APPLICATION NOTE

Inverted microscope ECLIPSE Ti2-I

The Ti2-I inverted microscope empowers microinsemination with sophisticated optical performance and operability - ICSI/IMSI -

Intracytoplasmic sperm injection (ICSI) is a microinsemination technique in which sperm cells are manually injected into egg cells. These oocytes can be visualized with NAMC (Nikon Advanced Modulation Contrast), which allows observation of transparent samples with relief-like contrast. Another technique called intracytoplasmic morphologically-selected sperm injection (IMSI) requires a high magnification objective lens and Differential Interference Contrast (DIC) to select high-quality sperm based on morphology. Thus, the microscope plays a very important role in microinsemination. However, fluidly switching between bright field, NAMC, and DIC (IMSI) with a manual microscope is complicated and gaining proficiency takes time.

In this application note, we introduce the ECLIPSE Ti2-I inverted microscope, which can easily switch between bright field, NAMC and DIC.

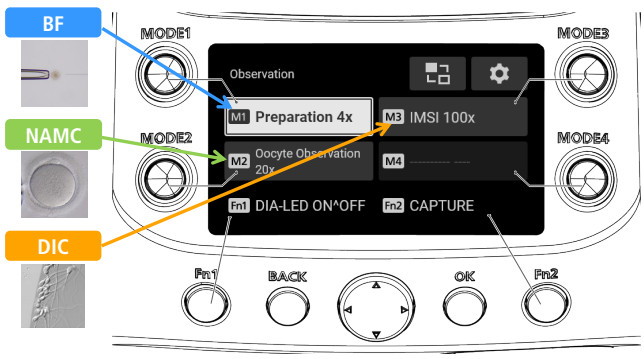
Keywords : relief contrast, Differential Interference Contrast (DIC), microinsemination, ICSI, IMSI

Automated switching according to observation method

The Ti2-I is mainly operated using the front panel and physical buttons of the microscope body, which also indicate lightpath components. It does not require a remote controller, and can be easily operated by hand while visually confirming that the correct components and settings are in place for each particular observation mode or contrast technique while performing a typical microinsemination workflow (Fig. 1).

Contrast technique settings can be registered and automatically selected using the front panel of the microscope: Brightfield (Fig. 1 upper left: "Preparation" in the front panel and button), NAMC (Fig. 1 upper left: "Oocyte Observation" in the front panel and button) and DIC (Fig. 1 upper left: "IMSI" in the front panel and button). Once registered, the mode, objective lens, optical modules, etc. will automatically engage with one click (lower left of Fig. 1). The microscope is easy to operate even when wearing gloves or looking through binoculars. An alert function indicates when a component is in a different state than when it was set (Fig. 1, upper right). The alert shown in Fig. 1 indicates that the optical path and intermediate magnification have changed.

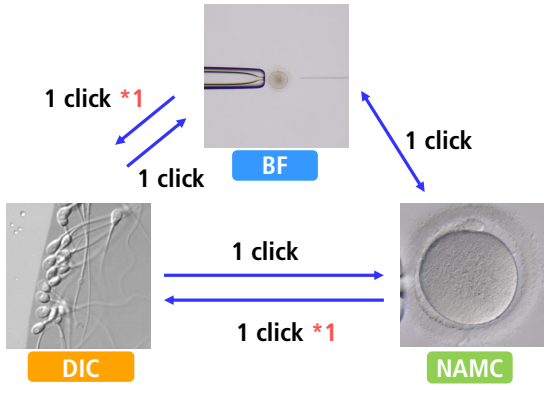
Furthermore, a light intensity management (LIM) function automatically adjusts the light intensity to maintain a constant brightness even when changing contrast techniques.



Front panel and button

Alert display

Fig. 1. An example of microinsemination workflow and Ti2-I operation/display panel



Switching observation methods

*1: Only when switching to IMSI will the anti-collision warning appear and the MOVE button must be pressed.
But if the warning is canceled, you can operate with one click.

Product Information

Inverted microscope ECLIPSE Ti2-I

The inverted microscope ECLIPSE Ti2-I supports microinsemination.

By registering the observation methods used in microinsemination, such as bright field, NAMC (for ICSI), and DIC (for IMSI), as modes, it is possible to reproduce the registered conditions with one click.

The operation and confirmation functions are mounted on the front of the main body, making it possible to perform all tasks with fewer eye and hand movements.

Click here for detailed product information.