Cras-3.0

Cell Respiration Assay System

***N*on-Invasive**

***E*asy Operation**

***O*bjective Assessment**

Measurement Device

Clinical Innovation
CLINO CO.

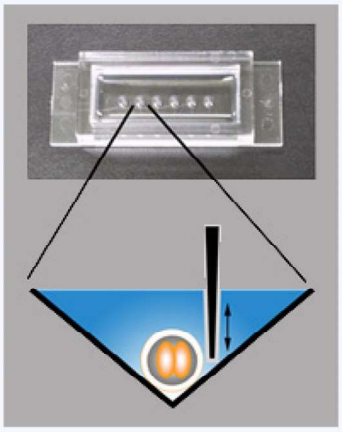
Non-Invasive

Detect oxygen reduction current and measure its concentration

Scan microprobe through periphery of embryo

Measure up to 5 embryos per measurement plate

Complete measurement within 15 mins per plate



Easy Operation

Real time observation with high performance camera

Easy operation throughmouse click

Precise control byminimum of 1μm unit

Improvedwork efficiency with automatedprobe movement

Objective Assessment

Improved evaluation accuracy by adding objective indicators to morphological observation

Subjective Indicator (conventional method)

- Morphological observation
- Time-lapse observation of embryo development

+

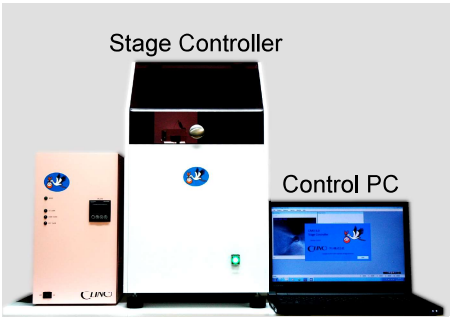
Objective Indicator

Respiration Assay

Cras-3.0

The Cell Respiration Assay System (CRAS) is a measurement system applied with the latest electrochemical measurement technology.
It electrochemically measures the concentration gradient of dissolved oxygen in the vicinity and offshore of the embryo by scanning the microprobe and calculate the respitory volume using a sherical diffusion theory formula.

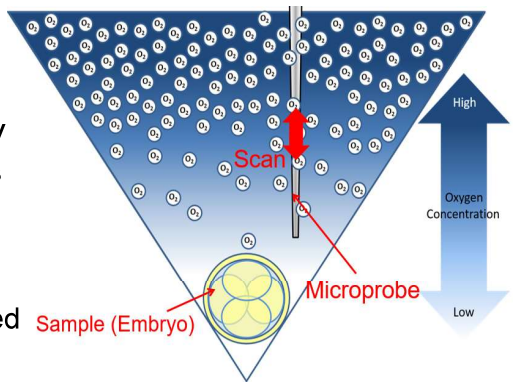
Its designed measurement plate equipped with six inverted conical wells allows the user to make successive measurements. By using this system, the user can non-invasively measure the embryo's respiratory activities while placing the microprobe around its periphery. This measurement system will have no influence on the embryo's vaiability or development ability.



Potentiostat

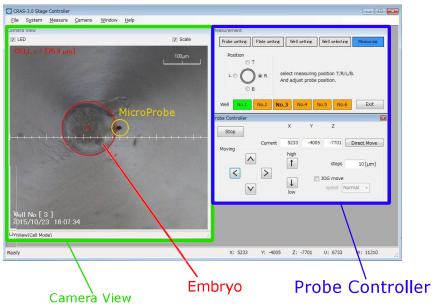
Measurement Method

Measurement is carried out on the embryo put in the inverted conical well of the measremet plate filled with measurement solution.
Oxygen dissolved in the solution decreases in the vicinity of the embryo because it is consumed by its respiration, and a concentration gradient with the offshore occurs. By placing the microprobe with a voltage of -0.6V near the embryo and scanning it from the vicinity to the offshore, it detects the oxygen reduction current, measures the magnitude of the oxygen concentration gradient, and calculates the embryo's respiration volume. Because the microprobe scans the periphery of the embryo, non-invasive measurement is achieved. Additionally, when the voltage of -0.6V is applied to the microprobe, an electric field of 0.1uV or less is formed in the vicinity of the microprobe. However, it is less than 1/600,000 of a cell's intrinsic membrane potential (60mV) and the impact on the embryo itself is insignificant.



Easy Operation

Operation of CRAS -3.0 is done using specialized software.
Its high-performance camera allows the user to easily perform high-precision operation in units of 1μm minimum by the click of a mouse while checking the position of the embryo and the microprobe in real time. Since all movement distances can be confirmed by numerical values, accurate and highly reproducible measurement is made possible.

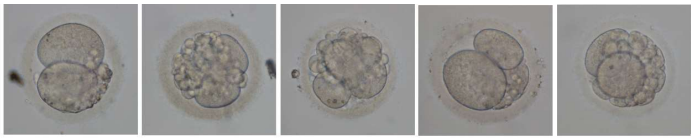


Objective Assessment

CRAS can quantitatively evaluate respiratory activities of embryos. It adds objective indicators to the morphological observation of embryos generally done in the conventional method, and significantly improves the accuracy of embryo evaluation.

Relationship between respiration volume and morphology in human embryos

Even with the same grade (3g3) in morphological evaluation, the embryo's respiration volume varies among each embryo.

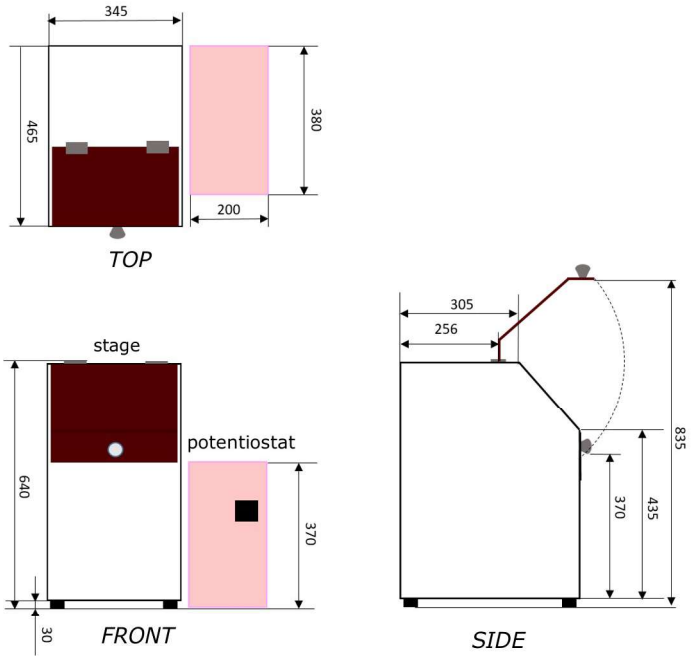


Quality grade (Veeck's)	3g3	3g3	3g3	3g3	3g3
Oxygen consumption	0.94	0.61	0.68	0.18	0.19

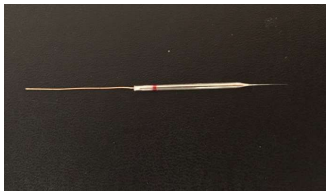
Oxygen consumption: $F \times 10^{14}$ mol·s^{-1}

Cras-3.0

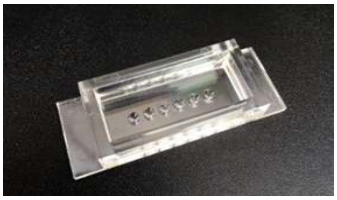
Major Device Specifications *Device specifications may change without notice.

Device Components	Measurement Stage, Potentiostat, Temperature Control Thermoplate (built in Stage)
Power Supply	AC100V (*3 electric outlets required)
Control PC	Laptop PC with Windows7 32bit
Accessory Software	Measurement Software "CRAS-1.0" Stage Controller Software "CRAS-3.0 Stage Contorller"
Microprobe	ϕ5μm Platinum Electrode
Reference Electrode	Ag-AgCl Reference Electrode
Measurement Plate	Plate with 6 inverted conical wells / 5 plates per case Measure up to 5 samples per plate
Recommended Solution	HEPES-added HTF Medium (*needs to be prepared by user)
Dimensions	

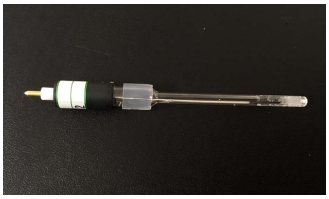
Accessories



CME-0002 Microprobe



CMP-0001 Measurement Plate



CRE-0001 Reference Electrode

- This product is made for research purposes and not intended for use in in-vitro diagnosis or for clinical purposes.

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