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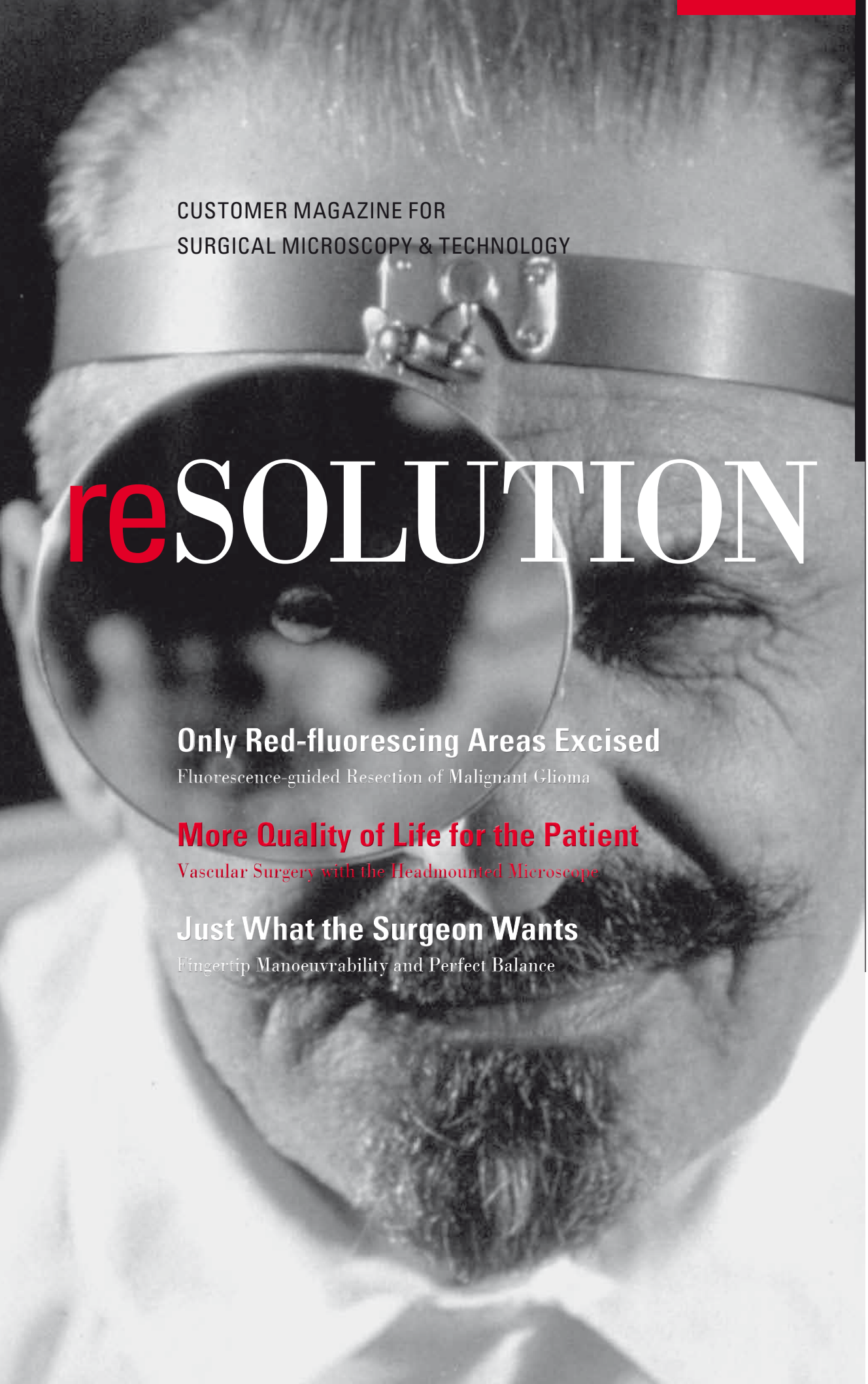

Only Red-fluorescing Areas Excised

Fluorescence-guided Resection of Malignant Glioma

More Quality of Life for the Patient

Vascular Surgery with the Headmounted Microscope

Just What the Surgeon Wants

Fingertip Manoeuvrability and Perfect Balance

EDITORIAL

Dear Readers,

We are proud to present the first issue of reSOLUTION for Surgical Microscopy & Technology. The aim of this magazine is to provide a balanced mix of information from the world of microscopic technology combined with users' experiences in their daily working environment.

In this edition you will find application reports on the headmounted microscope and fluorescence-guided brain tumour resection. Both techniques can contribute to more quality of life for the patient.

We also want to give you an understanding of the evolution of microscopy. After a hundred and fifty years of being built only of glass & brass, our microscopes are now developing into new designs with integrated electronics and software that help you to be part of the network and give you a new degree of freedom. It is interesting to see how quickly these ideas have been picked up in the different countries, and how each individual uses the new opportunities to improve his or her daily work.

We also report on a completely different application of a surgical microscope you are familiar with: in the restoration of works of art. In fact, our surgical microscopes are used in quite a lot of places for micro-inspection of large paintings or sculptures.

We hope you enjoy this first edition and are looking forward to your feedback, which will be useful for improving our next issue due in the autumn.

Have fun reading!

Anja Schué
Corporate Communications

Angel Viosques
Marketing Manager Surgical Europe

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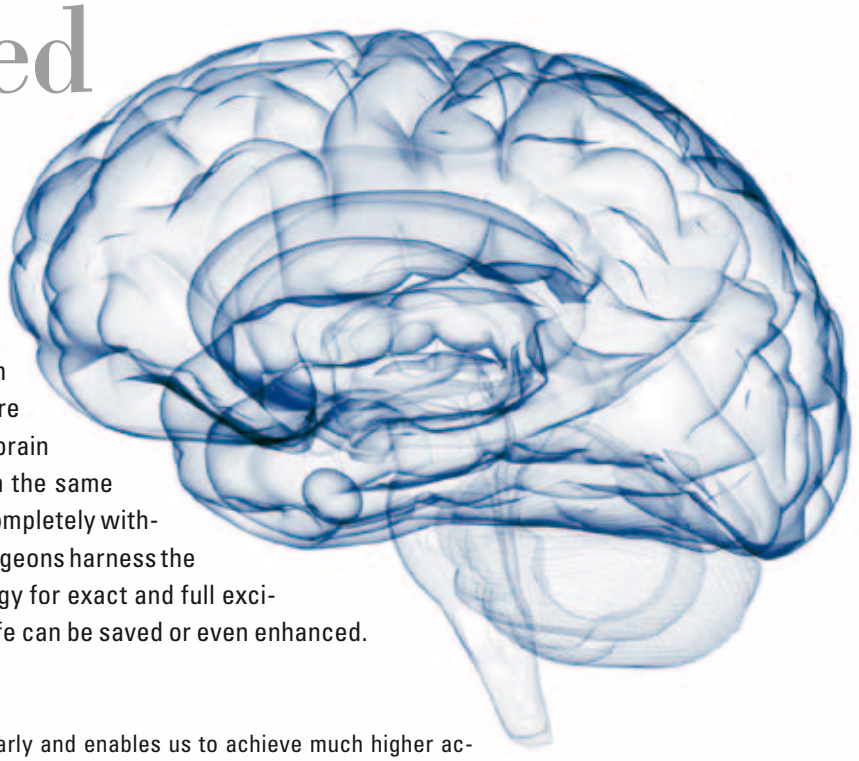
Cover picture: Photo from 1936 ca., Doctor with an observation lens. Courtesy of Balocchi Vincenzo Fratelli Alinari Museum of the History of Photography-Balocchi Archive, Florence, Italy.

Fluorescence-guided Resection of Malignant Glioma

Only Red-fluorescing Areas Excised

Anja Schué, Leica Microsystems



When William Shakespeare has Prince Henry say the words "... and his pure brain, which some suppose the soul's frail dwelling-house..." in his play "King John", he is expressing a mediaeval notion that we still find fascinating today, for instance when we see how brain disease can alter a person's nature or when brain surgery is necessary. For resection of brain tumours in particular, neurosurgeons are faced with the same dilemma time and again: how to remove the tumour completely without destroying neurological functions. Nowadays, surgeons harness the possibilities of intraoperative fluorescence technology for exact and full excision of tumour tissue so that the patient's quality of life can be saved or even enhanced.

Today, the issue of whether a brain tumour can be operated on is more a question of whether the operation makes medical sense, as every tumour localisation is possible with modern surgical techniques. One example is neuronavigation, a technique similar to GPS, which substantially improves not only the planning of the operation, but also intraoperative orientation. For malignant glioma, which are among the most common types of brain tumour, accounting for 30 per cent of all cases, and are 100 per cent fatal, exact localisation is not the only challenge, however.

No scope for resection errors

"Malignant glioma exhibit characteristic infiltrative proliferation and even under a powerful surgical microscope the tumour perimeters are hard to differentiate from healthy tissue. In brain surgery we can't remove a bit of extra tissue to be on the safe side because that tissue is always functional," explains Dr. med. Carsten Schoof, Senior Consultant of the Neurosurgical Department of the Carl-Thiem hospital in Cottbus, Germany. "Since the beginning of 2008 we have been using a new fluorescence technique that shows up tumour cells extremely clearly and enables us to achieve much higher accuracy with tumour resection."

Well-tolerated 5-ALA labels tumour cells

Brain tumours like glioma are able to accumulate a substance called 5-aminolevulinic acid (5-ALA) and transform it into the strongly fluorescing protoporphyrin IX (PPIX). Three hours before the operation, patients drink a solution containing 20 mg of 5-ALA per kilogram bodyweight. The solution tastes rather sour, but is well tolerated and causes practically no side effects, because 5-ALA occurs naturally in the body as a precursor of the haem. The PPIX is made to fluoresce under blue-violet light, enabling the surgeon to clearly identify and safely remove the otherwise hard to spot tumour perimeters and any tumour residue remaining after resection of necrotic tissue and the solid tumour.

Fluorescence at a keystroke

To perform fluorescence-guide tumour resection, surgeons need a microscope that is equipped with a special light source and appropriate filters. Dr. Schoof

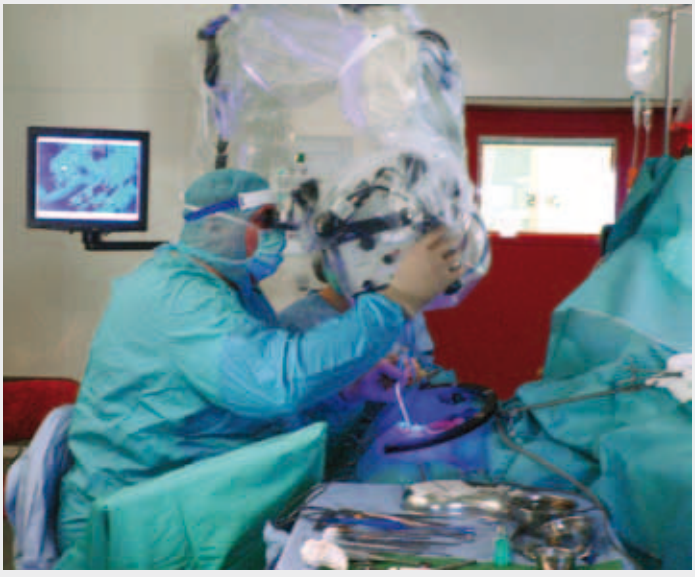
Dr. med. Carsten Schoof, Senior Consultant of the Neurosurgical Department of the Carl-Thiem hospital in Cottbus, Germany has already operated on over 40 brain tumour patients with the 5-ALA fluorescence method.

uses a Leica surgical microscope configured with the Leica FL400 Fluorescence Module. He can switch between white light and fluorescence mode during the operation simply by pressing a key. "Fluorescence-guided surgery is easy to learn, not requiring any changes to the surgeon's familiar routine. We have meanwhile operated on over 40 brain tumour patients with the fluorescence-guided 5-ALA method and are highly satisfied with the surgical results," says Dr. Schoof. "Whereas I used to ask myself 'Where should I stop cutting?' I now know that I've done a good resection when I have removed everything that fluoresces red."

Studies prove longer survival rates

Large-scale studies conducted between 2004 and 2006 have shown that the fluorescence-guided 5-ALA method yields better results than conventional resection. Patients treated with this method were relapse-free for comparatively longer and lived longer. The 5-ALA drug Gliolan has been officially approved since the beginning of 2008.

Reference
Stummer, W., Pichlmeier, U., Meinel, T., Wiestler, O.D., Zanella, F., Reulen, H.J.: Fluorescence-guided surgery with 5-aminolevulinic acid for resection of malignant glioma: a randomised controlled multicentre phase III trial, Lancet Oncology 2006 May; 7(5):392-401



Under blue-violet light, the surgeon can clearly identify and safely remove the tumour cells labelled with 5-ALA during surgery. Under normal white light, the tumour perimeters and any remaining tumour residue are hard to spot after resection of necrotic tissue and the solid tumour.

The Leica M525 OH4 with the integrated Leica FL400 5-ALA fluorescence module offers the lightest movement and highest quality optics of any surgical microscope. The two illumination systems, the observation filters and an optional blue mode optimised video camera interact automatically with a simple push on a button found on the pistol grip or foot pedal of the surgical microscope. This offers perfect bright blue illumination and easy and ergonomic change of the observation modes.

Leica FL400 Fluorescence Module

For precise and safe judgement of the situation under the microscope, the two most decisive factors are the experience of the surgeon and the high quality optics. In addition to the usual visible white light image, the Leica FL400 module provides the surgeon with information from optimised fluorescence procedures, not visible for the human eye.

This Photodynamic Imaging (PDI) is the combination of a tumour selective photosensitiser, excitation light of an appropriate wavelength and a well adjusted observation spectrum. Perfect filters and optimised optics allow good orientation in the resection area. The vital tumour shines with red sensitiser fluorescence in good contrast to normal tissue under blue light illumination.

To flip from white light to fluorescence mode and vice versa requires only a click of a button on the handle or foot pedal. The type of illumination, the observation filters for different fluorescence applications and an optional mode controlled video camera specifically aligned for fluorescence are controlled automatically via the Leica CAN bus. The resection can be performed not only in the white light mode but also in the blue light mode. The latter, however, requires sufficient brightness in order to resect the last residuals of the tumour which always appear red or pink in colour.

An appropriate microscope to facilitate working with fluorescence is needed but this represents a one-off investment, which at any rate is still more affordable than equipment required for an intra-operative MRI. To use blue light fluorescence on e.g. the Leica M525 OH4 the microscope can be easily upgraded with the Leica FL400 module.

Note: 5-ALA is not approved in the USA, Japan and some other countries. Please check the status of approval with your local Leica representative.

Vascular Surgery with the Headmounted Microscope

More Quality of Life for the Patient

Dr. Maria Lehrl, Leica Microsystems

The Dean of Paracelsus Medical University in Salzburg and long-standing President of the Austrian Society for Vascular Surgery enjoys an excellent reputation as a vascular surgeon among Austrian and European experts and headed Austria's largest vascular surgery department for many years. As Medical Director of University Hospital in Salzburg, Austria, Univ. Professor Heinrich Magometschnigg now bears cross-departmental responsibility for the quality of treatment in one of the country's leading hospitals.

Univ. Professor Heinrich Magometschnigg, Medical Director of University Hospital in Salzburg, Austria

Professor Magometschnigg, why is the Leica HM500 especially useful for vascular surgery?

My highly esteemed teacher, Professor Deutsch, always said to me: "You can only operate on what you can see – and you never see enough." This is the reason why visual aids have become important companions in my career. I can't imagine operating without them. Consequently, the headmounted microscope has replaced all my surgical loupes, as it is a real help in every single phase of surgery: Already when making the skin incision I can see exactly whether I'm making a straight cut or applying the scalpel at an angle, which leads to wound healing disorders or ugly scars.

How would you describe the contribution of the headmounted microscope for parts of surgery?

A good view is essential for all phases of surgery: if nerves in subcutaneous tissue are damaged, there will be postoperative sensory disturbances. In particular, damage to the small arteries and veins of the subcutis in tissue where blood circulation is disturbed, such as in the case of the diabetic foot, often causes extremely stubborn wound healing disorders and ulceration. Furthermore, the dissection of larger lymphatic vessels can lead to lymph fistulas or serious oedemas. The worst case is to damage nerves along the motoric pathway, because this might result in paralysis.

Then there are the difficult, i.e. dangerous recurrence operations where the tissue and nerves requiring surgery are enclosed by scar formation. Without visual aids it is impossible to distinguish properly between nerves and scars. Using the headmounted microscope, however, I get a clear overview of all the structures. For the most important part of the operation, the anastomosis, I can sew the vascular stitches extremely close together to prevent bleeding and postoperative haematomata.

The Leica HM500 enables the surgeon to move his head. What effect does that have on the operation?

The fact that I can move my head with the Leica HM500 means that even the tiniest "errors" – such as the inversion of the vascular wall or the bypass vein – show up clearly and can be immediately and easily remedied. Otherwise, these structures cause thrombosis and may block the bypass. Incidentally, early blockages, i.e. the ones that occur within a few days after surgery, are almost always attributable to technical errors – a further argument in favour of the Leica HM500.

What are the main differences between a surgical loupe and the headmounted microscope for your work?

Different operations require different tools with different magnifications and working distances. In vascular surgery, some of our work is done on the surface, for instance accessing inguinal vessels or the peripheral bypass. On the other hand, we also work in deeper cavities in the body, such as in aorta surgery, for which a long working distance is required. Another important requirement is the degree of magnification. I have to switch quickly between overview and high resolution, which is no problem with the Leica HM500.

With the headmounted microscope I can choose the working distance to suit the operation, which isn't possible with a surgical loupe. The headmounted microscope also offers a lot more flexibility and mobility. I can bend my head to look at a vessel from all sides, even from the inside, which is sometimes impossible with a loupe. As well as this, you often have to move round to the other side of the patient during the operation. I wouldn't have this flexibility with a microscope.

"I can bend my head to look at a vessel from all sides, even from the inside."

How does the Leica HM500 contribute in the patient's quality of life?

The most important result of an operation is the impact on the patient's quality of life. The Leica HM500 delivers substantially better surgical results in this respect. For example, the rates of openness for peripheral bypass operations are higher. And there is less damage to nerves and other vessels when the headmounted microscope is used instead of a loupe.

Your colleagues have told us that you always take your Leica HM500 with you if called to an emergency in another department ...

If I am called upon to support a colleague in an emergency, it's usually a severely damaged artery or vein which is bleeding heavily. This really is an emergency, and I can't afford to do anything wrong. The headmounted microscope gives me a safe feeling when performing surgery and I would never leave it at home.

"The switchover really is worthwhile in terms of the quality of the surgical result."

What was it like for you to switch over to the headmounted microscope?

At the beginning I had problems and had to get used to wearing something on my head during the operation. This phase lasted about three to four weeks. During this time I had to adapt my motoric skills and the way I handled the instruments to the new visual perception. It meant a total change to the way I operate. But it's really worthwhile in terms of the quality of the surgical result. Now I've become accustomed to it, it only takes me two minutes to put on the Leica HM500 and be ready to operate.

Freedom Combined with Outstanding Vision

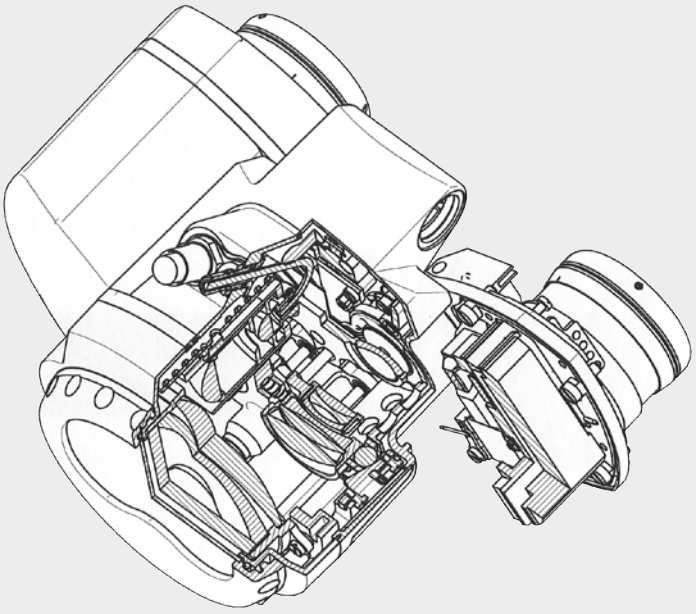
Leica HM500 – The World's First Headmounted Microscope

The human eye is a highly developed organ. It can focus close up or at great distance, and in a fraction of a second it can adjust its focus to a different object. Together, a pair of eyes provide three-dimensional images and automatically correct aberrations along the optical axis.

In the world of microcosm however, the eye requires assistance. While loupes, glasses, binoculars and microscopes can provide magnification, they do not have the flexible properties of the human eye. Headmounted microscopy combines it all: the continuously variable magnification of a high-end microscope, change of field of view and focus like a camera, the automatic parallax correction of the eye, and the ease-of-use of a pair of glasses.

The Leica HM500 headmounted microscope is worn like a pair of glasses and serves as a fast, flexible, and easily adjusted microscope. It permits complete freedom of movement while offering variable magnification and a sharp, crystal-clear 3D image. The microscope is equipped with the very best precision technology. Coaxial light allows completely shadow-free illumination of the operating field. The precise footswitch controlled, stepless optical zoom allows an infinitely variable selection of magnification factors between 2.0 and 9.0.

"For the maxillofacial approach, the Leica HM500 offers a clear advantage over the traditional microscope in positioning and angle of light," states Dr. Roberto Pareschi, MD in the ENT Department of the Legano Hospital in Milan, Italy. Other fields in which the revolutionary technique of the Leica HM500 has become essential are vascular, cardio, plastic, paediatric, orthopaedic, urology and spine surgery.



Dr. Roberto Pareschi, MD in the ENT Department of the Legano Hospital in Milan, Italy uses the headmounted microscope for the maxillofacial approach.

Trends in Cataract Surgery

Seeing Without a Haze

Anja Schué, Leica Microsystems

Cataract surgery has been practised for centuries and is one of the most common operations performed worldwide today. Ultra modern surgical techniques with tiny incisions and high-quality prosthetic lenses make the operation extremely safe and yield excellent results. Nevertheless, cataract surgery is being perfected all the time. Antoine P. Brézin, Professor of Ophthalmology at René Descartes Université Paris V and Head of Ophthalmology at Cochin Hospital, Assistance Publique – Hôpitaux de Paris, is a specialist in cataract surgery and trains future eye surgeons.

Prof. Brézin, what were the most important innovations in cataract surgery in the last few years?

The most important innovation of the last 25 years was phacoemulsification. With this technique, an incision is made in the cornea and the lens capsule is opened before the lens is broken up (emulsified) into tiny pieces with an ultrasonic probe and then suctioned off. The back of the capsule is preserved and the prosthetic intraocular lens is implanted into it. As eye incisions only have to be a few millimetres in size with this technique, phacoemulsification has improved the safety of this operation and substantially reduced rehabilitation time. It is the standard method used today all over the world, except in some developing countries.

20 years ago, the first foldable intraocular lenses appeared on the market. As long as the prosthetic lenses were rigid, the corneal incision had to be as large as the size of the prosthetic lens, i.e. at least six millimetres. With the advent of new foldable materials such as acrylic and silicone, the incision only had to be as large as necessary for phacoemulsification, i.e. 3 mm or less.

Since then, there has been fierce competition in the industry to minimise the incision size required for phacoemulsification and to produce lenses that can be implanted through smaller and smaller openings. The necessary incision length has thus been reduced to 2.3 to 2.4 mm. Today there are even phaco probes that work through a 1.8 mm opening. At the moment, there is a lot of discussion on whether quality is being sacrificed with these extremely folded lenses. But there is an unmistakable trend towards procedures through mini incisions, also called MICS (MicroIncision Cataract Surgery).

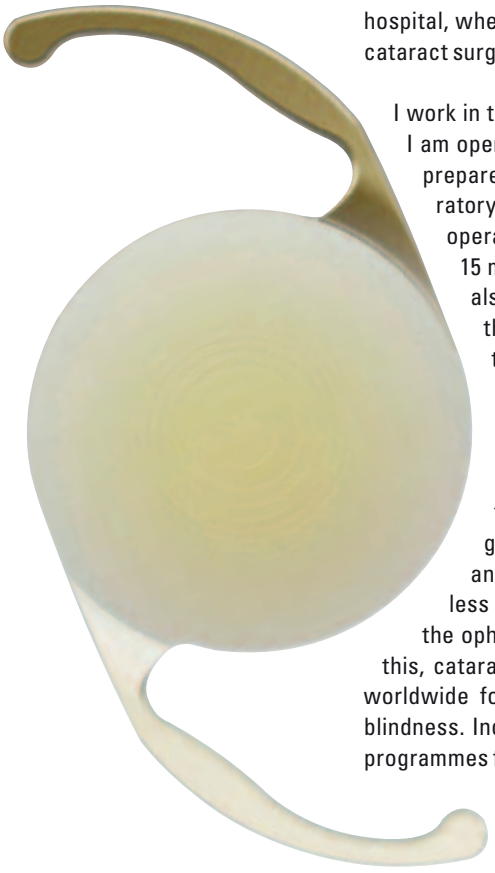
What progress is being made in the development of new lenses?

We used to only have monofocal lenses, with which the patient could either see close up or long-distance and additionally needed glasses to correct his vision. Then, industry developed multifocal lenses, although they cannot really make up for the missing accommodation. They sharply focus both a close-up and a distant image on the retina, and the eye then chooses the right image. However, this may be at the expense of contrast sensitivity, and this type of lens is not suitable for every patient.

A totally new approach is accommodating lenses. New materials and designs are developed to enable the lens in the eye to actively focus . These lenses could take advantage of the fact that the ciliary muscle responsible for accommodation often still functions in very elderly patients. With lenses such as these we could fully restore patients' eyesight. A great deal of research is being done in this direction, but the products have not achieved sufficiently satisfying results yet.

How many cataract operations do you perform and how long does the operation take?

I did twelve operations yesterday. In a year, I do about 500 – which is not a particularly large number in comparison with colleagues doing surgery full time, who do up to a thousand. I also work in a university



Modern intraocular lenses, such as the multifocal, aspherical AcrySof® IQ ReSTOR® IOL from Alcon, have a special optic design that makes spectacles unnecessary in most cases. Courtesy of Alcon, Inc.

hospital, where part of my job is to train doctors in cataract surgery.

I work in two operating rooms in parallel. While I am operating in one room, the next patient is prepared in another. Altogether, all the preparatory measures even take longer than the operation itself, which usually takes 12 to 15 minutes. The duration of the operation also depends on how hard the lens is, as this influences the ultrasonic destruction.

In general, it can also be said that the number of operations is continuing to rise all over the world. One reason is that people are living longer and longer. Also, cataract surgery is so safe and stressless for patients that they are less afraid of the operation and go to see the ophthalmologist in good time. Apart from this, cataracts are still the most common cause worldwide for treatable and therefore reversible blindness. India, for instance, finances large-scale programmes for low-cost cataract surgery.

What role does the microscope play in cataract surgery?

This operation is not possible without an excellent microscope. Another equally important factor is good organisation of the whole procedure – not least because the effect of the normally used local anaesthetic starts to wear off after 15 minutes. Therefore, the microscope has to be immediately ready for use at the beginning of every operation. I have no time to focus my eyes on anything else but the eye of the patient through the microscope. The microscope must provide the assistant with an excellent image as well. Working as a trainer of medical students, I often sit in the assistant's place, so I know how important this function is.

What do you expect of future surgical microscopes?

It would be a great help, for example, if I could see data and settings of other instruments directly in the microscope – like a virtual overlay in a corner of the image. This would be particularly useful during phacoemulsification, when I am looking through the microscope and adjusting the ultrasound on the basis of different sounds from the instrument. After all, I can't look at the screen of the instrument.

Another point, which doesn't apply to the microscope alone, is the full integration of all surgical and patient data. The microscope of the future should be able to communicate with all computer and software systems of the hospital. However, this would require standardisation of data formats – even including video formats to allow a video of the operation to be directly added to the patient's virtual file.

Prof. Brézin works in two operating rooms in parallel. While he is operating in one room, the next patient is prepared in another.

NEW: Leica Rotatable Beamsplitter

For those surgical procedures where an assistant is needed or the microscope's configuration has to be changed between surgical procedures, Leica Microsystems has developed the Leica Rotatable Beamsplitter. This easy side-to-side quick changer of the assistant observer optics is the ideal accessory for the increasing number of temporal approach cataract surgeries. The interface for the Leica Video Adapter is conveniently placed at the rear for maximum flexibility.

- Perfect solution for temporal approach cataract surgeries
- World's first and only two-beampath solution
- Enables time-saving between procedures
- Increases efficiency in the operating room
- Minimises potential damage to the binoculars

Antoine P. Brézin, Professor of Ophthalmology at René Descartes Université Paris V and Head of Ophthalmology at Cochin Hospital, Assistance Publique – Hôpitaux de Paris: "I work with two ceiling mounted Leica M844 C40 microscopes, and my team and I are extremely satisfied. We particularly appreciate the optical performance and the illumination concept. The ergonomic design and the extremely easy and safe operation are a great help for our work. The ceiling mount gives us the greatest possible freedom of movement."

Fingertip Manoeuvrability and Perfect Balance

Just What the Surgeon Wants

Anja Schué, Leica Microsystems

We've all experienced an everyday product at some time that had great technology and a stylish design but was totally impractical to use. A designer coffee pot that spills its contents all round the cup or a mobile phone with such tiny keys that you can't help pressing two at once. If instruments for medical professionals were designed with so little regard for practical application, they'd have no chance of surviving on the market. That's why user-oriented development of new microscopes has a long tradition at Leica Microsystems. The Leica M525 F20, which is mainly used in ENT and neurosurgery, is an example of successful translation of users' requirements into an innovative product.

Finger-light movement without vibration to easily achieve the most challenging views

"With the user, for the user" – this was the motto of Ernst Leitz I when he introduced industrial production in the company over 150 years ago. A motto that explains the success of Leica Microsystems' products now more than ever. Before ideas are converted into an innovative product nowadays, in-depth consultations are held with future users. For the new Leica M525 F20 surgical microscope, face-to-face interviews were conducted with customers in hospitals and practices, and questionnaires were distributed at medical congresses.

Comments of the surgeons while testing the prototype:

"Fantastic optical quality, 3D and depth perception."

"The movement of the optics carrier is without any doubt better than any other microscope I have seen."

An idea for a product is like a raw diamond

The analysis showed that easy handling and smooth manoeuvrability were among surgeons' top priorities. Further important criteria in their view were high image quality, safe illumination and a compact design. At first, these wishes seem rather general – in fact, you'd think they'd be taken for granted for a surgical microscope. However, the requirements mentioned in the customer survey were exactly geared to the needs of ENT and neurosurgeons in the technical development of the Leica M525 F20.

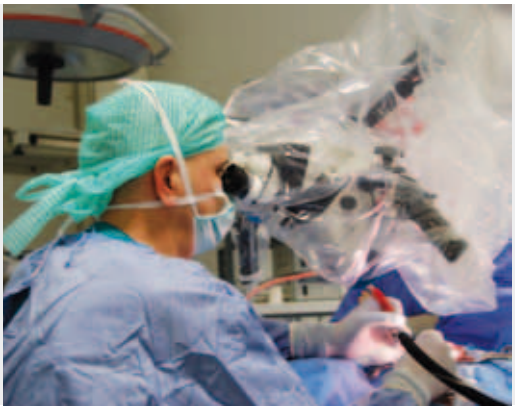
"The idea for a product is like a raw diamond at first. The answers of our customers help us to clearly cut the facets," product manager Andreas Tedde describes the process. "Also, our own sales associates were involved during the entire development process and gave us equally valuable feedback."

Enthusiastic test users

One of the most exciting phases began when the prototype had to pass the acid test in live operations in various hospitals and doctors' practices. This clinical evaluation took several weeks and enabled the finishing touches to be put to the product. The positive feedback of the test users already confirmed that surgeons' needs have been excellently considered in the new Leica M525 F20.

Ease of movement & brilliant optics

The new microscope combines the brilliant optics of Leica OptiChrome™ technology with finger-light movement and is thus the perfect answer from Leica Microsystems to the surgeon's needs. The Leica M525 F20 is finger-light to move and stays perfectly balanced over the complete range of movement, thus making it possible to guide the microscope securely, even with just the eyes and nose. The effortless handling ensures fatigue-free, time-saving surgery.



"The motorised balancing is well appreciated by all of my operation team."

"It's fabulous to set all parameters including light and video functions on the hand switch – very user friendly."

Best view & safer illumination

A crisp image and a large depth of field allow the surgeon to see more details. The surgeon does not have to refocus frequently, and this is especially important when working in narrow and deep cavities. BrightCare™ and AutoIris™ technology ensure high-quality as well as safer illumination and give enough light for the deepest operative sites while providing more patient safety.

Your Opinion is Valuable!

Win a LEICA Binocular Trinovid 8 x 20 BCA!

Dear Reader,

Please let us have your comments about the first issue of reSOLUTION Surgical Microscopy & Technology. Not only will it provide us with valuable suggestions for improving the magazine; you will also get a chance to win a Leica binocular Trinovid 8 x 20 BCA. You can access the competition via the following link. Please enter your comments and your address:

www.leica-microsystems.com/EU-Surgical

The winner will be drawn from all complete entries received by 30 September 2009.

The World's Most Compact Surgical Microscope

Freedom to Work

Kerstin Pingel, Leica Microsystems

For years, surgeons have needed a surgical microscope with smaller, more compact optics. In the traditional optic design, the zoom lens system of the microscope head was designed vertically and the size of the optical head was very large, displacing the surgeon and the assistant farther from the patient. Also, the surgeon's working room and his ability to work comfortably were limited.

improvement in comfort, as he can easily direct the microscope to any necessary position and naturally adopt a healthy working posture. This is particularly effective for operations like posterior fossa cranial surgery where patients sit upright.

"This scope will make it possible to go back to the most direct surgical corridors, because you are much more comfortably positioned to your target," says Dr. H. Hunt Batjer MD. Dr. Batjer is internationally recognised as a leading cerebrovascular surgeon, especially for complex aneurysms, vascular malformation, and brain ischaemic states.

Horizontal Optics technology

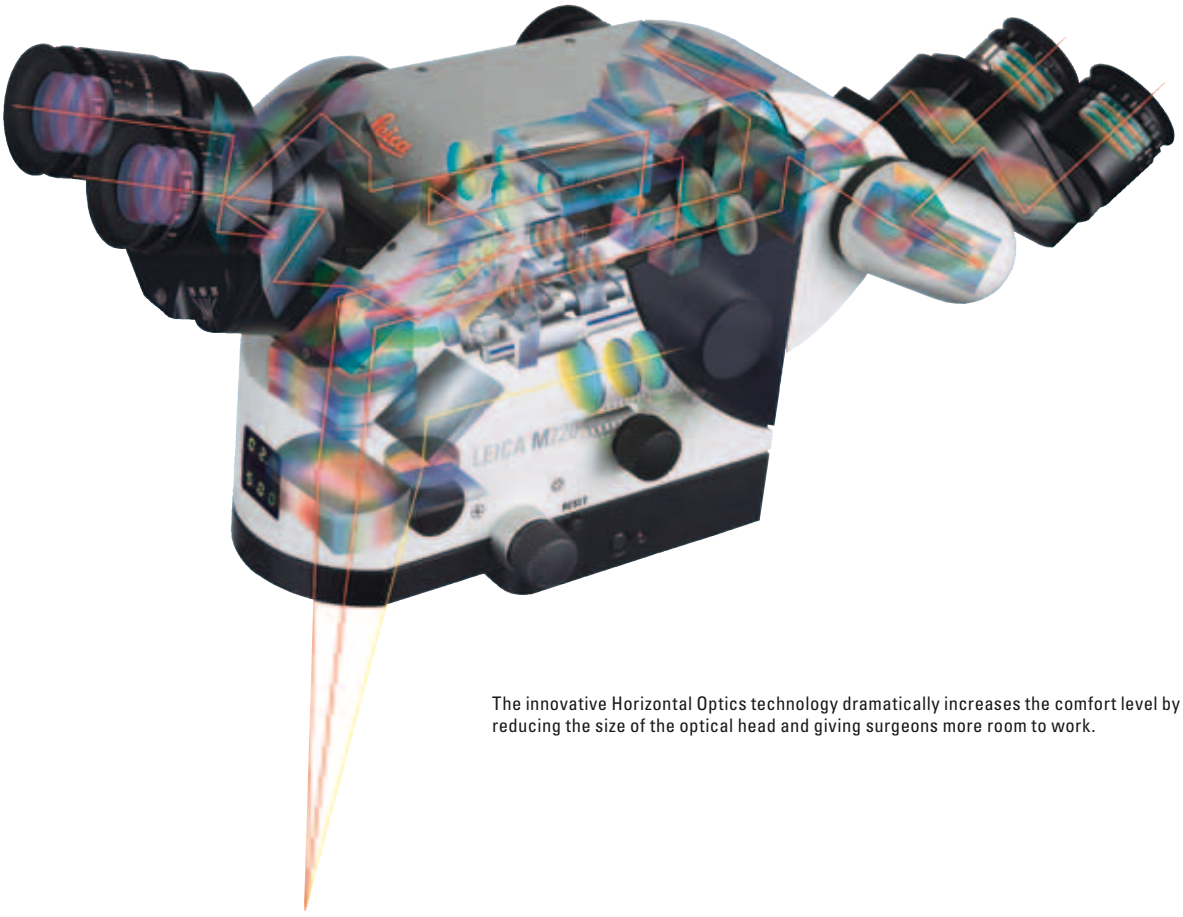
With its new Surgical Microscope Leica M720 OH5, Leica Microsystems responds to surgeons' needs and writes a revolutionary new chapter in microscope design. The heart of the innovation is the Horizontal Optics technology.

Significant improvement in comfort

Designed along a horizontal plane, the Horizontal Optics technology makes the Leica M720 optical head of the OH5 the most compact surgical microscope available. The surgeon gains a significant

For optimal cooperation of surgeon and assistant

Horizontal Optics technology provides more working space, allowing the unobstructed use of larger and bigger tools. At the same time, thanks to the compact optical head, the surgeon may also get closer to the patient and the surgical field if needed, assuring more precision in the surgical process. The Leica M720 OH5 offers a great benefit for craniotomy surgeons who do vascular, aneurysm or tumour surgery as well as for spine surgeons.



The innovative Horizontal Optics technology dramatically increases the comfort level by reducing the size of the optical head and giving surgeons more room to work.

"The Leica M720 OH5 is a real advance in the field of microsurgery," says Dr. Batjer. "It is a microscope that puts the surgeon back in touch with the patient and the surgical field, and the observer is brought back into an assistant role, he is not just observing." The Leica M720 OH5 offers individual adjustable components, e.g. the Leica butterfly binoculars, for both the surgeon and his assistant, providing optimal ergonomic conditions for concentrated and precise work.

More light for longer working distance

The Leica M720 OH5 ideally combines original APO OptiChrome™ optics and a 300 Watt xenon illumination system to give the surgeon a steadily clear and sharply focused image for the entire duration of the operation. As the longer working distance requires more light, Leica Microsystems has made further improvements in the microscope architecture, increasing the light for the main observer by 185 %.

Dr. H. Hunt Batjer MD: "Horizontal Optics are the most important advance in microsurgery that I have seen during my time."

Interview with James Lewis, Director Surgical Sales Europe

Prepared for the Future

Anja Schué, Leica Microsystems

How does Leica Microsystems support surgeons in their work?

Developing products that give surgeons ideal working conditions – that's our business. But we do far more than that. Just as important are dependable advice and individual support. Together with surgeons we are always on the lookout for ways of advancing microsurgery. For example, one of our most experienced associates has been concentrating solely on application support in neurosurgery since the beginning of this year. This way, we can integrate customer needs in our development even more effectively.

Before we develop a new product, we ask our customers extremely specific questions in a voice-of-the-customer process. Every prototype is subjected to a clinical evaluation. And we continuously analyse the feedback from our customers on a permanent basis.

How has your division developed over the last few years?

In particular our European business has soared in recent years and significantly contributed to the success of our surgical division. Parallel to this, we have expanded our Sales and Technical Service team. We now have specialists in every country in Europe. Most of them are Leica employees, although in some countries we work with qualified contract partners. We're better prepared for the future than ever before.

Which product features are becoming more and more important?

One point is the integration of technology into the processes and systems inside hospitals, which are subject to extremely rapid change. Every new generation of microscopes is equipped with new features accordingly. An example of this is our high-definition platform for the digital recording and live visualisation of microscope images.

What would you count as the most significant product innovations?

For ophthalmic surgery we have developed optics that allow operations to be performed with the lowest possible light intensity – for the safety of both the patient and the surgeon. In neurosurgery it was the development of a technique for intraoperative tumour and vascular fluorescence. And most recently: the world's first headmounted microscope that the doctor wears like a pair of eyeglasses.

"Before we develop a new product, we ask our customers extremely specific questions in a voice-of-the-customer process."

What has impressed you most in the last twelve months?

What fascinates me most of all is the headmounted microscope. Even surgeons using it for the first time are astounded by the convenience of not having to operate with a large overhead instrument. Some of our customers from special areas of surgery in which high magnifications are becoming increasingly important are even discovering how useful the headmounted microscope is for new applications – it was recently used for operations in foetal heart surgery.

Surgical Microscope in the Service of Art Restoration

An Age-old Patient

Jørgen Wadum, Statens Museum for Kunst of Copenhagen

It is 2.79 by 4.67 metres in size, and around 400 years old – the Statens Museum for Kunst of Copenhagen, Denmark, had a very ill patient. With the help of a Leica M651 surgical microscope, the oil painting created by the Flemish master Jacob Jordaens (1593-1678) with the title "The Tribute Money – Peter Finding the Silver Coin in the Mouth of the Fish," also known as "The Ferry-Boat to Antwerp", has been examined, conserved, and restored.

The present appearance of the canvas was impaired by darkly discoloured varnish, numerous places where the paint had faded, and discoloured retouching from earlier restoration efforts. Thus, the first important step in the restoration consisted of removing layers of varnish and retouchings from the almost 14 square metre surface of the painting. Then, the paint layer was examined carefully and restored where necessary.

At the same time, experts attempted to determine the type of ageing phenomena that resulted in quality sacrifices. Painting techniques and paint layers were analysed intensively to determine their structure, pigment compositions, and binders in order to place the work in the context of Jordaens' artistic and technical development.

Restoration before the eyes of the public

In an open workshop in the middle of the museum gallery, visitors had the rare opportunity to get exciting insights into the masterpiece and the most intimate details of conservation and restoration techniques. By means of wireless projection on a screen, visitors could follow the current work at the microscope in real time. The project team meticulously gathered all information on the genesis and the nature of this 400-year-old painting. Cross sectional, x-ray, and infrared analyses were used, among other techniques.

For more information see http://www.smk.dk/jordaens and the publication: Jordaens. The Making of a Masterpiece, 120 pages. ISBN 978-97-92023-26-1

The microscope work in the open restoration workshop of the Statens Museum for Kunst of Copenhagen, Denmark

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 Microsystems 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.

Dr. David Martyr, President of Leica Microsystems

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.

Events

Please also visit our website on www.leica-microsystems.com/events for further information on Leica Surgical events in Europe.

Annual Scientific Meeting of the British Association of Oral and Maxillofacial Surgeons
June 3–5
Bournemouth, UK
www.baomsmeetings.org.uk

XVI National Congress of the Italian Society of Maxillofacial Surgery
June 10–13
Turin, Italy
www.sicmftorino2009.it

XLIV Congress of the Spanish Society of Plastic, Reparatory and Aesthetic Surgery
June 10–12
Cádiz, Spain
www.secprecadiz2009.com

10th Congress of the European Paediatric Surgeons' Association
June 17–20
Graz, Austria
www.eupsa.org

22nd International Congress of German Ophthalmic Surgeons
June 18–21
Nürnberg, Germany
www.doc-nuernberg.de

Swiss Society of Oto-Rhino-Laryngology, Head and Neck Surgery
June 25–26
Geneva, Switzerland
http://orl-hno.ch

Neurosurgery Workshop Universidade do Minho
June 26–27
Braga, Portugal
www.uminho.pt

Scientific Meeting of the British Association of Plastic, Reconstructive and Aesthetic Surgeons
July 1–3
Leeds, UK
www.bapras.org.uk

13th British Academic Conference in Otolaryngology and ENT
July 8–10
Liverpool, UK
www.bacouk.org

Swiss Society of Ophthalmology
September 2–5
Lugano, Switzerland
www.sog-sso.ch

Annual Conference of Plastic Surgeons
September 10–12
Hannover, Germany
www.dgpraec2009.de

Annual Conference of the German Society of Plastic and Reconstructive Surgery
September 10–11
Rostock, Germany
www.dgpw2009.de

Annual Conference of the German Society of Urology
September 16–19
Dresden, Germany
www.dgu-kongress.de

Joint Annual Meeting of the Swiss Society of Intensive Care, Neurosurgery and Neuroradiology
September 24–26
St. Gallen, Switzerland
http://kongress2.imk.ch/SGI2009/home?language=de

National Congress of the Italian Society of Plastic, Reconstructive and Aesthetic Surgery
September 28–October 1
Sanremo, Italy
www.sicpre.org

VIII National Congress of Vascular and Endovascular Surgery
September 27–30
Milan, Italy
www.sicve2009.it

Congress of the French Society for Otolaryngology, Facial and Neck Surgery
October 4–6
Paris, France
www.sforl.org

82nd National Congress of Urology
October 4–7
Rimini, Italy
www.siu.it

International Congress of Retina Surgery
October 10
Monza, Italy
www.unikasrl.com

58th National Congress of the Italian Society of Neurosurgery
October 14–17
Lecce, Italy
www.sinch.it

Hands-on Brain Course Universidade do Minho
November 16–20
Braga, Portugal
www.uminho.pt

Medica
November 18–21
Düsseldorf, Germany
www.medica.de

103rd French Congress of Urology
November 18–21
Paris, France
www.urofrance.org

89th National Congress of the Italian Society of Ophthalmology
Milan, Italy
November 25–28
www.sedesoi.com

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