



PRIMO Vision System

Time-lapse embryo monitoring



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CE

Patents pending
Protected by community design



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PRIMO Vision System includes



Controller HUB – with built-in microPC. One controller can manage six microscopes. Electricity is switched on via USB only for the seconds of image acquisitions. You only need to set it to a convenient place in your lab and connect a monitor, a keyboard and the 3D mouse.

3D mouse – for smooth zooming and panning.

Digital inverted microscopes – One microscope monitors one dish with all embryos of one patient. Microscopes are placed into your own incubator and are connected via USB cables to the Controller HUB through the side/back port of your incubator.

WOW dishes – Our 9-well embryo culture dishes are constructed according to the needs of the PRIMO Vision System.



Features

- **Custom made optics**, dedicated for high quality imaging in large field of view
- **Optimized homogenous green light**, harmonized with the optics, the intensity of which equals to 0.01% of the ambient light in the lab
- **Remote focusing**
- **Automatic or manual scanning** (imaging in multiple focal planes)
- **Remote access** directly to the developing embryos, from the lab, office, home, or anywhere by your laptop or smartphone
- **No movement** of dishes, because all embryos are observed in the same field of view
- **No exposure to electromagnetic fields**, because all electric currents are switched off between exposures by the external Controller HUB
- **Optimal, undisturbed environment** by using your own preferred incubator, media and culture system

Precise identification of:

- PN formation, ploidy
- Multi-nucleation
- Time-points of cleavages
- Fragmentations

Rapid handling with obvious steps:

- **Positioning** of the dish requires only one second
- **Operation** is easy, evident, the software is simple and user-friendly
- **Embryo analysis** can be performed remotely by zooming, screening through multiple focal planes and by using the intelligent 3D mouse
- **The time-lapse video** can be moved forth and back, providing broad possibility for thorough analysis of events by the Analysing software
- **Easy reporting** and archiving

Microwell (WOW) embryo culture system:

- **Embryos** can be easily identified and individually monitored
- **Quantitative** and qualitative improvement in embryo development



No shear stress



No lubricants



No electro smog

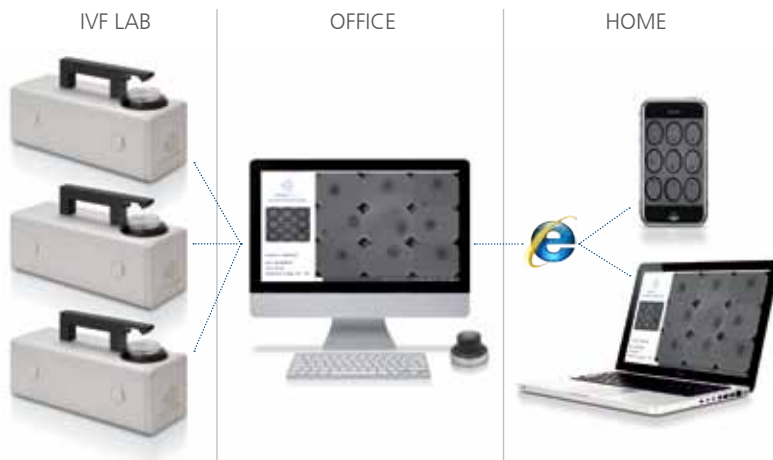


Minimal light exposure



The PRIMO Vision System is a real-time embryo monitoring device. The system has been developed to follow-up all embryos of your patients during the whole embryo culture period, inside of your own incubator.

Remote access



You can check what happens to the embryos in your incubator anytime, without even going to the lab.
 You can follow up embryo development on your office computer, on your home computer, even on your smartphone.
 You can control the embryos from all over the world.

Publications supporting time-lapse embryo monitoring and PRIMO Vision concept

M. Montag et al. (2010): **Time-lapse based evaluation of human oocytes from ICSI up to the pronuclear stage.**

Human Reproduction – 25 (Supplement 1): 170-210.

The results of this study show that human oocytes after ICSI differ regarding the time-course of second polar body extrusion and pronucleus formation. This timing (observed and analyzed by PRIMO Vision System) seems to have a direct influence on the pronuclear pattern and the first cleavage. Results indicate that the exact determination of the time of pronuclear formation and the first cell cycle offers a possibility to predict the developmental potential of the embryo.

D. Hlinka et al. (2010): **Permanent embryo monitoring and exact timing of early cleavages allow reliable prediction of human embryo viability.**

Human Reproduction – 25 (Supplement 1): 170-210.

The chronology of early mitotic events of human embryos was analyzed by continuous embryo monitoring with PRIMO Vision System. Premature cleavage was found to be associated with impairment of embryonic development. All the 28 embryos that resulted in pregnancies exhibited synchronized and precisely timed cleavages.

C. Pribenszky et al. (2010): Case report: **Pregnancy achieved by transfer of a single blastocyst selected by timelapse monitoring.**

Reproductive BioMedicine Online – in press, available online 20 July 2010

This is the first report about a pregnancy achieved with the transfer of a single blastocyst selected according to the analysis of time-lapse records (by PRIMO Vision System) of all the embryos of a patient.

C. Pribenszky et al. (2010): **Prediction of in-vitro developmental competence of early cleavage-stage mouse embryos with compact time-lapse equipment.**

Reproductive BioMedicine Online 20, 371-379.

Time-lapse investigation of mouse embryos indicated that the time of the first and second cleavage (to the 2- and 3-cell stages, respectively) had a strong predictive value for further development in vitro. Analysis of time-lapse records showed that most fragmentations are reversible and are reabsorbed in an average of 9 h. Fragmentations occurring in a defined time frame have a strong influence on the in vitro embryo development, as well. However, the routinely applied daily or bi-daily microscopic controls of embryo development would fail to detect 36 or 72% of these fragmentations, respectively.

R. Beraldi et al. (2003): **Mouse early embryos obtained by natural breeding or in vitro fertilization display a differential sensitivity to extremely low frequency electromagnetic fields.**

Mutation Research 538. 163-170.

Authors describe that electromagnetic field (EMF) exposure causes significant decrease in the survival rate of in vitro cultured embryos. This is one of the many studies proving the detrimental effects of EMF originating from everyday use of electric devices.

Y. Xie et al. (2006): **Shear stress induces preimplantation embryo death that is delayed by the zona pellucida and associated with stress-activated protein kinase-mediated apoptosis.**

Biology of Reproduction 75, 45-55.

Preimplantation embryos are sensitive to shear stress. Chronic shear stress increases embryo mortality and induces mitogen-activated protein kinase 8/9 phosphorylation resulting in decreased growth rate and/or premature differentiation.