

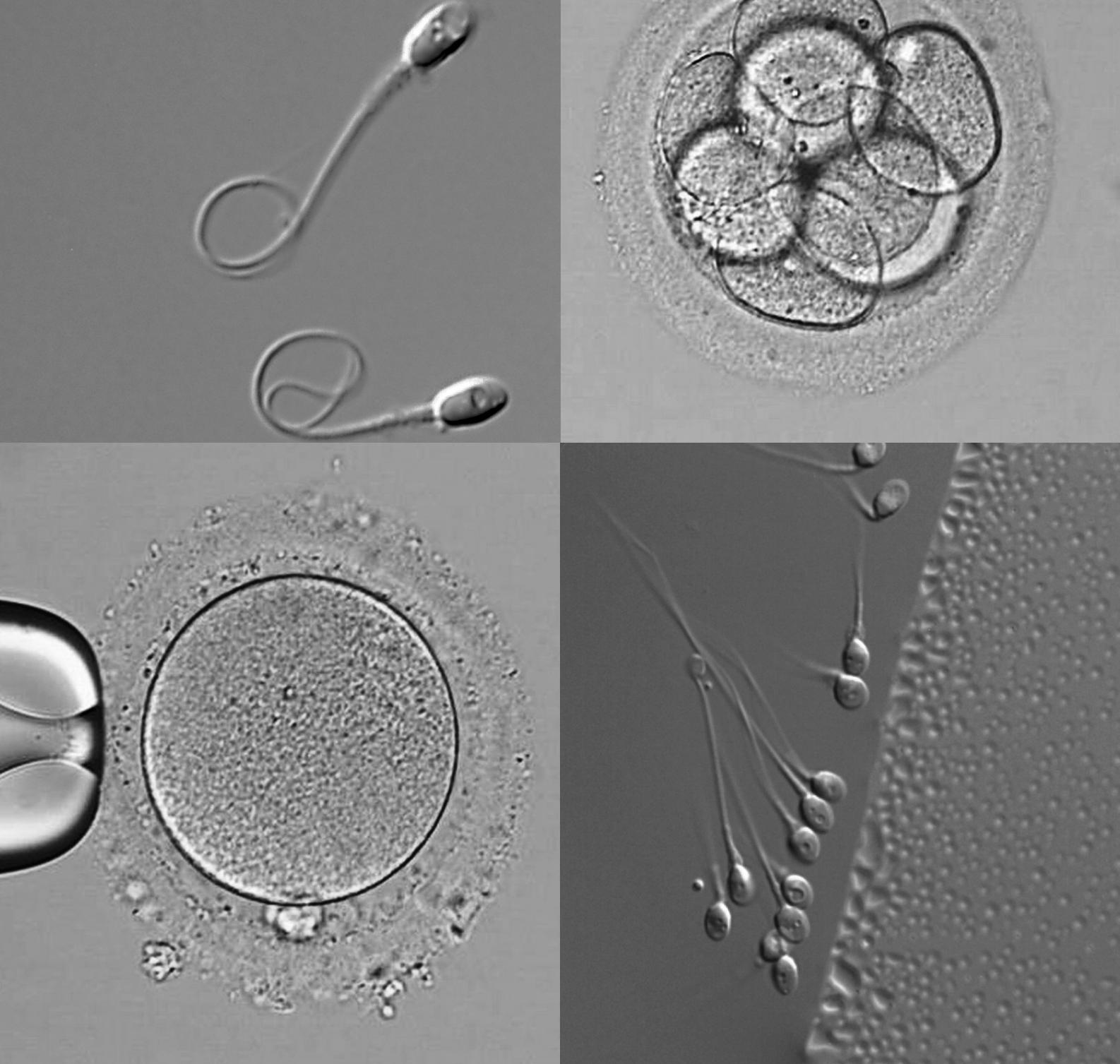
From Eye to Insight

Leica
MICROSYSTEMS

IN VITRO FERTILIZATION

Your Applications – Our Solutions

Systems and Instruments for the IVF Lab



FOCUS ON THE OOCYTE

At a glance:

- Free of vibrations – stable stand to carry all common types of micromanipulators
- Freedom of choice – manual and automated components, such as stage, condenser, objectives
- Superior optics for brilliant images – unique Leica integrated modulation contrast for standard objectives 5x–63x
- Convenient handling of the petri dish at the right temperature – 37°C heating stage with flat surface and glass bottom
- Compatibility – further supporting components for daily routine or sophisticated research



Courtesy of: C. Mehnert, Zentrum für *In vitro* Fertilization, Giessen, Germany



The Leica MATS, heating plate becomes flush with the stage surface to ensure easy handling of the specimens and easy operation of the manipulator

Intracytoplasmic Sperm Injection (ICSI) has become a standard method in IVF labs around the globe. The right equipment in your lab supports your effort to constitute a good laboratory practice, to work in a convenient and effective way and at the end to increase the reproduction rate.

The microscopes and accessories of Leica Microsystems are designed to support your daily work.

The Leica Microsystems inverted microscopes are especially appreciated for their superior optical performance in imaging oocytes, sperms and injection capillary. Stability and robustness are matters of course to provide you with best tools for your work.



The perfect ICSI workstation: Leica DMi8, 3-plate stage, condenser S40 for modulation contrast for objectives 5x to 63x, new Narishige manipulators with injection units, heating stage 37°C.

ZOOM IN ON THE SPERM

The method of intracytoplasmic morphologically selected sperm injection (IMSI) has gained a lot of interest in the last years. In close collaboration, listening to the voice of our users, Leica Microsystems has set up a sophisticated and convenient working station for IMSI.

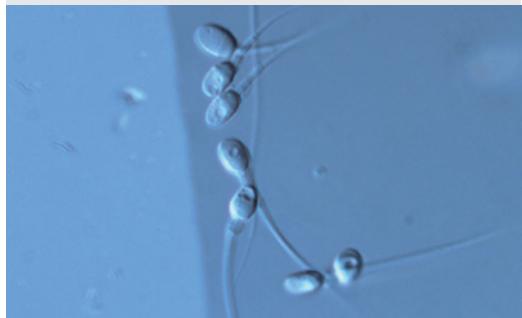
The Leica Microsystems solution provides superior optical performance combined with ease of use: The unique microscope system Leica DMi8 combined with IMSI allows the control of the micromanipulator and microscope by one control panel and offers highest performance for IMSI and ICSI on one workstation. The 100x objective with high numerical aperture together with additional optical magnification provides a total magnification of up to 8000x on an LCD screen to clearly identify and analyze the morphology of the sperm.



The perfect combined IMSI and ICSI workstation: Leica DMi8, motorized 3-plate stage, DIC or modulation contrast for objectives 5x up to 100x, Leica MATS heating stage.

At a glance:

- Manipulator and microscope connected via digital interface – manipulator movement is aligned to magnification
- Less vibration – one control panel for microscope and manipulators
- Reproducible images – all system functions are intelligently automated
- Only one company to deal with – one supplier of electronics, optics and mechanical components
- Ergonomic benefits and operating safety – by integral control and top level motorization



Superior DIC – Best contrast at the push of a button. Depending on the user preferences the Leica Integrated Modulation Contrast is also available.



Perfect DIC – with dry Objective

The new HC PL FLUOTAR L 100x/0.85 CORR objectives allows to visualize high magnified sperms through the glass heating insert and a glass bottom of the Petri dish

THE SPERMOGRAM

At a glance:

- Stability and robustness, combined with highest optical performance – complete range of routine phase contrast microscopes Leica DM1000 to DM3000
- Long working distance objectives – 10x, 20x, 40x, 63x to allow work with counting chambers
- Study the fine morphology of the sperm – up to 100x oil objective
- Heating stage 37°C available
- Ergonomical, fatigue-free working – height adjustable focus knobs and other equipment



MAKLER Counting Chamber for rapid sperm analysis perfectly fits the Leica DM1000-3000 stages for convenient evaluation.

The first step to assisted reproduction is to check the quality of spermatozoa, via motility, morphology, composition of the ejaculate and other biochemical parameters.

Leica Microsystems' contribution to this step are high quality, ergonomic upright microscopes, equipped with 37°C heating stage to support your work the best way. The phase contrast visualizes the sperm head as a small white sphere, while the flagellum shows up as a dark filament. Leucocytes present within the ejaculate can be easily identified.

A full range of ergonomic equipment like tilting tubes, height adjustable focus knobs, and ergonomical stages make work more comfortable, pleasant, and fatigue-free.



Ideal solution for sperm analysis: the unique ergonomic system microscopes Leica DM1000, DM2000, DM2500 and DM3000 with heating stages 37°C.

DECORONIZATION AND ZYGOTE OBSERVATION

After the collection of the oocytes via follicle puncture, the oocytes must be stripped of their granulosa cells. This delicate and important work requires excellent stereoscopic, 3D visualization combined with a long working distance to offer easy and convenient access for the tools of the operator.

After fecundation, the zygotes are observed to check the number, size and location of the pronuclei. The stereomicroscope is one of the optical tools used for visualization of the development from the zygote to the blastocyst state. Highest image quality combined with ergonomic design, ease of use and reliability are crucial for this essential step within assisted reproduction.

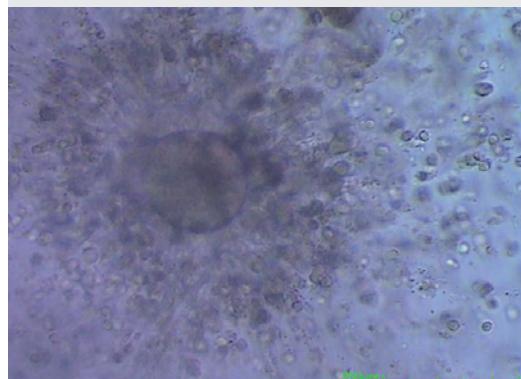
The new Leica stereomicroscopes are available as five preconfigured systems certified according to the European directive for *in vitro* diagnostics. Each of the systems works out-of-the box and is tailored to the specific requirements in an IVF laboratory.



Highly effective instruments for manual inspection:
Leica M-Series stereomicroscopes.

The oocyte in stereo:

- Brilliant image quality
- Perfect stereo impression
- High working distance up to 135 mm
- Zoom up to 120x (1x objective)
- Stable and vibration free design
- Preconfigured systems including all required accessories like cameras, heating stages and transmitted light bases



Human oocyte before decoronation



Human oocyte after decoronation

Courtesy of: Pr.S. Viville, Dr. C. Wittemer CMCO-SIHCUS Schiltigheim (France)

Leica M60 B



Leica M80 B



Leica S8 APO B



Leica M125 B



Leica M165 CB



LEICA DMS1000 B

New Leica DMS1000 B digital microscope system – the core piece in *in vitro* fertilization! Observing the oocytes or zygotes without eyepieces now makes it possible to carry out experiments even in closed laminar flow cabinets. This keeps the risk of contaminating the specimen to a minimum.

The integrated full HD digital camera enables the users to visualize, to capture and to store images of the oocytes or zygotes directly on the integrated SD card.

The accessories include Leica transmitted light bases as well as the Leica MATS heating stage which allow advanced contrasting for crystal clear images at a constant temperature of 37°C.

At a glance:

- Stand-alone operation: The built-in HD camera allows the user to visualize and to capture images of oocytes without the need for a PC.
- No eyepieces needed: The Leica DMS1000 B can be used even in closed laminar flow cabinets. More safety for the specimen and the user.
- Built-in encoded zoom: Capture calibrated images including a scale bar even without a PC.
- Preconfigured system: All required accessories are combined under one article number. Works out-of-the-box.
- Fast live images: Live images in full HD resolution with up to 30fps. Eliminates image delay during pipetting of oocytes.
- Highly ergonomic: The HD monitor can be easily adjusted to multiple users. Work more comfortable and fatigue free.

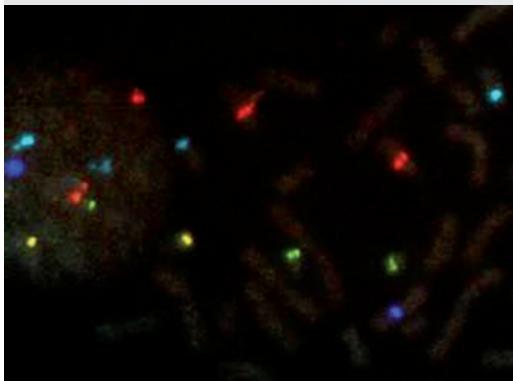


Ideal solution to document the zygote development: The unique digital microscope system Leica DMS1000 B

THE PLATFORM FOR EVERY

CytoVision at a glance

- Karyotyping
- FISH
- Tissue FISH
- Karyotype CGH
- M-FISH
- Flexible Karyotyping (for non-human)
- Scanning platforms also feature:
Metaphase scanning and capture
- Automated/manual Spot counting for
cellular FISH



Different DNA areas on different chromosomes are marked using fluorescent probes. Courtesy of: Guangzhou No.2 Ren Min Hospital – O&G Institute; X. F. Sun

CytoVision is the one image analysis and case management system that provides cytogenetic laboratories with an integrated, scalable platform for brightfield and fluorescent samples. Only Leica Microsystems combines the expertise in image analysis, robotics, and microscopy needed to deliver and support a truly integrated cytogenetics platform.

Used in over 2000 laboratories worldwide, the CytoVision platform provides the convenience and comfort of on-screen analysis together with flexibility in software and hardware configurations. CytoVision supports all laboratories from the simplest, single application workstation to fully networked, automated, multi-application, nationwide programs. CytoVision is highly cited in the literature across a breadth of applications from routine clinical diagnostics to contemporary stem cell and oncology research.



CytoVision*

The platform for every cytogenetics and FISH lab

CYTOGENETICS AND FISH LAB

Reduce reporting times; improve consistency, free skilled staff to spend their time producing quality analysis and reports

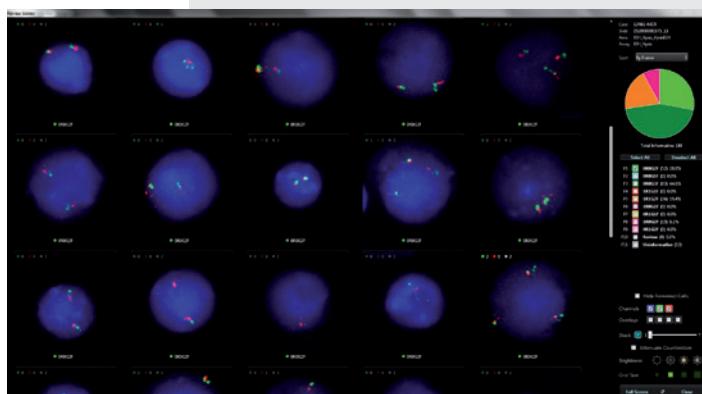
Many facilities face growing demands to increase productivity, efficiency, reduce backlogs, and improve reporting times. From our new high sensitivity cameras for manual capture to unattended scanning and capture using the unique combination of CytoVision software and GSL slide loaders, CytoVision enables every laboratory to improve efficiency.

Future-proof your laboratory with a choice of application modules and automation within CytoVision

A broad range of application modules ensures full flexibility to meet changing laboratory requirements. CytoVision is ready to grow with your lab, analysis modules can easily be added to new or existing systems to adapt to your evolving needs. The CytoVision platform enables expansion from a single capture station to fully automated scanning and capture stations with review stations supported by client / server networks and LIMS connections. CytoVision offers secure remote access servers and software to allow cases to be analyzed, reported and reviewed from anywhere in the world.

Fluorescence analysis modules in CytoVision support a variety of applications including FISH, spot counting/interphase FISH, CGH, tissue FISH, and M-FISH

Automated slide loaders enable unattended scanning, location, and capture of fluorescence images, minimizing fading problems, and sending images to review stations for on-screen analysis. Simple interface screens guide the operator through the analysis workflow, as illustrated by this cellular FISH example.

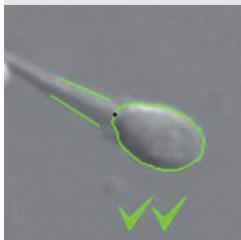


On-Screen Analysis brings FISH out of the Dark Room

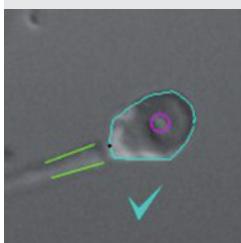
*Reg. US Pat & TM Off and in other jurisdictions throughout the world.

"Please refer to the Intended Use Statement found at www.leicabiosystems.com/cytovision for your intended application"

SUPERB IMAGE QUALITY FOR BEST ANALYSIS



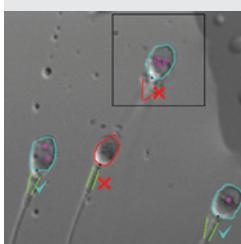
Normal cells show two green checkmarks, plus a green sperm head circumference, green mid-piece designators, and no pink vacuole circles.



Sub-normal cells show one blue checkmark. The colors of the overlay and text will be either green or blue. Vacuoles (2 or less) will be designated by magenta circles.



Abnormal cells show one red X. Either the color of at least one parameter will be red or 3 or more vacuoles will be designated by magenta circles.

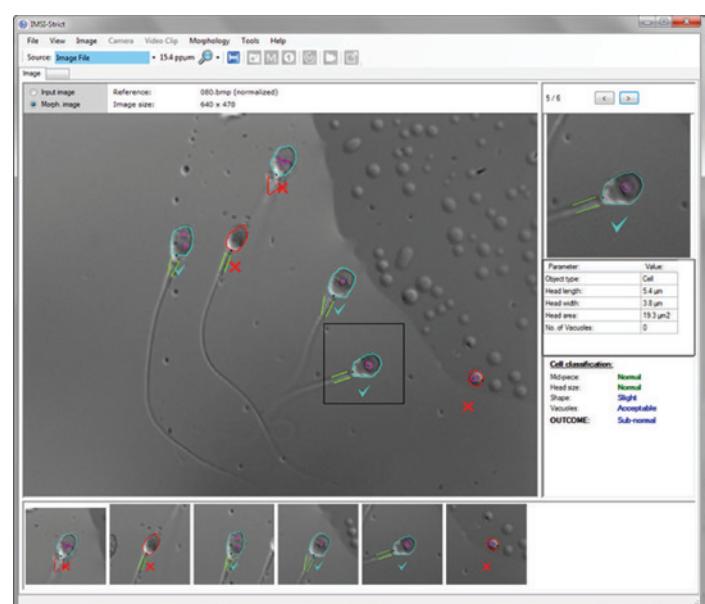


The IMSI-Strict™ software includes the ability to turn off cell annotations on the main image to allow close visual inspection.

IMSI-Strict™, developed on Leica DIC microscopes, is the only automated software solution for live sperm morphology analysis under high magnification. IMSI-Strict™ combines Tygerberg Strict Criteria with motile sperm organelle morphology examination (MSOME) and provides software-based categorization using head size, head shape, mid-piece number of vacuoles as well as the ratio between head size and size of the vacuoles. Using these analyzed parameters, sperm are assigned to one of three categories – normal, sub-normal or abnormal (see images on the left side).

IMSI-Strict™ software was developed using the standards of the Tygerberg Strict Criteria, in cooperation with Prof. T.F. Kruger, Stellenbosch and Tygerberg Hospital, South Africa and evaluated by Prof. J. Parinaud, Toulouse, France.

With IMSI-Strict™, there are three methods of analysis from which to choose: 1) perform real-time morphology on the live, motile image, 2) take a snapshot of the live image and then initiate morphology analysis, or 3) record and save a video to use for analysis.



Hamilton Thorne IMSI-Strict™ Software:
Strict Criteria Brought to IMSI

OPEN AND COMPATIBLE WITH ADDITIONAL EQUIPMENT

The Leica Microsystems portfolio covers a wide range of products useful within your IVF laboratory for routine and more sophisticated applications and related research applications. Beside inverted, upright and stereomicroscopes a wide range of digital cameras are available, offering highest resolution and highest sensitivity.

Digital Leica cameras and comprehensive software packages are available for digital imaging using single shots or movie sequences.



Leica LAS Application software modules:
Image database, measurement and analysis.

Leica Microsystems is in close contact with other suppliers for IVF to continuously optimize our offering for your needs:

- Zona pelucida laser drilling
- Sterile clean benches
- Consumables (capillaries, dishes, counting chambers, ...)
- Manipulators and further equipment around IVF



The best combination for zona pelucida drilling –
Leica DMI8 and the Hamilton Thorne ZILOS-tk® laser



Cleanbench with Leica AM6000 workstation for IVF

Leica Microsystems operates globally in three divisions, where we rank with the market leaders.

LIFE SCIENCE DIVISION

The Leica Microsystems Life Science Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement, and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems' customers at the leading edge of science.

INDUSTRY DIVISION

The Leica Microsystems Industry Division's focus is to support customers' pursuit of the highest quality end result. Leica Microsystems provide the best and most innovative imaging systems to see, measure, and analyze the microstructures in routine and research industrial applications, materials science, quality control, forensic science investigation, and educational applications.

MEDICAL DIVISION

The Leica Microsystems Medical Division's focus is to partner with and support surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

Leica Microsystems – an international company with a strong network of worldwide customer services:

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Belgium - Diegem	+32 2 790 98 50	2 790 98 68
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Canada - Concord/Ontario	+1 800 248 0123	847 405 0164
Denmark - Ballerup	+45 4454 0101	4454 0111
France - Nanterre Cedex	+33 811 000 664	1 56 05 23 23
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Sweden - Bromma	+46 8 625 45 45	8 625 45 10
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