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No. 04

CUSTOMER MAGAZINE FOR PATHOLOGY & DIAGNOSTICS
EUROPEAN EDITION

reSOLUTION

The “Secret” of Lean Histology™

Interview with Johnathon Deniz

Enhanced Research Applications for IHC

The New Leica Bond™ Research Platform

Digital Microscopy Proves its Value

Leica DMD108 in Remote Breast Cancer Diagnosis



Dear Readers,

Productivity, efficiency, "lean" – concepts that only used to matter in a factory environment have long assumed major significance in everyday laboratory routine, too – and are becoming more and more important in these difficult times. Especially while the global economic crisis is still making the headlines, and every organisation is watching closely to see what the impact will be on their own business.

Health Care will probably suffer less than other areas. But it will be vital both for responsible lab personnel and for their industrial partners like Leica Microsystems to adapt to the changing environment. This issue of reSOLUTION for Pathology & Diagnostics reports on opportunities for improving processes and saving valuable time, and the great potential for laboratories, pathologists and patients. Lean Histology™ and remote diagnosis are only two examples of this broad subject.

This reSOLUTION also features a topic that is related to both clinical and research applications for immunohistochemistry. With the introduction of the Leica Bond™ Research Platform, well established histological techniques can now be performed in a fully automated, consistent and standardised manner.

We hope you like our choice of topics. If you have requests or suggestions, we would be pleased to hear from you.

Have fun reading!



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Cover picture: Mixed cell-line cytospin of Ramos (B-cell Burkitts lymphoma) and Jurkat (T-cell leukemia) with Novocastra antibodies to CD3 (clone LN10) and CD20 (clone MJ1) with light hematoxylin counterstain

Value Stream Mapping (VSM) is an important part of Lean. Can you explain how VSM works and what are the objectives of creating a Value Stream Map?

Value Stream Mapping is all about eradicating waste. So it's about identifying the opportunities to improve. The way to apply it to histology is to look at a specific sample which is a biopsy or a piece of tissue and actually walk that through the process so you get a snapshot of how the laboratory works. For example, you can see if the laboratory over-produces barcode labels or if samples are left waiting for someone to collect them or put them through a machine or if there's a long delay waiting for a massive batch before they get processed.

So VSM is about capturing all these processes with timestamps and lead times in the form of a map that is called a Value Stream Map. Then you can graph all your data and see where your main road blocks are, and most of those are usually around waiting time; waiting for a machine to finish processing or waiting for a staff member to be available or waiting for a pathologist for a diagnosis.

Can you provide an example of how Leica Microsystems helps laboratories with Value Stream Mapping?

We conducted a VSM workshop at a histology lab at Addenbrooke's, one of the largest NHS teaching hospitals operating in the UK. We started by meeting the Acting Histopathology Manager, Ian Sturdgess, about a month beforehand, to answer some specific questions like how many staff they have, what their average working day is, whether they work to a roster, how many machines they have, how many slides they generate per day on average – all the general sorts of questions.

On the actual two to three days of the workshop we had an introduction where we explained the concept to the team for about half an hour. Following this, using 'post-it' notes the team mapped out the workflow for a typical day and then we said to them: "Now go away and do your thing like a normal day". The next day was spent literally watching their workflow. There were five of us from Leica Microsystems who joined the three to four teams depending on the processes that we were watching. At the end of each day we got back together to produce a Value Stream Map that we presented to the hospital the very next day.

Who was involved from Leica Microsystems?

Myself, Vincent Niles, Sales Account Manager, Ben Jean and Vedran Arnautovic, who are Technical Product Specialists, and our Key Account Scientist, Andrea Cleghorn. Like all Leica Microsystems people they have internal experience of Lean concepts and are now excited to be using that knowledge to help our customers.

What did the customer expect from the VSM process?

Ian Sturdgess and his team had some understanding of Lean concepts. For us, it was very important to explain to them that Value Stream Mapping identifies the waste, it doesn't get rid of the waste itself. In one to two days you can suggest improvements but then it's up to their team to sustain the momentum and keep the process driving forward.

From the customer side, who participated in VSM and how did they find the process?

Ian Sturdgess was obviously involved. There were two main laboratory Team Leaders, Maggie Luff and Debbie Morgan, and Lisa Happerfield, the Immuno Section Team Leader who was also involved as immuno staining was part of the process we covered. Most of the Team Leaders in the main Histology laboratory were involved in some way so all in all there were ten participants.

The feedback was very positive. All were surprised that when they looked at the overall process lead time – which is basically from start to end taking into account all the waiting times, operator activity and machine processing times – that it was roughly around the time that they had estimated it took. A big plus is that with the VSM they finally have data to present at their service improvement meetings, they can say: "this is a current issue, how can we go forward?"

You didn't get in the way of the laboratory's normal work?

Addenbrooke's is like a finely tuned racehorse and they don't have time to slow down, so they actually appreciated having external people coming in to look at their process. A credit to the two leaders – they are naturally busy but they still attended every report-out session and then stayed back to finish

around 7:30/8:00 pm every night to keep the daily workload rolling on. They also appreciated that we were going back to our hotels at 5:00 pm to produce the data for the presentations for the next day. So the feedback was definitely positive.

What's the next step for the lab at Addenbrooke's?

One of the biggest things I'm looking forward to is presenting what we have done to the pathologists who are keen to get involved. One point Ian Sturdge wanted to portray, which I really agree with, is that you can improve your pathology laboratory as far as possible but if a sample just sits at a pathologist's desk you haven't really improved your overall turnaround time for the patient. I've also noticed that the people in the laboratory equip each other with a positive mindset, saying "how are you doing this, where can we improve?", so I'm sure the momentum at this laboratory will definitely continue, and what we've started with them is a process of continuous improvement that they are now driving.

Are there any areas in particular where you see the laboratory could further improve?

With LIS (Lab Information System) the laboratory could easily save up to an hour per day in the immuno section because they enter a lot of slides every day. Also, a classic Lean technique is to create work cells and some real improvement could be achieved by organising different sections in this way, so floor plans were proposed to help with some critical areas. To drive this, I have planned for key staff at Addenbrooke's to attend labs that have already embraced Lean.

How do you see Lean and VSM contributing to histology labs in the future?

In my opinion, it's something that could yield a lot of improvement in existing laboratories just because it's a completely different way of thinking. Addenbrooke's are a classic example. They actually halved their batch sizes and split into two teams to do all the operations. Although this doesn't change the overall workload, far more importantly it allows for patient samples to flow through the process faster.

Most importantly, by using Lean and VSM, we can quantitatively show the areas of improvement and

that is really, really impressive. We could, for example, mention a certain technique or a certain piece of equipment, and we could actually show percentage gains and losses. Laboratories, particularly managers, understand quantitative improvement quite well and I think VSM is the first step to going there. Customers are smarter than accepting "if you get this, your laboratory will be better", I'm starting to find that is not good enough any more. Everyone is looking for more sophisticated solutions. Lean and VSM are part of that solution and while it's a challenge for laboratories, and it's a challenge for us, it's definitely an exciting one.

Novocastra Science™ – experience, innovation and support that delivers quality reagents for consistent staining.



Johnathon Deniz, Automation Product Manager at Leica Microsystems

Lean Culture at Leica Microsystems

Leica Microsystems doesn't just talk Lean, they live and breathe Lean as an integral part of their business culture. Here, Ian Macfarlane, Melbourne Manufacturing Centre Manager discusses how Leica Microsystems' facility in Melbourne, Australia dramatically improved its operation since becoming part of Leica Microsystems in 2007:

For our Melbourne facility we commenced a Lean conversion program in March 2007 using systems tried and tested throughout our new parent organisation. Importantly, the management mandate included the provision of experienced people to help us get started down the path of Lean. Our first Lean events, known by the Japanese term "Kaizen", focused on Standard Work and Kanban material replenishment in our production area. Standard Work involves the creation of very efficient work cells, while the Kanban is a just-in-time system that dramatically improves stock and inventory management.

Since the first Kaizen events, we have held about 20 Kaizen events to convert all of our major manufacturing to a Lean approach. The results have seen typically 20% productivity improvements. In addition, visual management has allowed improved communication on issues facing the production team and highlighted opportunities for quality improvement. In one example, the first-pass yield in a cell has improved from a historical average of around 75% to around 95% to 100%.

One important element that has evolved over the period is that the entire organisation from the management team to the associates on the shop floor have seen the benefits that Lean operation brings and are now enthusiastic advocates for continuing the Lean journey. There are many more improvements ahead of us yet, and with the right attitude and experience, we will find the opportunities and successfully implement them.



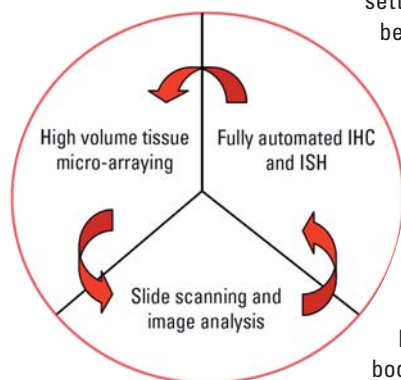
Ian Macfarlane, Melbourne Manufacturing Centre Manager

The New Leica Bond™ Research Platform

Enhanced Research Applications for IHC

Michael Gandy and Craig Barker, Leica Microsystems

A wide variety of histological techniques have long been employed in cancer research and diagnostics. Historically these techniques, such as immunohistochemistry (IHC) and in situ hybridisation (ISH), have been manual, time consuming and labour intensive. In the field of histology, three major technical advancements over the last decade – High volume tissue micro-arraying, Fully automated IHC and ISH, and slide scanning and image analysis – have enabled histological investigation to remain as one of the key life science research tools used today.



Multiple chromogenic labelling

Yet to find widespread application in the diagnostic setting, multiple labelling is a technique that has been successfully performed in various formats for a number of years. Two of the main uses of multiple labelling techniques have been their utilisation in evaluating antigen versus antigen or antigen versus gene expression in samples with limited viable cellular material or in samples where cellular differentiation and/or antigenic expression in adjacent cellular targets require same slide evaluation. Figure 1 illustrates a case of Hodgkin's Lymphoma stained with Novocastra™ antibodies to CD3 (clone LN10), CD20 (clone MJ1) and CD30 (clone 1G12).

Direct immunofluorescence

The application of direct immunofluorescence is a useful research tool for assessing primary antibody specificity. The lack of subsequently applied chromogenic detection chemistry allows the assignment of a specific fluorescence signal to the antibody under evaluation, ruling out any potential detection system cross reactivity. This technique can often be used with multiple marker/multiple fluorophore labels to demonstrate and differentiate a range of highly specific cellular components. Figure 2 illustrates fully automated direct immunofluorescence of the SKBR-3 human breast cancer cell line stained with the anti-FITC conjugated mouse monoclonal anti-HER2 antibody clone CB11 and counterstained with DAPI. Note the slight granular appearance of the direct fluorescent signal attributed to the spe-

cific heterogeneity of membrane HER2 expression. This specific membrane expression pattern is often lost when layered chromogenic signal amplification is applied.

Cytological immunopreparations

The performance of immunocytochemistry on cytological preparations is again commonplace in the clinical setting, but it also has a role within cancer research. The use of cytological preparations in tumour biology research allows for cellular antigens to be evaluated and localisation determined without the artifacts induced by the rigours of prolonged formalin fixation and paraffin processing. Figure 3 shows dual colour labelling on an in-house grown, polyethylene glycol (PEG) fixed, mixed cell-line cytopspin of Ramos (B-cell Burkitts lymphoma) and Jurkat (T-cell leukaemia) with Novocastra antibodies to CD3 (clone LN10) and CD20 (clone MJ1), with a light hematoxylin counterstain. Note the polar membrane localisation of CD20 together with blanket membrane and cytoplasmic staining of the CD3 antigen.

More information on the Leica Bond™ system:
Aidan.Schurr@leica-microsystems.com

More information on research solutions and applications:
Martha.Foley@leica-microsystems.com

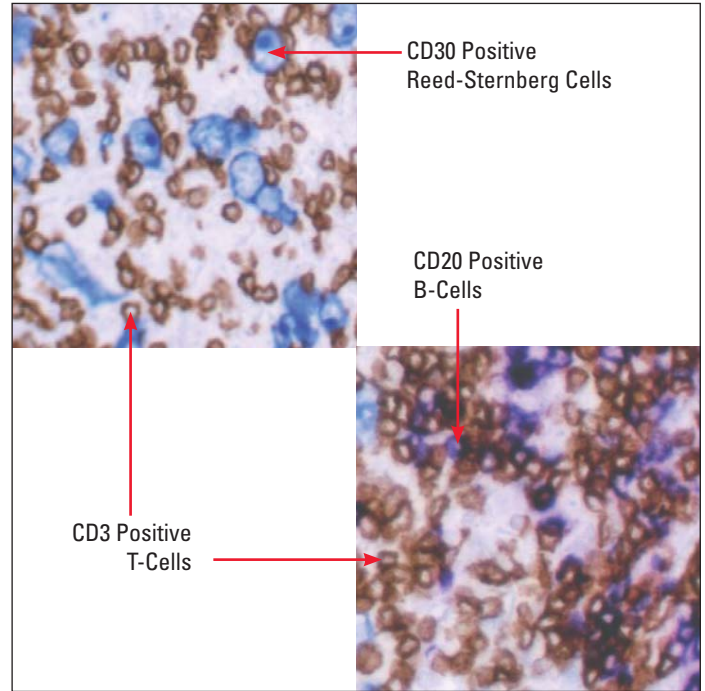
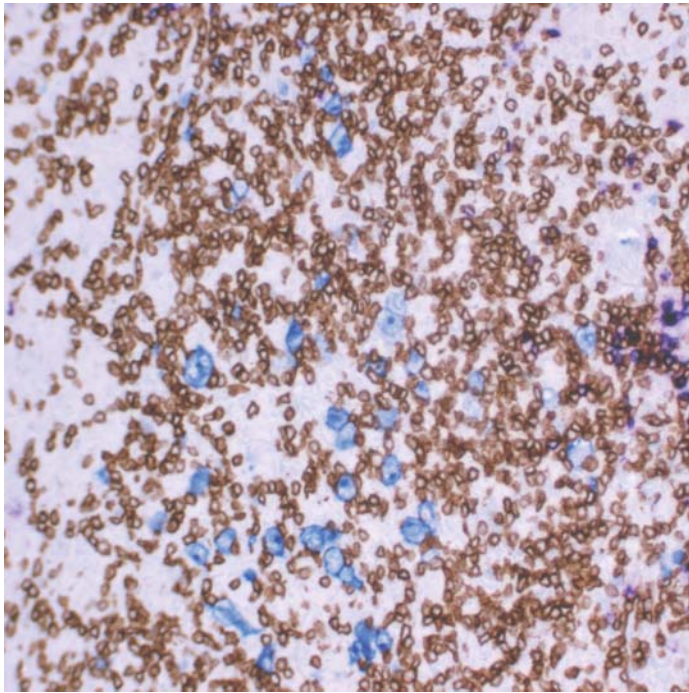


Fig. 1: Hodgkins Lymphoma stained with Novocastra antibodies to CD3 (clone LN10), CD20 (clone MJ1) and CD30 (clone 1G12)

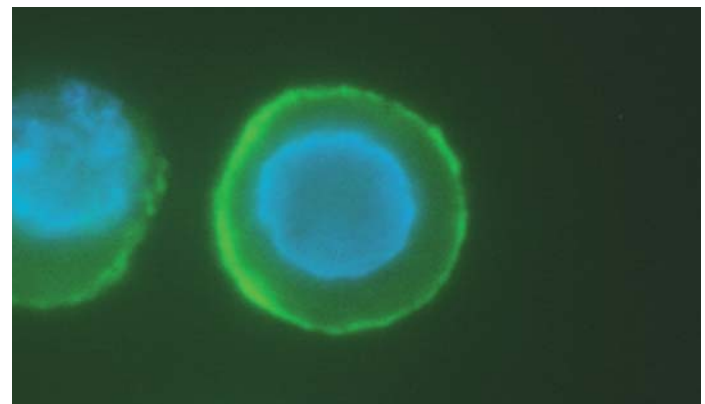
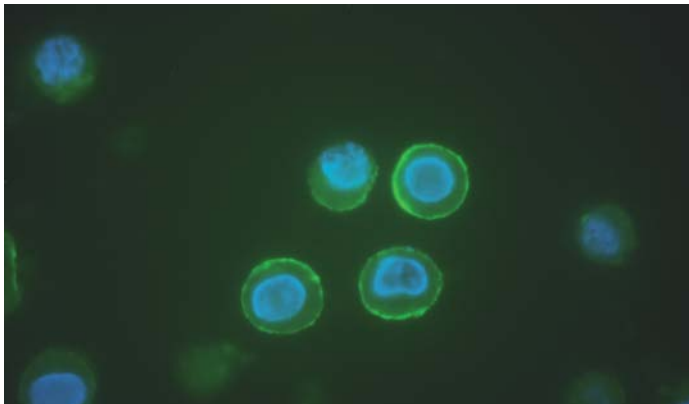


Fig. 2: SKBR-3 (3+) Human Breast Cancer Cell Line stained with HER2 (CB11)-FITC + DAPI counterstain

Leica Bond™ Fully Automated Staining System

The research functionality of the Leica Bond fully automated staining system is an ideal support to the research laboratory, offering consistency and standardisation over conventional manual research techniques and between different researchers working within the same field. Each system consists of a central host computer, between one and five processing modules, and Bond reagents. Each processing module has a 30-slide capacity split into three independent trays for continuous processing.

Continuous processing is a key benefit of Bond that facilitates high-productivity Lean Histology™ workflows as the independent trays allow samples to run when they're needed, not when the instrument

is full. For consistent quality, all Bond reagents are created in-house using Novocastra Science to perfectly match Bond's reagent delivery and incubation characteristics. By creating the ideal staining environment, the Covertile™ system ensures high quality IHC and ISH staining and optimum tissue care.

The Bond research platform enhances the flexibility of reagent and protocol selection and provides researchers with an optimal solution for research needs. These enhanced applications provide researchers with the flexibility and dependability to make Leica Microsystems a leader in research histological systems worldwide.

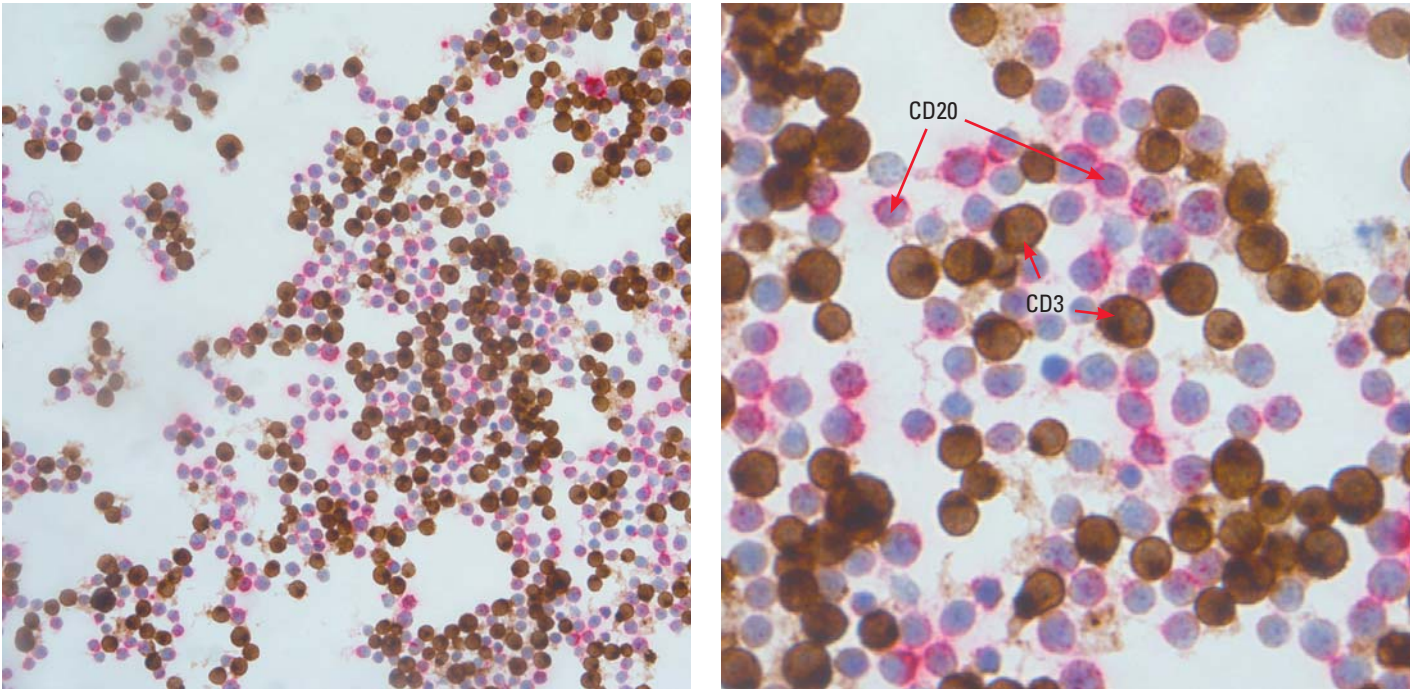


Fig. 3: Mixed cell-line cytospin of Ramos (B-cell Burkitts lymphoma) and Jurkat (T-cell leukemia) with Novocastra antibodies to CD3 (clone LN10) and CD20 (clone MJ1) with light hematoxylin counterstain



Note: All techniques have been stained using the fully automated Leica Bond IHC and ISH system with Research Platform enabled, and have not been validated for clinical use.

Leica DMD108 in Remote Breast Cancer Diagnosis

Digital Microscopy Proves its Value

Anja Schué, Leica Microsystems

When the surgeon in Varberg Hospital in the South of Sweden takes a tissue sample from a patient's lymph node before a breast operation, a frozen section is immediately produced for clinical diagnosis. But the pathology unit that makes the diagnosis is 70 kilometres away, in Halmstad County Hospital. Nevertheless, the pathologist there has the high resolution microscopic image before his eyes immediately, as soon as the specimen preparation is complete.



That this is possible today can be attributed first and foremost to an innovative technology from Leica Microsystems. The Leica DMD108 digital microscope was integrated into the videoconferencing system of the two hospitals for that purpose in 2007. Dr. Tomas Seidal, Head of the Pathology and Cytology Department at Halmstad County Hospital, talks about his experiences with the Leica DMD108.

Dr. Seidal, how successful has the introduction of digital microscopy been?

In our breast cancer diagnosis, the Leica DMD108 has proved excellent. We are extremely satisfied with the system. The remote diagnosis saves us from losing valuable time transporting samples. Our pathologists are very pleased with the quality of image resolution and colour, and also with the easy, user-friendly handling. And I would like to stress that Leica Microsystems provided excellent support for the installation of the Leica DMD108 equipment and during the start-up phase.

"The Leica DMD108 is at the forefront of digital microscopy techniques by now."

The Leica DMD108 is also a great help to us in our conferences with surgeons, pathologists and oncologists. I well remember how surprised and impressed all those involved were the first time they saw the excellent quality of the microscope image on the monitor. Another advantage is that microscope stage movements are immediately visible on screen and easy to follow for the viewer.

In the days when we were still using several microscopes with discussion bridges and someone kept moving the sample extremely quickly by hand, it almost made us seasick to watch.

Is remote microscopic diagnosis here to stay in pathology?

The subject of telepathology has been discussed for many years and is an innovation driver. The reasons for the interest in telepathology are the increasing specialisation of medical centres and also the specialisation of pathology itself – which entails a growing need for a second opinion. Digital microscopy is a significant development in this context. It offers fantastic image quality today and saves time, although it is not used everywhere yet.

Some pathologists are still sceptical and reluctant to trust new technologies. Nevertheless, I think the future belongs to virtual microscopy, even if it takes a few years before it is fully accepted. It can lead to shorter surgery times – not only in cases of breast cancer, but also for other forms of cancer, where biopsies are made during the operation. The digitisation of specimens and the integration of the data in the patients' files offer tremendous potential for innovations and improvement of work routines.

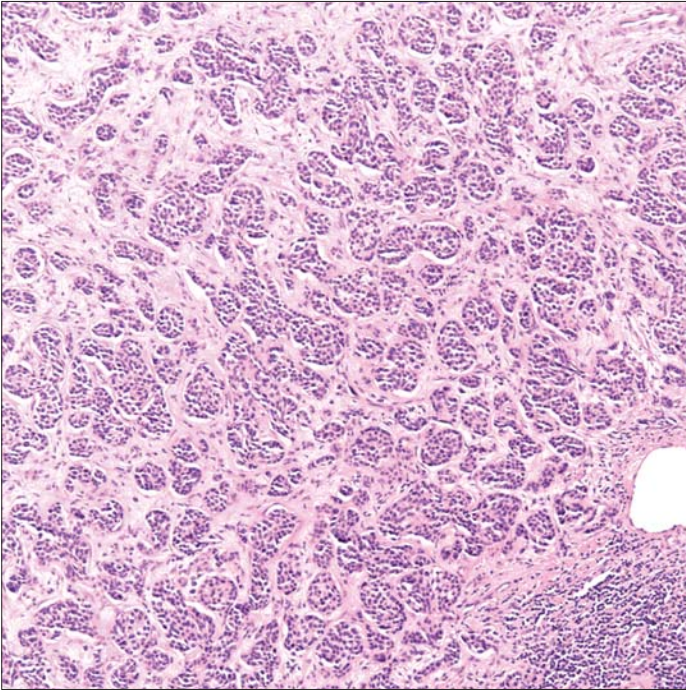


Fig. 1: Diffuse metastatic growth of ductal breast carcinoma in a sentinel node. In the lower right corner normal lymphocytes can be seen.

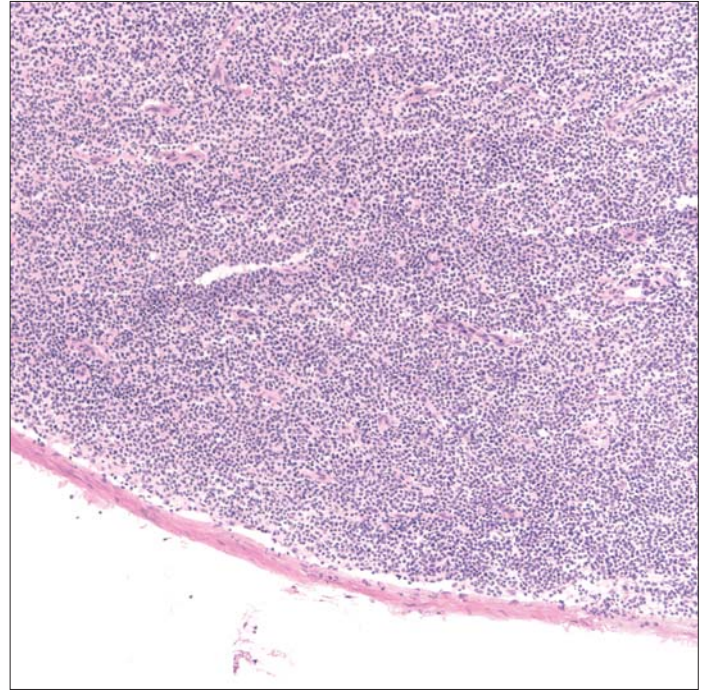


Fig. 2: Normal lymphnode with no metastatic growth. The capsule of the node is well preserved, which is important for the possibilities to detect metastasis, which often starts in the sub-capsular area.

Your Opinion is Valuable!



Dear Reader,

Which article in this edition of reSOLUTION did you like best? Which topic would you like to learn more about in forthcoming editions? As a reward for your feedback we will send you this practical travel adapter plus a surprise gift!

Please post your comments (including your address) by September 30, 2009 to:

www.leica-microsystems.com/EU-PandD

Keyword: Digital Resolution

Beware of Pixel Mania

Urs Schmid, Leica Microsystems

Photokina – Every two years the latest digital cameras are presented at the biggest international exhibition of photography and imaging, as manufacturers race to outdo each other with ever-increasing numbers of megapixels. The world record for professional medium format digital cameras has now surpassed 60 megapixels per shot using a very large and expensive sensor with a resolution of about 9000 x 6700 pixels. Each time you capture such an image you get about 180 MB of uncompressed data and even more if you switch to 16-bit per colour for full dynamic range.

The choice of camera type depends on your application

Digital photography has been in the clutches of pixel mania for years now – and there is no end in sight. In microscopic applications, however, the camera with the most pixels is not necessarily the best one. The application and optical power of the microscope are the factors determining which camera will ultimately produce the best imaging results. The key criterion for microscopic resolution is the numerical aperture (NA), i.e. the light-gathering power of an optical system.

Ten-metre thick microscopes?

The light-gathering power of cameras or telescopes can be increased by using larger lenses with more diameter. The world record is held by the new 10.4 metre diameter mirror at the astronomy observatory in Las Palmas, Spain. However, this is not possible with microscopic lenses. You can increase the light gathering power effectively by interposing a medium with a high refraction index between lens and specimen, but in general the NA of a good dry lens is limited to about 1.0 and a good immersion oil lens to about 1.45. The NA for stereo microscopes



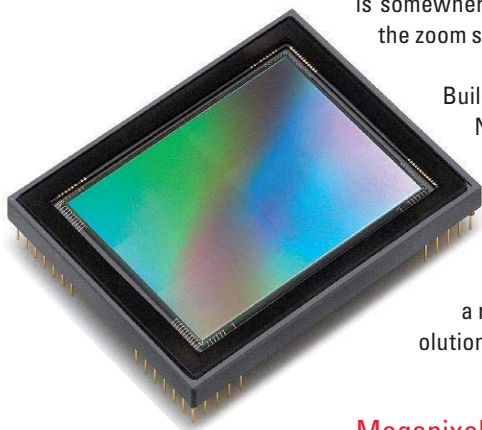


Fig. 1: CCD Sensor for digital microscope cameras

is somewhere between 0.01 and 0.2 depending on the zoom setting.

Building stereo objectives with even higher NA is extremely difficult as you have to stay within the 24 mm stereo base to avoid altering the geometry of the stereoscopic system. With innovative FusionOptics™, however, Leica Microsystems succeeded in setting a new world record for stereoscopic resolution and depth of field.

Megapixels versus magnification

Applying the formula of $3000 \times NA$ you can easily calculate how many pixels are actually available at the sensor of the camera taking into account the actual magnification and the sensor size. At low magnification, the microscope is usually able to deliver more details to the camera than it can capture. At high magnification however, it is the optical system that limits the amount of detail that a camera can capture. At 1x magnification the instrument delivers about 14.3 megapixels of information to the camera, while at 16x this figure drops to 2.6 megapixels.

How do you explain this apparently inverse effect? It has to do with the limited field of view. At high magnification or zoom settings, the field of view is relatively small. Looking at the round and bright circle

on your specimen when using coaxial illumination clearly indicates that the higher you magnify, the smaller the bright spot becomes. You can resolve more details when you zoom into a detail or switch to a lens with higher NA.

Enhancing your camera

If you work mostly at very high magnifications, the optical system is limited to about 3 – 5 megapixels that can be transferred to the sensor of a camera. Setting the camera to a high resolution of, say, 12 megapixels would produce a larger image, but you would not gain any additional information. If you use the microscope at low magnification on the other hand, then you definitely need a high resolution digital camera to capture all the details that your microscope can deliver – even such details in your specimen that you cannot see with the naked eye at that magnification.

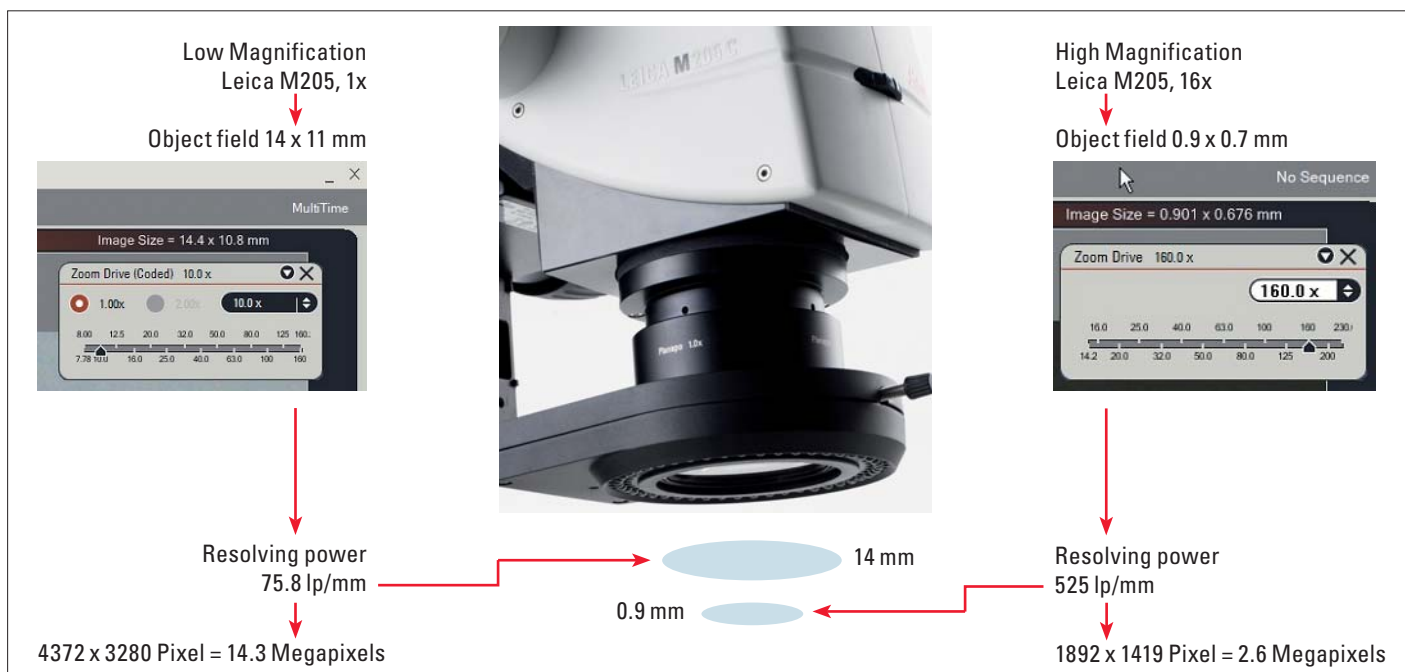


Fig. 2: Resolving power at low/high magnification

New Leading-edge Laser Microdissection Systems

Perfection of Dissection

Kerstin Pingel, Leica Microsystems

Laser microdissection (LMD) allows pathologists to selectively and routinely analyse microscopic regions of interest down to single cells. Applying this technique, they obtain results that are reproducible and specific. For laser microdissection, a microscope is used to visualise small structures. The individual cells or cell clusters are subsequently selected using software, excised from the surrounding tissue by a laser, and released into a collection device for analysis.

Leica Microsystems is a driving force of LMD instrumentation technology. For the first time, high laser power and high laser repetition rates are combined within one instrument – the Leica LMD7000 system. The laser's high pulse repetition rate is ideal for the fast excision of regions of interest from thin and soft samples. Additionally, high laser power allows the dissection of thick and hard specimens. Both, laser repetition rate and power, can be adjusted to the sample.

The Leica LMD7000 as well as the Leica LMD6500 laser microdissection systems use gravity for specimen collection. The dissected material, independent of its size or shape, is collected in a contact-free, contamination-free manner for further analysis. No additional procedures are necessary for collection. The laser beam movement of the Leica LMD system

is controlled by high precision optics, whereas the microscope stage and the sample are both fixed. This allows high cutting speed at low magnifications as well as precise cutting accuracy at high magnifications, which is a prerequisite to obtain homogeneous material for downstream analysis and reliable results.

The Leica LMD7000 and Leica LMD6500 laser microdissection systems are the ideal instruments for dissecting live cells, single cells, and specific cell clusters for biomarker research, molecular pathology, and many more applications.

- Specimen collection by gravity – contact-free and contamination-free
- Movement of the laser beam via optics – for the highest possible precision and cutting speed
- Integration of a flexible, adjustable laser – for the highest feasible power and thinnest cutting lines at the same time



Fig. 1: The full two-screen support of the Leica Microsystems LMD software offers new possibilities, such as a horizontal pen-screen for drawing, and a second vertical screen for viewing with all the necessary controls.

Fig. 2: Section of muscle (human) following dual histochemistry for cytochrome c oxidase (COX) and succinate dehydrogenase, both mitochondrial enzymes. The blue muscle fibre is deficient in COX. Courtesy of Dr. G. Borthwick, Institute of Human Genetics, University of Newcastle.

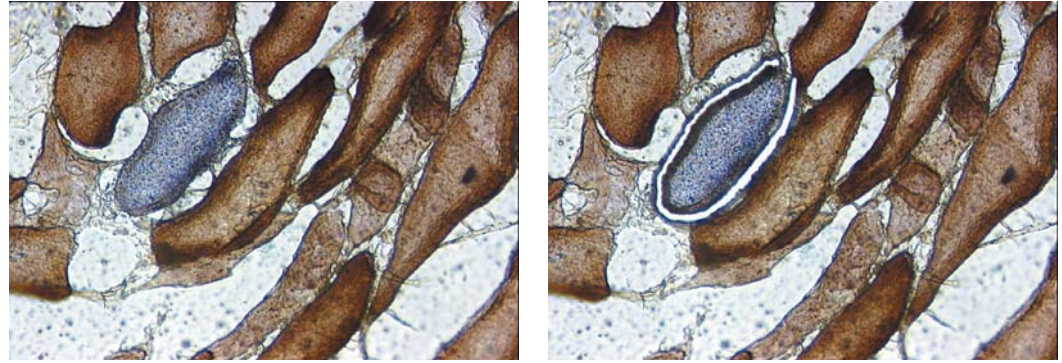
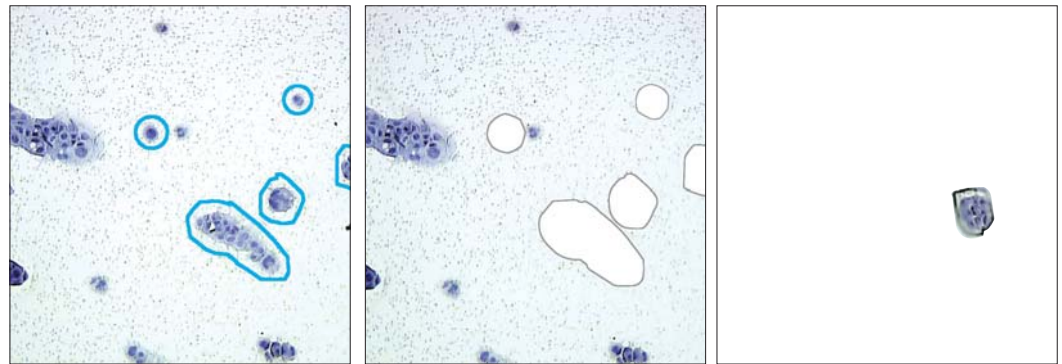
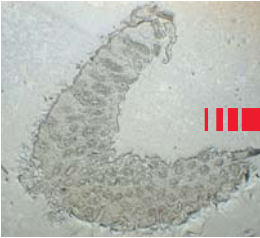



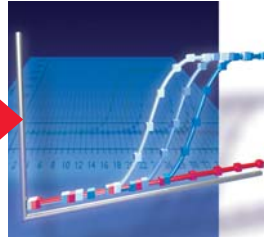


Fig. 3: Primary cell culture from pancreatic adenocarcinoma (PDAC) stained with hematoxylin, objective 10x (before cutting, after cutting and inspection). Courtesy of N. Funel, Department of Oncology, University of Pisa, Italy.



Specimen Preparation	Staining	Microdissection	Extraction	Analysis
 <p>Section and prepare biological specimens</p> <p>For example:</p> <ul style="list-style-type: none"> - Histological specimens (formalin-fixed/paraffin-embedded or cryo sections) - Live cells and cell cultures - Chromosome spreads - Smears - Cytospins - Plant material - Sperm and other forensic preparations 	 <p>Visualize regions of interest</p> <p>For brightfield, with for example:</p> <ul style="list-style-type: none"> - HE (hematoxylin-eosin) - Cresyl violet - Toluidin blue - Thionin - Immunohistochemistry <p>For fluorescence, with for example:</p> <ul style="list-style-type: none"> - Secondary antibodies - Acridine-orange - FISH 	 <p>Selectively dissect regions of interest</p> <ul style="list-style-type: none"> - Contact-free - Contamination-free - Any size from cell compartments of a few μm^2 to 4.5 mm^2 - Any shape - Up to a thickness of 300 μm and more 	 <p>Extract and prepare molecules that are important for specific research</p> <p>For example:</p> <ul style="list-style-type: none"> - DNA - RNA - Proteins - Metabolites - Biomarkers 	 <p>Obtain relevant, reproducible, and specific results</p> <p>For example:</p> <ul style="list-style-type: none"> - PCR - Quantitative real-time PCR - Microarrays - Expression profiling - Genetic fingerprinting - LOH - FISH - LC-MS/MS - 2-D PAGE - SELDI - MALDI

Leica SFL100

LED Illumination for Fluorescence Microscopy

The age of expensive mercury burners, which were awkward to centre and always failed at the wrong moment, is finally over. Also the compromises that had to be made in image quality. To boost the efficiency of fluorescence microscopy in pathology, cytology, microbiology and many other fields, there is a new solution developed by Leica Microsystems: Leica SFL100. This compact and attractively priced fluorescence illumination makes light work of FITC applications as used in immunohistochemistry, for example.

The new LED illumination system offers superlative image quality for fluorescence applications while being maintenance-free, compact and easy to operate. It also saves valuable microscopy time.

Optimised FITC applications

For applications requiring one fluorochrome only, the Leica SFL100 is the solution. In pathology, cytology, microbiology

and immunohistochemistry, where fluorescein is normally used, this ultra compact and user-friendly LED illumination with its excitation wavelength of 470 nm is ideal. Other wavelengths are available on request. The illumination unit works without a ballast, can be easily connected to e.g. Leica DM1000–3000 microscopes equipped for fluorescence, requires no centering and is extremely easy to use – just switch on and work. Thanks to its long life, lamp change is not an issue. The Leica SFL100 is also an attractive alternative to traditional illumination systems in terms of acquisition cost.



Fig. 1: Small but powerful: modern LED illumination for transmitted light and fluorescence with Leica SFL100 and Leica DM1000 LED.

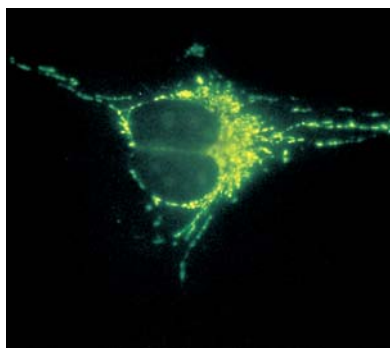


Fig. 2: Leica SFL100 provides brilliant fluorescence against a perfectly dark background.

Leica SFL100 at a glance

- Genuine incident light fluorescence with adjustable light intensity for optimum image quality
- 470 nm excitation, ideal for all FITC applications (other excitation wavelengths on request)
- LED lifetime of 10,000 hours, i.e. no need for lamp change, practically maintenance-free and hardly any follow-up costs
- Minimum footprint due to compact design without a ballast – more room in the lab
- Smart and easy operation, no centration, just switch on and work – saves valuable time
- No need to wait after switching off, switch on and off whenever necessary

Leica DM750

Science Teaching Made Easy

To enable students of medicine, and biology, as well as junior health care professionals to be effectively prepared for the tasks that lie ahead of them, Leica Microsystems has developed a microscope specifically for use in practical science teaching. With its excellent optical performance and user-friendly features, the Leica DM750 not only supports educational applications in laboratories and universities, but is also an attractively priced alternative for small, low-budget laboratories.

Replacing the long successful Leica DM E, the Leica DM750 is based on the same optic platform as the one used for Leica Microsystems' high-end microscopes. Besides its convincing optical performance, it is compatible with many accessories of the DM series. When equipped with high-quality optic components such as the new 100x dry objective (NA = 0.8) from the proven HI PLAN series for high resolution without immersion oil, the microscope has wide application potential. Weight-optimised focus knobs, the large selection of viewing tubes and the new specimen holder that can be operated with one hand and also protects the specimen slide, ensure a high level of user convenience.

Safe, economical and flexible

For shared observation, a freely rotating viewing tube is available, or Leica multi-viewing systems with up to a maximum of five viewing stations can be adapted to the Leica DM750. Cool white light is provided by the longlife energy-saving LED illumination, which switches off automatically after two hours of not being used. The microscope is easy to carry due to its integrated grip. The special shape of the stand, the integrated cord wrap and non-wearing surface of the stage protect the microscope from damage. But safety does not stop with the design: A special treatment inhibits the growth of bacteria on the surface of the microscope.

Easy documentation

The broad range of imaging solutions, including the Leica ICC50 digital camera module, provides a full choice of image capturing and archiving options. Adapted between the viewing tube and the microscope stand, this new three megapixel camera delivers fast, high-resolution live images. Photomicrographs can be saved directly on an SD memory card. There is also an analog and a USB port for direct connection of a monitor or a computer. Naturally, the innovative Leica ICC50 camera module is also compatible with the other microscopes in the Leica DM series, e.g. Leica DM1000–3000.



Fig. 1: Equipped with high-quality optic components, the Leica DM750 has wide application potential.



Fig. 2: Adapted between tube and stand, the Leica ICC50 digital camera module delivers fast, high-resolution live images.

Paraplast™ – The Superior Infiltration Media

Completed Product Range

With the acquisition of Coretech Holdings and McCormick Scientific, based in St. Louis, Missouri, USA, Leica Microsystems has expanded its leading position in histopathology. Strong brands including Paraplast™ embedding media and TurbOflow II™ histology cassettes now complete the broad histology product range. For years, Paraplast™ has been the benchmark tissue embedding medium in histology, known for its purity and enhanced polymers, and superior sectioning ability.

The three varieties of Paraplast™ – Paraplast, Paraplast Plus and Paraplast X-TRA – meet the needs of the histologist to infiltrate, embed and section tissues of a wide range of infiltration and cutting characteristics. All Paraplast tissue embedding media are made of a combination of highly purified wax and several plastic polymers of greater tensile strength and elasticity. This results in greater compressibility – without crumbling – during sectioning, rapid infiltration and thinner sections which flatten in a thermostatically controlled water bath.

Paraplast – for routine use

Paraplast is the ideal medium for general tissue embedding. Its refined mixture of highly purified paraffin contains plastic polymers of regulated molecular weights that provides better tissue infiltration and superior quality sections. Paraplast greatly minimises tissue compression due to sectioning, gives brittle, difficult to cut tissues – such as fibroid tumours, blood-engorged tissues, thrombi, decalcified bone and cartilage – an innate elasticity which will produce excellent, wrinkle-free sections. Clearing is complete and without stainable residue.

Paraplast Plus – for large tissue

For large tissues or tissues which normally present infiltration problems Paraplast Plus is the embedding medium of choice. Its controlled mixture of highly purified paraffin contains plastic polymers of regulated molecular weights and a small percentage of dimethyl sulphoxide (DMSO) for faster tissue penetration. Of course, Paraplast Plus offers the same benefits for tissue embedding as Paraplast.

Paraplast X-TRA – ideal at low temperature

Paraplast X-TRA is developed especially for lower temperature infiltration preventing tissue distortion. It consists of a unique blend of low molecular weight polymers and highly purified paraffins for exceptional compression resistance and ribbon continuity. Low viscosity permits complete infiltration of dense tissue. Cut sections are free of distortion and morphology is preserved.



Paraplast tissue embedding media are made of a combination of highly purified wax and several plastic polymers of greater tensile strength and elasticity.

Leica Microsystems Reports Record Sales for 2008

Strategic Acquisitions and Organic Growth

Dr. Kirstin Henze, Leica Microsystems

For the first time in its history, Leica Microsystems' annual sales volume for 2008 exceeded the billion US dollar mark. "Over the last two years, we have seen a dramatic increase in the demand for our products throughout the world. In most of the markets in which we operate – including biomedical research, clinical applications, industry, microsurgery, and histopathology – we have achieved double-digit organic growth rates. Moreover, we have substantially expanded our product breadth through a number of strategic company acquisitions," comments Dr. David Martyr, President of Leica Microsystems.

Numerous company acquisitions expand product range and benefit customers

Leica Microsystems was purchased by Washington D.C.-based Danaher Corporation (NYSE: DHR) in the summer of 2005. Since that time, Leica Microsys-

tems has acquired and integrated eight companies in Australia, Europe, the US, and Asia. With these acquisitions, Leica Microsystems has significantly broadened its product offering and now provides one of the most comprehensive ranges of microscopy and histopathology products on the market. Leica Microsystems' histology offering now includes consumables for use with its instruments. This allows histology customers to obtain all needed products from a single source. "I'm pleased to say that we've not only expanded our product portfolio through strategic acquisitions, but we have also gained significant market share as a result of innovation within our existing segments," says Martyr.

Innovative strength drives organic growth

An important pillar of the success of Leica Microsystems, according to Martyr, is its innovative strength. In 2008 alone, the Life Science, Biosystems, Industry and Surgical Divisions launched over 50 new, and in some cases, breakthrough products. As a result of its recent product launches, Leica Microsystems is now at the cutting edge of technology. Examples of innovation in life science include the super high-resolution STED technology, the macro confocal Leica TCS LSI, and stereomicroscopes with FusionOptics™.

Leica Microsystems is owner of the Leica brand

Leica Microsystems owns the rights to the Leica name and the Leica brand and controls its use through licensing agreements. Leica Microsystems, Leica Geosystems, and Leica Camera are financially, legally, and operatively independent companies, operate in different markets, and belong to different owners.



Dr. David Martyr,
President of Leica Microsystems

Events

Please also visit our website on www.leica-microsystems.com for further information on Pathology & Diagnostic events in Europe.

Congreso de la SEAP + SEC
May 20 – 23
Sevilla, Spain
www.seapcongresos.com/

GI Cancer Forum
May 21
Cambridge, UK

ADH – Annual Meeting
May 21 – 24
Friedrichshafen, Germany
www.derma.de/adh/html/veranstaltungen.html

Colloque de la Société des Neurosciences
May 26 – 29
Bordeaux, France
www.neurosciences.asso.fr/Activites/colloques/sn09/indexEN.html

Arbeitskreis Diagnostische Veterinärpathologie
May 28 – 30
Erbenhausen, Germany

Scottish Association of Histotechnology
May 29
Glasgow, UK
www.saht.org.uk/

ISCOMS
June 2 – 5
Groningen, The Netherlands
www.iscoms.nl/

Jahrestagung DGP
June 4 – 7
Freiburg/Breisgau, Germany
www99.mh-hannover.de/institute/pathologie/dgp/Z_Tagung_DGP.html

Congresso della Società Italiana di Istochimica
June 8 – 10
Rome, Italy
www.istochimica2009.org/

Surgical Pathology Update
June 11 – 13
Leipzig, Germany
www.conventus.de/spu2009/

Association Française d'Histotechnologie
June 18 – 19
Nice, France
www.inra.fr/internet/Hebergement/AFH/

ESHRE
June 28 – July 1
Amsterdam, The Netherlands
www.eshre.com/

Pathological Society
June 30 – July 3
Path Soc Summer Meeting 2009
Mercure Holland House Hotel,
Cardiff, UK
www.path.org.uk/

UK NEQAS Meeting
July 1
Cardiff, UK
www.ukneqasicc.ucl.ac.uk/meetings_July.shtml

The 19th Nordic Fertility Society Conference
August 5 – 8
Nyborg, Denmark
www.nordicfs.org

European Congress of Pathology and National Congress Siapec
September 4 – 9
Florence, Italy
www.ecp2009.com

Congreso Bienal de la SENC
September 5 – 9
Valencia, Spain
www.senc2009.com

Deutsche Gesellschaft für Neuropathologie – Annual Meeting
September 16 – 19
Düsseldorf, Germany
www.dgmn.de/de/index.php

European Cytology Congress
September 27 – 30
Lisbon, Portugal
www.cytologylisboa2009.com/

IBMS Congress
September 28 – 30
International Conference Centre,
Birmingham
www.ibmscongress.com/

Leica for Science – 2nd Nordic Confocal & Fluorescence Meeting
October 20 – 22
Sigtuna, Sweden

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Leica Microsystems

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Living up to Life

Leica
MICROSYSTEMS