

Colorado Center for Reproductive Medicine

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Dr. David K. Gardner, Scientific Director



Equipment: Sanyo MCO-5M CO₂/O₂ Mini Incubator

Test Laboratory:

Dr. David K. Gardner, Colorado Center for Reproductive Medicine, August 2005

The following is a summary of our experience with the new Sanyo MCO-5M CO₂/O₂ Mini Incubator, received by the Colorado Center for Reproductive Medicine in July 2005.

The incubator delivered in July was initially set up and allowed to settle for 72h. Typically, one has to let incubators "burn off" for several weeks, or even months, before use. However, our previous experience with Sanyo incubators is to the contrary, in that they work "straight out of the box". Therefore, we tested the MCO-5M chamber 72h after it arrived and post cleaning. Consistent with other Sanyo chambers, the MCO-5M CO₂/O₂ incubator supported excellent development of 1-cell mouse embryos to the blastocyst stage. The chamber was then retested a further three times and the results were identical with excellent embryo development (see attached report).

The chamber has also been used for clinical IVF procedures. Human embryo development was evaluated in the new MCO-5M CO₂/O₂ incubator, and compared to our MCO-18M CO₂/O₂ incubators. Embryo development was equivalent. The MCO-5M CO₂/O₂ incubator is now being validated clinically.

Description of Bioassay

The initial bioassay performed was an F1 one-cell mouse embryo culture in a simple medium (designated SG1) which facilitates embryo development, but lacks important components such as protein and amino acids which confer benefit to the embryo by acting amongst other things as chelators. The medium therefore makes the embryos more sensitive to their environment and increases the efficacy of the bioassay. The end point is blastocyst development after 4 days of culture. The acceptance criterion is 80% blastocyst development.

The second bioassay involved the culture of outbred (CF1) mouse embryos. These embryos are far more sensitive to their environment and are difficult to culture in vitro. Therefore the acceptable blastocyst development is 60% when cultured in the sequential media G1&G2.

Results of Bioassays

Number of embryos	Test Type	Day 5 %Exp. Blastocyst	Day 5 % **hatching	Cell Number	SEM (±)	Outcome Pass/Fail
32	F1 / SG1	86%	29%	86	2	Pass
33	CF1 / G1&G2	91%	43%	80	3	Pass
49	CF1 / G1&G2	67%	36%	76	3	Pass
110	CF1 / G1&G2	81%	33%	73	2	Pass

It can be seen from the results that the Sanyo MCO-5M CO₂/O₂ incubator supported excellent rates of mouse embryo development. A further analysis of development was also undertaken, that being determination of blastocyst cell numbers. The Sanyo MCO-5M CO₂/O₂ Incubator supported excellent cell division. The incubator is now being used clinically. Of great significance is the speed at which the MCO-5M chamber establishes the correct CO₂ and O₂ levels after opening. Furthermore, we noticed a significant reduction in amount of nitrogen used by the chamber compared to its larger counterpart the MCO-18M. In light of the results to date I give my endorsement for the Sanyo MCO-5M CO₂/O₂ Incubator and plan to acquire more chambers.

Dr. David K. Gardner
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