LF301 cell fusion • nuclear transfer • oocyte activation

Applications

- **Cell fusion**
  Producing hybridoma
- **Somatic nuclear transfer**
  Cloning cow, mini-pig, cat, dog and wolf etc.
  Producing nuclear transfer ES cell
- **Oocyte activation**
  Electrical activation before or after ICSI

Features

Resistance measurement

A built-in resistance measurement function enables one to check the resistance value of buffer in an electrode prior to fusion. It is necessary to align two different kinds of cells to be fused into line. However, if the ion concentration of buffer is too high, ions may cause convection which will disturb a cell alignment process. With a resistance measurement function, ion concentration can be confirmed prior to fusion and can be adjusted to the appropriate level if necessary. Therefore, this function will improve the reproducibility of an experiment.

A variety of electrodes

For cell fusion, there are different sizes of electrodes for high-through-put and small volume process. A clear box is also available and protects precious samples from contamination in the entire process of an experiment. As it is made of acryl, the electrode inside a clear box can be observed by microscope. A pair of needle electrodes is designed for the fusion of an oocyte and donor cell. With a pair of needle electrodes, dozens of eggs are prepared in a petridish and are handled one by one. Unlike a chamber electrode which carries only several eggs at once, it enables one to handle more number of eggs very quickly. In addition, another advantage of a pair of needle electrodes is to allow one to check the quality of an egg prior to fusion as it is operated with a microscope and micromanipulator. For the oocyte activation purpose, there are some kinds of petridish type electrodes available.

Short AC/DC shift interval

In the process of electro cell fusion, alternating current (AC) is applied in order to align cells into line and then direct current (DC) pulses are applied for fusion. The shift interval time between AC and DC must be short enough to apply DC pulses before a line of cells falls apart. LF301 can shift from AC to DC in 5 μsec.

Manual DC output

For routine work, a cell fusion program can be set. However, if parameters of a program are unknown, the manual DC output mode is useful. DC (direct current) can be applied manually while the process of the cell alignment is observed.

Fade-out AC

There are two different kinds of post-fusion alternating current (AC) modes available. One is a standard mode in which the amplitude of AC is constant from beginning to end. The other mode is a fade-out AC mode. In this mode, the amplitude of AC decreases gradually in a given time. A fade-out mode generating less heat is expected to minimize damage on cells.

Bipolar DC pulse

There are two different kinds of DC pulse modes available. One is a normal mode in which DC pulses are generated in only one direction. The other is a bipolar mode in which DC pulses are generated in one direction and then in the opposite direction after a polarity is reversed automatically. The bipolar mode is expected to improve cell fusion efficiency.

Specifications

AC	Waveform	Sine
	Voltage	0 ~ 75Vrms (1V increment)
	Frequency	1MHz
	Duration	Pre-fusion 0 ~ 100sec (1sec increment) Post-fusion 0 ~ 10sec (1sec increment)
	Post-fusion AC mode*	Normal mode • Fade-out mode
	Electrical load	>50Ω

DC	Waveform	Standard mode : Square Bipolar mode : +/- Square
	Voltage	0 ~ 1200V (1V increment)
	Pulse length	0 ~ 100µsec (1µsec increment)
	Pulse interval	0.1 ~ 10sec (0.1sec increment)
	No of pulses	1 ~ 100
	Output	Auto (Max 100 pulses) or Manual

Miscellaneous			
Resistance measurement range	30Ω~ 35KΩ	Power	100 ~ 240V 200VA 50/60Hz
AC/DC shift interval	< 5µsec	Dimensions	W360mm x D380mm x H180mm
Memory	Max 99 programs	Weight	12.5Kg

*In a normal mode, amplitude of AC is constant. Fade-out mode decreases amplitude of AC in a given time.

* Product specifications are subject to change without notice

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LF101 cell fusion • nuclear transfer • oocyte activation

Applications

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  Producing hybridoma
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Features

Various applications

For a cell fusion model, the voltage range is up to 930V. LF101 can be used for a variety of applications such as the fusion of mammalian cells and of plant cells. On the other hand, the maximum voltage of a somatic nuclear transfer model is restricted to 200V in order to increase the voltage accuracy and the model is calibrated to the voltage range around 50V which is often used for the purpose of a somatic nuclear transfer. The high accuracy of the voltage control increases the fertilization efficiency considerably. The wave form of DC pulse is a clear square and increases the fusion efficiency.

Flexible AC setting

For the cell alignment before cell fusion called pearl chain and maturation process of a fused cell, AC (alternative current) can be programmed flexibly. In addition, AC also can be applied manually.

Footswitch control

A footswitch included in a system as standard enables one to apply DC pulse or excecute a fusion program with operating a micromanipulator.

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Manual DC output

For routine work, a cell fusion program can be set. However, if parameters of a program are unknown, the manual DC output mode is useful. DC (direct current) can be applied manually while the process of the cell alignment is observed.

Specification

AC	Waveform	Sine curve
	Voltage	0 ~ 50V_{p-p}
	Frequency	0.1 ~ 3.9MHz
	Duration	0 ~ 99sec
	Post-fusion duration *	0 ~ 9sec or ∞
	Load	> 50Ω

* AC can be applied continuously until it is terminated manually.

DC	Waveform	Square
	Voltage	Cell fusion model: 0 ~ 930V Nuclear transfer model: 0 ~ 200V
	Pulse length	5 ~ 99μsec
	Pulse interval	0.1 ~ 9.9sec
	No of pulses	1 ~ 99
	Output	Auto (Max 99 pules) or Manual

Power	Single phase 100V 2A 50/60Hz	Dimensions/weight	W370mm x D430mm x H180mm 12.5Kg

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