

# THE CUTTING EDGE

## REGION IX NEWSLETTER



SPRING NEWSLETTER ~ MARCH 2008

### Greetings from the Region IX Director Heather Nymeyer

It is at this time of year that our thoughts change from the winter activities of snowboarding and skiing to golf, gardening and spring cleaning. It is also at this time we start to look forward to receiving information on our Region IX's education sessions and the NSH S/C.

The Region IX Education Committee has been working hard at organizing and finding speakers for this year's education session. Moncton, New Brunswick will host this year's session and from the look of the program, the Education Committee has done a great job at putting together an outstanding program. Schedule and registration forms are available on the Region IX website at [www.nshregionix.org](mailto:www.nshregionix.org). The schedule can also be found within this newsletter.

The NSH 34<sup>th</sup> Symposium/Convention will be held in Pittsburgh, PA from Sept 12-18, 2008. The complete program should be available on the NSH website very soon ([www.nsh.org](http://www.nsh.org)).

Awards, awards, awards. Don't forget to check out both the NSH and Region IX's awards list. Deadlines are approaching fast, so visit both websites, NSH website ([www.nsh.org](http://www.nsh.org)) and Region IX ([www.nshregionix.org](http://www.nshregionix.org)) for complete details. It would be great to see more Region IX members on the award's podium at the S/C in Pittsburgh.

It is also at this time every second year that the NSH elections are being held. In addition to myself running for a second term as your Region IX Director, Janet Tunnicliff is seeking the position as NSH President. Janet started with the NSH over 30 years ago and has held such positions as Region IX Director, Treasurer and NSH Vice President just to mention a few. What ever position Janet holds, she always gives it her full attention. I believe that Janet would make a great NSH President. Go Janet!

~



### Region IX Education Day Moncton, New Brunswick June 6-7, 2008

Region IX's Education Committee has finalized the details for the next Education Day. This year's Region IX's education session will be held in Moncton, New Brunswick June 6-7<sup>th</sup>.

New Brunswick was one of the first four provinces to join the Canadian Confederation. This province is often referred to as the Loyalist Province after being named for the British royal family of Brunswick-Lüneburg. Known as the Hub of the Maritimes, Moncton is within 2 hours drive from New Brunswick's capital; Fredericton; its neighbouring province, Prince Edward Island, and 2 1/2 hours from Halifax.

Region IX extends a warm Maritime invitation to all our members and to our American neighbours to the south.

The educational session will be held at the Ramada Plaza Crystal Palace Hotel and will be a two day event with the Friday being a meet and greet session with the vendors. Registration forms and hotel information is available on our Region IX website at [www.regionix.org](http://www.regionix.org) or by contacting Mark Elliott at [mark@regionix.org](mailto:mark@regionix.org). A registration form is included in this newsletter.

## Education Update

**Mark Elliott** [mark@nshregionix.org](mailto:mark@nshregionix.org)

Region IX Education Committee, Chair

It is hard to believe that spring is here already, although with the weather some parts of the country are receiving it is really hard to tell that spring is actually here. We had a few nice days so far this spring but the "April" showers have started already.

As Heather mentioned in her "Greetings" the next Region IX Education Day is being held in Moncton on June 6/7. The Friday night will kick off with the "Wine and Cheese" greet and meet with the vendors. Saturday will see a full day of speakers as well as a chance to meet again with the vendors. Our speakers include Donna Willis from Milestone talking on the use of microwaves in the Histology Lab; Ryan Williams from Houston, talking on the use of Immunohistochemistry to expedite Cancer Drug Discovery; Vicki Kalscheur of the NSH Hard Tissue group discussing "Decalcified and Undecalcified Bone: Histology Techniques"; Dr Martin Bullock from Halifax discussing Thyroid cancers; and Dr Avi Ostry, also from Halifax, discussing QA. We have made arrangements with the Ramada Plaza Crystal Palace Hotel for a block of rooms to be set aside for us but you need to book these before May 6, 2008. We have a number of vendors who have confirmed their presence already and it will be a great chance to see and hear about the "newest and greatest" in the field of Histology. A copy of the schedule and the registration form are available on the Region IX website ([www.nshregionix.org](http://www.nshregionix.org)). Keep checking the website for updates.

There also is the possibility of a workshop on Microwaves later this spring in Vancouver, sponsored by ESBE Scientific. We are still working out the details as to exactly where and when and this information will be posted on the website once finalized.

By now many of you may have received information on the NSH Summer Symposium being held in Albuquerque, New Mexico June 20-21. More information is on the NSH website.

Finally, make plans to attend the 34<sup>th</sup> NSH S/C in Pittsburgh in September. It should be a great event, as usual.

## Washington State Meeting Announcement

We are having our meeting in Pasco, Washington on April 26th and 27th. All workshops have not been chosen yet, but will apprise you when they are all set. Pasco is in the lower Southeast corner of the state near Walla Walla. It is easily accessible by Interstate roads. Would look forward to any of our northern friends presence. It will be held at the Holiday Inn Express and we are working on getting 9 accredited NSH workshops. For more information and registration, contact Martha Pope at [popem@BATTELLE.ORG](mailto:popem@BATTELLE.ORG)

## NSH Teleconference Schedule

[www.nsh.org](http://www.nsh.org)

- **ROLE OF IMMUNOHISTOCHEMISTRY IN PROSTATIC LESIONS**  
Date: April 23, 2008  
Time: 1:00pm EST  
Presented by Mitul Amin, M.D., William Beaumont Hospital, Royal Oak, MI
- **SOLVENT RECYCLING – Anyone can do it!**  
Date: May 28, 2008  
Time: 1:00pm EST  
Presented by Kim Szczepanek, HT(ASCP), CGB Biotech, Ltd., Columbus, OH
- **Her2/neu TESTING FOR BREAST CANCER: STANDARDIZATION AND VALIDATION**  
Date: June 25, 2008  
Time: 1:00pm EST  
Presented by Elizabeth Sheppard, MBA, HT(ASCP), Ventana Medical Systems, Tucson, AZ
- **FROZEN SECTIONING**  
Date: July 23, 2008  
Time: 1:00pm EST  
Presented by Carole Barone, HT(ASCP), A. I Dupont Institute, Wilmington, DE

**For additional teleconference information, visit the NSH website at [www.nsh.org](http://www.nsh.org).**



**Region IX Education Day  
TENTATIVE SCHEDULE  
June 6 & 7<sup>th</sup>, 2008  
Ramada Plaza Crystal Palace Hotel  
499 Paul St  
Dieppe (Moncton) NB**

**June 6<sup>th</sup>**

**7:00-10:00 pm**

Wine and Cheese Reception  
Vendors Exhibition Area

**June 7<sup>th</sup>**

**7:00 a.m.** - Registration Opens

**7:30-8:00 a.m.**

Breakfast at the Foyer

**8:00 a.m. – 8:05 a.m.**

Welcome –Opening Remarks

**8:05 a.m. – 8:10 a.m.**

Schedule for the Day  
Mark Elliott, PhD  
Education Chair

**8:10 a.m. – 8:15 a.m.**

Introductions  
Region IX Executive Officers  
Heather Nymeyer  
Director, Region IX

**8:15 a.m. – 9:45 a.m.**

**Donna Willis**  
Use of Microwaves in the Histology  
Laboratory  
Sponsored by Esbe Scientific

**9:30 a.m. – Exhibit open**

**9:45 a.m. – 10:15 a.m.**

Coffee Break  
Networking at the Exhibitors' display  
booths

**10:15 a.m. – 11:30 a.m.**

**Ryan Williams**  
Use of Immunohistochemistry to  
Expedite Cancer Drug Discovery  
Sponsored by Leica/Vision  
BioSystems

**11:30 a.m. – 12:30 p.m.**

Lunch  
Networking at the Exhibitors' display  
booths

**12:30 p.m. – 1:30 p.m.**

**Vicki Kalscheur**  
Decalcified and Undecalcified Bone  
Histology Techniques

**1:30 p.m. – 2:30 p.m.**

**Martin Bullock, MD**  
Thyroid cancers

**2:30 p.m. – 3:00 p.m.**

Coffee Break at the Foyer  
Networking at the Exhibitors' display  
booths

**3:00 p.m. – 4:00 p.m.**

**Avi Ostry MD**  
Quality Assurance

**4:00 p.m. – 4:05 p.m.**

Closing Remarks  
Fill out Speakers' Evaluation forms to  
obtain Continuing Education credits  
Mark Elliott, Education, Chair

Thank you to our generous Sponsors  
for your continued support for Region  
IX

**Provisional List of Exhibitors who  
will be in Attendance:**

- Ventana Medical Systems
- Dako Canada Inc.
- *chaptec*
- Leica Microsystems Canada
- Davis Diagnostics Limited
- Mediacorp
- Dako Canada Inc.
- *chaptec*
- Leica Microsystems Canada
- Davis Diagnostics Limited
- Mediacorp
- Somagen Diagnostics
- Surgipath Canada Inc.
- Inter Medico
- Esbe Scientific
- Vision BioSystems Inc.
- Thermo Fisher
- Vector Labs
- TBS
- ACP Chemical

**Suggested Hotel:**

**Ramada Plaza Crystal Palace Hotel**

499 Paul Street,  
Dieppe (Moncton) NB E1A 6S5  
(506) 858-8584

[www.crystalpalacehotel.com](http://www.crystalpalacehotel.com) Some  
rooms have been reserved for this  
meeting.

Please quote NSH Region IX when  
booking

Rooms Released May 6, 2008

Rate \$139.95/night plus taxes, non-  
smoking  
2 queen beds

### ***Picro-Sirius Red Dye, Polarization and Collagenous Tissue***

Vicki Kalscheur, HT(ASCP), Jessica Riehl, B.A.  
 Comparative Orthopaedic Research Laboratory  
 University of Wisconsin, School of Veterinary Medicine  
[kalschev@svm.vetmed.wisc.edu](mailto:kalschev@svm.vetmed.wisc.edu)

There is a well known ***Sirius*** Sunlight Glass Studio in Historic and ***Sirius*** is one of the brightest stars in the night sky. In our ***Sirius*** Red F3BA is a complex acid dye, developed in Germany special stain methods such as looking at collagenous tissue, a connective tissue.



Mineral Point, WI  
 histology specialty  
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The role of connective tissue is to strengthen and support the organs, muscular, vascular and nerve tissues within the skeletal framework. Connective tissue consists of cells separated by a jelly-like extracellular substance made up of salts and water, protein and carbohydrates. The cells found are a small portion of the tissue. It is the extracellular substance, consisting of collagen fibers (protein fibers) in connective tissue that we are interested in. The fibers can be divided into three types *collagen, elastic and reticular fibers*.

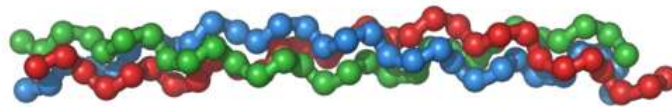


Fig. 1 *Tropocollagen triple helix molecule, forms the collagen fibrils*

#### Background facts:

- Connective tissue fibrocytes and fat cells are *fixed cells* –unable to move freely within the tissue. Fibroblasts are seen during tissue damage repair situations.
- *Wandering cells* in connective tissue are macrophages, lymphocytes, mast cells, eosinophils and neutrophils.
- Loose connective tissue allows blood vessels to pass through it, assisting in nutrition to all tissues.
- Tendons and ligaments are formed from dense connective tissue.
- Other specialized connective tissues are found in: adipose, cartilage, bone, blood tissue and lymphoid.

***Extracellular Substance – Collagen fibers*** – *Collagen fibers are the dominant fiber in most connective tissues. The primary function of the fibers is to add strength to the connective tissue.* The collagen molecules are packed together for mechanical strength (Fig 1).

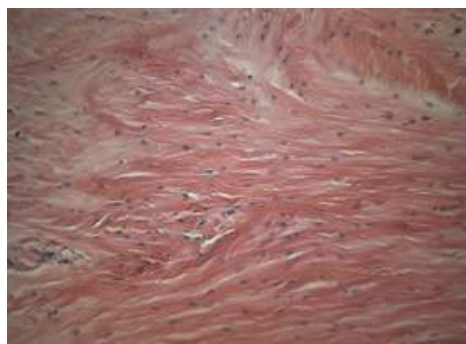


Fig. 2 H & E, tendon, light microscopy (See cellular proliferation in center)

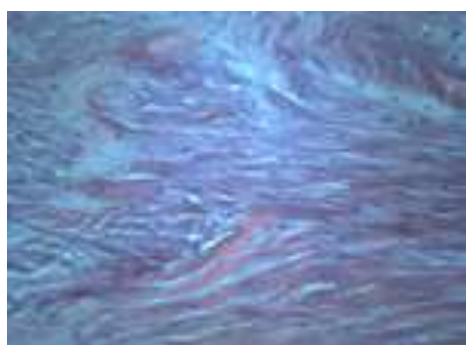


Fig. 3 Same tendon, polarized filter, light microscopy (Using H&E slide)

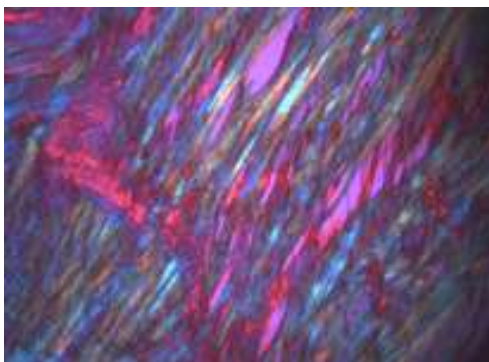


Fig. 4 PSR Stained tendon, polarized microscopy (Same level as H&E)

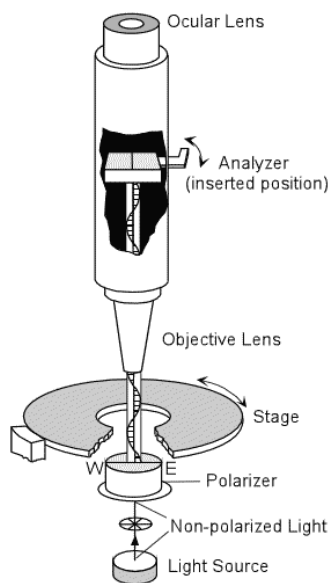


Fig. 5 Polarized microscope

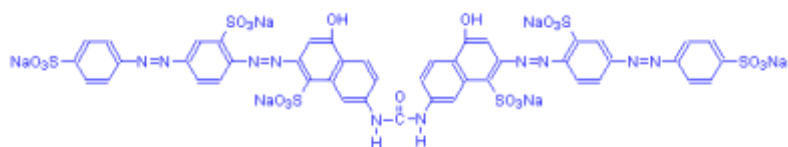


Fig. 6 Acid dye structure Sirius Red F3BA

Sirius Red F3BA is an acid dye selectively staining collagen and can be used to replace acid fuchsin in Van Gieson connective tissue stains. In the literature, it is used in amyloid methods, for basement membrane and reticulum. Following staining with Picro-Sirius Red (PSR), the key is to visualize with polarized light microscopy, as the natural birefringence of collagen is greatly enhanced by the binding of long, aligned fiber molecules dyed with sirius red. Under polarized light the collagen fibril orientation shows orange/red bands against a dark background. In order to see all the fibers under polarization the slide is traditionally “rotated” under the light so all levels can be visualized, for if left in one orientation areas can be missed. Rotating allows the light to diffuse through the tissue and fluoresce showing changes in the components of the tissue. The same slide under light microscopy shows the collagenous fibers as red; other tissue elements will be a bright yellow. The filter combinations can vary the resulting polarized color – experienced researchers select what is optimal.

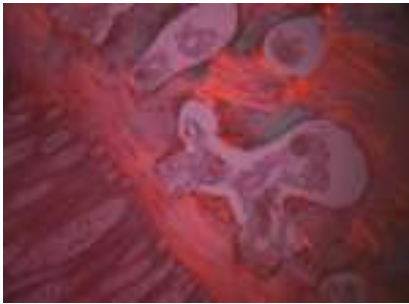


Fig. 7 *PSR stained collagen bundles in growth plate (left) and newly forming osteoid (right) (3 week old puppy physis) polarized microscopy*

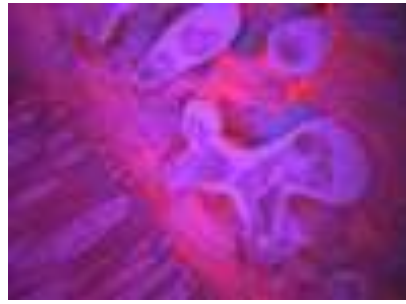


Fig. 8 *Another view (Fig. 7) different filters (3 week old puppy physis) polarized microscopy*

In our musculoskeletal research area, we use PSR as a connective tissue stain for bone collagen (Type I) which is coarsely fibered (woven bone) or osteoid. Briefly, the next step in the bone development process is when the mineral components, hydroxyapatite, consisting of calcium, phosphate and hydroxyl ions (Type II, III) are laid down. Collagen is very organized in bone, less so during the healing process. We have used this stain on dental tissues, tendon studies, collagen bundles in the growth plate, tissues from thermal energy studies and ocular abnormalities.

There must be more to it. In a research setting that is the case. In the images (Fig. 7, 8) stained polarized tissue color varies from green to yellow through red and shades of orange depending upon the crosslinking of the collagen which reflects the age and fiber bundle size, with older collagen being more crosslinked. Deposition of collagen starts out as fine fibrils which later become crosslinked into larger fibers and bundles. The pattern and time frame of healing is of interest.

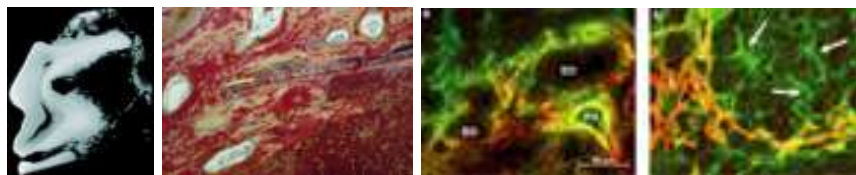


Fig. 9 *Images of stained PSR using polarized microscopy, see dental radiography; see PSR of abnormal mandible region; see two images of elastic fiber under polarized light.*

Histologically, using the PSR stain in a musculoskeletal research setting involves collection of tissue (dental, orthopaedic with connective tissue and more); fix in 10% neutral buffered formalin for at least 48 hours before processing; then embed, section at 5  $\mu\text{m}$ , and stain following the procedure published by Sweat, et al, 1964. All histology slides are examined microscopically with regular transmitted light (*H & E*) and then polarized light with an analyzer set at 60° to the plane of the light with a first-order-red plate inserted into the analyzer. We then determine morphology and patterns plus signs of birefringence such as debris and fibrous tissue organization. We find that slow decalcification does not visibly affect birefringency when using the PSR stain. Fine detail radiographs (Fig. 9) can be helpful for tumor or dental abnormalities as compared to the histology. Additionally, our interpretation is supported by immunohistochemistry methods such as the use of collagen III antibodies that bind c-propeptide of collagen I.

The information supplied is an overview. There is much to be learned when conducting connective tissue evaluations for pathological and research needs. Modify accordingly, for optimal results needed in your setting. Other connective tissue stains that offer contrast are the Masson's Trichrome and the Modified Russell-Movat Pentachrome Method. Both result in elastic fiber, collagen, mucin and muscle differentiation.

In summary, older references and newer web-based interpretations of this stain assured us that it is a highly interpretive stain used in research such as porcine heart valve studies, in the study of collagen diseases, and more. Feel free to contact us for procedural information. Take time to look at the stars, visit the galleries and enjoy the beauty of ***Sirius***, whatever form it may take.

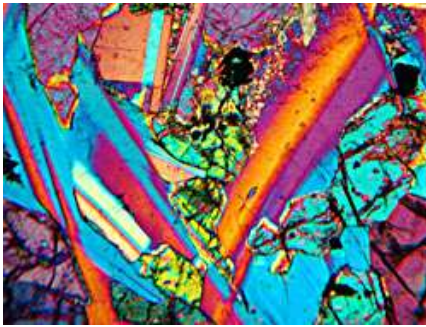


Fig. 10 *Star Sirius*

For further information, the following Web sites and references may be helpful.

- Biological Stain Commission: [www.biostains.org](http://www.biostains.org)
- Rowley Biochemical, Inc. Catalog and Price [www.rowleybio.com](http://www.rowleybio.com)
- Dyes and Colors: <http://dyesonline.net/dyes/History.jsp>
- Stains File: <http://stainsfile.info/StainsFile/index.html>
- Microscopy site: <http://www.microscopy-today.com>
- Collagen, Connective Tissue Stain Information: <http://www.histonet.org>

#### References

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- Bignolas G, Brentani RR: *Picrosirius Staining Plus Polarization Microscopy, a Specific Method for Collagen Detection in Tissue Sections*. Histochemical Journal 1964; 78:447-455.
- Breur GJ, Farnum CE, Padgett GA, Wilsman NJ: *Cellular Basis of Decreased Fate of Longitudinal Growth of Bone in Pseudoachondroplastic Dogs*. The Journal of Bone and Joint Surgery April 1992; 74:516-528.
- Dallek M, Jungbluth KH, Holstein AF: *Studies on the arrangement of the collagen fibers in the infant epiphyseal plates using polarizing light and scanning electron microscopy*. Arch Ortho Trauma Surg 1983; 101:239-245.
- Greenberg SR: *A New Method for the Histological Study of Collagen*. Laboratory Medicine 1986; 17:474.
- Goodfellow BS, Mikat EM: *A Stain for the Simultaneous Demonstration of Collagen, Muscle, and Elastic Elements in Mammalian Tissue*. Laboratory Medicine 1988; 19:243-244.
- Hayashi K, Markel MD: *Thermal Capsulorrhaphy Treatment of Shoulder Instability*. Madison, WI: Lippinott Williams & Wilkins, Inc., 2001.
- Junqueira LCU et al: *Differential Staining of Collagens Type I, II, III by Sirius Red and Polarization Microscopy*. Arch Histo Jap. 1978; 71:267-274.
- Lillie RD, ed. *H.J. Conn's Biological Stains*. Baltimore, MD: The Williams & Wilkins Company, 1977.
- Sweat F, Puchtler H, Rosenthal SI: *Sirius red F3BA as a stain for connective tissue*. Arch Pathol Lab Med 1964; 78:69-72.

Histology photographs taken on a Leitz Orthoplan 2 microscope at the School of Veterinary Medicine, UW-Madison, WI. Chemical images taken from Rowley Biochemical Institute Catalog.

#### Region IX Feature Article

Region IX would like to thank Vicki Kalscheur, HT(ASCP) and Jessica Riehl, B.A. for allowing ***The Cutting Edge*** to reprint their article

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### HISTO-KU PUZZLE

The object is to fill in the blank squares in such a way that the letters HISTOLØGY appears exactly once in each row, column and square

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L	O				S		
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							Y
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O				H	T		S

### Future Dates NSH S/C Dates

**34th Annual Symposium/Convention**  
September 12-18, 2008 in Pittsburgh, PA

**35th Annual Symposium/Convention**  
October 3-8, 2009 in Birmingham, AL

**36th Annual Symposium/Convention**  
2010 ~ Seattle, WA

**37th Annual Symposium/Convention**  
2011 ~ Cincinnati, OH

**38th Annual Symposium/Convention**  
2012 ~ Vancouver, BC Canada

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### **NSH 2008 Nominations/Application Form**

The Deadline for submission of the 2008 Awards Nominations/Application form is May 1, 2008. Once you complete this online application please mail all supporting documentation to:

National Society for Histotechnology  
Awards Committee  
10320 Little Patuxent Parkway, Suite 804  
Columbia, MD 21044

All supporting information must be postmarked by May 1, 2008 for consideration by the Awards Committee.

If you have any questions please feel free to contact the NSH Office, 443-535-4060 or the Award Committee Chair, Jean Mitchell, 608-263-9184.

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### Executive Update

In the last issue of "The Cutting Edge", the NSH Board of Director's strategic plan was explained. Since that issue, the board has held teleconferences to move forward with this plan.



**NSH Region IX would like to thank Surgipath Canada for their continued sponsorship of **The Cutting Edge Newsletter.****



[www.nsh.org](http://www.nsh.org)

**NSH**

### MISSION STATEMENT

*The National Society for Histotechnology is a non-profit organization, committed to the advancement of Histotechnology, its practitioners and quality standards of practice through leadership, education and advocacy.*

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HISTOKU ANSWERS

I	T	Ø	H	Y	L	G	O	S
G	S	Y	Ø	I	O	H	L	T
L	O	H	T	G	S	Y	Ø	I
T	G	O	L	Ø	Y	S	I	H
Y	I	S	G	O	H	Ø	T	L
H	Ø	L	S	T	I	O	G	Y
S	H	I	O	L	Ø	T	Y	G
Ø	Y	T	I	S	G	L	H	O
O	L	G	Y	H	T	I	S	Ø

## Region IX Executive Committee

**Heather Nymeyer**  
[Heather@nshregionix.org](mailto:Heather@nshregionix.org)  
**Director**

**Rose Clarke**  
[Rose@nshregionix.org](mailto:Rose@nshregionix.org)  
**Past Region IX Director**

**Michele Shackleton**  
[Michele@nshregionix.org](mailto:Michele@nshregionix.org)  
**Treasurer**

**Ann Lynde**  
[ann@nshregionix.org](mailto:ann@nshregionix.org)  
**Secretary**

**Michael Ho**  
[Michael@nshregionix.org](mailto:Michael@nshregionix.org)  
**Member at Large**

### Sub Committees

**Rose Clarke**  
[Rose@nshregionix.org](mailto:Rose@nshregionix.org)  
**Awards Committee, Chair**

**Teresa Estioko-Timuri**  
[Teresa@nshregionix.org](mailto:Teresa@nshregionix.org)  
**Award Committee, Co-Chair**

**Mark Elliott**  
[mark@nshregionix.org](mailto:mark@nshregionix.org)  
**Education Committee, Chair**

**Tom Wells**  
[tom@nshregionix.org](mailto:tom@nshregionix.org)  
**Membership, Chair**

### Region IX Committee Members Serving on Other NSH Committees

**Janet Tunncliffe**  
[janet@nshregionix.org](mailto:janet@nshregionix.org)  
**NSH Vice President**

**Nominations and Elections, Chair**  
**Kevin Gibbon**  
[Kevin@nshregionix.org](mailto:Kevin@nshregionix.org)

**Bylaws Committee**  
**Mark Elliott**  
[mark@nshregionix.org](mailto:mark@nshregionix.org)

**Region IX Website:**  
[www.nshregionix.org](http://www.nshregionix.org)



# 2008 MEMBERSHIP APPLICATION

JANUARY 1 - DECEMBER 31

NATIONAL SOCIETY FOR HISTOTECHNOLOGY  
10320 Little Patuxent Parkway, Suite 804, Columbia, MD 21044  
PHONE: 443-535-4060 FAX: 443-535-4055 WEB: [www.nsh.org](http://www.nsh.org)

Source: ONLINE PDF

**TYPE OF MEMBERSHIP:**

NEW MEMBER : \_\_\_\_\_ PROFESSIONAL \_\_\_\_\_ STUDENT \_\_\_\_\_ RETIRED \_\_\_\_\_ INTERNATIONAL

Program Director/Supervisor Name(*required for Student Status Only*): \_\_\_\_\_

MEMBERSHIP YEAR RUNS FROM JANUARY 1 TO DECEMBER 31. RENEWAL NOTICES ARE SENT IN OCTOBER FOR FOLLOWING YEAR

MEMBER NAME: \_\_\_\_\_

**HOME ADDRESS:**

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_

PROVINCE/STATE: \_\_\_\_\_ ZIP/POSTAL CODE: \_\_\_\_\_

COUNTRY: \_\_\_\_\_

HOME TELEPHONE: \_\_\_\_\_

PERSONAL EMAIL: \_\_\_\_\_

**WORK ADDRESS:**

COMPANY: \_\_\_\_\_

DEPARTMENT: \_\_\_\_\_

TITLE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ PROVINCE/STATE: \_\_\_\_\_

ZIP/POSTAL CODE: \_\_\_\_\_ COUNTRY: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

WORK EMAIL: \_\_\_\_\_

Referred by NSH Member: \_\_\_\_\_

State Histology License Number (if applicable) \_\_\_\_\_

**MAIL PREFERENCE**  
**Please Note:** All NSH Correspondance will be sent to this address. In addition this address is published in our online membership directory.  
 HOME ADDRESS     WORK ADDRESS

**MEMBER DEMOGRAPHICS:**

Date of Birth: \_\_\_\_/\_\_\_\_/\_\_\_\_ Gender:  Female  Male Year entered Profession: \_\_\_\_\_

CHECK ALL APPLICABLE BOXES:

- HT (ASCP)    HTL (ASCP)    MT (ASCP)    CT (ASCP)    SLS (ASCP)    QIHC (ASCP)  
 RT (CSMLS)    ART (CSMLS)    MLT (CSMLS)    NOT CERTIFIED    OTHER \_\_\_\_\_

HIGHEST LEVEL OF EDUCATION:

- AA    BA/BS    MA/MS    PHD    MD    DVM    OTHER \_\_\_\_\_

I PRACTICE HISTOLOGY IN(CHOOSE ONE):

- \_\_\_Botany   \_\_\_Clinical:Hospital   \_\_\_Clinical:University   \_\_\_Clinical:Private Lab   \_\_\_EM   \_\_\_Industry  
\_\_\_Marine   \_\_\_Research   \_\_\_Veterinary

**PAYMENT:** Remit fee with completed application in US funds to the NSH Office: 10320 Little Patuxent Pkwy, Suite 804, Columbia, MD 21044.

**Circle Membership Dues:** \$60.00 (2008 Professional/Intl)   \$30.00 (2008 Student/Retired)

**Circle Membership Pin (\$10.00):** Yes   No Thanks

**Optional ADA Fund Contribution** \$ \_\_\_\_\_ (*Your donation to the ADA will aid in furthering the education of the physically challenged.*)

**Total Due** \$ \_\_\_\_\_

A check for the total amount due payable to "NSH" is included with this application.

Please charge my Visa, MasterCard or American Express for the Total Due listed above.

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