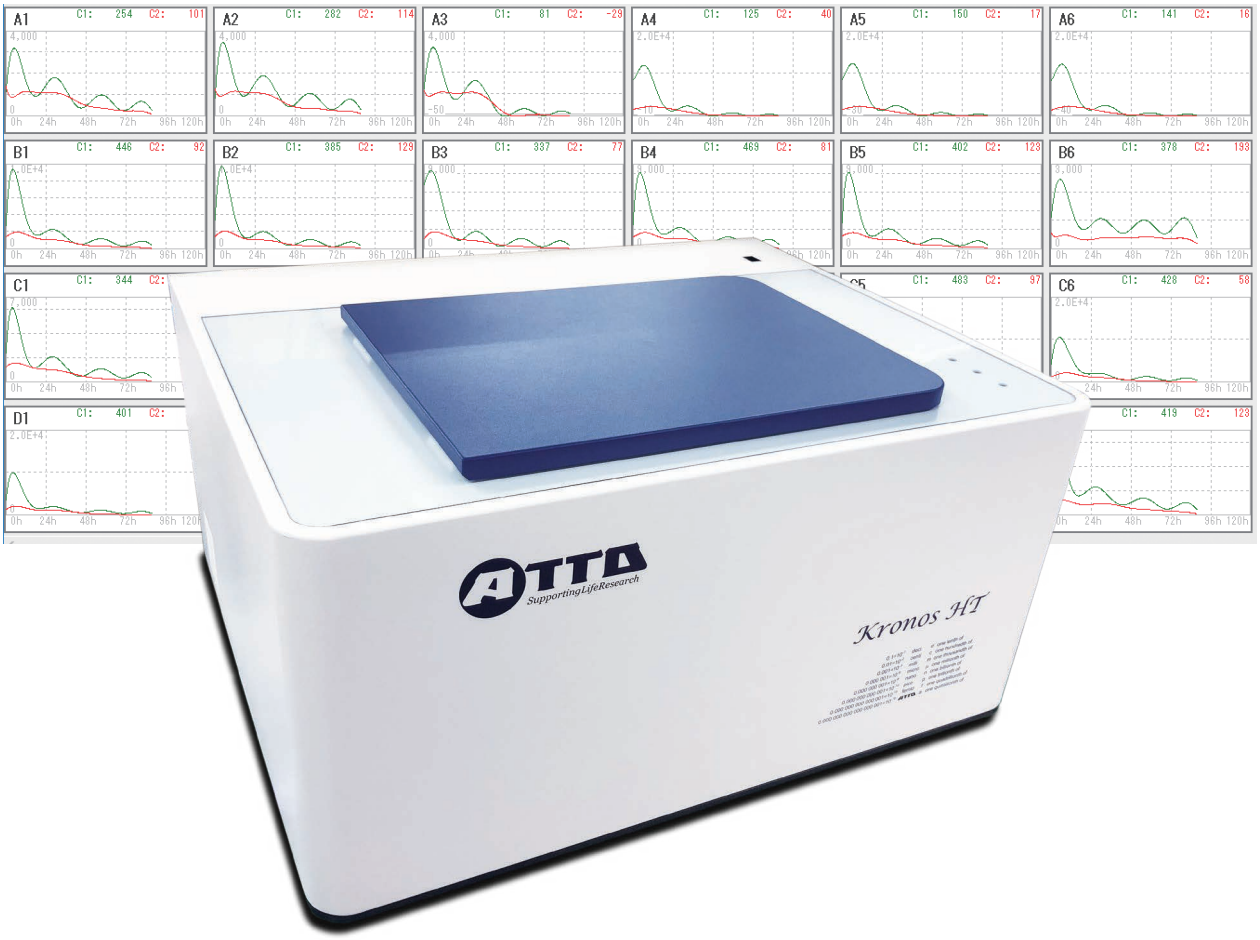
ATTO High throughput real-time luciferase assay system

WSL-1565 ATTO Kronos HT



A multi-well plate compatible model appeared in Kronos series which measures changes in gene expression over time with bioluminescence of luciferase while culturing cells.

Since 1964
ATTO
Made in Tokyo
SupportingLifeResearch

High throughput real-time luciferase assay system Kronos HT

NEW

High throughput assay system for real-time gene expression monitoring of living cells

WSL-1565 Kronos HT is the high throughput support model of the assay system that measure the gene expression of living cells in real-time with the bioluminescence of luciferase. Kronos Dio, which is a precedent model compatible with 35 mm dish, has been used as a real-time luminescence measurement system with cell culturing function, but this time a new lineup of model compatible with multiwell plate measurement is added.

With this new product Kronos HT, we succeeded the know-how cultivated in the precedent model in order to measure the luminescence while culturing the cells, and further strengthened functions and performance for high throughput measurement. Please consider adopting Kronos HT for high-throughput measurement in biological clock analysis, change in drug response with time, cytotoxicity test etc.

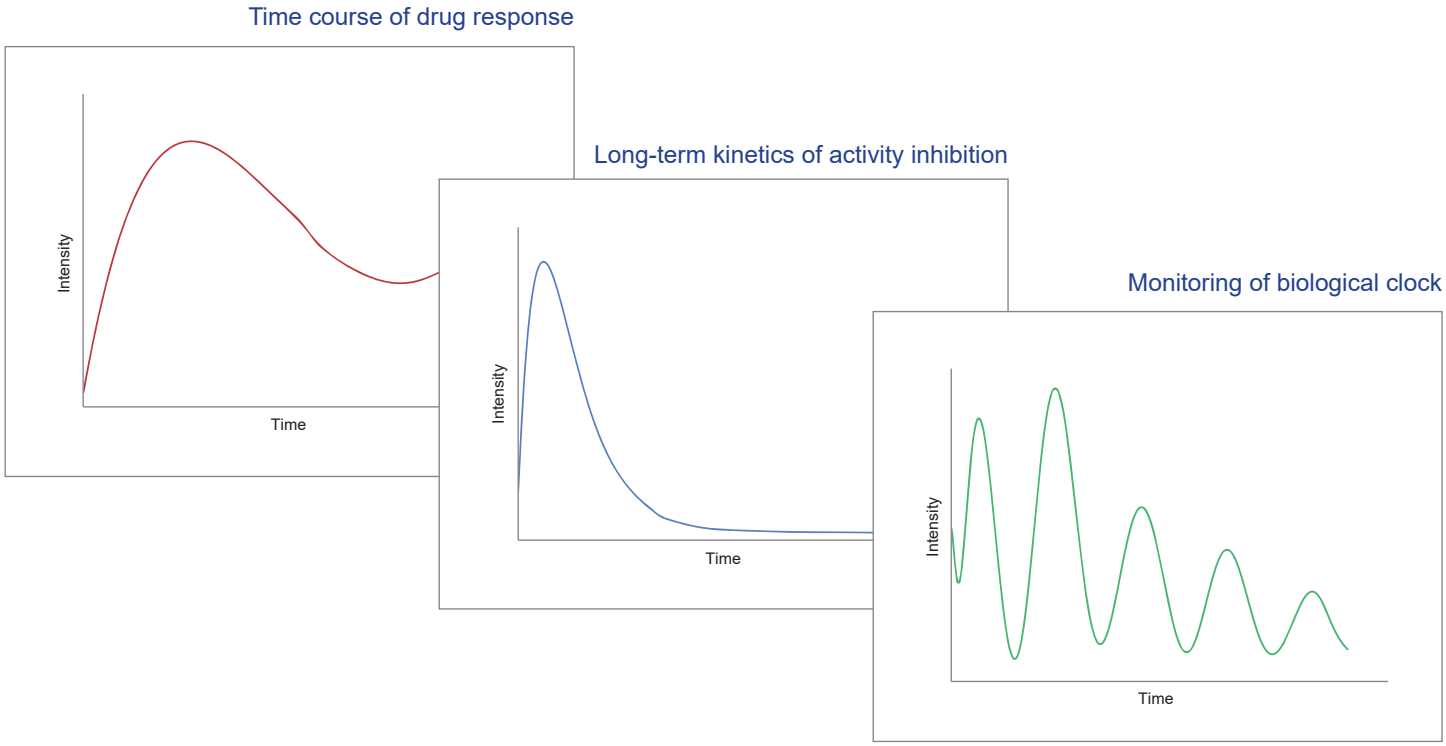
Biological clock, organ clock and cell clock...

- Cell culture function with temperature contol, humidifying and controlling CO_2 concentration
- 24 and 96 well plate format
- Scan 2 plates with 2 detectors (PMTs)
- It does not shake or vibrate cells by scanning with detector moving and cuture plates not moving.

Reporter assay in real time with culturing cells

Reporter assay is used to measure the transcriptional activity of gene transcription regulatory sequences such as promoters, for researches on drug response and gene expression control, evaluation of gene transfer effciency, and so on. Among them, the method of measuring the amount of bioluminescence using bioluminescent enzyme luciferase using a device called a luminometer is superior in terms of high sensitivity and low background and is widely used.

Usually, transcription activity at a certain point (end point) is measured, but the assay is also becoming used for tracking transcription activity over time such as stimulation response, time course of transgene expression level, periodic variation of biological clock gene. Kronos HT is a system to optimize for such assays with the ability to monitor the bioluminescence over time as cells are cultured.



chronomedicine, research progresses in the world.

- High sensitive and low noise detection by cooling of detectors (PMTs)
- Compatible with multicolor luciferase assay
- Easy setting with software on Windows PC, and displaying and saving measurement data in real time.

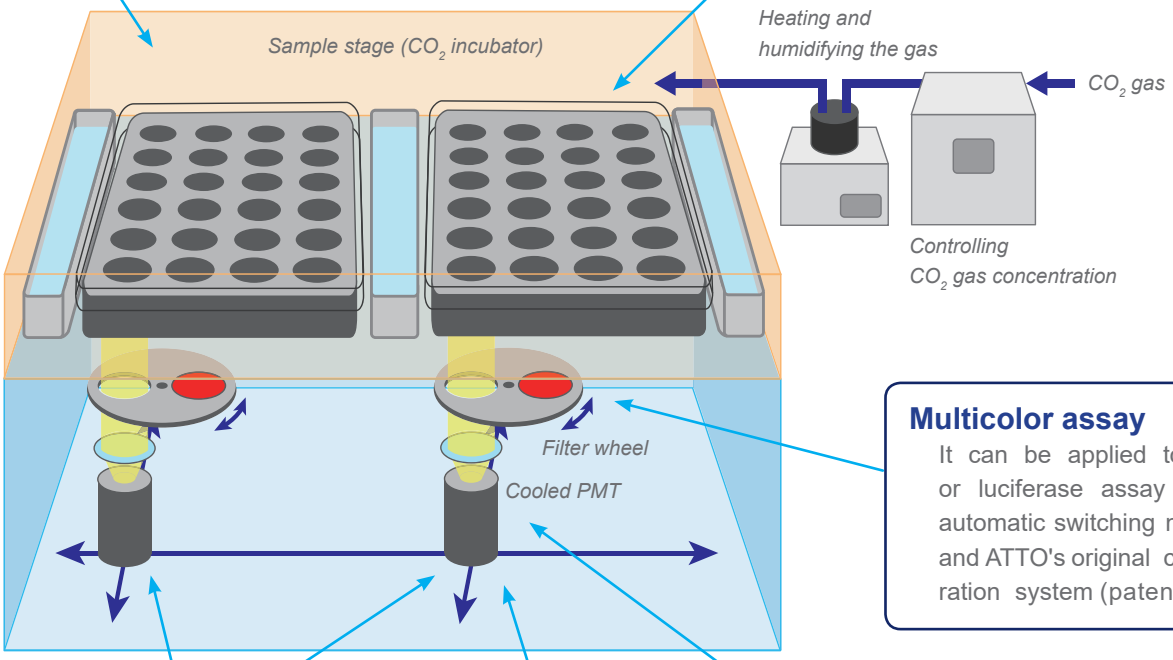
Light detecting with culturing cells

Maintain cell culture environment

The sample stage is a CO_2 incubator with constant temperature, humidification and CO_2 control.

24/96 well plate compatible with adapter exchange

Although it is compatible with 24 well plates in the standard model, it is also able to use 96 well plates by simply replacing it with an adapter of an optional item.



Multicolor assay

It can be applied to multicolor luciferase assay with filter automatic switching mechanism and ATTO's original color separation system (patent).

Efficient measurement of multiple samples

Since two plates are scanned simultaneously by two detectors, more samples can be measured at shorter intervals.

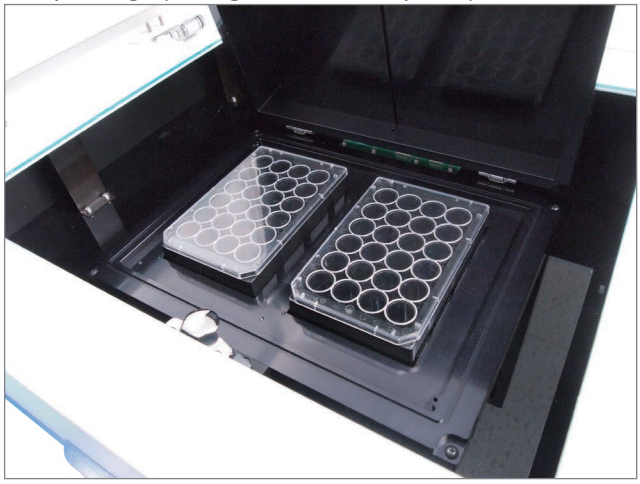
High sensitive detection

Weak light can be detected by cooling the detector (photomultiplier tube, PMT) to 10°C to suppress thermal noise.

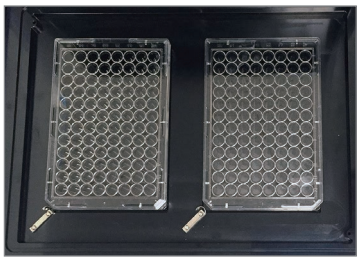
Cell-friendly scanning mechanism

Since it has a mechanism to move the detectors without moving the sample stage, the cultured cells are not shaken or vibrated.

Sample stage (setting two of 24 well plates)



Exchanged to a 96 well plate adaptor (option)

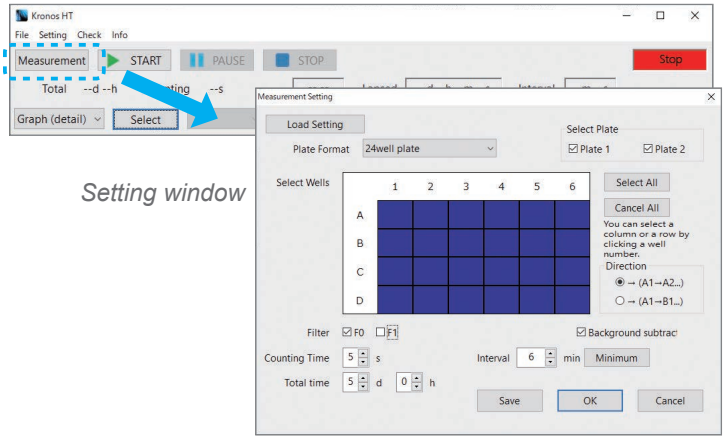


Software

Setting measurement conditions

You can set it by simple operation. Setting operation can be omitted by using the function to save and load the setting condition as a file.

Main window

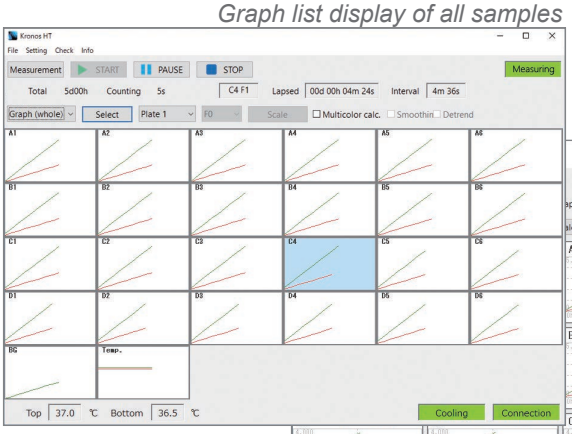


Setting window

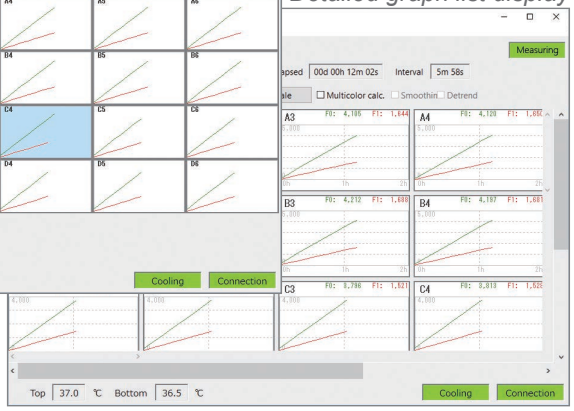
Display measurement data in real time

Since the data under measurement is displayed in real time, you can check how the measured value changes over time. Measurement data is automatically saved and the data file can be taken out even during measurement.

Graph list display of all samples



Detailed graph list display



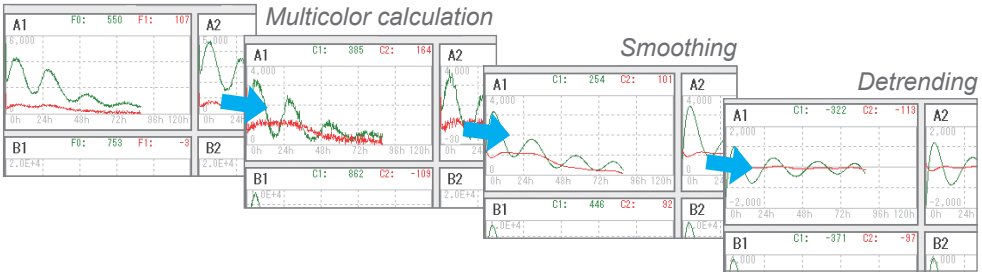
Data processing

It has a smoothing function to remove noise component from data and smooth it, a multicolor calculation function to calculate each color emission value from measurement value of each filter, and a detrending function to extract rhythm variation of biological clock.

Multicolor calculation

Smoothing

Detrending

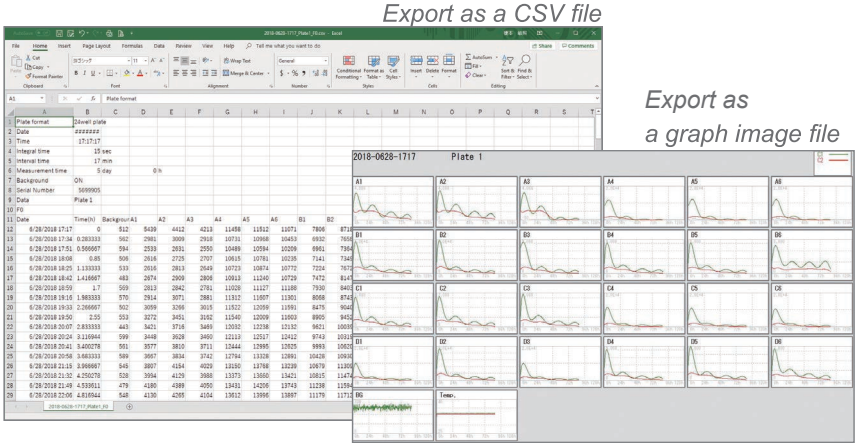


Data export

Since data can be exported as a CSV format file, it can be managed and edited with spreadsheet software such as Microsoft Excel or other analysis software. Also, you can export the graph list of each data as an image file.

Export as a CSV file

Export as a graph image file

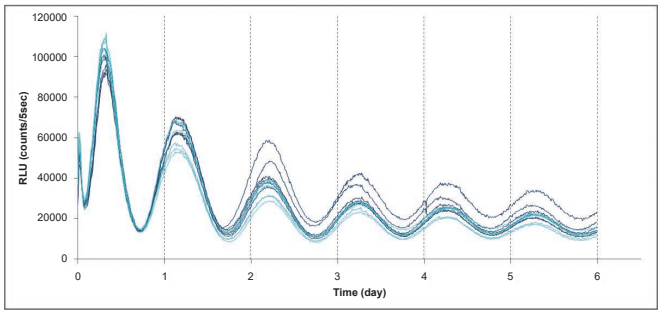


Application

Circadian rhythm of clock gene expression

Transcriptional activity of clock gene, *mPer2*

mPer2 promoter - Eluc (PEST) expressed fibroblast stable cell line in 24 well clear bottom plate
Measurement time: 5s / well, Interval time: 10min

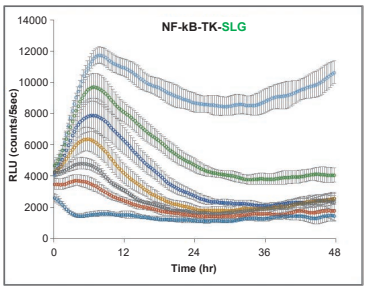


Drug response of transcription factor

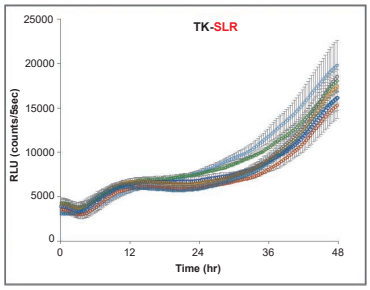
Dual-color real-time luciferase assay of TNF-α induced NF-κB transcriptional activity

NF-κB response elemnt - TK promoter - SLG (green color emited luciferase) and TK promoter - SLR (red color emitted luciferase) expressed fibroblast cell line in 96 well clear bottom plate
Measurement time: 5s x 2 color / well, Interval time: 30min
(A) Transcriptional activity of NF-κB response element for 48h
(B) Transcriptional activity of TK promoter for 48h
(C) Normalized by activity of control (TK promoter)
(D) Ratio to NF-κB activity without TNF-α

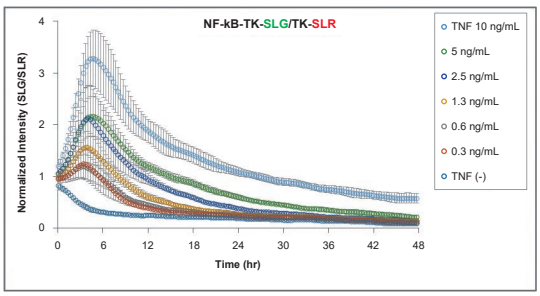
(A)



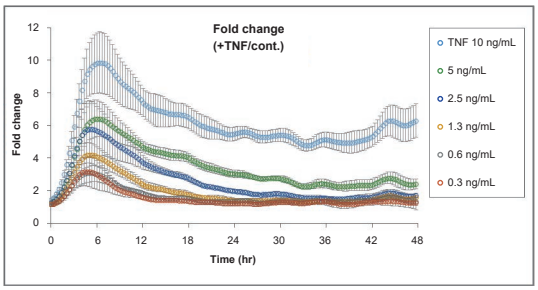
(B)



(C)



(D)



Specifications

Main unit

PC
(PC is not included in standard components)

Humidifying unit

CO_2 gas mixer

Model	WSL-1565 Kronos HT
Detector	Photomultiplier tube (10°C cooling) x 2 units, X-Y actuating
Measurement	Photon counting method
Measurement time	Integral time: 1 - 60 s/well, Measurement term: 1 h - 30 days
Plate format	Clear bottom 24 well plate x 2 Clear bottom 96 well plate x 2 (Option), 35mm dish x 12 (Option)
Throughput	48 samples (24 well plate x 2) 192 samples (96 well plate x 2) with an optional item, 96well plate adaptor 12 samples (35mm dish x 12) with an optional item, 35mm dish adaptor
Incubation temperature control	Room temperature + 5°C to 45°C (0.1°C step) at room temperature 20 - 28°C
CO_2 gas control	Control to 5% by CO_2 gas mixer
Humidification	Setting of water reservoir in incubator and humidified 5% CO_2 gas flowing intermittently by humidifying unit, Maintaining >90%RH
Multi-color assay	Measurement with automatically selected optical filter to 2 colors (There is also a model for 3 color separation. Request inquiries.)
PC requirements	OS: Windows 10 / 8.1 / 7, 64 / 32 bit, Memory: more than 4 GB, HDD: more than 20 GB free space, Interface: USB2.0 x 1 port
Dimensions, Weight	Main unit: 650 (W) x 520 (D) x 340 (H) mm, 40 kg CO_2 gas mixer: 160(W) x 300 (D) x 200 (H) mm, 4.8 kg Humidifying unit: 170 (W) x 140 (D) x 115 (H) mm, 1.6kg
Power	Main unit: AC 100 - 240 V, 50 / 60 Hz, 400 W (max) CO2 gas mixer: AC 100 - 240 V, 50 / 60 Hz, 100 W (max) Humidifying unit: AC 100 - 240 V, 50 / 60 Hz, 24 W (max)

Code No.	Model
3510140	**WSL-1565 Kronos HT** Kronos HT main unit, Control software (for Windows PC), CO_2 gas mixer, Humidifying unit, 24 well plate adaptor

Option

Code No.	Model
3510147	96 well plate adaptor
3510148	35mm dish adaptor

Related product

Real-time luciferase assay system
35 mm dish format model

AB-2550 ATTO Kronos Dio

> Reporter assay in real time with culturing cells

> Cell culture function with temperature control, humidifying and controlling CO_2 gas concentration

> 35 mm dish format, 8 dishes

> Compatible with multicolor luciferase assay

> Easy setting with software on Windows PC, and displaying and saving measurement data in real time.

Model	**AB-2550 Kronos Dio**
Detector	PMT (Photomultiplier tube)
Measurement	Photon counting method
Throughput	8 samples (35 mm culture dish x 8)
Measurement time	1 s - 60 min / dish
Incubator	Temperature setting: 20°C (RT - 5°C) to 45°C (1°C step), CO_2 concentration: 5% (fix), Humidification: Humidification sponge installation
Multi-color assay	Measurement with automatically selected optical filter to 3 colors
PC requirements	OS: Windows 10 / 8.1 / 7, 64 / 32 bit, Memory: more than 4 GB, HDD: more than 20 GB free space, Interface: USB2.0 x 1 port
Dimensions, Weight	280 (W) x 400 (D) x 330 (H) mm, 16 kg
Power	AC 100 - 230 V, 50 / 60Hz, 150W (max)

Code No.	Model
3510120	**AB-2550** Kronos Dio

(주)아토코리아
대전광역시 유성구 복용로40번길 5-6, 102호
Tel. 042-822-1117 / Fax. 042-825-1116
URL : www.attokorea.co.kr
E-Mail : info@attokorea.co.kr

0.000 001 = 10^{-6} micro
0.000 000 001 = 10^{-9} nano
0.000 000 000 001 = 10^{-12} pico
0.000 000 000 000 001 = 10^{-15} femto
0.000 000 000 000 000 001 = 10^{-18}