference can be found.

M: *AccuLadder*™ Protein Size Marker (Low)
Lane E: Samples in the middle of the expression
Lane P: The final product after the expression

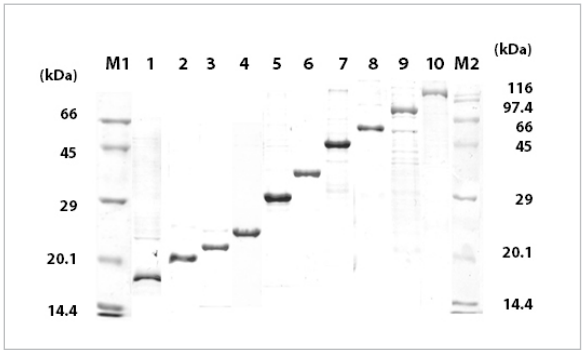


Figure 2. Various sizes of proteins expressed in *ExiProgen*™ shown with SDS-PAGE data

Various sizes of proteins can be expressed at once (Plasmid DNA – 10~120 kDa, PCR product – 10~60 kDa synthesized)

M1: *AccuLadder*™ Protein Size Marker (Low),
Lane 1: CalmL3 (17.5 kDa), Lane 2: RNase H (20 kDa),
Lane 3: DUSP 3 (22kDa), Lane 4: CAT (24 kDa),
Lane 5: AcGFP (29 kDa), Lane 6: EF-Ts (34 kDa),
Lane 7: VF (45 kDa), Lane 8: Poly A polymerase (50 kDa),
Lane 9: *M-MLV* RTase (75 kDa), Lane 10: BM3 (117 kDa),
M2: *AccuLadder*™ Protein Size Marker (Broad)

A-5041	*ExiProgen*™		
Dimension(cm)	32(W) x 53.5(D) x 50(H)	Weight	27 kg
Temperature Range	15~35℃	Humidity Range	20~80%, no condensation
Operating System	Stand alone (Built-in)	User Interface Display	320 x 240 touch screen TFT LCD
Adaptor(AC Input)	100–240 VAC, 2.3~0.8 A, 50/60 Hz	Instrument(DC Input)	24 VDC, 7.5 A
Adaptor(DC Output)	24 VDC, 7.5 A	UV Sterilization	15 minute cycle
Communications	TCP/IP	Heating Temperature	40~90℃

Agaro-Power™ | Electrophoresis

Agaro-Power™ is an instrument for agarose-gel electrophoresis that can quickly load 96 samples. The loading adaptor that can insert multi-channel pipettes is equipped with a cover that can load 96 samples within a minute. The main body of the electrophoresis system and the gel casting tray is made of polycarbonate, increasing the durability. A power supply capable of controlling two voltage levels is also included.

A-7020	*Agaro-Power*™ System
Distance Between Electrodes	22.8 cm
Buffer Volume	700 ml
Gel Tray Size (cm)	16.3(L) x 14.9(W)
Comb (No. of teeth)	25 or 34 well/line x 1 ea
	21 or 34 well/line x 1 ea
	15 or 34 well/line x 1 ea
	13 or 34 well/line x 1 ea
Caster Size (cm)	17(L) x 15.6(W)
Input Voltage	110 VAC 50/60 Hz, 220 VAC 50/60 Hz
Output Voltage	High: 150V±10%, Low:75V±10% (User selectable)

Agaro-Power™ System

A

Tank/Lid

The tank is made with transparent polycarbonate, allowing not only to be durable, but also to see the electrophoresis process clearly.

B

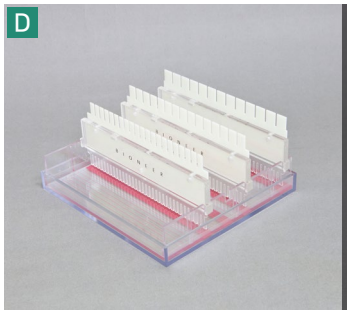
Loading adaptor

The self-developed loading adaptor is capable of fixing the well in the correct position for the samples to load quickly and accurately.

C

Power supply

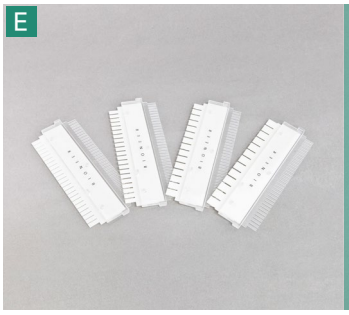
Our power supply can supply low (75 V) or high (150 V) voltage which can be controlled with ON/OFF system.



D

Gel caster & Tray

The combs and the dam allows the users to easily create the gel with their same depths and isolate it.



E

Comb set

The set consisting of 4 combs having 34/25/21/15/13 wells per line will be provided together after purchasing the *Agaro-Power*™ System.

DUALED Blue/White Transilluminator

Electrophoresis

DUALED Blue/White Transilluminator is a highly sensitive instrument that can be used to check either nucleic acids or proteins using two light sources (Blue/White LED). Nucleic acids with fluorescence dyes can be identified using 470 nm blue LED light while dyed proteins can be seen under white LED light through SDS-PAGE gels.

1 Two LED light sources

① Blue LED light: Check the fluorescence dyed nucleic acids on an agarose gel under the blue light (products after cloning, PCR, gel cutting, purification, sequencing, etc.)
② White LED light: Check the protein dyed with Coomassie Blue Staining Solution on the dyed SDS-PAGE gel and western blot X-ray film under the white light

2 Safety

See the dyed nucleic acids safer by using *GreenStar*™ Nucleic Acid Staining Solution I (Cat.No. C-9036, Bioneer), unlike the conventional EtBr having carcinogenic properties. Moreover, *GreenStar*™ Nucleic Acid Staining Solution provides clearer image than the latter.

3 Removable Excitation Light Filter

Move the excitation light filter in 0° and 60° while being removed for better sample observation and convenient gel cutting.

4 Light source using Bottom-up method

Gain clearer image without the background.

5 3-Level Light Control System

Control its light intensity in 3 levels.

6 Convenience

Freely move and place the instrument with its light weight and compact size.

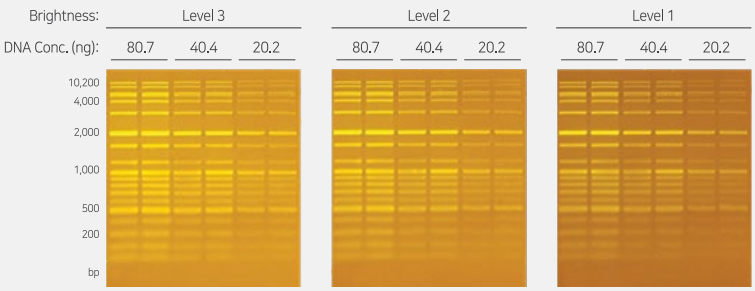
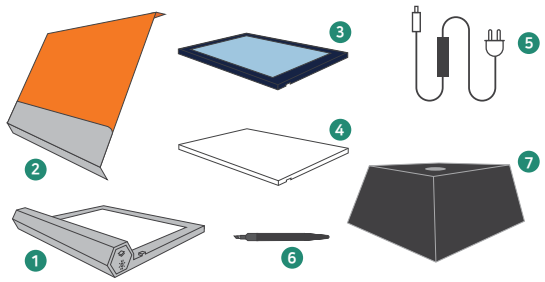


Figure 1. A gel image showing a clear photo of nucleic acids dyed with *GreenStar*™ Nucleic Acid Staining Solution I (Cat. No. C-9036, Bioneer), viewed under three different light intensity levels.



Components

1. DUALED Blue/White Transilluminator base
2. Amber filter cover
3. Blue plate
4. White plate
5. Power cord
6. Gel-cutting knife and replacement blade
7. Mini darkroom

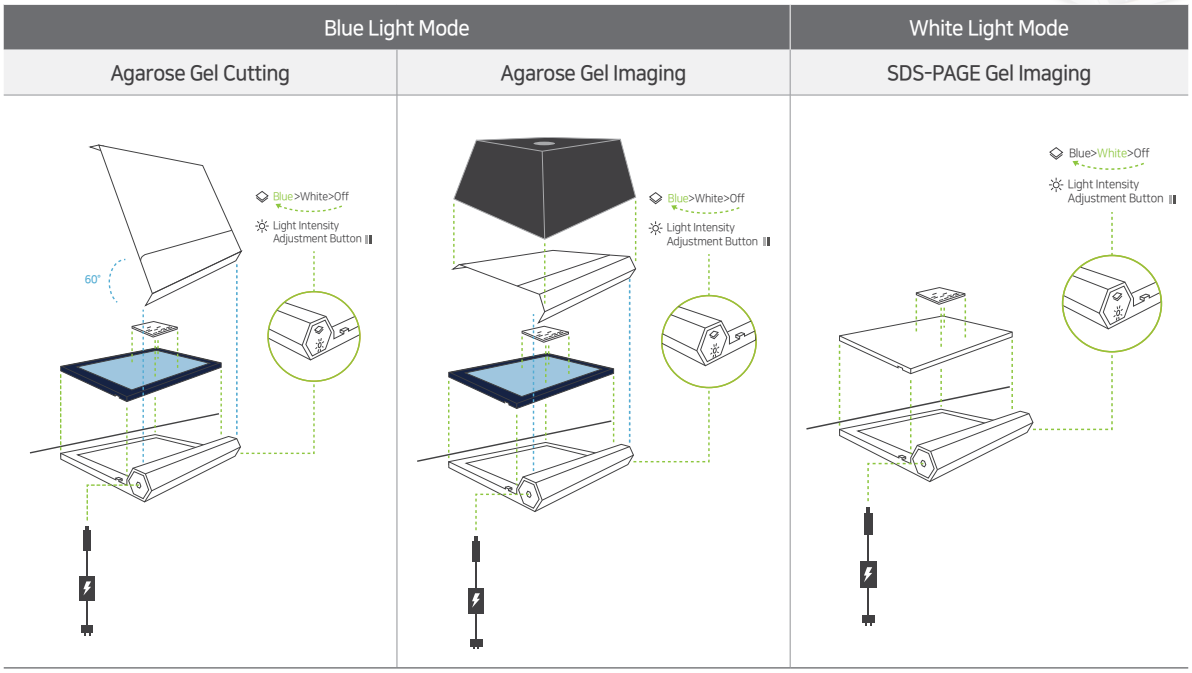


Figure 2. Experimental method of DUALED Blue/White Transilluminator

A-6020	DUALED Blue/White Transilluminator		
Dimension(cm)	18.5(W) x 22(D) x 3(H)	Input Voltage	100-240 VAC
Viewing Surface Dimension (cm)	12(W) x 18(D)	Input Current	2.0 A
LED Wavelength	470 nm	Automatic Power-Off	5 min
Lid/Filter	Amber (580 nm)	Unit Weight	2.27 kg
LED Life (hours)	> 30,000	The number of LED lamps	36 blue-light LED lamps/ 24 white-light LED lamps
Cetrifications	CE/ETL	Package Set	Gel-cutting knife, replacement blade, mini darkroom

HT-*MegaGrow*® Shaking Incubator

How to incubate using HT-*MegaGrow*®

① Two-step setting: Load maximum 20 of 96-deep well plate to incubate 1,920 types of strains of 1 ml per well

② One-step setting: Load maximum 10 of 96-deep well plate to incubate 960 types of strains of 1.5 ml per well

Application

Antibody Drug Development / Microbiome Studies / Functional Strain Screening
Protein Engineering / Synthetic Biology

A-4080	*HT-MegaGrow*® Shaking Incubator		
Dimension(cm)	72.5(W) x 56(D) x 56(H)	Temperature Range	30~40℃
Weight	160 kg	Temperature Accuracy	Set value ± 1℃
Input Voltage	220V, 60 Hz	Humidity Range	Over 90%
Power Dissipation	450W	Maximum RPM	1,200 rpm
Operating Temperature	15~25℃	Eccentricity	4 mm

1 Fast rotation with efficient incubation

- The small rotating radius and fast speed allows to incubate the strains effectively.
- The strain is 30~40% faster than a conventional incubator.

2 Large Scale Synthesis

- A total of 1,920 samples can be incubated at once by using 20 96-deep well plate at maximum.

3 Simplified controls with various features

- Temperature can be maintained using temperature control systems
- During the operation, the temperature deviation is about ± 1℃, allowing the incubator to stability maintain the optimal temperature for the cell's growth condition.
- The oxygen concentration and the injection will be automatically controlled according to the set values.
- A moisture supply vessel is installed to prevent the air in the incubator from drying out.

4 Cross Contamination Prevention

- No well-to-well cross contamination have been found regardless of high rotation number.

5 Convenience

- The accessory for supporting the plates divided into upper and lower parts, allowing to easily separate and load them.

96 Deep well plate Cell Growth Curve

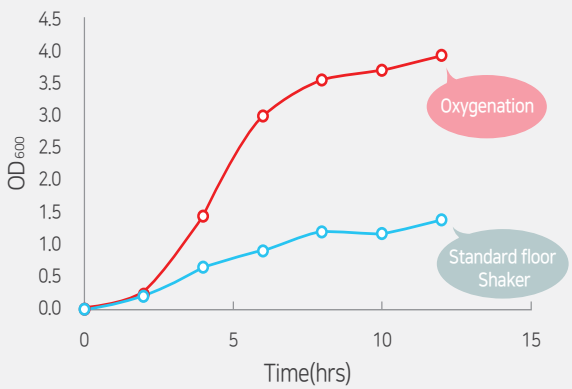


Table 1. Culture Conditions

HT-*MegaGrow*®	37℃, 1,200 rpm, no aeration, oxygenation (No delay, 1 minute interval, 1 second on)
Plate	96 Deep well Plate, round-bottom, square-wells, plate lids (Cat. No.90061, Bioneer)
Media	500 µl/well of 1x Terrific Broth Ampicillin (100 µg/ml)
Strain	*E. coli*, DH5α carrying pBluescript (no insert)
Innoculation	5 µl pre-culture added to each wells with multi channel pipettor
Growth Time	12 hours

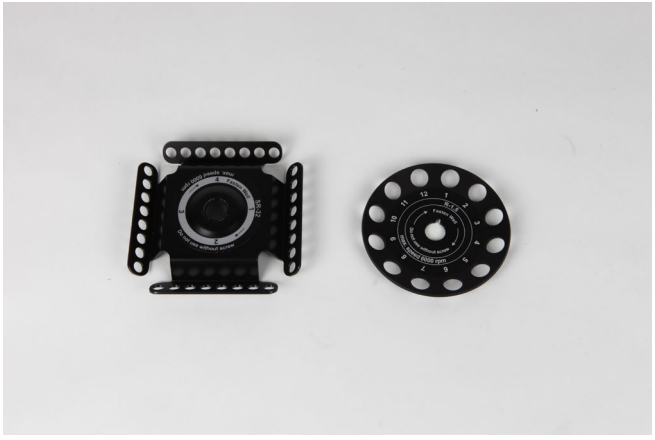
*Standard floor shaker: 37℃, 750 rpm.

ExiSpin™, *ExiSpin*™ 96

ExiSpin™ and *ExiSpin*™ 96 are instruments that can automatically undergo repetitive procedures of vortexing and spin-down using our BIONEER program. **Those instruments are essential for researches of all the fields utilizing microtubes, including but not limited to molecular diagnostics, biochemistry, molecular chemistry, etc.**

Application

Bacterial Cell lysis
PCR/qPCR
Restriction Enzyme, kinase/ligation reaction
Experiments requiring to do multiple amounts of mixing and spin-down



<*ExiSpin*™ rotors for 8-strip and microcentrifuge tube>

Fully Automated Spin-Mix-Spin Technology

Duration and speed can be selected for every spin-mix-spin procedures. The maximum amount of cycles that can be set is 999. The spin-down and mixing parts can be selectively adjusted depending on the types of samples and conditions for each steps. The instrument will run and undergo the set steps automatically in efficient and reproducible ways.

① **1st spin**: Spin down sample
② Vortexing of samples
③ **2nd spin**: Spin down mixed sample

Microcentrifuge & Vortexing

Both the vortexing and centrifuging function can be done with not only microcentrifuge tubes, but also PCR tubes. Rotors for the each types will be provided.

Are you still doing vortexing & spin-down separately?

ExiSpin™

A-7040	*ExiSpin*™
Dimension(cm)	19(W) x 23.5(D) x 12.5(H)
Weight	2.7 kg
Spin Regulation	1,000~3,500 rpm
Spin Timer	1 sec~30 min
Vortexing Strength	Soft, Medium, Hard
SMS-Cycle Regulation	1~999 Cycles
Power Supply	AC 24 V, 1,250 mA

Use maximum of 32 samples in a single run

- 4 x 8-strip tubes
- 12 x 1.5 ml tubes

ExiSpin™ 96

A-7140	*ExiSpin*™ 96
Dimension(cm)	28.5(W) x 35(D) x 19(H)
Weight	6.1 kg
Spin Regulation	300~1,500 rpm
Min. RCF at 1500 rpm	175 xg
Vortex Regulation Range	300~1,200 rpm
Setting Resolution	100 rpm
Display	LCD, 2 x 16 signs
Centrifugation Mode Time Range	0-30 min (increment 1 sec)
Vortex Mode Time Range	0~60 sec (increment 1 sec)
Number of cycles	1~999 cycles
Chamber Diameter	210 mm
Input Current/ Power Consumption	12V, 1.5A/18W
External Power Supply	Input AC 100-240V 50/60 Hz Output DC 12V

Use maximum of 192 samples in a single run

- 12 x 8-strip tubes
- 8 x 12-strip tubes
- 2 x 96 well plate

Ordering Information

01 Real-Time PCR | *Exicycler*™ 96/384/HD

Cat. No.	Product Description
High-Throughput Real-Time PCR System	
A-2060-1	*Exicycler*™ 96 (Ver.4) Real-Time Quantitative Thermal Block
A-2060-2	*Exicycler*™ 96 (Ver.4) Fast Real-Time Quantitative Thermal Block
A-2061	*Exicycler*™ 384 Real-Time Quantitative Thermal Block
A-2070	*Exicycler*™ HD Real-Time Quantitative PCR System
A-2070-9	*Injector*™ Sample Injection System
Plastic Consumables	
3111-4110	Adhesive Optical Sealing Film, 100 sheets
3111-50	Opaque White 0.2 ml PCR 8-tube strip Tube, 250 Strips
3111-52	Opaque White 96-well Semi-skirted PCR Plate, 25 Plates
3111-53	Opaque White 96-well Full-skirted, Low Profile PCR Plate, 25 Plates

02 Conventional PCR | *AllInOneCycler*™

Cat. No.	Product Description		
AllInOneCycler™ PCR System			
A-2041-1N	*AllInOneCycler*™ 96 well PCR system		
A-2041-2N	*AllInOneCycler*™ 384 well PCR system		
A-2041-3N	*AllInOneCycler*™ Slide PCR system		
AllInOneCycler™ Fast PCR System			
A-2041-1F	*AllInOneCycler*™ Fast 96 well PCR system		
A-2041-2F	*AllInOneCycler*™ Fast 384 well PCR system		
A-2041-3F	*AllInOneCycler*™ Fast Slide PCR system		
AllInOneCycler™ Thermal Block			
A-2041-1-1	*AllInOneCycler*™ 96 well thermal block only	A-2041-1-2	*AllInOneCycler*™ Fast 96 well thermal block only
A-2041-2-1	*AllInOneCycler*™ 384 well thermal block only	A-2041-2-2	*AllInOneCycler*™ Fast 384 well thermal block only
A-2041-3-1	*AllInOneCycler*™ Slide thermal block only	A-2041-3-2	*AllInOneCycler*™ Fast Slide thermal block only
AllInOneCycler™ PC Control Software			
A-2041-9	*AllInOneCycler*™ PC control software		
Plastic Consumables			
TC2-02-N	0.2 ml Flat Cap PCR Tube, Natural, 1000 ea		
T-028-CN	0.2 ml 8-Strip PCR Tubes with 8-Strip Caps, Natural, 125 ea		
T-0212-CN	0.2 ml 12-Strip PCR Tubes with 12-Strip Caps, Natural, 80 ea		
3420-00	96-Well PCR Cycle Plate, Semi skirted, Natural, 10 ea		
3430-00	384-Well PCR Cycle Plate, Full skirted, Natural, 10 ea		
3510-00	Sealing mat(silicon rubber) for 96-well PCR plate, 5 ea		

03 DNA/RNA Preparation

Cat. No.	Product Description
A-5030	*ExiPrep*™16 Plus
A-5150-1	*ExiPrep*™48
A-5250	*ExiPrep*™96 Lite
A-5030-A21	*ExiCracker*™
A-6040	*ExiBeater*™

04 Protein Synthesis & Purification

Cat. No.	Product Description		
A-5041	*ExiProgen*™		
Accessories			
A-5041-A	Accessories Set for *ExiProgen*™ (A2,3,4,5,6,7,10)	A-5041-A5	Reaction Block (For Protein synthesis)
A-5041-A1	Multi Puncher (option)	A-5041-A6	Waste Tray
A-5041-A2	Setup Tray	A-5041-A7	Hole Puncher (6-hole)
A-5041-A3	Disposable Tip Rack	A-5041-A9	AC Adapter for *ExiProgen*™
A-5041-A4	Elution Tube Rack	A-5041-A10	Contamination Shield

05 Electrophoresis

Cat. No.	Product Description
A-7020	*Agaro-Power*™ System
Plastic Consumables	
A-7020-1	*Agaro-Power*™, Power Supply
A-7020-2	*Agaro-Power*™, Agar Tank/Lid
A-7020-3	*Agaro-Power*™, Comb Set
A-7020-3-1	*Agaro-Power*™, Comb (25 well / 34 well)
A-7020-3-2	*Agaro-Power*™, Comb (13 well / 34 well)
A-7020-3-3	*Agaro-Power*™, Comb (15 well / 34 well)
A-7020-3-4	*Agaro-Power*™, Comb (21 well / 34 well)
A-7020-4	*Agaro-Power*™, Gel Caster/Tray
A-7020-5	*Agaro-Power*™, Cable Jack
Cat. No.	Product Description
A-6020	DUALED Blue/White Transilluminator
Related Product	
C-9036	*GreenStar*™ Nucleic Acid Staining Solution I

06 Microbial Culture

Cat. No.	Product Description
A-4080	*HT-MegaGrow*® Shaking Incubator
A-4080-1	96 Shallow Well Plate Rack (Top)
A-4080-2	96 Shallow Well Plate Rack (Bottom)
Plastic Consumables	
90061	96 Well Deep Plate-Dome, 10 ea/pk
90062	96 Well Deep Plate-Dome, 50 ea/pk
90063	96 Well Deep Plate-Dome, 100 ea/pk
3111-4110	Adhesive Optical Sealing Film, 100 Sheets

07 Vortexing & Spin-down

Cat. No.	Product Description
A-7040	*ExiSpin*™
A-7140	*ExiSpin*™ 96
A-7140-1	Rotor for 96 well plate
A-7140-2	Rotor for 8-strip tubes / 96 tubes
A-7140-3	Rotor for 12-strip tubes / 96 tubes

Related Products

Real-Time PCR | *Exicycler*™ 96/384

01 Quantitative PCR/RT-PCR PreMix & Master Mix

dsDNA Binding Dye Type Kit

Cat. No.	Product Description
AccuPower® *GreenStar*™ qPCR PreMix & 2X Master Mix	
K-6200	*AccuPower*® *GreenStar*™ qPCR PreMix, 50 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™ 96, optical film included
K-6203	*AccuPower*® *GreenStar*™ qPCR PreMix, 50 µl/rxn, 96-well plate, 96 rxn, *Exicycler*™ 96, optical film included
K-6210	*AccuPower*® *GreenStar*™ qPCR PreMix, 20 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™ 96, optical film included
K-6213	*AccuPower*® *GreenStar*™ qPCR PreMix, 20 µl/rxn, 96-well plate, 96 rxn, *Exicycler*™ 96, optical film included
K-6251	*AccuPower*® 2X *GreenStar*™ qPCR Master Mix, 50 µl/rxn, 100 rxn, 80X ROX Dye (0.1 ml X 1 ea)
K-6253	*AccuPower*® 2X *GreenStar*™ qPCR Master Mix, 50 µl/rxn, 100 rxn, without ROX Dye
AccuPower® *GreenStar*™ RT-qPCR PreMix & Master Mix	
K-6400	*AccuPower*® *GreenStar*™ RT-qPCR PreMix, 50 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™ 96, optical film included
K-6403	*AccuPower*® *GreenStar*™ RT-qPCR Master Mix (2X), 2.5 ml, 100 rxn

Hydrolysis Probe Type Kit

Cat. No.	Product Description
AccuPower® *DualStar*™ qPCR PreMix	
K-6100	*AccuPower*® *DualStar*™ qPCR PreMix, 20 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™ 96, optical film included
K-6103	*AccuPower*® *DualStar*™ qPCR PreMix, 20 µl/rxn, 96-well plate, 96 rxn, *Exicycler*™ 96, optical film included
K-6110	*AccuPower*® *DualStar*™ qPCR PreMix, 50 µl/rxn, 8-tube strips, 96 rxn *Exicycler*™ 96, optical film included
K-6113	*AccuPower*® *DualStar*™ qPCR PreMix, 50 µl/rxn, 96-well plate, 96 rxn, *Exicycler*™ 96, optical film included
AccuPower® Plus *DualStar*™ qPCR PreMix & Master Mix	
K-6600	*AccuPower*® Plus *DualStar*™ qPCR PreMix, 50 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™ 96, optical film included
K-6603	*AccuPower*® Plus *DualStar*™ qPCR Master Mix (2X), 2.5 ml, 100 rxn
AccuPower® Plus *DualStar*™ qPCR PreMix & Master Mix (with UDG)	
K-6605	*AccuPower*® Plus *DualStar*™ qPCR PreMix (with UDG), 50 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™ 96, optical film included
K-6608	*AccuPower*® Plus *DualStar*™ qPCR Master Mix (2X) (with UDG), 2.5 ml, 100 rxn
AccuPower® *Dual-HotStart*™ RT-qPCR PreMix & Master Mix	
K-6704	*AccuPower*® *Dual-HotStart*™ RT-qPCR PreMix, 50 µl/rxn, 96-well plate, 96 rxn, *Exicycler*™ 96, optical film included
K-6707	*AccuPower*® *Dual-HotStart*™ RT-qPCR Master Mix (2X), 2.5 ml, 100 rxn

Conventional PCR | *AllInOneCycler*™

02 DNA Polymerase & PCR PreMix

Cat. No.	Product Description
K-2012 / K-2013	*AccuPower*® PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2012-1	*AccuPower*® PCR PreMix (with UDG), 96 tubes, 20 µl
K-2601 / K-2603	*AccuPower*® *Taq* PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2631 / K-2633	*AccuPower*® *ProFi Taq* PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2022 / K-2023	*AccuPower*® *Pfu* PCR PreMix, 96 tubes, 20 µl / 50 µl
K-5050 / K-5052	*AccuPower*® HotStart PCR PreMix, 96 tubes, 20 µl / 50 µl
K-5050-1	*AccuPower*® HotStart PCR PreMix (with UDG), 96 tubes, 20 µl
K-2611 / K-2613	*AccuPower*® *PyroHotStart Taq* PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2621 / K-2623	*AccuPower*® *GoldHotStart Taq* PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2301 / K-2302	*AccuPower*® HotStart *Pfu* PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2111 / K-2112	*AccuPower*® Multiplex PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2115 / K-2117	*AccuPower*® Gold Multiplex PCR PreMix, 96 tubes, 20 µl / 50 µl

03 Reverse Transcriptase & RT-PCR PreMix

Cat. No.	Product Description
K-2041 / K-2043	*AccuPower*® RT PreMix, 96 tubes, 20 µl / 50 µl
K-2044 / K-2047	*AccuPower*® *CycleScript*™ RT PreMix (dT20), 96 tubes, 20 µl / 50 µl
K-2045 / K-2048	*AccuPower*® *CycleScript*™ RT PreMix (dN12), 96 tubes, 20 µl / 50 µl
K-2046 / K-2049	*AccuPower*® *CycleScript*™ RT PreMix (dN6), 96 tubes, 20 µl / 50 µl
K-2101 / K-2103	*AccuPower*® *RocketScript*™ RT PreMix, 96 tubes, 20 µl / 50 µl
K-2201 / K-2203	*AccuPower*® *RocketScript*™ Cycle RT PreMix (dT20), 96 tubes, 20 µl / 50 µl
K-2205 / K-2207	*AccuPower*® *RocketScript*™ Cycle RT PreMix (dN6), 96 tubes, 20 µl / 50 µl
K-2208 / K-2210	*AccuPower*® *RocketScript*™ Cycle RT PreMix (dN12), 96 tubes, 20 µl / 50 µl
K-2221 / K-2223	*AccuPower*® *RocketScript*™ RT PreMix, RNase H Minus, 96 tubes, 20 µl / 50 µl
K-2241 / K-2243	*AccuPower*® *RocketScript*™ RT PreMix (dT20), RNase H Minus, 96 tubes, 20 µl / 50 µl
K-2245 / K-2246	*AccuPower*® *RocketScript*™ RT PreMix (dN6), RNase H Minus, 96 tubes, 20 µl / 50 µl
K-2247 / K-2248	*AccuPower*® *RocketScript*™ RT PreMix (dN12), RNase H Minus, 96 tubes, 20 µl / 50 µl
K-2055 / K-2057	*AccuPower*® RT-PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2501 / K-2503	*AccuPower*® *RocketScript*™ RT-PCR PreMix, 96 tubes, 20 µl / 50 µl
K-2231 / K-2233	*AccuPower*® *RocketScript*™ RT-PCR PreMix, RNase H Minus, 96 tubes, 20 µl / 50 µl
K-6710 / K-6711	*AccuPower*® *Dual-HotStart*™ RT-PCR PreMix, 96 tubes, 20 µl / 50 µl
K-6714 / K-6715	*AccuPower*® *Dual-HotStart*™ RT-PCR PreMix (with UDG), 96 tubes, 20 µl / 50 µl
K-2211 / K-2213	*AccuPower*® *RocketPlex* RT-PCR PreMix, 96 tubes, 20 µl / 50 µl

Sample Preparation

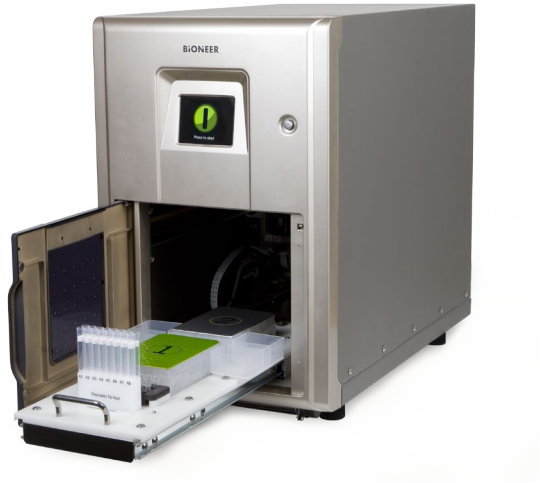
04 *ExiPrep*™16 Plus

Cat. No.	Product Description
Genomic DNA	
K-3200-CB	*ExiPrep*™ Beef Genomic DNA Kit
K-3200-CR	*ExiPrep*™ Rice Genomic DNA Kit
K-3225	*ExiPrep*™ Tissue Genomic DNA Kit
K-4211	*ExiPrep*™ Plus Blood Genomic DNA Kit
K-4214	*ExiPrep*™ Plus Bacteria Genomic DNA Kit
K-4215	*ExiPrep*™ Plus Plant Genomic DNA Kit
K-4217	*ExiPrep*™ Plus Seed Genomic DNA Kit
Total RNA	
K-4241	*ExiPrep*™ Plus Total RNA Kit
K-4244	*ExiPrep*™ Plus Plant Total RNA Kit
Viral DNA/RNA	
K-4271	*ExiPrep*™ Plus Viral DNA/RNA Kit

05 *ExiPrep*™96 Lite

Cat. No.	Product Description
K-4611	*ExiPrep*™ 96 Genomic DNA Kit
K-3601	*MagListo*™ 5M Plasmid Extraction Kit, 100 rxn in mini
K-3603	*MagListo*™ 5M Genomic DNA Extraction Kit, 100 rxn in mini
K-3613	*MagListo*™ 5M Universal RNA Extraction Kit, 100 rxn in mini
K-3619	*MagListo*™ 5M cfDNA Extraction Kit
K-7200	*MagListo*™ His-tagged Protein Purification Kit
K-7710	*MagListo*™ Protein G Kit
K-7720	*MagListo*™ Protein A Kit
K-7730	*MagListo*™ Protein L Kit

Protein Synthesis & Purification | *ExiProgen*™



06 Protein Synthesis/Purification Kits

Cat. No.	Product Description
Protein Synthesis kit for *ExiProgen*™	
K-7300~2	*ExiProgen*™ EC Protein Synthesis Kit (16/32/96 reactions)
K-7310	*ExiProgen*™ EC-Maxi Protein Synthesis Kit, 8 reactions
K-7320	*ExiProgen*™ EC-Tagfree Protein Synthesis Kit, 8 reactions
K-7330	*ExiProgen*™ EC-Disulfide Protein Synthesis Kit, 8 reactions
K-7340	*ExiProgen*™ EC-Bulk Protein Synthesis Kit
Protein Purification Kit for *ExiProgen*™	
K-7220~1	*ExiProgen*™ His-tagged Protein Purification Kit (16/32 reactions)
K-7710	*MagListo*™ Protein G Kit
K-7720	*MagListo*™ Protein A Kit
K-7730	*MagListo*™ Protein L Kit
KA-3001	*ExiProgen*™ Consumable SET, 16 reactions
K-7240	*ExiProgen*™ Dialysis kit, 8 reactions

07 Nucleic Acid Extraction Kits

Cat. No.	Product Description
Nucleic Acid Extraction Kit for *ExiProgen*™	
K-3200-CB	*ExiPrep*™ Beef Genomic DNA Kit
K-3200-CR	*ExiPrep*™ Rice Genomic DNA Kit
K-3225	*ExiPrep*™ Tissue Genomic DNA Kit
K-4211	*ExiPrep*™ Plus Blood Genomic DNA Kit
K-4214	*ExiPrep*™ Plus Bacteria Genomic DNA Kit
K-4217	*ExiPrep*™ Plus Seed Genomic DNA Kit
K-4241	*ExiPrep*™ Plus Total RNA Kit
K-4244	*ExiPrep*™ Plus Plant total RNA Kit
K-4271	*ExiPrep*™ Plus Viral DNA/RNA Kit

*Instrument specifications can be changed for performance upgrade without any prior notifications

Reference List

BIONEER instruments are in many of the published literatures.
The ones below are only the examples. Other than those, at least 1,000 literatures are published using our instruments.

Exicycler™ 96

Year of Publication	Literature	Authors	Journal
2019	AIMP1 downregulation restores chondrogenic characteristics of dedifferentiated/degenerated chondrocytes byenhancing TGF-β signal	Ahn J, Kumar H, Cha BH, Park S, Arai Y, Han I, Park SG, Lee SH.	Cell Death Dis. 2016 Feb 18;7:e2099.
2018	Molecular Cloning and Effects of Tm14-3-3ζ-Silencing on Larval Survivability Against E. coli and C. albicans in Tenebrio molitor	Seong JH, Jo YH, Seo GW, Park S, Park KB, Cho JH, Ko HJ, Kim CE, Patnaik BB, Jun SA, Choi YS, Kim YW, Bang IS, Lee YS, Han YS.	Genes (Basel). 2018 Jun 29;9(7).
2018	TmCactin plays an important role in Gram-negative and -positive bacterial infection by regulating expression of 7 AMP genes in Tenebrio molitor	Jo YH, Kim YJ, Park KB, Seong JH, Kim SG, Park S, Noh MY, Lee YS, Han YS.	Sci Rep. 2017 Apr 18;7:46459.
2016	mRNA Expression of Bax, Bcl-2, p53, Cathepsin B, Caspase-3 and Caspase-9 in the HepG2 cell line following induction by a novel monoclonal Ab Hep88 mAb: Cross-Talk for paraptosis and apoptosis	Mitupatum T, Aree K, Kittisenachai S, Roytrakul S, Puthong S, Kangsadalampai S, Rojpibulstit P.	Asian Pac J Cancer Prev. 2016;17(2):703-12.
2013	Down-Regulation of Gab1 Inhibits Cell Proliferationand Migration in Hilar Cholangiocarcinoma	Sang H, Li T, Li H, Liu J.	PLoS One. 2013 Nov 28;8(11):e81347.
2013	Status Epilepticus Induces Vasogenic Edema via TumorNecrosis Factor-α/ Endothelin-1-Mediated Two Different Pathways	Kim JE, Ryu HJ, Kang TC.	PLoS One. 2013 Sep 5;8(9):e74458.

ExiProgen™

Year of Publication	Literature	Authors	Journal
2018	Highly efficient genome editing by CRISPR-Cpf1 using CRISPR RNA with a uridinylate-rich 3′-overhang	Bin Moon S, Lee JM, Kang JG, Lee NE, Ha DI, Kim DY, Kim SH, Yoo K, Kim D, Ko JH, Kim YS	Nat Commun. 2018 Sep 7;9(1):3651
2017	A long-term study on the effect of magnetite supplementation in continuous anaerobic digestion of dairy effluent–magnetic separation and recycling of magnetite	Baek G, Jung H, Kim J, Lee C.	Bioresour Technol. 2017 Oct;241:830-840.
2017	Anaerobic co-digestion of spent coffee grounds with different waste feedstocks for biogas production	Kim J, Kim H, Baek G, Lee C.	Waste Manag. 2017 Feb;60:322-328.
2016	A long-term study on the effect of magnetite supplementation in continuous anaerobic digestion of dairy effluent–Enhancement in process performance and stability	Baek G, Kim J, Lee C.	Bioresour Technol. 2016 Dec;222:344-354.
2016	Bioaugmentation of anaerobic sludge digestion with iron-reducing bacteria: process and microbial responses to variations in hydraulic retention time	Baek G, Kim J, Shin SG, Lee C.	Appl Microbiol Biotechnol. 2016 Jan;100(2):927-37.
2015	Removal of the mechanoprotective in uence of the cytoskeleton reveals PIEZO1 is gated by bilayer tension	Cox CD, Bae C, Ziegler L, Hartley S, Nikolova-Krstevski V, Rohde PR, Ng CA, Sachs F, Gottlieb PA, Martinac B.	Nat Commun. 2016 Jan 20;7:10366.

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Year of Publication	Literature	Authors	Journal
2018	Pyrosequencing-based quantitative measurement of CALR mutation allele burdens and their clinical implications in patients with myelopro-liferative neopla	Oh Y, Song IC, Kim J, Kwon GC, Koo SH, Kim SY.	Clin Chim Acta. 2018 Aug;483:183-191.
2017	Comparison of allele-specific PCR, created restriction-site PCR, and PCR with primer-introduced restriction analysis methods used for screening complex vertebral malformation carriers in Holstein cattle	Avanus K, Altınel A.	J Vet Sci. 2017 Dec 31;18(4): 465-470.
2016	Adult-onset hyperthyroidism impairs spatial learning: possible involve-ment of mitogen-activated protein kinase signaling pathways	Bitikta S, Kandemir B, Tan B, Kavraal , Liman N, Dursun N, D nmez-Altunta H, Aksan-Kurnaz I, Suer C.	Neuroreport. 2016 Aug 3;27(11): 802-8.
2016	Low-frequency stimulation induces a durable long-term depression in young adult hyperthyroid rats: the role of p38 mitogen-activated protein kinase and protein phosphatase 1	Tan B, Bitikta S, Kavraal S, Dursun N, D nmez Altun-tas H, Suer C.	Neuroreport. 2016 Jun 15;27(9): 640-6.


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