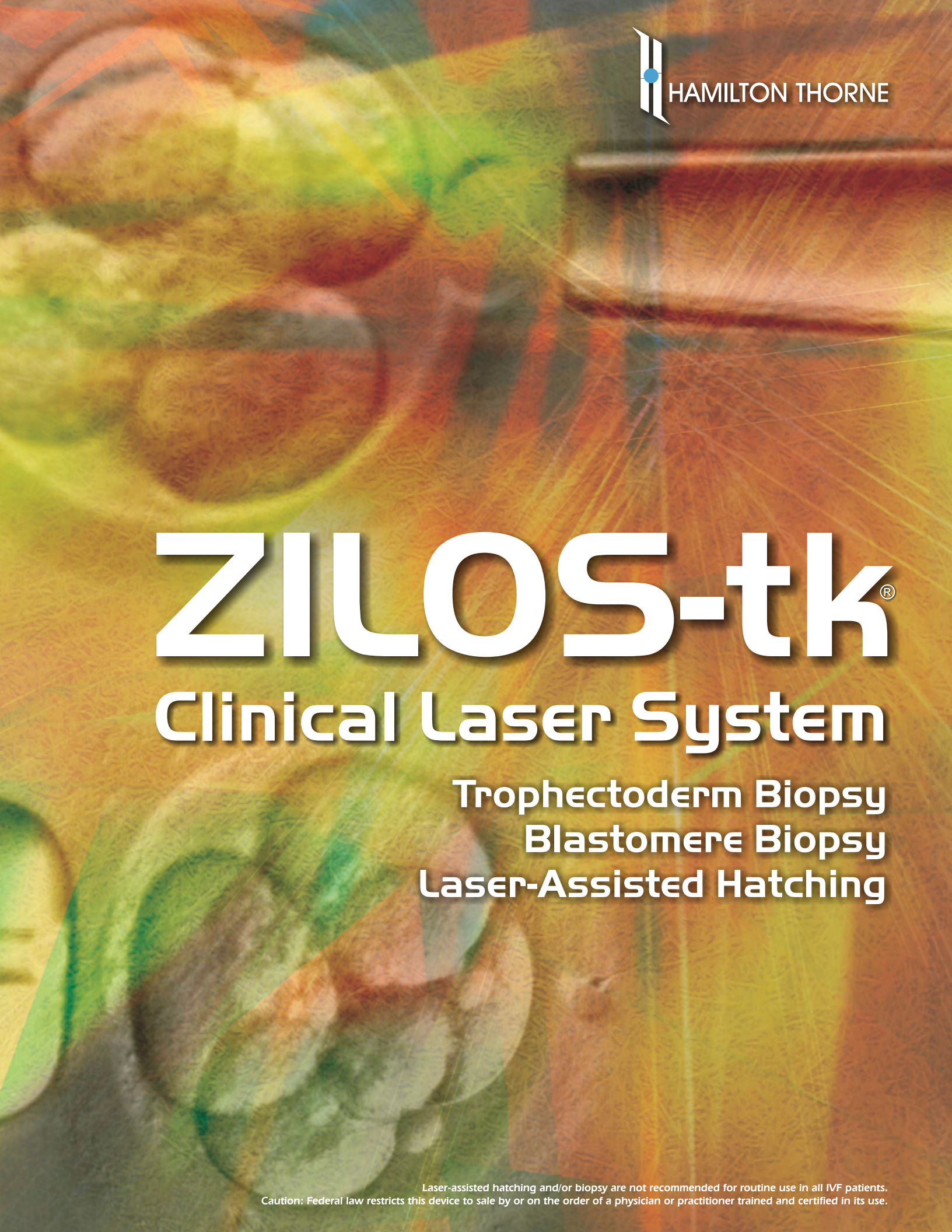
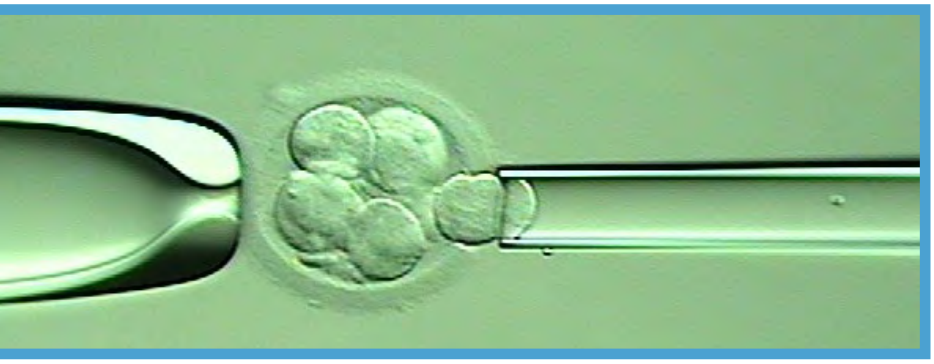

HAMILTON THORNE
ZILOS-tk®
Clinical Laser System
Trophectoderm Biopsy
Blastomere Biopsy
Laser-Assisted Hatching
Laser-assisted hatching and/or biopsy are not recommended for routine use in all IVF patients.
Caution: Federal law restricts this device to sale by or on the order of a physician or practitioner trained and certified in its use.

Applications of ZILOS-tk Laser



Laser-assisted Hatching

By drilling a small hole in the zona pellucida, embryo hatching can be facilitated. In addition to using 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.

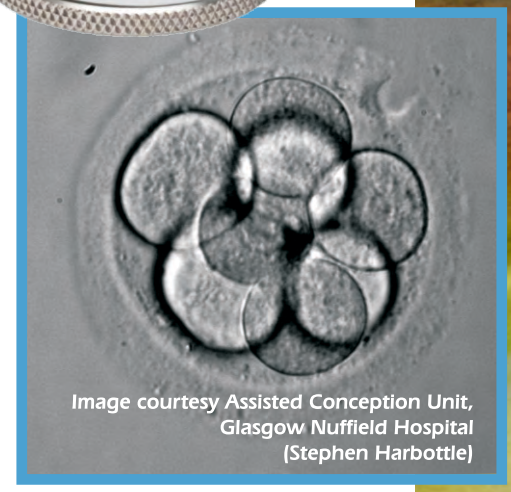


Image courtesy Assisted Conception Unit, Glasgow Nuffield Hospital (Stephen Harbottle)

Blastomere Biopsy

Removal of a blastomere from a cleavage stage embryo on day 3 is a common method of obtaining embryonic DNA for PGD [1]. The ZILOS-tk 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.

Trophectoderm Biopsy

Performed at the blastocyst stage, trophectoderm biopsy for pre-implantation genetic diagnosis (PGD) offers many potential advantages over cleavage stage biopsy [2, 3, 4].

- 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


Image courtesy Michael Tucker, PhD, Shady Grove Fertility Reproductive Science Center

The ZILOS-tk 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

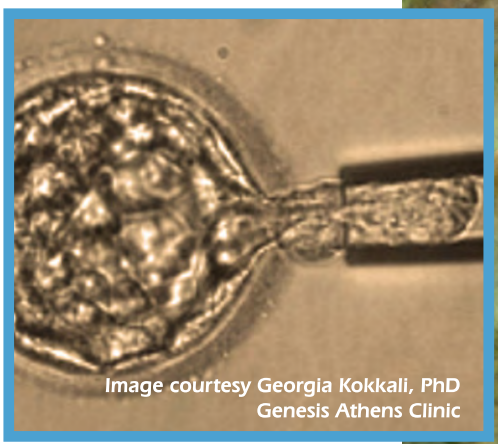


Image courtesy Georgia Kokkali, PhD Genesis Athens Clinic

1. 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.
2. 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.
3. Lathi RB, Behr B. Pregnancy after trophectoderm biopsy of frozen-thawed blastocyst. Fertil Steril. 2009 May;91(5):1938-40.
4. 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.

Precise Laser Ablation for LAH & Biopsy

- Laser is integrated into specially designed 40x objective that functions in both visible and infrared wavelengths.
- High-power, Class 1, 1460 nm laser with pulse durations as low as 1 microsecond
- Choice of computer-generated drilling targets, including patented Isotherm Rings™, to visualize heat conduction and hole size for safe zona ablation
- 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
- Easy installation, simple set-up, and intuitive software

The ZILOS-tk Offers One-of-a-Kind Laser Solutions

The ZILOS-tk offers precise computerized laser delivery for assisted hatching and embryo biopsy and provides solutions not found on any other system. The hardware and software features of the ZILOS-tk work together seamlessly to provide a sophisticated yet easy-to-use 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.

No Alignment Hassles

The ZILOS-tk laser is aligned once at the factory and locked into place, so you never have to worry about physical laser alignment accuracy or perform tedious alignment procedures. Simply click the mouse to set the computer generated target on to the laser spot and you are ready to go.

Compatible with Fluorescence

The ZILOS-tk does not require removal of any component to use your microscope's fluorescence. All that is needed is to rotate the turret to position the fluorescence objective. Note that no therapeutic or clinical laser procedures should be performed under fluorescent illumination using the ZILOS-tk.

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

Software Features

Image Capture

- Save images with or without the target overlay
- Capture image automatically upon laser firing
- Save to .bmp, .tif or .jpg formats
- Save images with File Name Stamp and auto-labels
- Automatic image naming using user-defined root name or report name
- Magnification value saved with image

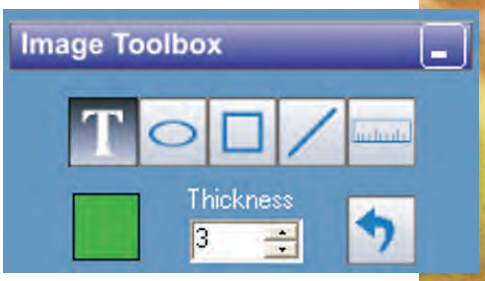
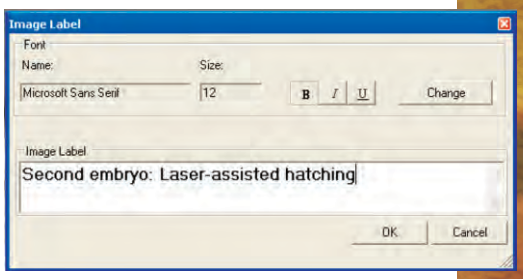


Image Auto-labeling

- User-defined auto-labeling allows creation of multiple labels
- Choose from date, time, objective information and report input values (such as patient name and embryo ID)
- Designate specific location of each label on image
- Enable or disable labels at will



Real-time and Time-lapse Video Capture

[Time-lapse video capture should not be used for therapeutic or diagnostic procedures.]

- A great tool for presentations, teaching, archiving, and quality control
- Record real-time or time lapse video of the current image field at the touch of a button
- Set maximum clip length to prevent excess video storage
- Automatic video file naming using user-defined root or report name
- User-defined video playback speed (frames/sec)
- Video scroll bar to quickly move forward or back to any segment of the open video

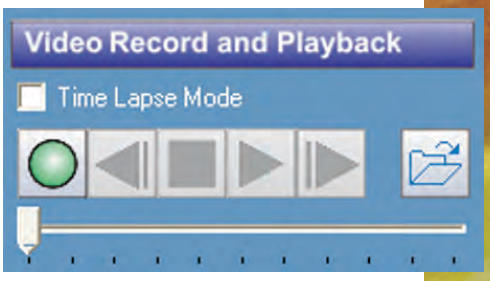


Image and Video Thumbnails

- Unlimited thumbnail storage
- Select icon to switch between still image and video thumbnails
- Auto-restore of thumbnail images in the event of non-standard software shutdown

Freehand Text/Drawing/Measuring Tools

- Add custom text using any available font type and style, in any system color
- Draw ellipses, rectangles or lines, select outline thickness and color
- Measure any aspect of the captured image

On-Screen Measures

- Make on-screen measurements of zona thickness, embryo diameter, pronuclei diameters, and drill hole size on stored images. One user-defined ruler is also available.
- Measurements, calculated means, and standard deviations are transferred to the report at the touch of a button.
- Images may be saved to report with graphic measurement overlay.
- Toolbox features allows measuring of additional image areas (for storage with image file only).

Comprehensive Reports

- Create comprehensive reports combining general information, measurements and pre- and post-treatment images
- Reports saved in JPG format for easy import into other applications
- Import field data and export report data in ASCII (txt and mer) format. Compatible with IDEAS V.5™ (formerly IDS), RecDate, BabySentry, and others
- Option to replace Embryo Evaluation report data with two additional images
- Choose to save images to report with or without measurement overlay

Trophectoderm Biopsy using ZILOS-tk Laser

Laser-assisted hatching on Day 5 blastocyst

Trophectoderm cells herniate through hole in zona.

Trophectoderm cells are dissected from the blastocyst using laser pulses.

Images courtesy Georgia Kokkali PhD, PGD Director, Senior Clinical Embryologist, Centre for Human Reproduction, Genesis Athens Clinic, Athens, Greece

ZILOS-tk Components

Standard ZILOS-tk Configuration Includes:

- Class 1 laser diode, 1460 nm, 40x objective-laser combination
- Proprietary laser software
- Turret adapters for installation on inverted microscopes
- Laser controller box
- Color analog or digital camera, with de-magnifier lens
- Choice of high speed, customized desktop system with 20" flat panel monitor or laptop system
- Remote foot switch for firing laser

Call or visit our web site today for more information or to arrange an on-site demonstration!

Distributed by:

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