

LYKOSTM

Laser System

Trophectoderm Biopsy
Blastomere Biopsy
Polar Body Biopsy
Laser-Assisted Hatching

Applications of LYKOS Laser

Trophectoderm Biopsy

Performed at the blastocyst stage, trophectoderm biopsy for pre-implantation genetic diagnosis (PGD) offers many potential advantages over cleavage stage biopsy [1,2, 3].

- Trophectoderm cells are removed with little or no effect on the inner cell mass
- Lower percentage impact on total embryo cell number
- More cells are obtained for analysis for improved ability to detect mosaicism
- Higher survival and implantation rates

The LYKOS laser aids the trophectoderm biopsy procedure in two ways:

- By breaching the zona, which allows the trophectoderm to herniate through the opening
- By breaking or weakening the junctions between the trophectoderm cells so they may be aspirated into the biopsy micropipette

Blastomere Biopsy

Removal of a blastomere from a cleavage stage embryo on day 3 is the most common method of obtaining embryonic DNA for PGD [4]. The LYKOS laser is applied to the zona pellucida to create an opening near the blastomere to be removed. Using either gentle suction by micropipette or displacement by positive pressure, the single blastomere is removed.

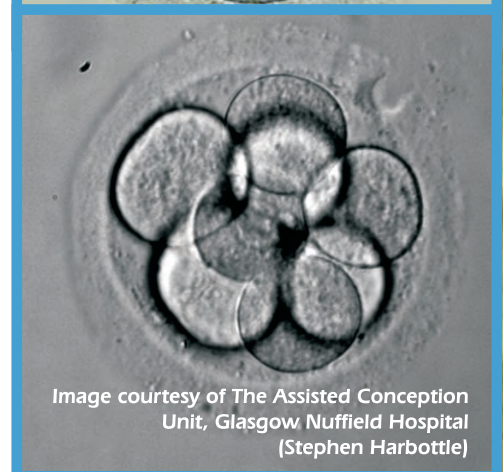
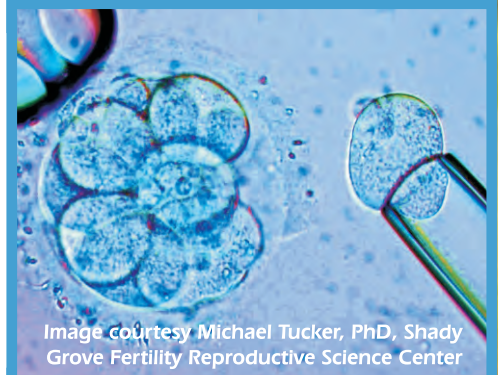
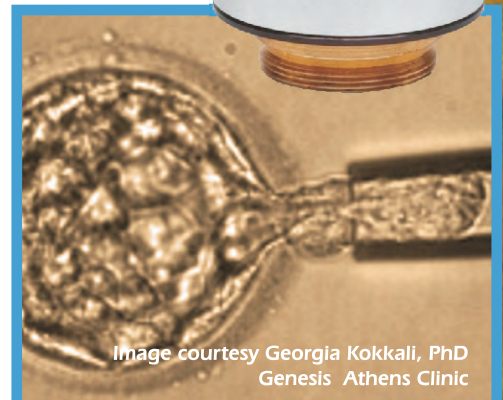
Polar Body Biopsy

In instances where only the maternal genetic contribution is of concern, the first and second polar bodies of the oocyte may be removed. "The analysis of polar bodies may be used to determine aneuploidy related to maternal meiosis and maternally derived unbalanced translocation chromosomes and detect single gene defects in the maternal genome allowing for day 3 embryo transfers" [4]. Using the LYKOS laser to create a small hole in the zona pellucida, polar bodies are easily removed using a biopsy micropipette.

Laser-assisted Hatching

In addition to using laser-assisted hatching (LAH) to facilitate the trophectoderm biopsy process, LAH has also been applied in specific conditions of IVF with the goal of increasing the implantation rate.

1. McArthur SJ, Leigh D, Marshall JT, de Boer KA, Jansen RP. Pregnancies and live births after trophectoderm biopsy and preimplantation genetic testing of human blastocysts. *Fertil Steril.* 2005 Dec;84(6):1628-36.
2. Lathi RB, Behr B. Pregnancy after trophectoderm biopsy of frozen-thawed blastocyst. *Fertil Steril.* 2009 May;91(5):1938-40.
3. Schoolcraft WB, Fragouli E, Stevens J, Munne S, Katz-Jaffe MG, Wells D. Clinical application of comprehensive chromosomal screening at the blastocyst stage. *Fertil Steril.* 2010 Oct;94(5):1700-6.
4. Schoolcraft WB, Janzen JC. "Embryo biopsy: towards trophectoderm isolation and blastocyst analysis." *Human Assisted Reproductive Technology: Future Trends in Laboratory and Clinical Practice.* Eds., David Gardner, Botros Rizk, Tommaso Falcone. Cambridge: Cambridge University Press, 2011. 260-268.



LYKOS Laser - Precise & Safe Biopsy & LAH



- Laser is integrated into specially designed 40x objective that produces high quality images
- Functions in visible, infrared and ultraviolet wavelengths
- High-power, Class 1, 1450 nm laser with pulse durations as low as 1 microsecond
- Choice of computer-generated drilling targets, including patented Isotherm Rings™
- Ability to measure captured images allows you to minimize the time the embryo spends outside of the incubator. Objective calibration information saved with each image to ensure measurement accuracy
- Fire laser by mouse or foot switch remote
- Toolbox feature allows addition of freehand text, shapes, and measurements
- Two-way data import / export
- No laser realignment required
- Easy installation, simple set-up, and intuitive software

The LYKOS - A Quantum Leap in Laser Technology

The LYKOS represents the next generation of clinical lasers from Hamilton Thorne. With both the laser and RED-i[®] target locator built into a customized 40x objective, the LYKOS provides solutions not found on any other system. The hardware and software features of the LYKOS work together seamlessly to provide a sophisticated yet easy-to-use and safe laser system for the ART facility.

Patented Isotherm Rings™ for Highest Safety

Our hallmark Isotherm Rings is a software generated target visible on the monitor that allows safe positioning of the cell during laser treatment. Only the Isotherm Rings show the peak temperature reached at each position due to the selected laser pulse. Any adjustments made to the laser settings are automatically factored into the calculated Isotherm Rings and immediately shown on the screen.

RED-i[®] Target Locator

The RED-i target locator is visible through the microscope eyepieces. By allowing you to position the cell under the laser beam without looking at the monitor, the RED-i speeds workflow, increases efficiency and heightens accuracy during laser application. The target spot always remains in focus and has an adjustable brightness level.

Compatible with Fluorescence

The LYKOS does not require removal of any component to use your microscope's fluorescence. The LYKOS objective itself possesses enhanced UV transmission and is compatible with stains such as Hoechst, DAPI, plus others.

Staccato[®] Multipulse Software Option

The Staccato option allows for rapid, multi-pulse firing of the laser for fast and easy trophectoderm biopsy. (For non-clinical use only in USA.)



The LYKOS quickly installs on most inverted microscopes and allows easy access to other installed objectives.