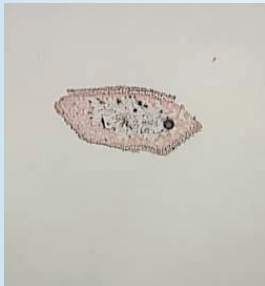
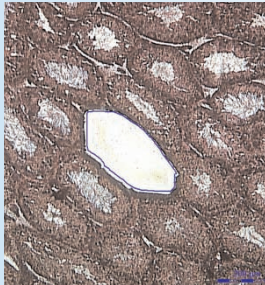
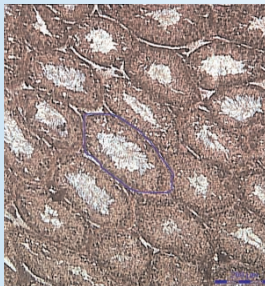


Obtaining Cell-Specific Analysis with the Laser Scapel

By Christoph Horlemann

Marketing – Life Science Research

Leica Microsystems, Inc. Life Science Division



Bouin's fixed paraffin tissue, stained with Hematoxylin and Eosin, magnification 40x; before dissection, after dissection, dissected specimen.

Courtesy of P. Sawhney, PhD, College of Pharmacy, The University of Texas, Austin, Texas.

The origin and course of many diseases depends on specific genetic activities and interactions of proteins in single or few cells. In order to make unambiguous and reliable diagnoses, it is necessary to selectively isolate cell populations to obtain the required material for cell-specific analysis of RNA, DNA or proteins.

The Leica LMD6000 easy-to-use laser microdissection system makes it possible to select and cut extremely small areas (even single cells) from tissue sections. A pulsed laser beam is focused through the objective of an upright microscope onto the sample. The laser hits the sample at short intervals of less than 1ns, which allows absolutely no build-up of heat within the area in the focus. The series of pulses creates the desired cutting line.

In addition to the laser and the control software for selecting the dissectates, the upright microscope is equipped with a special stage, which accommodates three specimen slides and the corresponding collection devices. Laser microdissection samples are normally

prepared on a substrate membrane, which can be easily and effectively removed after dissection since the dissected areas fall into a collection device underneath the stage due to the force of gravity. The Leica LMD6000 also cuts specimen slides made of glass, e.g., from older archived specimens. The dissectate can be directly separated from the slide with a special technique.

continued on page 2

Is "Lean" Right for My Lab?

By Andreas Kaepplein

Group Marketing Manager – Core Histology Products

Leica Microsystems, Inc. Biosystems Division



The expertise of a histotechnologist/technician has always been required to apply sophisticated laboratory techniques so that accurate diagnoses can be made. Histology techniques and workflow have come a long way over the past twenty years, and there is no work step that cannot be automated. Over the years, histology processes have evolved to enable the histotechnologist to produce finished slides more quickly than ever before in a safer environment. Technological advancements that promote histotechnologist health and safety are crucial now, automation is key in providing safety to laboratory personnel and higher throughput. Many of today's laboratories consider the benefits of automation during new equipment acquisition. The following discussion highlights a few of the issues that laboratories take into account during the acquisition process.

Equipping your laboratory with automated solutions today prepares you for the laboratory of tomorrow. The first step into histology automation is usually the acquisition of a stainer, and better yet, an integrated staining/coverslipping workstation. Microtomy automation is growing as well and is well accepted among histologists. Automation does not yet eliminate every manual step, but this is where Leica Microsystems sees an obligation and an opportunity to help histologists do an even better job of delivering fast, precise, high-quality results.

How do we get started?

Equipping your laboratory with automated solutions today prepares you for the laboratory of tomorrow. The first step into histology automation is usually the acquisition of a stainer, and better yet, an integrated staining/coverslipping workstation. Microtomy automation is growing as well and is well accepted among histologists. Automation does not yet eliminate every manual step, but this is where Leica Microsystems sees an obligation and an opportunity to help histologists do an even better job of delivering fast, precise, high-quality results.

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Cell-Specific Analysis

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The powerful diode laser is ideal for fast and highly precise dissection. The Leica LMD6000 controls the cutting movement through special prisms. Therefore, precision increases in direct proportion to the objective magnification. For an objective with 63x magnification, a cut width of about 1µm is attained, for a dry objective with 150x magnification the width of the cut is even less than 1µm.



Objectives specially constructed for laser microdissection with highest UV-transmission. The unique 150x dry objective is optimal for the dissection of single cells



With Leica Microsystems easy-to-use laser microdissection system it is possible to select and cut even single cells from tissue sections.



Is “Lean” Right for My Lab?

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Lean Histology

Today's histology laboratory faces many challenges. In addition to meeting the requirement to provide the highest quality results to pathologists to assure precise diagnoses, laboratories need to provide faster turnaround times and maintain compliance to strict regulatory standards. Due to a national shortage of certified histotechnologists, many laboratories strive to improve their workflows by streamlining and automating processes. In recent years, the industry has begun adopting “lean” principles, and they have already proven beneficial from both a workflow and financial standpoint. The goal of “lean” is to eliminate unnecessary work steps and sustain continuous improvement.

Leica Microsystems' Lean Histology™ philosophy takes the best principles of “lean” and applies them in histology laboratories to improve workflow. As a long-time advocate of automation and safety, Leica Microsystems is devoted to providing high quality products that simultaneously simplify work and improve the quality of the end result. Leica Microsystems now takes that action a step further and offers a full range of products that are essential to achieve faster turnaround time, improve safety, streamline workflow, and increase the quality and precision of diagnoses.

Lean Histology™ starts in the grossing room. The Leica IP C Cassette Printer eliminates the manual process of labeling tissue cassettes with patient information by automatically printing them with barcodes and alphanumeric characters. The Leica IP C can also be integrated with a Laboratory Information System (LIS) to eliminate duplicate entries, which further streamlines the process and reduces the potential for errors.

The next step in the histology workflow process, tissue processing, is supported by the Leica Peloris™ Rapid Tissue Processor. The Leica Peloris enables laboratories to process tissue faster and in smaller batches, which supports the lean principle of continuous workflow. After embedding the tissue in paraffin on one of Leica Microsystems' embedding centers, the Leica IP S Slide Printer can automatically print onto slides before sections of the block are mounted on them. When reading barcode information from the block, Leica HistoPAL™ software simplifies the process of producing slides and ensures that the correct patient information appears on the slide.

Is “Lean” Right for My Lab?

continued from page 2

Next, sectioning tissue blocks on a Leica RM2000 Series fully automated or manual microtome ensures precision sectioning with consistent thickness, while providing the utmost comfort to the user. Another cornerstone of the lean histology lab is a fully automated staining and coverslipping workstation. Leica Microsystems offers either the Leica ST5010 Autostainer XL or the ST5020 Multistainer platform for flexibility and high throughput. Both stainers create an integrated workstation with the Leica CV5030 glass coverslipper. Eliminating the manual process of transferring slides from stainer to coverslipper frees up valuable technician time to do other important tasks.

With the Leica Bond-max™ and Novocastra™ reagents, Leica Microsystems brings immunohistochemistry to the next level of automation, which also supports the lean principle of continuous workflow. From specimen identification, tissue processing, embedding, sectioning, staining, coverslipping, immunohistochemistry, to microscopy Leica Microsystems offers great solutions for implementing lean principles step-by-step in today's histology laboratory.



Make the Most of Your Instrument

Lab Automation – Specimen Preparation

By Michael Revolinski, *Software Application and Integration Specialist*
Leica Microsystems, Inc., Biosystems Division

As laboratories continue on the path to automation, they have a large opportunity to reduce errors and improve efficiencies by implementing a barcode solution for cassette and slide labeling. By including barcodes on cassettes and slides, a laboratory can replace or enhance many of its manual processes done today. When it comes to specimen identification, the barcode is key to saving time and reducing errors.

When we think of barcodes, many of us think of the barcodes found on the products we buy at the supermarket. These barcodes, called linear or 1 Dimensional (1D) barcodes, store information in a series of bars that are separated by white spaces. As the amount of information in the barcode grows, the barcode becomes longer. Due to the space required for this type of barcode, it is not well suited for unique labeling applications. The 2 Dimensional barcode was developed to resolve this spatial obstacle.



Leica IP C Cassette Printer and IP S Slide Printer

2 Dimensional (2D) barcodes have several advantages over traditional 1D barcodes. They allow more data to be stored in a smaller space and are more resistant to scanning errors that can occur due to damaged barcodes. 2D barcodes work by encoding data in both the horizontal and vertical dimensions,

which allows the barcode to take up much less space than a 1D barcode. There are many different types of 2D barcodes (also called symbologies). The Data Matrix barcode symbology is ideal for cassette and slide labeling due to its ability to encode a large number of characters in a small space. This symbology allows the encoding of up to 50 characters in a 2 to 3mm space. Additionally, Data Matrix has a much lower contrast requirement between the imprint and the surface it is printed on, which improves readability.

So, if you're looking to gain efficiency and reduce specimen identification errors in your lab, take a look at barcode labeling for cassettes and slides utilizing the Data Matrix 2D barcode symbology.



A Day in the Life

Rapid Tissue Processing

By Kurt Nauss

Histology Laboratory Manager

Florida Hospital, Orlando Florida Campus

The Orlando Campus histology laboratory serves all seven Florida Hospital campuses as well as our outreach physician offices. These campuses and physician's offices are all located in the Central Florida area. In order to provide services for such a large system, we have staggered our staff into 8-hour shifts to maximize workflow and improve efficiency. We currently work Sunday through Saturday. I have techs who comes in at 10:00pm, with one tech who works Sunday through Thursday, and two others who work Monday through Friday night. I also have one tech who works Sunday from 1:00pm to 9:30pm and another Monday through Thursday from 5:00pm to 1:30am. This staggered schedule gives us around-the-clock coverage so that tissue is continually in the process of being embedded, cut or stained.

Our lab processes an average of 900 blocks a day. Prior to acquiring our two Leica Peloris Rapid Tissue Processors, we used seven conventional tissue processors that we would start loading at 12:00pm. Since the Peloris cut the processing times in half, we have been able to minimize the amount of staff coming in the middle of the night because the processors run continuously. It is also important to note that because our two Peloris processors do the work of seven, it has also increased the amount of space in our laboratory tissue processing area.

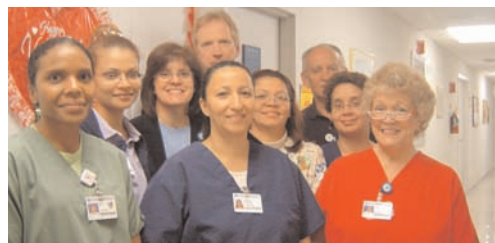
New Processing Schedule

Load Time	Processor	Retort	Tissue	End Time
12:00pm	Peloris I	A	Routine	5:15pm
12:00pm	Peloris II	A	Biopsy	2:15pm
3:00pm	Peloris I	B	Routine	8:00pm
3:00pm	Peloris II	B	Biopsy	5:15pm
6:00pm	Peloris II	A	Biopsy	8:45pm
6:00pm	Peloris II	B	Routine	11:45pm
6:30pm	Peloris I	A	Early Fat	2:30pm
9:00pm	Peloris II	A	Biopsy	11:15pm-12:00am
9:00pm	Peloris I	B	Routine	2:15am-3:00am
1:00-2:00am	Peloris I	A	Late Fat	9:00am-10:00am

1. Routine and Biopsy out at 5:00pm
2. Routine out at 8:00pm
3. Biopsy out at 8:30pm
4. Biopsy out at 11:00pm-12:00pm
5. Routine out at 11:30pm
6. Routine out at 2:00am-3:00am
7. Early Fat out at 2:30am
8. Late Fat out at 9:00am-10:00am

The last tissue processor run depends on when the pathology assistants are done with the gross dissection for the evening. This streamlined schedule has helped alleviate a backlog of work, which we used to encounter every morning because the work would stack up with all of the work coming off the processors around the same time. We used to have a lot of cases to complete on Saturday, but due to the rapid processors, we actually complete them Friday night. This allows the techs on Saturday to do a large volume of the work that would normally be done on Monday. The early Sunday tech also comes in and works on the blocks for Monday while loading and processing all of the blocks that are gross-dissected by the pathology assistant.

All slides are being labeled continually, so by 7:30am on Monday, 80% of the slides are signed off and ready for distribution to the pathologists with excellent quality. Another benefit I would like to note is that with our seven old processors, we used to change all the solutions once a week. We have cut down our usage from 355 gallons to 125 gallons per month. Not only is the Peloris saving us money on solutions, but also the cost of chemical disposal.



Left to Right: Back row: Kurt and Hernando. Front row: Rose, Carol, Barb, Nubia, Iris, Marta and Webby



Left to Right: Dennis, Maggie, Jessie, Patricia, and Cidoine



Left to Right: Connie, BJ, Maria, and Lily



Upcoming Events

The Biosystems Division of Leica Microsystems cordially invites you to attend the 2008 Symposia Series

"Advances in Histology and Immunohistochemistry Techniques"

You will learn about exciting industry advances that are shaping the Histology laboratory, earn free CEU credits, and see demonstrations of state-of-the-art laboratory solutions for your workflow challenges.

Keynote Speaker:

Dr. Cynthia Cohen, *Department of Pathology, Emory University Hospital*
"In Situ Hybridization in Today's ImmunoPathology Laboratory"

Guest Speakers:

Jim Burchette, HT (ASCP) QIHC, *Director of Immunopathology, Duke University*
"Specialized Immunohistochemistry and Troubleshooting Techniques"

Dr. Mark Rees, *Molecular Biology Manager, Novocastra™, Leica Microsystems*
"The First Quantitative Comparison of Immunohistochemical Rabbit and Mouse Monoclonal Antibody Affinities Using Biacore Analysis"

David White, *Group Marketing Manager, Leica Microsystems*
"Histology: Maximizing Quality and Workflow"

Date: Wednesday, May 21, 2008

Time: 9:00 a.m. to 3:30 p.m. (8:30 a.m. registration)

At noon, we invite all attendees to enjoy a complimentary lunch and the chance to network.

Place: Emory Conference Center

1615 Clifton Road

Atlanta, GA 30329

Please R.S.V.P. to help us plan the event.

Email broadpectrumhistology@leica-microsystems.com



Your Local Leica Team



To find your local Leica Sales and Service Team, visit:

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Editorial Staff

Editor-in-Chief:	Molly Baker
Managing Editors:	Pam Jandura, Doug Giszczynski, Andreas Kaeppler, Jan Minshew, Kathy Bucknell
Graphic Design:	M.N. Kennedy
Contributors:	Christoph Horlemann, Michael Revolinski
Special Thanks:	Kurt Nauss, Florida Hospital

Note: We are interested in your comments and thoughts about the newsletter. Please feel free to email your comments to:
pathologypartners@leica-microsystems.com