Development of High Performance Cellular Respiration Measurement System

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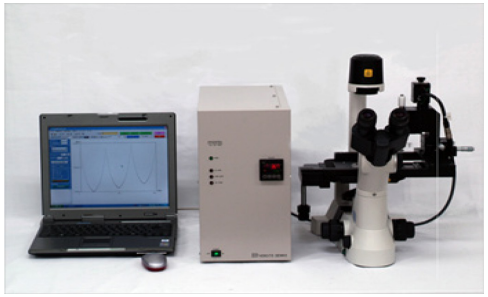
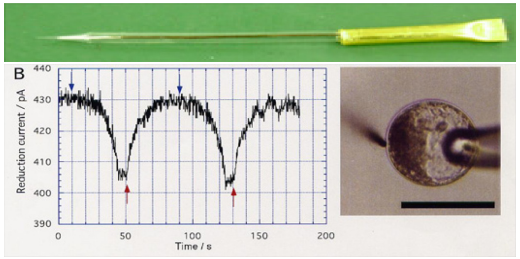
Illustration

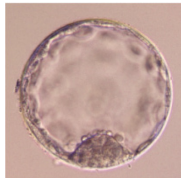
Cellular Respiration Measurement System Based on Scanning Electrochemical Microscopy



Measurement of Oxygen Consumption of Single Embryo using High Performance Microelectrode



Evaluation of Embryo Quality
Analysis of Mitochondrial Function



- **Diagnotic System for Embryo and Islet quality**
- **Cell Screening System Based on Respiration**

Content:

The goals of the present study are 1) to develop a device to measure cellular respiration based on electrochemical measurement technology, 2) to establish a diagnostic system using respiratory activity as an indicator to evaluate embryonic quality, and 3) to apply the measuring device and diagnostic system to clinical fertility treatments on a trial basis. To achieve these goals, we developed a cellular respiration measurement system based on scanning electrochemical microscopy (SECM). This system could measure the respiratory activity of a single embryo, such as cattle and mouse, all with high reproducibility. Recently, we are conducting experimental clinical research using human embryos. A noteworthy outcome of our recent research is that we successfully measured, for the first time, the respiratory activity of a single human embryo, providing a mean to accurately monitor mitochondrial respiration in human embryos. This added momentum to the effort to establish a diagnostic system for human embryonic quality.

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