New York State Histotechnological Society

On Stage

Volume 31, Issue 2 Spring 2012

Celiac Disease: Confirmation by Biopsy

By: Dr. Pamela Colony,HT (ASCP)
SUNY Cobleskill

Celiac disease, also known as celiac sprue, nontropical sprue or gluten-sensitive enteropathy, is a chronic autoimmune disease that occurs in genetically predisposed individuals. It is a surprisingly common disease with an estimated occurrence of about 1 in 100. One of many problems with this disease is the fact that it is often not diagnosed for years after symptoms first occur, due at least in part, to the heterogeneity and non-specific nature of many of the symptoms. In children, for example, the symptoms frequently occur in the gastrointestinal tract and may include malabsorption, abdominal bloating and pain, constipation or chronic diarrhea, fatty stool and weight loss. In contrast, adults may present with a wide variety of non-intestinal symptoms such as fatigue, an itchy skin rash called dermatitis herpetiformis, arthritis or bone loss. Despite the variable symptoms, at least one common contributing factor has been identified. Individuals with celiac disease cannot tolerate gluten, a protein present in wheat and the related grains, rye and barley. Ingestion of foods containing gluten by a celiac patient can stimulate an inappropriate immune mediated inflammatory response. In the histology lab, the changes are often manifests in the small intestine, particularly the duodenum, and the morphological changes include a loss of villus structure, increase in crypt length and an increase in intraepithelial lymphocytes.

The morphological changes occurring in the small intestine of a celiac patient can be viewed as a disruption in the balance between cell renewal and cell loss in the cells lining the intestine. The small intestine is organized into four layers: the mucosa, the submucosa, the muscularis externa and the serosa. The mucosa consists of three components, the simple columnar epithelium that borders the lumen, the underlying loose connective tissue called the lamina propria, and a thin layer of smooth muscle, the muscularis mucosa. Deep to the mucosa is the collagen rich submucosa which serves as a pathway for large blood vessels, lymphatics and nerves. The muscularis externa has an inner circular smooth muscle layer and an outer longitudinal layer. The serosa is often difficult to visualize as it consists of a simple squamous epithelium and associated connective tissue. Another name for the serosa is the visceral peritoneum as it is the inner lining of the peritoneal cavity which covers the surfaces of visceral organs including the small intestine. In the histology lab the tissue samples submitted for confirmation of a diagnosis of celiac disease are typically biopsies. These only include the mucosal layer(s), not the full thickness of the intestinal wall.

As shown in Figure 1 the normal mucosal surface is arranged into long fingerlike structures called villi which are lined by villous absorptive cells or enterocytes and goblet cells. At the base of the villi are the crypts, short straight mucosal glands. The glands contain a population of dividing cells called the undifferentiated crypt cells. These function as stem cells and give rise to the villous absorptive cells (VAC). The VAC's in the crypt are immature cells that are destined to migrate out of the cypts onto the villi. As they travel up the villi they mature and they become actively involved in the digestion and absorption of nutrients. After approximately 5-7 days these cells reach the tips of the villi where they are sloughed off into the lumen. There is, therefore, a dynamic relationship between the formation of immature absorptive cells in the crypts and the loss of fully differentiated cells at tips of the villi. In celiac disease this dynamic equilibrium is disrupted.

On Stage is published quarterly by the New York State Histotechnological Society for its membership. Contributions, suggestions and advertisements are welcome. Please visit the NYSHS website for submission information and guidance. Permission to reprint is granted as long as source and author are acknowledged and a copy of the reprint is sent to the editors. Articles without bylines are written by the editors. Please submit manuscripts to the editor-in –chief.

Deadlines for Submission are:

September 1 - Fall
December 1 – Winter
March 1 - Spring
June 1 - Summer

Membership in the New York State Histotechnological Society, includes a subscription to *On Stage*. The annual membership fee is $20.00. Please direct membership inquiries to:

nyshsmembership@yahoo.com

Inside this issue:

As I am sure we all are experiencing, the expectations to do "more with less" which continues to pressure everyone working in the laboratory field. Recent headlines such as "New effort by MD's to cut wasteful medical spending" (Associated Press, http://www.apnews.com) suggest that this trend will continue for the foreseeable future. The industry, and in particular the laboratories, are feeling the squeeze more and more. Lower reimbursements rates and fewer ordered tests means that budgets will continue to shrink. Hospital mergers and closures create a high degree of uncertainty regardless of whether you are an administrator or tech. In fact, the number of mergers is expected to continue and quite possibly surpass last year, adding more anxiety to an already stressful environment (Hospital mergers, acquisitions expected to maintain quick pace, AmedNews http://www.ama-assn.org/amednews). What does this all mean? We all have to be on "our toes"! We all have to work smarter, more efficiently to minimize any risk to ourselves and our laboratories. One of the best ways to accomplish this is to continue to educate ourselves. So, we are very excited and pleased to be hosting the Region 1 Symposium this April at the Islandia Marriott on Long Island. NYSHS has worked hard in creating a strong educational program at a reasonable expense to offer current hot topics. With 13 faculty members and over 20 CEU credits, the topics range from forensics and laser microtomy to the histology of hair and changes in medical coding regulations. We are hosting our second career day with 60 students visiting from a local area high school. Over 20 individuals have volunteered their time and effort to help make this another successful recruiting drive for future histologist. We have 23 vendors and have extended exhibit hall hours to accommodate what we hope is a very large crowd. Be sure and register soon as the deadline is fast approaching. For more information, please visit the NYSHS website and download the meeting program. We hope to see you there!!

As we move into early summer, we look forward to a much needed break…… but don't forget, NYSHS elections are coming up and we are always looking for volunteers to help with all aspects of operating the society.

All the best

Luis

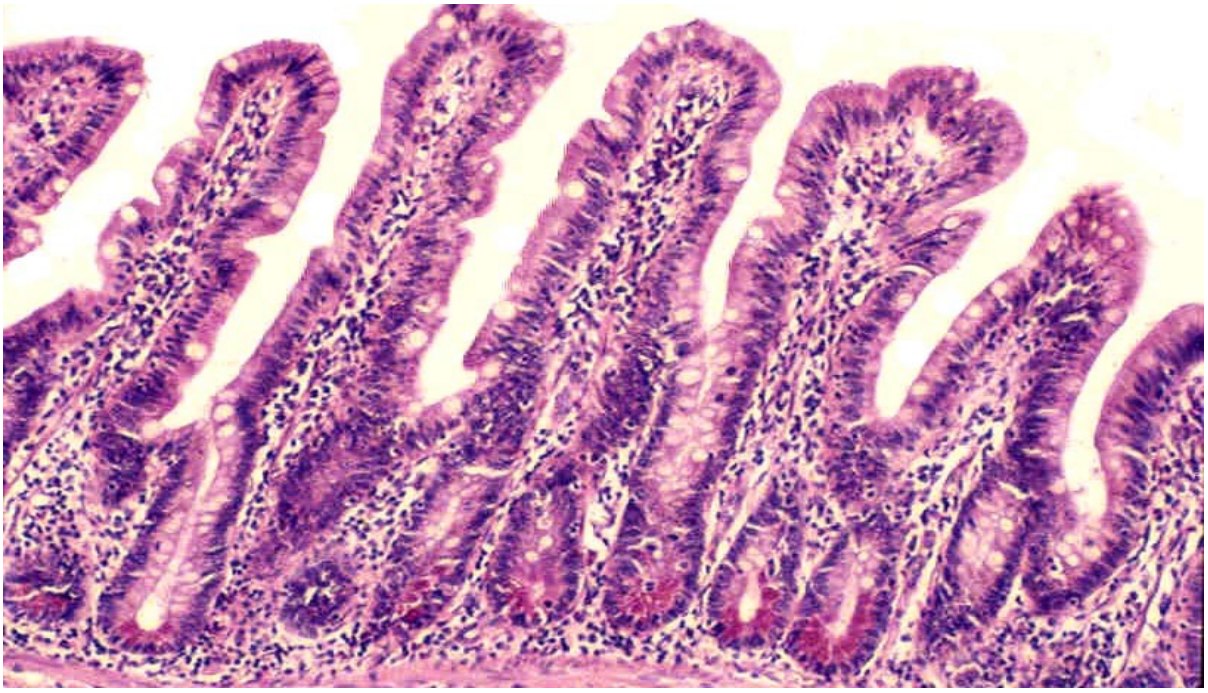


Figure 1: Long fingerlike villi with short straight tubular crypts are present in healthy mucosal samples. In this section Paneth cells can be seen at the base of the crypts with their intensely eosinophilic apical granules. Smooth muscle cells of the muscularis mucosa are

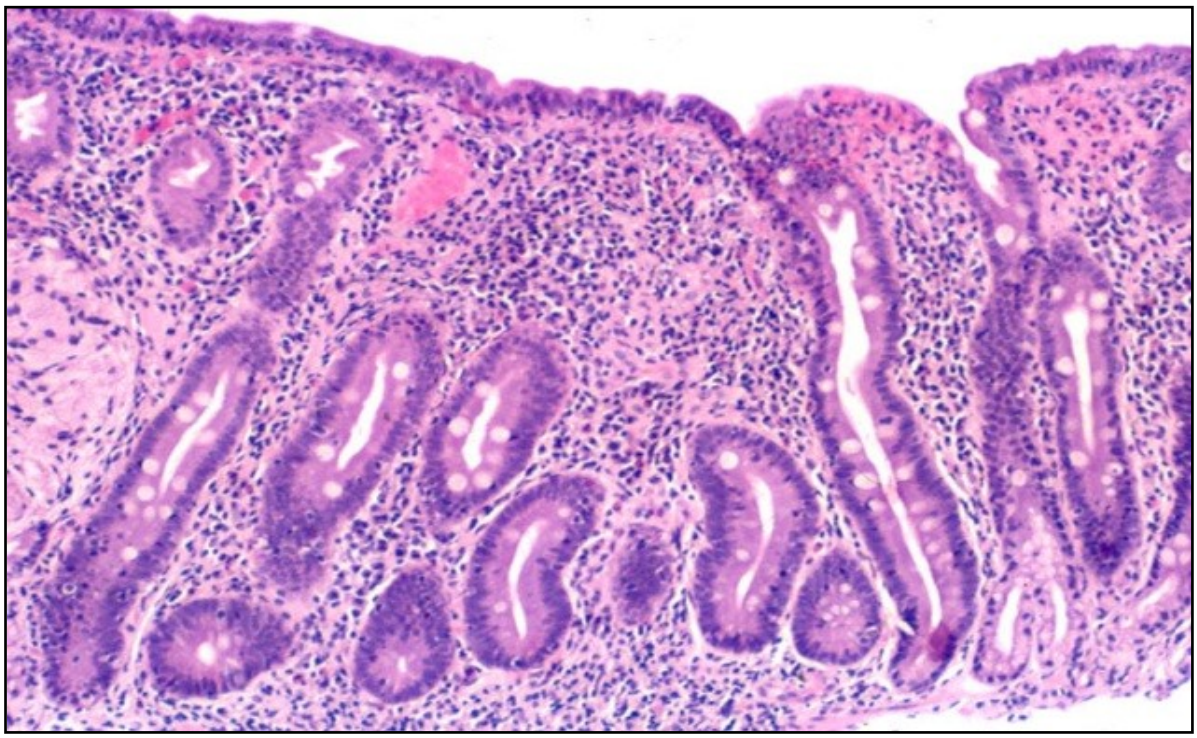


Figure 2: This biopsy tissue was taken from the duodenum of a celiac patient. Note the total loss of villi and the increased length of the crypts. (H & E)

The offending agent in celiac disease, gluten, is actually a family of proteins present in wheat and related grains. Some of the proteins that make up gluten (the ones that are dissolved by alcohol) are called gliadin (Van de Wal Y et al 1998). In the presence of gluten (gliadin), the mucosal T lymphocytes are activated to release cytokines that result in damage and death of the villous absorptive cells, a prelude to the subsequent histological changes. One specific cytokine that has been implicated in the pathogenesis is interferon gamma (R T

Call for 2012 NYSHS Elections

The Election Committee is now accepting nominations
for the following positions:

- President
- Corresponding Secretary
- Membership Secretary
- Three Members of the Board of Directors

To be nominated, the person must be a member of NYSHS for at least one year and currently in good standing.
Please be sure before nominating a member that they are willing to serve the Society for a minimum of a 2 year term and confirm they will accept the nomination. Individuals who accept the nominations must provide a CV/ resume and write their own bios (Please limit biographies to a brief paragraph) for the balloting process and submit them in a timely fashion to nomination chair:

Kathleen.caleri@roswellpark.com.

If you would like to nominate someone, please fill in the nomination form on the next page. The form is also available on the website. Additional nominations forms will be available at the registration table at the 2012 meeting. All nominations must be received by the close of the annual meeting
Ballots for the election will be sent out in early June.

Watch your mail and be sure to vote!!

NYSHS ELECTION NOMINATION FORM

The Nominations Chairperson is accepting nominations for this year's elections. To view the open positions, please visit the website at

http://www.nyhisto.org/

To be nominated, an individual must be a member of NYSHS for at least one year and currently in good standing. They should have expressed a willingness to serve the society.

If you would like to nominate someone, please fill in the nomination form below.

I _____ nominate

_____ For the NYSHS office of:

_____

He/She has been a member of NYSHS for at least one year and is currently in good standing. He/She has also expressed a willingness to serve the society.

Nominator's Signature_____ Date_____

NOMINATIONS MUST BE RECEIVED NO LATER THAN

THE CLOSE OF THE ANNUAL MEETING

Please return completed forms by email or snail mail to:

Nominations Chairperson:

Kate Caleri
57 Azalea Drive
West Seneca NY 14224
kathleen.caleri@roswellpark.org

First Call for Constituent Society HOD

Delegates and Alternates

The annual meeting of the House of Delegates of the National Society for Histotechnology will convene on **October 3rd** at 7:00 PM in Vancouver Canada . Constituent Societies may seat the President of the society or Presidential alternate, and one (1) delegate or alternate for each fifty (50) NSH members, or any part thereof, in that state. The requirements are

The President of the Society or Presidential alternate and all individuals selected as delegates or alternates must be current active NSH members in good standing for at least one (1) year (this is interpreted as a calendar year) prior to the meeting of the House of Delegates in order to be eligible to serve in the House. Article I, Section 2, Part B of the Bylaws states: ***"Active member in good standing: A member of this Society who has an active membership classification and whose dues are paid in full for the current year and who is not under suspension. Only active members shall be entitled to vote, hold office, act as delegates, or serve on any board or committee."***

Names of the Constituent Society President and/or alternate, all delegates and alternates must be submitted on and received by the committee no later than **August 1st 2012.** (All names must be received at least sixty (60) days prior to the HOD meeting)

If you would like to serve as a delegate, please contact

Luis Chiriboga at:

litepath2000@yahoo.com

(Continued from page 4)

Przemioslo et al 1995, Nilson et al, 1995).

The precise role of the T lymphocytes in celiac disease continues to be an area of extensive research. Within the past ten years several serological tests reflecting activities related to T cell activation and response(s) have been correlated with the presence of celiac disease. In fact, serologic testing for anti-gliadin antibodies, tissue transglutaminase (t-TG) antibodies and/or anti-tissue endomysial antibodies have all been used as indicators of celiac disease (Bazzigaluppi, E., et al, 2006. Zanini et al, 2011, Vitoria, J.C., et al, 2009, Green & Cellier 2007). Despite these findings, however, the duodenual biopsy is still the most definitive method to confirm a diagnosis of celiac disease.

Bazzigaluppi, E., Roggero, P., Parma, B, and Brambillasca, M., Antibodies to recombinant human tissue-transglutaminase in coeliac disease: Diagnostic effectiveness and decline pattern after gluten-free diet, Digestive & Liver Disease, 2006, 38: 98-102

Green PHR, Cellier C. Medical progress: celiac disease. *The New England Journal of Medicine.*2007;357:1731–1743

Nilsen E.M., Lundin K.E.A., Krajci P., Scott H., Sollid L.M., Brandtzaeg P. Gluten specific, HLA-DQ restricted T cells from coeliac mucosa produce cytokines with Th1 or Th0 profile dominated by interferon-γ *Gut.* 1995;37:766–776

Przemioslo R.T., Lundin K.E.A., Sollid L.M., Nelufer J., Ciclitira P.J. Histological changes in small bowel mucosa induced by gliadin sensitive T lymphocytes can be blocked by anti-interferon gamma antibody. *Gut.* 1995;36:874–879

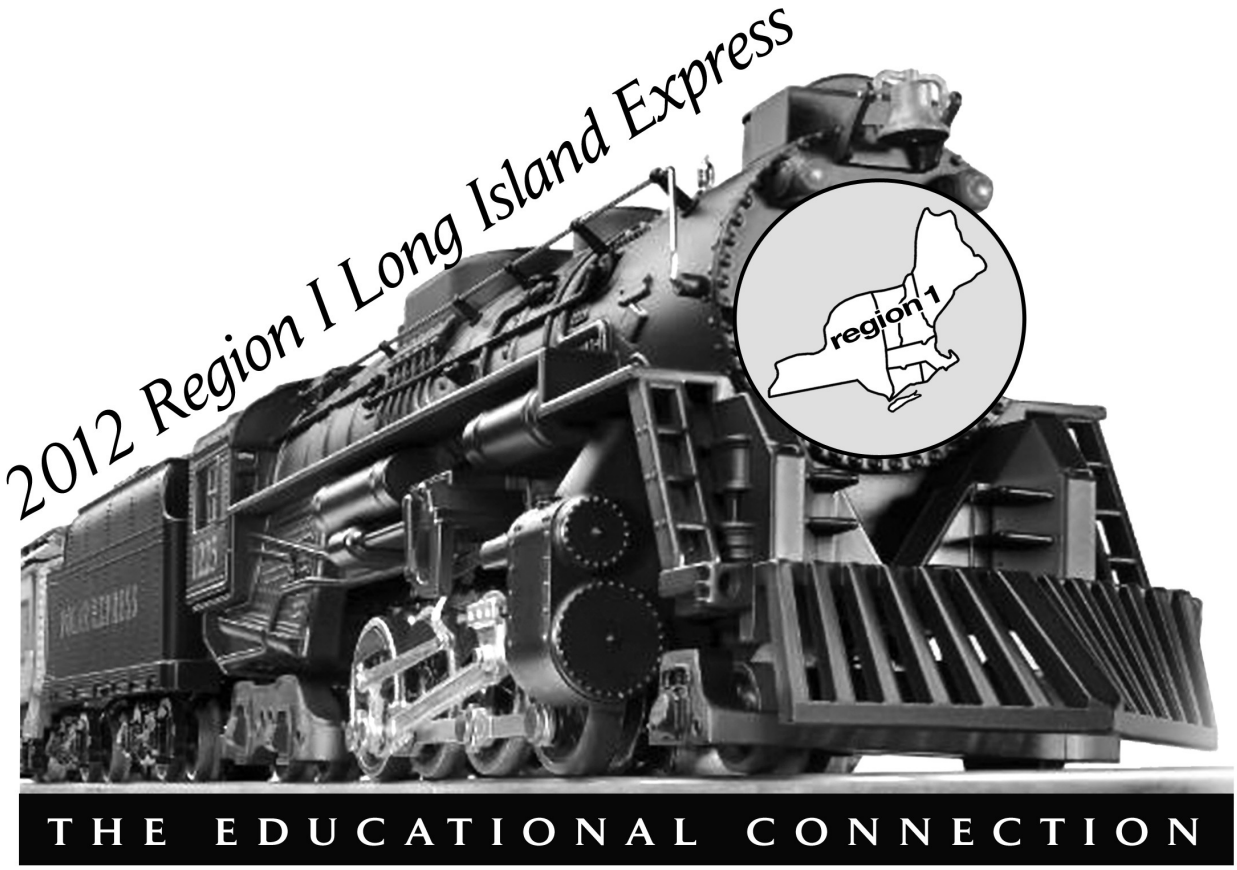
Van de Wal Y., Kooy Y.M., van Veelen P.A., Pena S.A., Mearin L.M., Molberg Ø., Lundin K.E.A., Sollid L.M., Mutis T., Benckhuijsen W.E. Small intestinal T cells of celiac disease patients recognize a natural pepsin fragment of gliadin. *Proc. Natl. Acad. Sci. USA.* 1998;95:10050–10054

Vitoria, J.C., Arrieta, A., Arranz, C., Ayesta, A., Sojo, A, Maruri, N. et al., Antibodies to gliadin, endomysium, and tissue transglutaminase for the diagnosis of celiac disease. J. Pediatr Gastroenterol Nutr, 1999, 29: 571-574.

Zanini, B., Magni, A., Caselani, F., Lanzarotto, F., Carabellese, N., Villanacci, V., and C. Ricci, High tissue-transglutaminase antibody level predicts small intestinal villous atrophy in adult patients at high risk of celiac disease, 2012, Digestive & Liver Disease, 44:280-285.

2012 Region 1 Histotechnologist Symposium

April 27th and 28th 2012



Islandia Marriott Long Island

Islandia, New York

Hosted by the

New York State Histotechnological Society

General Symposium Information

Use one registration form per person. Forms may be duplicated. Name tags are required for entry into all functions.

Registrations received after **4/12/12** will be assessed a $25.00 late fee and cannot be refunded . For cancellation refunds prior to 4/12/12 please contact the registration coordinator (registration form, page 15).

Walk-in registration welcome and available with an additional $25.00 late fee.

For registration purposes, the membership rate is for individuals currently listed as members of either a state society within Region 1 or a member of NSH.

Hotel Room Reservation Deadline: **3/28/12** Please see Hotel information on page 14

Guests of attendees must register using a separate form. Guests are not permitted to attend educational sessions but are eligible to attend all other functions.

NSH Contact hours for CEU's will be given for all educational sessions.

Venue/Hotel Information

Marriott Islandia Long Island

http://www.marriott.com/hotels/travel/ispis-islandia-marriott-long-island/

Convention room rate: $ 119.00 for single or double room

The reservation deadline is **March, 28, 2012**

For reservations call: 1-800-228-9290

Group code: is **NYSHSregion I**

For reservations

Call direct 1800 228 9290

3635 Express Drive North Islandia, New York 11749

Travel Information

Driving: The Islandia Marriott is located off exit 58 on the westbound service road of the Long Island Expressway (I-495) New York.

Flying: Just 10 minutes from Islip MacArthur Airport (ISP). Complimentary Marriott Airport shuttle service available upon request by contacting the Marriott (1-800-228-9290).

Train: Central Islip - Ronkonkoma Line on the Long Island Railroad. For timetable and fares, please visit the www.mta.info/lirr

Bus: Local service is provided by Suffolk County Transit. For schedule and fares, please visit www.sct-bus.org/

Ferry:
From Bridgeport CT to Port Jefferson, NY *www.88844ferry.com*

Meeting at a Glance

Friday April 27

State Presidents Meeting: Friday April 27th 8:30-10:30AM
Registration Hours:
Friday April 27th 7:00 AM-11:00AM, 12:00-3:00 PM
Saturday April 28th 7:00 AM-11:00AM, 1:00-3:00 PM
Vendor Exhibit Hours:
Friday April 27th 11:30 AM-8:00 PM
Saturday April 28th 7:00 AM-3:00 PM

Registration Opens *Continental Breakfast Served*	7:00 AM
A. "Microwave Technology: Solutions for LEAN Workflow" Todd Schreiber BS, MS	8:00-9:00 AM 1.0 CEU
B. "Experiences of Double and Triple Automated Immunohisto-chemistry" Afsar Barlas MD: Memorial Sloan Kettering Cancer Research Center	9:30-10:30 AM 1.0 CEU
Coffee Break	10:30-11:00 AM
C. "Theoretical and Basic *in situ* Hybridization" James Hudock: Ventana Medical Systems	11:00-12:00 PM 1.0 CEU
Vendor Exhibit Hall Open	11:30-8:00 PM
Lunch On Your Own	12:00-1:30 PM
D. "A 2012 Medical Coding Update" Beth Sheppard: Ventana Medical Systems	1:30-3:00 PM 1.5 CEU
Coffee Break	3:00-3:30 PM
E. "Every Step you Take: Implementing a Tracking System" Clare Thornton BS, HTL (ASCP) QIHC: Dahl-Chase Diagnostic Services	3:30-5:00 PM 1.5 CEU
NYSHS General Membership Meeting	5:00-6:00 PM
Vendor Hall Wine & Cheese Reception ***Only light fare will be served***	6:00-8:00 PM

Saturday April 28

Registration Opens *Continental Breakfast Served*	7:00 AM
Vendor Exhibit Hall Open	7:00-3:00 PM
F. "The Critical Role of Microscopy in Forensic Pathology" Yvonne Milewski MD: Office of Suffolk County Medical Examiner	8:30-9:30 AM 1.0 CEU
G. "Coffee Talk for the Histotech" Tim Webster: Strata Pathology	8:00-9:30 AM 1.5 CEU
H. "Biomarkers in Cervical Dysplasia and Carcinoma" Sonya Hwang MD: Stony Brook University Hospital	8:00-9:30 AM 1.5 CEU
I. "Standardization and Validation of Immunohistochemistry" Beth Sheppard: Ventana Medical Systems	8:00-11:30 AM 3.0 CEU
J. "Laser Microtomy: The Future of Soft and Hard Tissue Histology" Jack Ratliff: NSH Hard Tissue Committee & BioMimetic Therapeutics	10:00-11:30 AM 1.5 CEU
Coffee Break	9:30-10:00 AM
Lunch/Region 1 Awards/Raffle	11:30-1:00PM
K."Insect Histology-Historical Overview and Current Perspectives" Damien Laudier: Laudier Histology Inc	3:00-4:30PM 1.5 CEU
L. "Forensic DNA Analysis of Histologically Prepared Specimens" Lawrence Kobilinsky PhD. John Jay College of Criminal Justice	3:00-4:30PM 1.5 CEU
Coffee Break	2:30-3:00PM
M. "Troubleshooting Immunohistochemistry Stains" Richard Cartun MD: Hartford Hospital	1:00-4:30PM 3.0 CEU
N. "Histology Workshop for Skin, Hair and Nails" Steven McClain MD: McClain Laboratories	1:00-4:30PM 3.0 CEU

Participating Vendors

AmeriPath
A LEADING ANATOMIC PATHOLOGY PROVIDER

MILESTONE
HELPING PATIENTS

AZER Scientific

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Servicing the Needs of the Medical Industry Since 1969. Made in the USA

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Tissue-Tek®—the most trusted name in histology
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Established 1944
MICROTOME KNIVES

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MEDICAL PRODUCTS

DAHL-CHASE

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SP SCIENTIFIC

Dako

STAFF ICONS

Electron Microscopy Sciences

StatLab
MEDICAL PRODUCTS

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LabStorage
Systems, Inc.

VENTANA®
A Member of the Roche Group

Leica
MICROSYSTEMS

VWR®

NSH Quick Facts: Contact Hour Certificates

- NSH reconciles and maintains contact hours for NSH members AND non-members for each approved meeting (state, regional and national)

- NSH does not authorize or assign credit until the meeting sign-in sheets are returned to the NSH office

- NSH members will receive an email notifying them that their contact hour certificates are available online for immediate download through their *My NSH* account

- Non-NSH member attendees of the meeting will be mailed a certificate within approximately four weeks of receipt of completed meeting paperwork

- If an attendee loses their certificate:
  - Members may reprint from their *My NSH* account at any time
  - Non-members can request a new copy from NSH but there is a transcript fee

- Questions? contact NSH by email at histo@NSH.org or call 443– 535-4060

NYSHS General Membership Meeting Minutes

Albany, NY

May 14, 2011

The meeting was called to order by President Luis Chiriboga at 12:32pm, seconded by Mary Georger. The minutes from the May 15, 2010 meeting were read. Motion to accept the minutes as read by Diana Scott, second by Mary Georger.

Treasurer: Michelle Fuller reported that the ending fund balance for the period of April 2010-March 2011 was $14,483.60. The ending fund balance for the period of October 2010-March 2011 was $14,483.60. Motion to accept by Laurie Marien, second by Sarah Mack.

Membership: Amy Farnan reported 187 members in good standing with 8 student members. Motion to accept by Mary Georger, second by Sarah Mack.

Newletter: Amy Farnan reported that our state newletter received a Merit Award at the NSH meeting. Motion to accept by Mary Georger, second by Sarah Mack.

Nominations: The positions to be filled include Vice President, Treasure and 2 BOD seats. Angela Fogg was nominated for the position of Vice President, Michelle Fuller was nominated for the position of Treasurer, Pam Colony, Leanne Strope, and Linda Chen were nominated for BOD seats.

Website: Luis Chiriboga reported an anticipated launch date for the new website of July 1st.

Awards: Sarah Mack reported for the committee only 5 awards were given out this year as there were not enough applicants. Sarah urged members to apply next year. 2 Gulf Coast Instrument Awards, each worth $500 went to Jun Jie Liang and Sara Laviska. The Leica Microsystems Award, worth $200 went to Jun Jie Liang. The Source Medical Products Award, in the amount of $250 went to Erin Bertani. The Sakura FinetekUSA Award, also in the amount of $250 went to Erin Bertani. The Source Medical Products Mentor Award, worth $250, went to Debra Kassay. The President's Award went to Sarah Mack. The Region I Histotechnician of the Year went to Amy Farnan.

Luis motioned to adjourn the meeting at 1:01pm. Laurie Marien accepted, second by Sarah Mack.

National Society of Histotechnology Recognizes Excellence

Sarah Lamoureux, a senior in the SUNY Cobleskill Histotechnology program, is the recipient of a prestigious National Award sponsored jointly by the American Society for Clinical Pathology (ASCP) and Siemens Healthcare Diagnostics. This scholarship honors and recognizes outstanding achievements and contributions to the community. Sarah will use her $1,000.00 scholarship to help defray education costs. After she completes her clinical rotation this summer she plans to find a job as a histotechnician. Her long term goals include further education and possibly entering a Pathologist Assistant program.

SUNY Cobleskill

Upcoming Calendar of Events from the NYSHS Message Board

4/12/2012	9:00 am	2012 Region 1 Meeting Registartion :Deadline (litepath2000) [Edit]
4/18/2012	All Day	New York State Public Health Association Annual Meeting & Conference (litepath2000) [Edit]
4/21/2012	All Day	ASIP Annual Meeting (litepath2000) [Edit]
4/22/2012	All Day	National Medical Laboratory Professionals Week (litepath2000) [Edit]
4/23/2012	All Day	National Medical Laboratory Professionals Week (litepath2000) [Edit]
4/25/2012	12:00 pm	NSH Teleconference: Decalcification? (litepath2000) [Edit]
4/26/2012	All Day	Region II Symposium (litepath2000) [Edit]
4/26/2012	2:00 pm	Webinar: Quality Management for the Histology Laboratory (litepath2000) [Edit]
4/27/2012	12:00 pm	NYSHS/Region 1 Meeting (litepath2000) [Edit]
5/1/2012	8:00 am	NYSHS Elections! (litepath2000) [Edit]
5/23/2012	12:00 pm	NSH Teleconference: Immunofluorescence: (litepath2000) [Edit]
6/1/2012	12:00 am	Deadline for Submission: Onstage Summer Issue (litepath2000) [Edit]
6/11/2012	All Day	NSH 5th Annual Summer Symposium (litepath2000) [Edit]
6/12/2012	All Day	NSH 5th Annual Summer Symposium (litepath2000) [Edit]
6/27/2012	12:00 pm	NSH Teleconference: Controlling Your IHC Stains (litepath2000) [Edit]
6/30/2012	All Day	NYSHS Membership Renewal Deadline (litepath2000) [Edit]
7/13/2012	All Day	NSH IHC Forum (litepath2000) [Edit]

NEW YORK STATE HISTOTECHNOLOGICAL SOCIETY

MEMBERSHIP APPLICATION

PERSONAL INFORMATION:

Name: _____

Address: _____

City: _____

State: _____

Zip Code: _____

E-mail: _____

Phone: _____Home

Phone: _____Work

Employer: _____

MEMBERSHIP INFORMATION:

Type of Membership: (check one)
( ) New
( ) Previous (date previous membership)
( ) Student (College name)

_____
Instructor's signature

National Information: (check one)
( ) Member of the National Society for Histotechnology
( ) Non-Member
( ) Please send me an NSH application

Nature of Work: (check one)
( ) Clinical
( ) Research
Education (highest level): _____
( ) HT
( ) MT
( ) HTL
( ) Other _____

Referred by member: _____

Registration: (check one) Membership year runs from July 1 to June 30

( ) Education Annual Membership Fee (tax deductible): $20.00

( ) Student Full Time Student Fee: $7.00

Membership will expire June 30th,

Please send applications & check payable to **NYSHS** to:

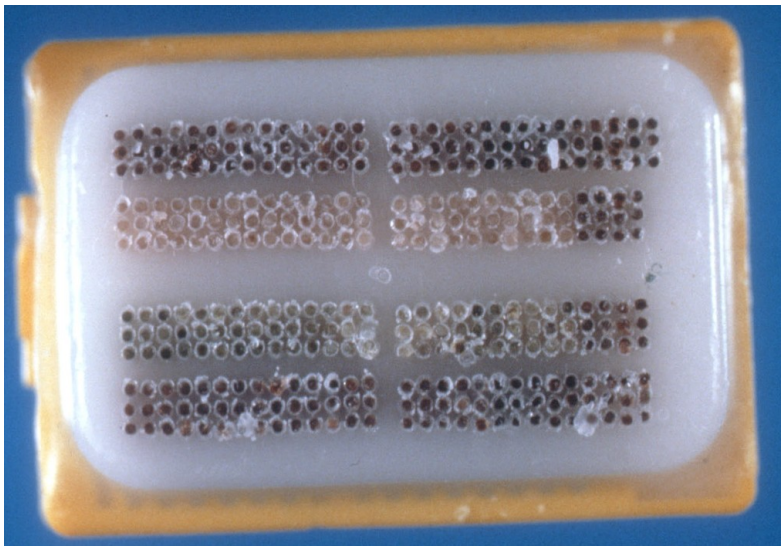
Amy Farnan , NYSHS Membership Secretary
3 Champlain Avenue, Apt #2
Mechanicville, NY 12118

NYSHSmemberships@yahoo.com

Tissue Micro Arrays

Loralee McMahon, MS, HTL (ASCP)
Department of Pathology and Laboratory Medicine
University of Rochester Medical Center
Rochester, NY

Histotechnologists have heard that histology is an art form; constructing a Tissue Micro Array (TMA) is an art within the art of histology. A well-put-together TMA is an incredibly useful tool in the histology lab both for the technologist and the pathologist. A TMA is a single paraffin block that contains from 10 to over 100 samples of paraffin- embedded tissue. One paraffin block could generate 200 to 400 slides, depending on the thickness of the sections and the tissue. One carefully constructed block could screen hundreds of antibodies. The possibilities are endless.



One TMA can consist of a hundred cores of several different types of tissue, allowing the pathologist to scan hundreds of cases in minutes as opposed to looking at hundreds of whole tissue slides All of the cores' labels (tissue type) are recorded onto a grid or spread sheet as a TMA key. Therefore, you know when looking at row 2, tissue core number 5, you have a particular type of tissue. In order to keep track of where you are when looking at hundreds of tissue cores on a stained slide (as you can imagine, you can get lost very easily), the technician places several anchors or markers to indicate the start of the rows. The above TMA has anchors on the upper right hand corner and also an empty row after three or four rows of tissue cores. This empty row can also assist in the orientation.

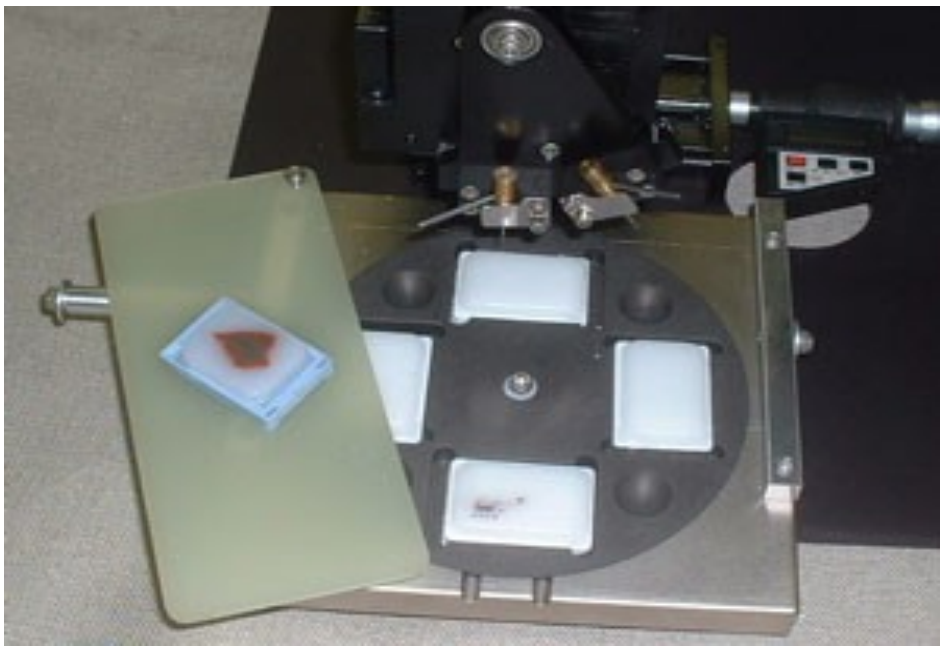
For antibody validation the use of TMAs is priceless. With all of the regulations surrounding antibody optimization and validation, you now have the ability to validate an antibody by staining one slide, instead of 30, 40 or even more. This economic feature is especially important when you pay for your immunohistochemistry reagents on a per slide basis. Another feature of importance is that the pathologist can easily scan the stained TMA slide to check the specificity of a particular antibody - saving lots of time.

Researchers can benefit from TMAs as well. Again, the cost of staining one slide versus the cost of staining hundreds can make or break a budget. Rather than cut hundreds of whole mounts to stain with several antibodies you can cut just a few TMA slides, saving time and expensive antibody. Since all of the tissue samples are on the same slide, staining conditions for each core are ensured to be exactly the same. TMAs can eliminate staining variations that can occur between staining runs, interruption of the technician during the staining run, or by a different lot number of antibody being used. A TMA can be constructed that contains just the tissue of interest, thereby saving time, money, and patients' tissue samples.

Smaller TMAs can be used for daily controls for routine immunohistochemistry. Our lab uses a 'sausage' style TMA of about 35 cores of tissue for a large portion of the routine antibodies. Half of the TMA contains normal tissues and the other half contains tumor tissues.

One drawback of using TMAs is the amount of time needed to construct them, but the benefits far outweigh this investment of time. A pathologist must first screen whole H&E tissue sections to select the best area for sampling. S(he) marks the area(s) of interest and the technologist takes this slide and matches it to the corresponding paraffin block. Then, using manual, semi-automated or automated TMA equipment, the technologist constructs the TMA block.

Our lab has a semi-automated TMA machine that can construct up to four replica TMA blocks at a time. {As shown below}



TMAs are a powerful and cost effective tool. TMAs can be used for rapid antibody and tissue screening, antibody validation, and even as a daily control for many different antibodies. The time and money that goes into the construction of TMAs pays for itself in the long run and can be utilized in all aspects of the immunohistochemistry lab.

BACK TO BASICS
FIXATION, PIGMENTS, METALS
Puzzle 1

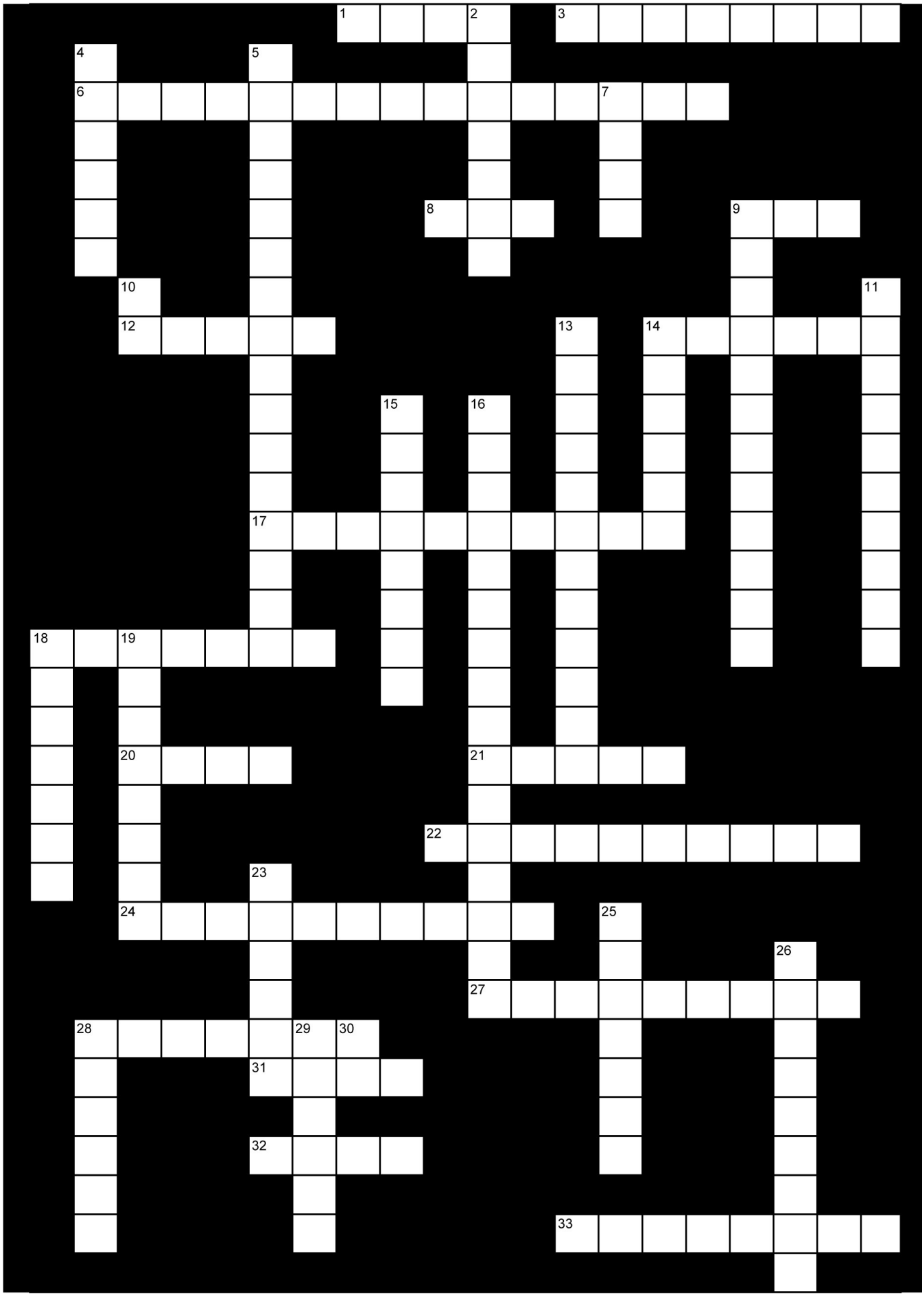
BACK TO BASICS: FIXATION, PIGMENTS, METALS CLUES

ACROSS

1 Replacement for Mercury
3 Magnesium silicate
6 Hazardous, used in EM
8 Optical _____piece
9 Buffered stock solution used in ICC
11 Produced within body
14 Exogenous pigment
17 Coagulates Nucleoprotiens (2 words)
18 Resurfacing and fixative for EM
20 Sodium thiosulfate
21 Preserves erthrocytes
22 Zenkers has a _____effect on tissue
24 Wear and tear pigment
25 Brown black precipitate on tissue from high acidic solution
26 Enzyme attack
28 Skin pigment
31 Bicarbonate of _____

DOWN

2 Preserves gylcogen
4 Ten to twenty times
5 Universal fixative
7 Hemosiderin
9 Bacterial attack
10 Scale used for acid and bases
12 Routine screening stain
13 Gout
14 AFB positive in rats
15 Enzymes rendered inactive
16 Heavy metal in B5 fixative
18 Recommended for PTAH staining or mordant
19 For touch preps or smears
23 Fixative for soft delicate structures
27 From outside taken in
28 Shipping media for Immunofluorscence
29 Removal of melanin, other half _____ and hypo
30 Neodymium abbrev.
32 Yellow green pigment
33 Stabilization of proteins



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