FUJIFILM
Value from Innovation

Uninterrupted Culture Media Recommended Protocol

Continuous Single Culture- NX (CSCM-NX) and Continuous Single Culture (CSCM)

Microdrop

CSCM-NX and CSCM are optimized to be used in an uninterrupted culture system without medium renewal or dish change on Day 3.

MEDIUM PREPARATION

CSCM-NX and CSCM do not contain protein components. General laboratory practice includes protein supplementation when using these media.[1]

PROTEIN SUPPLEMENTATION

It is recommended to supplement CSCM-NX or CSCM with 10% SSS-NX (Serum Substitute Supplement NX) for optimal fertilization and embryo culture. Alternatively, Human Serum Albumin (HSA) can be used as the protein supplement. To prepare supplemented medium, mix CSCM-NX or CSCM with protein in a sterile falcon tube:

- **Serum Substitute Supplement NX:** Mix 9 mL of the uninterrupted culture medium with 1 mL of SSS-NX, for a final protein concentration of 5 mg/mL (10% v/v).
- **Human Serum Albumin (HSA):** Mix 9.5 mL of the uninterrupted culture medium with 0.5 mL of HSA, for a final total protein concentration of 5 mg/mL (5% v/v).

DISH PREPARATION

A sufficient volume of protein supplemented medium is required so that oocyte collection, insemination, and embryo culture dishes can be prepared.

Oocyte Collection and Insemination Dishes (60 x 15 mm): On the day before oocyte retrieval (Day -1) prepare dishes with eight 100 µL volume drops of pre-supplemented uninterrupted culture medium along the perimeter of the dish with an 11 mL volume oil overlay.

Embryo Culture Dishes (60 x 15 mm): On the day of oocyte collection (Day 0), prepare microdrop dishes by aseptically dispensing at least six 50–100 µL drops of pre-supplemented uninterrupted culture medium into the dish. Four micro drops should be placed at the 3, 6, 9 and 12 o'clock position and the two remaining drops should be placed in the center of the dish to be used as wash drops. 11 mL's of Oil for Embryo Culture should be used to completely cover the uninterrupted culture medium microdrops. To avoid evaporation and changes in osmolality do not prepare multiple dishes at the same time. Immediately place the dish in a CO_2 incubator.

Time-lapse Surveillance System: CSCM-NX and CSCM works effectively in all time-lapse surveillance systems and should be used accordingly to the individual system's protocol.

To ensure proper temperature and pH of medium and oil, all dishes should be pre-equilibrated overnight to 37°C in a 5–6% CO_2 incubator on the day before oocyte collection (Day -1) and on the day of oocyte collection (Day 0). Minimum incubation time should be no less than 6 hours.

CO_2 AND PH

We recommend using reduced oxygen when possible; however, CSCM-NX and CSCM can be used in ambient oxygen incubators. Following CO_2 equilibration, the pH of the uninterrupted culture medium supplemented with SSS-NX or HSA should be within the acceptable pH range of 7.25–7.4 with a targeted pH of ~7.26–7.35.

Tri-gas Incubator: Ideally, we recommend 6% CO_2, 6% O_2, and 88% N_2 for optimal fertilization and embryo growth at or near sea level.

CO_2 Incubator: Alternatively, we recommend a 5–6% CO_2 for sufficient fertilization and embryo growth at or near sea level.

pH levels are affected by the altitude above sea level (elevation). As the elevation increases the gas pressure over the culture medium decreases requiring a higher CO_2 pressure to achieve the optimal pH for the uninterrupted culture medium (7.26–7.35). To adjust pH, increase CO_2 levels to lower pH and decrease CO_2 levels to raise pH to fall within the specified range. pH should always be verified with pH measurements using a pH meter.

OOCYTE RECOVERY

Immediately upon oocyte collection and identification, it is recommended that oocytes be placed into the pre-equilibrated oocyte collection dish (prepared on Day -1). Following the trimming of the cumulus coronal complex from each oocyte, place 1–3 oocytes into a fresh drop of the oocyte collection dish and return to the controlled gas incubator at 37°C for the desired recovery period. Oocytes should be incubated for a minimum of 1 hour prior to insemination, or denuding if ICSI is to be performed. Oocytes should remain in the collection dish for up to 4 hours prior to conventional IVF or insemination by Intracytoplasmic Sperm Injection (ICSI).

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INSEMINATION OF OOCYTES FOR CONVENTIONAL IVF

Upon oocyte recovery, trimming of cumulus complex, and incubation for up to 4 hours (minimum 1 hour), remove the oocytes from the collection dish and transfer the oocytes to the supplemented uninterrupted culture medium droplets in the pre-equilibrated insemination dish (prepared on Day -1). It is recommended to aseptically dispense 75,000–175,000/mL motile sperm per microdroplet containing 1–3 oocytes. Return the insemination dish to the incubator and check for normal fertilization 16–20 hours post insemination.

ICSI

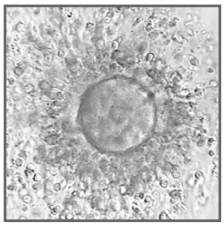
Following >1 hour post oocyte denuding, remove denuded oocytes from incubator and inseminate with sperm as per standard ICSI protocol. Immediately following insemination, place 1–3 inseminated oocytes into a fresh drop of the supplemented uninterrupted culture medium in the pre-equilibrated insemination dish (prepared on Day -1), and return the dish to the incubator and check for normal fertilization 16–20 hours post insemination.

EMBRYO CULTURE POST FERTILIZATION

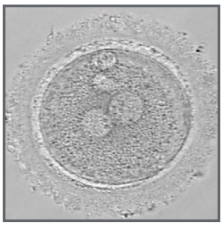
Following fertilization assessments with the identification of the presence of normal fertilization (two pronuclei and two polar bodies), transfer 2–5 2PN zygotes into each of the four pre-equilibrated 50–100 µL microdrops in the culture dish previously prepared on Day 0. We recommend embryos to be group cultured (maximum 5 embryos per microdrop) in an uninterrupted culture system, without dish change or medium renewal, until the desired stage of embryo development is achieved.

5 is the maximum number of embryos that we recommend being cultured in each 50–100 µL microdrop.

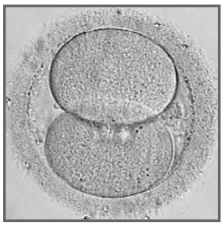
DAY 0
Oocyte



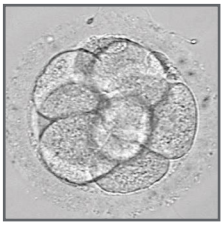
DAY 1
2PN



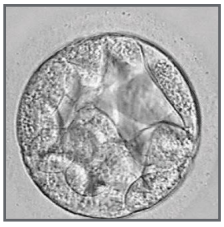
DAY 2
2–4 Cells



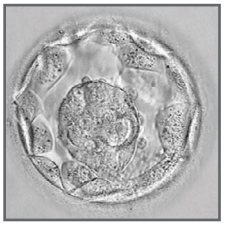
DAY 3
8 Cells



DAY 4
Compacting-Cavitating Cells



DAY 5/6
Blastocyst Stage



1. FUJIFILM Irvine Scientific has not validated these procedures and each laboratory should consult its own laboratory procedures and protocols which have been specifically developed and optimized for your individual medical program.

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