

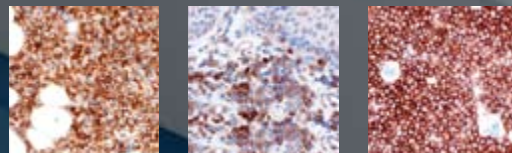
2007

Issue  
02

PATHOLOGY & DIAGNOSTICS NEWSLETTER  
EUROPEAN EDITION

# reSOLUTION

- In Vitro Fertilisation
- Immunohistochemistry
- Digital Microimaging
- Cryomicrotomy



**Dear Reader,**

The positive feedback received on our first edition has encouraged us and we are now ready with the second edition of reSolution – our European Pathology & Diagnostics Newsletter. In this issue we present applications and technologies from different branches of pathology and diagnostics.

This edition arrives after a major event: Vision BioSystems™ has joined the Leica Microsystems family. Together, the combined histology lines (including Novocastra™ reagents) form the new Biosystems Division of Leica Microsystems to create a unique single-source histopathology provider. Articles on Novocastra and immunohistochemistry (IHC) antibodies provide a taste of the scientific knowledge and innovation now added to Leica Microsystems' existing technology and innovation portfolio.

But Histopathology is not the only area where Leica Microsystems is contributing to improvements in diagnosis, and so we also take a look at In Vitro Fertilisation, the IMSI technique and the Leica AM6000, which allows this high-magnification & complex technique to be performed at the touch of a button.

To make life easier for pathologists and surgeons in hospitals in Sweden, the combination of two leaders in technology, Leica Microsystems & Tandberg, has transformed the Leica DMD108, presented in the last edition, into a simple yet powerful high-definition video-communication tool.



Finally, you can find the first information on the new world standard in cryo-sectioning launched in September at the European Pathology Congress in Istanbul: the Leica CM1950. It includes all the most advanced technologies available in a completely modular system, developed from the experience of thousands of cryostats and the feedback of customers from all over the world.

We hope to receive even more feedback and suggestions from you than after our first edition and are looking forward to presenting the Leica BME microscope to the winner of our contest soon.

Thank you again

Giancarlo Migliore  
European Marketing Director  
Leica Microsystems

**Page**

<b>2</b>	<b>“Beauty Contest” for Sperm</b> Morphological sperm selection increases chances of success in assisted reproduction
<b>6</b>	<b>First CD33 Antibody Effective in FFPE Tissue</b> New reagent to detect acute myeloid leukemias
<b>8</b>	<b>Contest</b>
<b>10</b>	<b>Novocastra™: Superior Reagents for IHC and ISH</b> A brief history of immunohistochemistry
<b>12</b>	<b>Because Every Second Counts</b> New quality in remote diagnosis and multidisciplinary discussion
<b>14</b>	<b>Leica CM1950</b> Rapid freezing and enhanced operator safety
<b>15</b>	<b>Pathology &amp; Diagnostics Events</b>
<b>15</b>	<b>Imprint</b>

# “Beauty Contest” for Sperm

## Morphological sperm selection increases chances of success in assisted reproduction

Sperm quality is frequently at fault when standard methods such as intra-uterine insemination (IUI), in vitro fertilisation (IVF) or intracytoplasmic sperm injection (ICSI) do not lead to fertilisation of the oocyte. The relatively new method of intracytoplasmic morphologically selected sperm injection (IMSI) uses high-resolution microscopy to select sperm according to specific morphological criteria that do not occur in conjunction with DNA defects.

Since Louise Brown, the world’s first “test-tube baby”, first saw the light of day in 1978, over 3 million babies have been conceived with the aid of reproductive medicine. That number is currently increasing by 200,000 per year. The interdisciplinary Centre Médico-Chirurgical et Obstétrical (SIHCUS-CMCO) in Strasbourg is one of the leading public centres for reproductive medicine in France. Professor Stéphane Viville, head of the Department of Biology of Reproduction, and Dr. Christiane Wittemer, head of the laboratory for assisted reproduction, annually treat around 2,000 couples who would not otherwise be able to conceive. The SIHCUS-CMCO has been working with IMSI since 2005, and is one of three centres in France to do so.

### Good looks matter

Studies have shown a positive correlation between the occurrence of defective DNA and abnormal morphology, especially intranuclear vacuoles, in sperm. The integrity of the nucleus (even shape, lack of vacuoles) is considered to be the most important parameter for successful injection. However, with the 200x–400x magnification typical of conventional ICSI, doctors cannot make out whether they have selected the best sperm in morphological and functional terms.

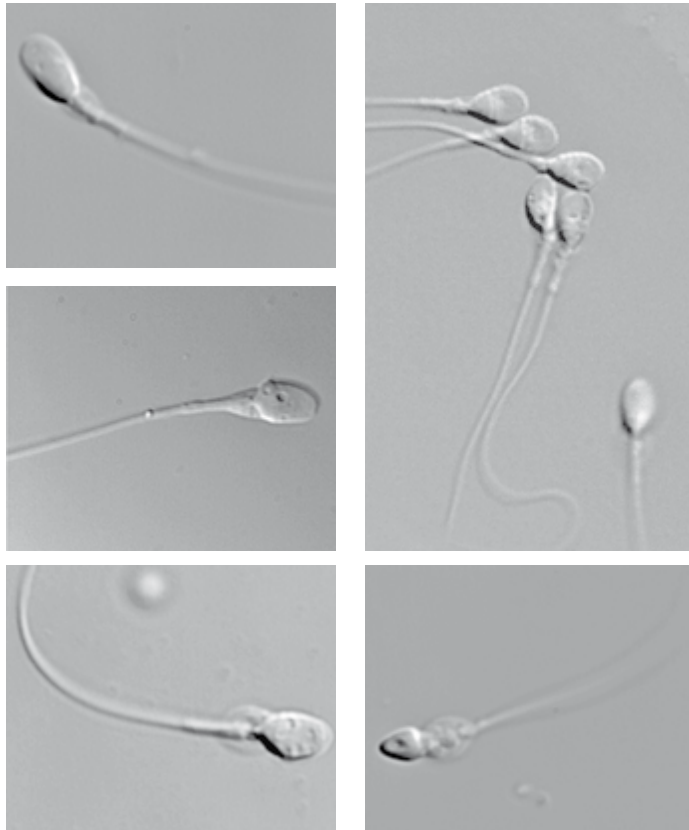
The Israeli biochemist and andrologist Professor Benjamin Bartoov, who has been studying the relationship between sperm morphology and successful fertilisation intensively for years, developed the IMSI method on the basis of ICSI four years ago. Using high-resolution optics for 6,000x–8,000x magnification, he was able to view and classify abnormal nuclei and other defects in sperm cells. With IMSI, real-time screening without dyes and the selection of sperm cells with the best possible morphological integrity became possible for the first time. >

Fig. 1: Sperm cell suitable for IMSI without conspicuous morphology



## IN VITRO FERTILISATION

Fig. 2–6: Sperm cells with vacuoles, abnormally shaped head or connecting piece



First-choice sperm had a maximum of one vacuole or several small ones covering less than 4% of the total area and the heads were of a smooth, symmetrical oval shape. Second-choice sperm had large vacuoles or misshapen nuclei. All other sperm with abnormalities at the head, connecting piece or tail are excluded if possible.

### Advantages of IMSI confirmed

To compare IMSI and IVF directly, Prof. Viville and Dr. Wittemer performed a study involving 55 couples for whom IUI treatments had failed. IVF or ICSI procedures were applied to groups of sibling oocytes. Per sample, they inspected at least 100 sperm cells at 12,500x magnification. In all, only 7.6% of all sperm were free of abnormalities. 64.9% had multiple intranuclear vacuoles or other defects.

The couples were divided into two groups: Group I (33 couples) with <8% normal sperm, and Group II (22 couples) with >8% normal sperm. In Group I, ICSI achieved a significantly higher fertilization rate over IVF (Table 1). The success rate of ICSI was high in both groups, i.e. regardless of the share

>

## Screening, selection, injection – all with a single system

### The Leica AM6000 Big S micromanipulation system

IMSI users need a system that offers both high resolution and flexible magnification. The high-resolution, automated Leica AM6000 Big S micromanipulation system is ideal for the purpose. Users can not only screen, but also select and perform the injection with this user-friendly system. The fully automated, inverted Leica DMI6000 B research microscope features Vario-Zoom for continuous zooming to a magnification of 16,000x on the monitor. This level is sufficient to make out the fine morphology of intracellular structures in sperm in detail. The integrated electrical manipulators and most important microscope functions can be operated via the multi-function panel. The y-off function moves the manipulators in the x-direction only, simplifying injection. The z-limit function prevents downward motion and prevents needle breakage. With its 100xIMM objective, the Leica AM6000 offers fully automatic dif-

ferential interference contrast (DIC). A Leica digital camera with a FireWire interface provides fast, live images on the monitor.

### Leica User Club

To address increasing interest in the IMSI method, Leica Microsystems has initiated a workgroup of Leica AM6000 users in cooperation with SIHCUS-CMCO in France. The group has nine further institutional members. In addition to regularly exchanging experiences, the participants are planning a multi-centre study to systematically explore the relationships between morphological and functional sperm properties, fertilisation rates, embryo development and implantation. This will lead to an improved definition of indications and a further improvement of

>

(n = 55)	Share of morphologically normal sperm	Fertilised oocytes	
		IVF	ICSI
Group I (n = 33)	<8%	38.8%	75.9%
Group II (n = 22)	>8%	65.7%	76.3%

Table 1: Influence of sperm morphology on fertilisation rate

of normal sperm, resulting in 15 pregnancies. The study shows the negative influence of a large share of morphologically abnormal sperm on IVF fertilisation results. This impact of fine sperm morphology also confirms the predictable advantages of the IMSI method.

Dr. Wittemer characterised the results to date as very promising. IMSI achieves higher pregnancy rates, the number of top-quality embryos is higher than with conventional ICSI, and fewer spontaneous abortions occur. SIHCUS-CMCO uses IMSI when conventional methods fail. The method is also the first choice in cases of pronounced sperm DNA fragmentation or severe teratozoospermia. The success rate justifies the higher time requirements for selection, which can take over two hours depend-

ing on the share of abnormal structures, as well as the exacting requirements with regard to the optical system.

## Reference

This article was published in LaborPraxis, 10/2007  
 Vogel Industrie Medien GmbH & Co. KG, Würzburg, Germany  
 Contact: Marc Platthaus, Phone +49 931 418-2352, Fax -2750,  
 marc\_platthaus@laborpraxis.de, www.laborpraxis.de

More information on SIHCUS-CMCO and IMSI:  
[Christiane.Wittemer@sihcus.fr](mailto:Christiane.Wittemer@sihcus.fr)



The high-resolution, automated Leica AM6000 Big S micromanipulation system with Vario-Zoom for continuous zooming to a magnification of 16,000x on the monitor and integrated electrical manipulators meets the most exacting standards for IMSI applications.

success rates. An image database and an iconographic atlas of sperm morphology is also being compiled. An important goal of these efforts is to establish detailed selection criteria for a standardised protocol.

More information on Leica AM6000 Big S:  
[Frederic.Ribay@leica-microsystems.com](mailto:Frederic.Ribay@leica-microsystems.com)

# First CD33 Antibody Effective in FFPE Tissue

## New reagent to detect acute myeloid leukemias

Dr. Kenneth Mitchell, Leica Microsystems, Biosystems Division

Detection of CD33 using monoclonal antibodies has been critical in immunophenotyping acute leukemias, particularly acute myeloid leukemias. To date this has only been possible by either flow cytometry or by frozen section immunohistochemistry. Now the first CD33 antibody has been developed that is effective on formalin-fixed, paraffin-embedded (FFPE) tissue.

CD33 is a 67 kD glycosylated transmembrane protein that is a member of the sialic acid-binding immunoglobulin-like lectin (Siglec) family (1, 2). This antigen is expressed in the earliest myeloid progenitor cells, but not in hematopoietic stem cells and is present during myelomonocytic differentiation as well as in granulocytes and resident histiocytes at low levels. It is an antigen retained on monocytes, expressed in dendritic cells and mast cells. Anti-CD33 antibodies have in the main been utilised to

phenotype acute myelogenous leukemias (3, 4). CD33 is also described as the target for Myelotarg<sup>®</sup> (Gemtuzumab Ozogamicin), a therapy used in the treatment of patients with acute myeloid leukemias, so immunophenotyping these and related tumours has also assumed greater therapeutic importance (5, 6).

In April of 2007, Novocastra<sup>™</sup> scientists developed the first ever antibody to CD33 antigen, (NCL-L-CD33, clone PWS44), effective on formalin-fixed, paraffin-embedded tissue. So now pathologists can view the morphology together with the immunophenotyping of CD33 positive cells in routinely fixed and immunohistochemically stained tissues without dependence on flow cytometry or on frozen section immunohistochemistry.

>

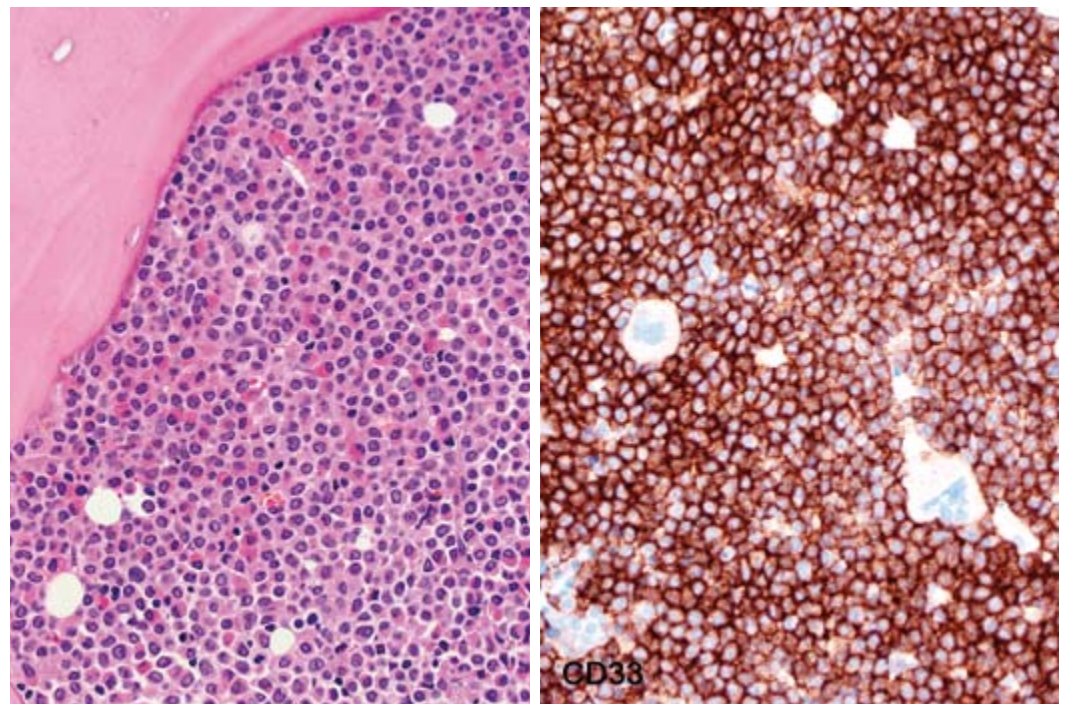
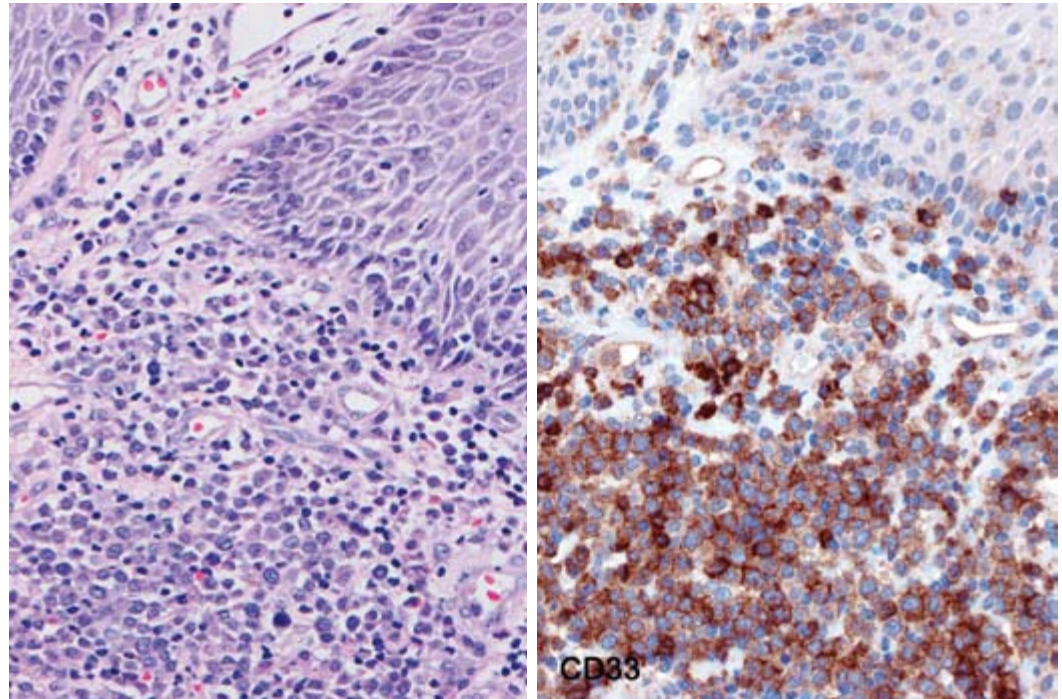


Fig. 1: Acute myeloid leukemia (M3) in bone marrow: Hematoxylin & Eosin stained section (left) and cytoplasmic and membrane immunohistochemical staining for CD33 antigen using NCL-L-CD33 (right). Paraffin sections.

Fig 2: Granulocytic Sarcoma of the tongue: Hematoxylin & Eosin stained section (left) and cytoplasmic and membrane immunohistochemical staining for CD33 antigen using NCL-L-CD33 (right). Paraffin sections.



### Evaluated by pathologists

After “in-house” evaluation on a range of various human tissue types, both normal and neoplastic, the new reagent was evaluated in the field by pathologists to maximise the understanding of its specificity, sensitivity and utility. The first published work with the new Novocastra CD33 (clone PWS44) antibody was a poster presented by Dr Alan Ram-

say, University College London Hospital, at the 191<sup>st</sup> Pathological Society meeting of Great Britain and Ireland. Subsequent presentations were made by Ahmet Dogan and colleagues from the Department of Laboratory Medicine and Pathology, Mayo Clinic Rochester, MN USA, and Elizabeth Hyjek and her team from Weill Cornell Medical College, New York at the 2007 USCAP meeting.

>

## CD33 antibody

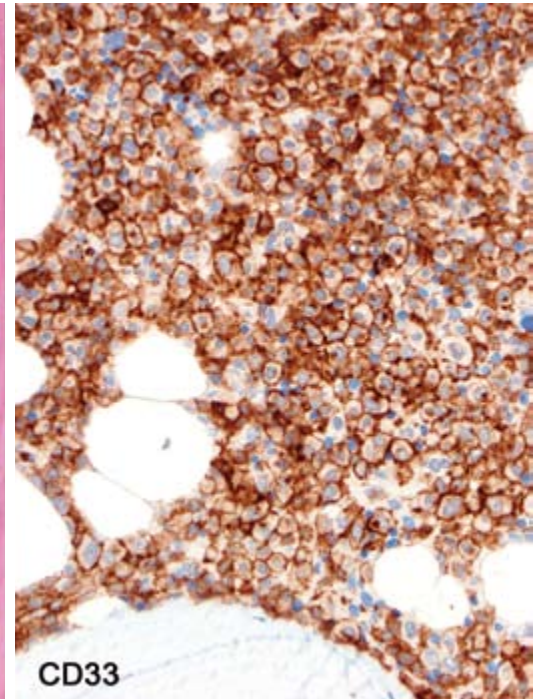
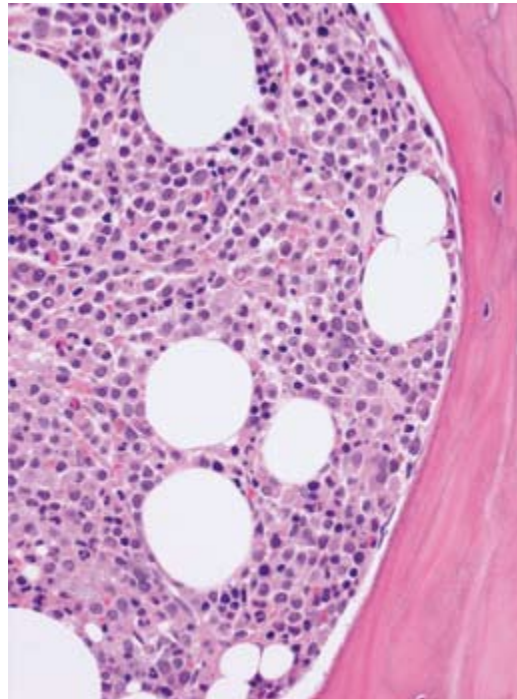
### Reagent Summary

- Product Name: **CD33**
- Product Code: **NCL-L-CD33**
- Mouse Liquid Monoclonal Antibody – clone **PWS44**
- For in vitro diagnostic use (or research use only depending on local regulatory status)

### Features and Benefits

- First monoclonal antibody in world to work on CD33 in FFPE tissue. Useful to type M4 and M5 AML's.
- Detects both CD33M and CD33m isoforms.
- Useful for pathologists who want to evaluate Acute Myeloid Leukemia cases by immunohistochemistry in addition to or as an alternative to flow cytometry.
- Useful to identify patients with CD33 (positive) Acute Myeloid Leukemia and other CD33 (positive) hematopoietic tumours who may benefit from anti-CD33 therapy when viable cells or frozen sections are not available for immunophenotypic analysis.
- May be of interest in characterising cases of multiple myeloma.

Fig 3: Plasma cell leukemia in bone marrow: Hematoxylin & Eosin stained section (left) and cytoplasmic and membrane immunohistochemical staining for CD33 antigen using NCL-L-CD33 (right). Paraffin sections.



## Dr. Alan Ramsey

Dr. Alan Ramsay evaluated the CD33 antibody (clone PWS44) against a range of tumors that included acute myeloid leukemia (Fig. 1), granulocytic sarcoma (Fig. 2), T-ALL and B-ALL cases and also cases of Burkitt lymphoma, classical Hodgkins lymphoma and plasma cell myeloma using Leica Microsystems' Bond-max™ automated immunostainer together with the Bond Polymer Refine Detection System (Leica Microsystems, Biosystems Division) and ER2 (pH 9.0) unmasking solution for 30 minutes. Dr. Ramsay observed the following:

- Clone PWS44 stains myeloid and monocytic cells in bone marrow and elsewhere, and is positive in most cases of acute myeloid and myelomonocytic leukemia.
- Clone PWS44 shows crisp staining with a broad range of myeloid and myelomonocytic leukemias (Fig. 3).
- Clone PWS44 stains mature histiocytes and macrophages in all tissues.
- Erythroid cells, megakaryocyte and lymphoid cells do not stain with Clone PWS44.
- Clone PWS44 stains myelo-monocytic cells reactive in bone marrows and in myelodysplastic/myeloproliferative conditions but is not useful for assessing cellular maturity.

## Dr. Elizabeth Hyjek

Dr. Elizabeth Hyjek's evaluation was based on the comparison of clone PWS44 using a Leica Microsystems' Bond-max™ and the Bond Polymer Refine Detection System (Leica Microsystems, Biosystems Division) with different CD33 antibodies bound to different fluorochromes. Furthermore, clone PWS44 was evaluated to characterise its pattern of staining with a range of other hematopoietic tumors. Her team made the following conclusions:

- Clone PWS44 can reliably detect CD33 expression in paraffin tissue sections by IHC on normal/neoplastic myelomonocytic lineage cells, mast cells and dendritic cells. The pattern of PWS44 reactivity parallels that of other anti-CD33 monoclonal antibodies by flow cytometry and frozen section immunohistochemistry.
- Clone PWS44 can identify low expression of CD33 in AML cases not detected by some FITC-conjugated anti-CD33 monoclonal antibodies (clone MY9-FITC used for immunophenotyping by flow cytometry).
- Clone PWS44 is useful in differentiating diagnosis of myeloid tumors from their lymphoid mimics and other non-hematopoietic tumours.
- Clone PWS44 can be reliably used for identifying patients with CD33 (positive) Acute Myeloid Leukemia and other CD33 (positive) hematopoietic tumors that may benefit from anti-CD33 therapy when viable cells or frozen sections are not available for immunophenotypic analysis. >

**Dr. Ahmet Dogan**

Further works by Dr. Ahmet Dogan and colleagues at the Mayo Clinic, provided results that agreed with the above findings where immunohistochemistry results correlated well with flow cytometry results showing similar sensitivity as well as defining other potential uses for this product that included cases of minimally differentiated acute myeloid leukemia (AML-M0), and acute monocytic leukemia (AML-M5) where other markers including myeloperoxidase may be negative. Recommendations in this communication (7) concluded that clone PWS44 should be used with other myeloid and lymphoid markers, as there are cases of myeloid-antigen-positive acute lymphoblastic leukemias that show genuine expression of the CD33 antigen.

Many scientific and utility-based questions can be asked about any new product, and for CD33 (PWS44), many of the answers are as yet unknown, or are just appearing on the horizon through continuous work at various centres. This information will become increasingly available via peer-reviewed publications.

**Acknowledgements**

My sincere thanks to Dr. Elizabeth Hyjek, Dr. Alan Ramsay and Dr. Ahmet Dogan for communication of their results.

**References**

1. Freeman SD, Kelm, Barber EK et al. Characterisation of CD33 as a new member of the sialoadhesion family of cellular interaction molecules. *Blood* 1995; 85: 2005–2012.
2. Crocker PR, Zhang J. New I-type lectins of the CD33-related siglec subgroup identified through genomics. *Biochemistry Society Symposium* 2002; 69: 83–96.
3. Lock K, Zhang J, Lu J, Lee SH, Crocker PR. Expression of CD33-related siglecs on human mononuclear phagocytes, monocyte-derived dendritic cells and plasmacytoid dendritic cells. *Immunobiology*. 2004; 209: 199–207.
4. Jaffe ES, Harris NL, Stein H, Vardmann JW. Tumors of hematopoietic and lymphoid tissue. WHO classification of tumors. IARC Press Lyon, 2001.
5. Golan J, DiGaetano N, Amica D et al. Gemtuzumab ozogamicin (Mylotarg®) has therapeutic activity against CD33-positive acute lymphoblastic leukemia in vitro and in vivo. *British Journal of Haematology* 2005; 128: 310–317.
6. Zwaan ChM, Reinhardt D, Jürgen H et al. Gemtuzumab ozogamicin in pediatric CD33-positive acute lymphoblastic leukemia: first clinical experiences and relation to single agent calicheamicin. *Leukemia* 2003; 468–470.
7. Hoyer JD, Grogg KL, Gamez JD, Hanson CA, Dogan A. CD33 detection by immunohistochemistry in paraffin-embedded tissues: A new antibody shows excellent specificity and sensitivity for cells of myelomonocytic lineage. *Am J Clin Pathol (in press)* 2007.

For more information on Bond or Novocastra reagents: [Kenneth.Mitchell@leica-microsystems.com](mailto:Kenneth.Mitchell@leica-microsystems.com)



**The winner of our last contest: Dr. Alves Ferreira from Hospital La Paz, Madrid, Spain, won the Apple iPod nano Red Special Edition.**

# Contest

## Your Opinion is Valuable!

Win a **Leica EZ4 stereomicroscope** or other nice prizes.

Dear Reader,

Please give us your comments on this European Pathology & Diagnostics Edition of reSOLUTION magazine. Send us your complete name and address of the institute where you work, along with your comments by going to the following link by 31 December, 2007:

[www.leica-microsystems.com/EU-PandD](http://www.leica-microsystems.com/EU-PandD)

Winners will be drawn from all completed entries.

# Novocastra™: Superior Reagents for IHC and ISH

## A brief history of immunohistochemistry

As immunohistochemistry came of age in the 1980s, a UK pathologist, Professor CHW Horne, realised there was a desperate need for antibodies specifically raised to work in formalin-fixed, paraffin-embedded (FFPE) tissue. At this time, pathologists had to rely on antibodies that were perhaps developed initially for other techniques, and were polyclonal anti-sera of varying efficacy or mouse monoclonal antibodies that, while developed for FFPE tissue, were less than consistent. Having identified the problems, and realising he could provide a solution, Professor Horne formed Novocastra Laboratories Ltd. (Newcastle, UK) in 1990.

### Setting new standards

Over the next ten years, Novocastra continued to grow, invested in its R&D capabilities and produced dependable market-leading reagents. They were the first, on many occasions, to develop monoclonal antibodies that work in FFPE. These antibodies included CD2, CD3, and CD10. One of the flagship antibodies over this period was the estrogen receptor antibody clone ER-6F11. Today, this is still one of the most popular clones. It has stood the test of time; it provides robust reproducible results and gives a high degree of consistency.

In 2002, Vision BioSystems Ltd. (Melbourne, Australia) acquired Novocastra Laboratories. Vision BioSystems™ manufactured instruments for routine histology and supplied many companies in this market including Leica Microsystems. Within the routine histopathology market, Vision BioSystems recognised an opportunity.

### A clever combination

In the mid-eighties, Vision BioSystems made arguably the first semi-automated immunohistochemistry platform, the ST5050. By the late-nineties, the automated immunohistochemistry market had matured and expanded with advances in the technologies

being supplied. During this period, Vision BioSystems developed next generation instrumentation, but they did not want to fall into the same traps as the other suppliers; either they manufactured the instruments and sourced the reagents or vice versa. Vision BioSystems' objective was to be in control of all aspects, which in turn would provide reliability and consistency for the customer.

### Continued expansion

The Novocastra range continued to expand with new antibodies of superior quality and Vision BioSystems began selling the Novocastra antibodies directly. This provided unprecedented access to the market and an opportunity to collaborate with pathologists and scientists. As a result, through consultation with the customers, the Novocastra range was reviewed, and a program to improve existing antibodies was started. Revised products included a new CD3 clone, LN10, which has surpassed expectation and has the potential to be the market leader. This was developed as a consequence of discovering why CD3-PS1 did not sell as well as expected in the USA. In the USA PBS-based diluents are predominantly used; Novocastra scientists however had originally developed PS1 using TBS. Now, all our monoclonal antibodies are developed to work in both buffers. Other re-developed antibodies include BCL-6, CK7 and CK20. Novocastra scientists still strive to develop first for FFPE tissue and in the last two years they have developed and released monoclonal antibodies to CD11c and CD33.

### Promising integration

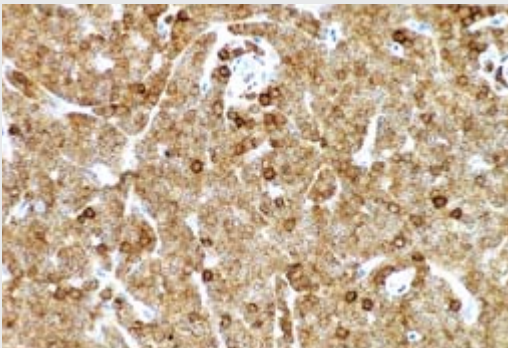
Today, the Novocastra product line includes an ever-expanding range of antibodies and ancillary reagents for diagnostic and research laboratories. In January 2007, Vision BioSystems (including the Novocastra range) joined Leica Microsystems. Together, the combined histology products form the new Biosystems Division of Leica Microsystems.

&gt;

This creates the most comprehensive histopathology portfolio in the market. Now, Leica Microsystems' Biosystems Division is the only histology supplier that seamlessly integrates instruments, consumables and Novocastra reagents across the entire histopathology process.

More information about Novocastra reagents:  
[Colin.Tristram@leica-microsystems.com](mailto:Colin.Tristram@leica-microsystems.com)

## Latest Novocastra Reagents for Diagnostic and Research Laboratories



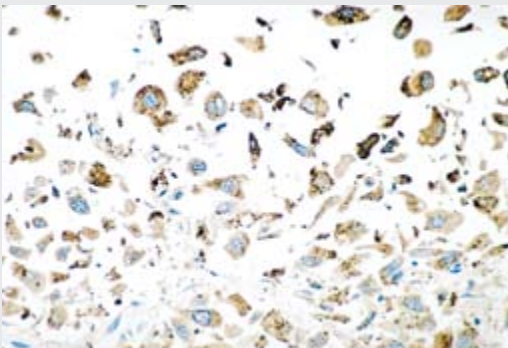
### **ZAP-70: *NCL-L-ZAP-70*; Clone L453R**

ZAP-70 is a member of the syk family of proteins. It is expressed on T cells and NK cells and is required for the T cell receptor activation that triggers an immune response. CLL B cells that express the non-mutated immunoglobulin VH genes, express levels of ZAP-70 protein that are comparable to those found in the blood T cells of healthy adults. Leukemic cells that express mutated IgVH genes generally do not express detectable levels of ZAP-70 protein and this is correlated with the high level expression of CD38. The ZAP-70 positive sub-type has been reported to be associated with a more aggressive phenotype.



### **Mismatch Repair Protein (MLH1): *NCL-L-MLH1*; Clone ES05**

MLH1 is a mismatch repair protein involved in maintaining the integrity of genetic information, alongside MSH2, MSH6 and PMS2. During DNA replication, strand misalignment can occur resulting in alterations to microsatellite repeats, often referred to as microsatellite instability (MSI). These defects in DNA repair pathways have been linked to human carcinogenesis. Mutations in the MLH1 gene have been reported to be found in tumours with MSI, such as some forms of colon cancer e.g. Hereditary nonpolyposis colon cancer (HNPCC), a subset of sporadic carcinomas and breast cancer. Loss of expression of MLH1 has also been reported in acute lymphoblastic leukemia, endometrial carcinoma, gastric carcinoma and ovarian carcinoma.



### **Napsin A: *NCL-L-Napsin A*; Clone IP64**

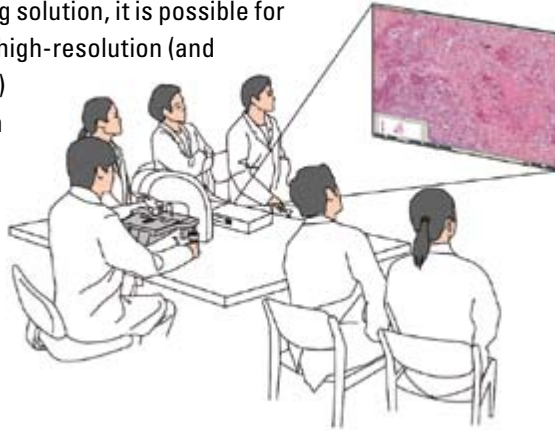
Napsin A has a specific function in normal alveolar epithelium and is proposed to play a role in the proteolytic processing of surfactant precursors. Napsin A is reported to be predominately expressed in lamellar bodies of type II pneumocytes, secondary lysosomes of alveolar macrophages, respiratory epithelium of terminal and respiratory bronchioles and plasma cells. It is also expressed within a subset of lymphocytes in normal lung, as well as in epithelial cells of renal tubules in normal kidney and weakly expressed in normal spleen. Studies have also reported that Napsin A is expressed in approximately 90 per cent of primary lung adenocarcinomas.

# Because Every Second Counts

## New quality in remote diagnosis and multidisciplinary discussion

Dr. Tomas Seidal, Halmstad County Hospital, Sweden

Due to the integration of an innovative digital microimaging device into a High-Definition video conferencing solution, it is possible for the first time to transfer live high-resolution (and therefore diagnosis-capable) microscope images between two hospitals.



There is a tendency within the medical sector towards specialised centers that are far apart, as is the case in Halland County in the south of Sweden. We therefore need better and faster communication techniques so as not to lose valuable and possibly even life-saving time when making decisions on patients.

### Live transmission of high-res microscope images

Halmstad County Hospital (2,300 employees) is responsible for servicing other hospitals in the region, particularly Varberg Hospital with its staff



## All in one solution – Digital microimaging & High Definition communication

**Leica DMD108 & Tandberg 1700 MXP**, most advanced technologies in digital microimaging and High Definition communication come together to provide you with high quality live sessions for remote consultation, diagnosis and medical education.

### Leica DMD108 traditional micro-handling with superb high definition images

For more efficient microscopic diagnostics Leica Microsystems has developed the new network imaging solution Leica DMD108. The superb image quality can be observed without eyepieces thanks to an integrated digital camera and a custom designed HW & SW embedded imaging system. The intelligent design facilitates a very comfortable body posture yet allows traditional handling of slides in x, y & z. Furthermore the Leica DMD108 features the following advantages:

- Automatic light intensity self-adjusted according to objective in use

- Integrated colour management system adapted to individual staining methods
- Magnification change at the push of a button or of the footswitch
- Instant image saving and comparison with other saved images in split-screen mode
- Quantification of structure sizes, measurement of distances and areas
- Macro navigation function shows the location of the image portion being viewed
- 2 DVI outputs for direct digital output to monitor & video communication systems

### Tandberg 1700 MXP fully integrated system for videoconferencing & display

To allow an integrated use at the desktop, Tandberg has developed this fully integrated system, which can be directly connected to the Leica DMD108. It can be used as a 20" local widescreen and as a workstation to communicate with other videoconferencing stations, thanks to the integrated HD



Dr. Tomas Seidal, Head of the Pathology and Cytology Department at Halmstad County Hospital, Halmstad, Sweden

of 1,300. We were therefore looking for a fast and efficient way of transmitting high-quality microscope images live between the two hospitals to enable our Halmstad pathologists to send their diagnoses to the surgeons in Varberg without losing any time.

The digital microimaging device Leica DMD108 was just the product we were looking for, being extremely user-friendly and reasonably priced and also easy to couple into our Tandberg videoconferencing system. We can now transfer high-resolution images with excellent colour representation straight from the microscope to the other hospital with less than half a second delay. At the same time, staff on each side are able to see and hear each other.

system plays a key role for Varberg in particular, enabling it to adhere to national guidelines for breast cancer surgery. Initially, we are mainly using the system for breast cancer operations to diagnose frozen sections of lymph nodes taken preoperatively.

Using the Leica DMD108 we are also able to offer remote diagnosis services and hold multi-disciplinary discussions and conferences including surgeons, radiologists and pathologists of both hospitals. We also plan to use the digital microimaging device for routine diagnostics and for training our hospital staff in the near future.

This type of solution offers small hospitals in general the opportunity to specialize in surgical disciplines without the need for an on-site pathologist.

## New possibilities of interactive cooperation

The combined Leica-Tandberg solution creates new possibilities of interactive diagnosis and patient data discussion for both hospitals. The

More information about Halmstad County Hospital & Varberg Hospital:  
[Tomas.Seidal@lthalland.se](mailto:Tomas.Seidal@lthalland.se)

camera & codec. The images of the Leica DMD108 can be projected locally & remotely, together with voice & video of participants. If 2 or more complete Leica DMD108 & Tandberg 1700 MXP solutions are connected, the micro-images of each system can be shared by all participants. In addition the physicians benefit from:

- All in one control centre designed for desktop use
- Compact HD camera & integrated 20" widescreen LCD
- Easy switch between a video call and PC display
- Connection of up to 4 video sites with embedded multisite functionality
- Up to 2 Mbps H.323/2 Mbps SIP/2.3 Mbps total multisite
- Protection against network interruption in point-to-point and multipoint calls



More information on Leica-Tandberg solution: [Peter.Schmitt@leica-microsystems.com](mailto:Peter.Schmitt@leica-microsystems.com)  
 More information on Tandberg products: [Paschalis.Kastoris@tandberg.com](mailto:Paschalis.Kastoris@tandberg.com)

# Leica CM1950

## Rapid freezing and enhanced operator safety

The new series of Leica CM1950 rapid sectioning cryostats combine high quality sectioning, user safety, and efficient workflow. They provide optimum conditions for receiving reproducible sectioning results within a few minutes. Extremely rapid freezing through a quick freezing shelf for up to 17 specimens, as well as independent specimen cooling for brief and frequent temperature changes are only two major details that allow quick specimen processing of large quantities of specimens. The new disposable blade holder CE with integrated, coloured safety guard and blade removal aid makes blade handling safer. The optional vacuum sectioning aid achieves time-saving section preparation and reduces section curling.

### Rapid freezing

Specimens adhere well to the pre-cooled, deeply grooved specimen discs. Because the discs feature a large back surface that fully contacts the freezing shelf with integrated Peltier element, specimens freeze very quickly. The specimen discs can be pre-cooled in the internal storage container, and then easily organised and transported. Color coded specimen discs help identify specimens coming from multiple sources.



### Maximum protection

The built-in UVC disinfection system provides certified protection from infectious material and minimises the risk of contamination in the cryochamber (Certification of the effectiveness of UVC disinfection: [www.leica-microsystems.com/cm1950\\_safety](http://www.leica-microsystems.com/cm1950_safety)). To efficiently reduce the propagation of infectious agents on the outside surfaces of the cryostat, the Leica CM1950 family features an antimicrobial nanosilver surface coating, called **AgProtect™**. Silver (**Ag**) ions are well documented for their ability to reduce bacterial growth.

### Easy cleaning

Section waste is easily removed by using the Section Waste Removal System during trimming with the magnetised nozzle, or during extensive cleaning with the flexible hose. Solid waste is collected in a concealed primary filter system and air is filtered through a HEPA filter for added safety in the laboratory environment. Liquid condensate is collected in a condensate bottle for safer disposal.

More information on Leica CM1950:  
[Claudia.Dorenkamp@leica-microsystems.com](mailto:Claudia.Dorenkamp@leica-microsystems.com)  
[leica-microsystems.com](http://leica-microsystems.com)



# Pathology & Diagnostics Events

Please also visit our website [www.leica-microsystems.com/EU-Pathology](http://www.leica-microsystems.com/EU-Pathology) for information on Leica workshops in Europe

## **IV Congresso Nazionale SIAPEC**

October 5–9  
Milano, Italy

## **Morphologie-Histologie Tage 2007**

October 12–13  
Kassel, Germany

## **33rd European Congress of Cytology (ECC) 2007**

October 14–17  
Madrid, Spain

## **Herbsttagung der Österreichischen Gesellschaft für Pathologie**

October 19–20  
Bad Ischl, Austria

## **Bioceramics 20 – 20th International Symposium of Ceramics in Medicine**

October 24–26  
Nantes, France

## **Histo-temadagen 2007**

November 1  
Odense, Denmark

## **Jahresversammlung der Schweizerischen Gesellschaft für Pathologie 2007**

November 8–10  
Winterthur, Switzerland

## **X. Congresso Nazionale SIGU**

November 14–17  
Montecatini Terme, Italy

## **Medica 2007**

November 14–17  
Düsseldorf, Germany

## **Société belge d'infectiologie et de microbiologie clinique**

November 15–16  
Brugge, Belgium

## **Carrefour Pathologie 2007**

November 19–23  
Paris, France

## **19. Fortbildungstagung für Klinische Zytologie**

November 22–25  
Munich, Germany

## **2. DVR-Kongress**

November 29 – December 1  
Bad Godesberg, Germany

## **10. Bamberger Morphologietage**

January 25–26, 2008  
Bamberg, Germany

## **9th European Congress on Telepathology**

May 15–17, 2008  
Toledo, Spain

## **III Intercontinental Congress of Pathology**

May 17–22, 2008  
Barcelona, Spain

## **ESHG**

May 31 – June 2, 2008  
Barcelona, Spain

## **ESHRE**

June 5–9, 2008  
Barcelona, Spain

This reSOLUTION Edition is the magazine for Leica Microsystems customers in Pathology & Diagnostics

### **Publisher**

Leica Microsystems GmbH  
Ernst-Leitz-Straße 17–37  
D-35578 Wetzlar (Germany)  
[www.leica-microsystems.com](http://www.leica-microsystems.com)

### **Editors in Chief**

Anja Schué,  
Corporate Communications  
[Anja.Schue@leica-microsystems.com](mailto:Anja.Schue@leica-microsystems.com)

Giancarlo Migliore,  
European Marketing  
[Giancarlo.Migliore@leica-microsystems.com](mailto:Giancarlo.Migliore@leica-microsystems.com)

### **Contributing Editors**

Oliver Garner  
Petra Kienle  
Kenneth Mitchell  
Anja Schué  
Tomas Seidal  
Colin Tristram

### **Layout**

Heinz Flick

### **Cover Picture**

Leica Microsystems

### **Production**

Uwe Neumann,  
Central Marketing

### **Printing Date**

September 2007



# Broad Spectrum Histology!

## A single source for all your histology needs

From patient to pathologist and all steps in between, you can continue to rely on the innovative histology solutions you've come to expect from Leica Microsystems and Vision BioSystems™. Through our integration, the newly formed Biosystems Division of Leica Microsystems provides all the high-quality instruments, Novocastra™ reagents, and consumables you need for efficient and accurate histology processes... the entire histology spectrum.

Histology has an exciting future. Partner with us for:

- Diagnostic confidence and proven experience
- Productivity improvements in your laboratory
- Outstanding technical and customer service

Leica Microsystems... now there's only one histology partner you need to call.

[www.leica-microsystems.com](http://www.leica-microsystems.com)