Histograph

www.histonsw.org.au

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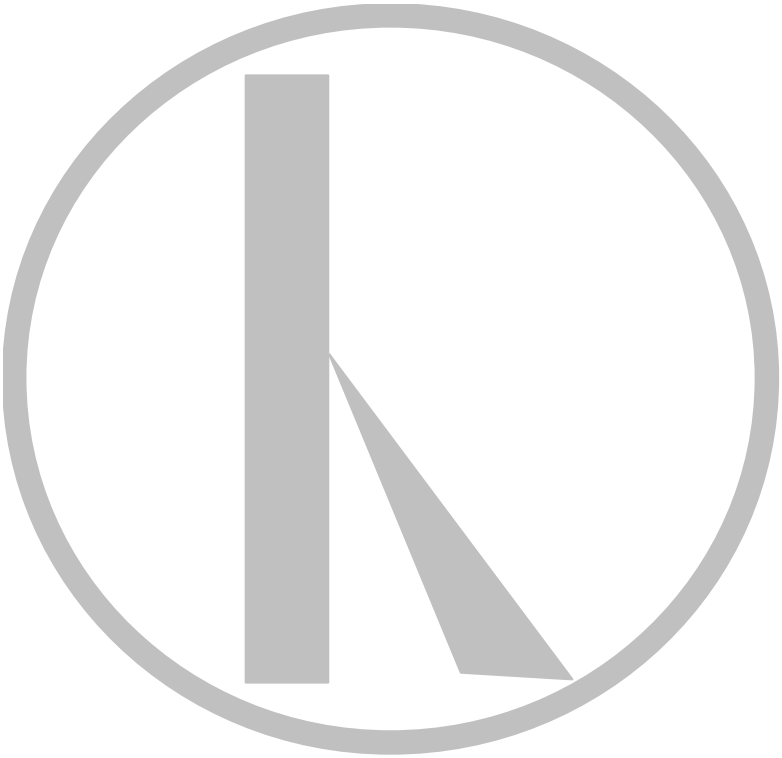

Newsletter of the Histotechnology Group of NSW

Contents

Editorial

I was fortunate to be able to attend the 4th National Histotechnology Conference in Adelaide and I was very impressed with the organisation, the scientific programme and the attendance. As all I have spoken with have concurred, HOSA should be commended on an excellent meeting. See Bharathi Cheerala's report in this issue.

In the past, when there has been a threat of a pandemic such as Bird Flu or SARS, I have diligently summarised the "state of play" for our members. Usually, by some "dumb luck", the threat has passed us by but now, with our microbiologists wilting under the excessive volume of Swine Flu testing and everyone seeming to have some comment on the pandemic, I don't think you would wish to be bored. And I seem to be suffering from Wombat Flu anyway!

Congratulations to our re-elected committee and especially those who have agreed to join the committee. Our admiration and support go with you.

Tony Henwood,
Editor
anthonyh@chw.edu.au

Chairman's Report

The 4th National Histology Conference in Adelaide has now come and gone. By all reports it was another successful National Conference. The baton has now been passed on to NSW to hold the 5th National Conference in the latter part of 2011.

We have already started to investigate possible venues and speakers. We are also fortunate in having several committee members who have had major roles in organising our previous conferences. So we are confident we can organise a conference that will continue the high standards previously set.

At this point the committee would welcome input on potential speakers and areas of Histology that you would like to see included.

In April we had an excellent presentation on "Is breast cancer sexually transmitted (by HPV)? ". This was presented by Dr Jim Lawson and Dr Noel Whittaker from the University of NSW. Dr Whittaker has previously worked with a research group in Europe. Harald zur Hausen was awarded the Nobel Prize for his work with this group in November 2008. This team at the University of NSW is involved in ground breaking research in this area. A very interesting evening with a good attendance. Thank you to DHM for hosting the evening.

Our new Website is operational with favourable comments. Work will continue on developing it to its full potential. Please review it regularly as our coming meetings are detailed in it. Our Website is www.histonsw.org.au.

By the time this Histograph goes to print we would have held our AGM. A number of our committee have re nominated which will give us stability going into the next National Conference. We are also looking for new members to bring in fresh ideas, so we would be pleased to here from any members who would like to join us. This can still be done after the AGM if you have not already nominated.

Thank you to the outgoing committee for your support, enthusiasm, encouragement and ideas through the past year,

Cheers,

Trevor Hinwood,
Chairperson,
Histotechnology Group of NSW.

Aspergillus Update

Filamentous fungi (moulds) are ancient lineages that have existed for approximately 1 billion years and thrive in soil and decomposing vegetation independent of an animal host (1).

The Fungi represent a single eukaryotic kingdom, characterized by an osmotrophic growth habitat in which extracellular enzymes are secreted to break down complex substrates, the resulting simple sugars and amino acids being taken up by the growing fungus. Fungi exist in two distinct morphological growth forms, the unicellular yeasts (which grow by budding or simple fission) and the filamentous fungi (which produce polarized hyphal strands that aggregate to form a network called a mycelium). The osmotrophic growth habit of fungi is extremely effective for colonizing diverse habitats and has made the fungi the principal degraders of biomass in all terrestrial ecosystems and also important pathogens of both plants and animals (3).

We regularly inhale the spores of aspergillus species, yet fungal disease is uncommon. Aspergillus-related diseases are associated with a spectrum of disorders of immunity. Invasive aspergillosis is typically a disease of highly immunocompromised persons and is a leading cause of infection-related death in patients with acute leukaemia and recipients of allogeneic hematopoietic stem-cell transplants. At the other end of the immunologic spectrum, allergic forms of aspergillosis, such as allergic bronchopulmonary aspergillosis, result from a poorly controlled inflammatory response to hyphae colonizing the sinopulmonary tract (1).

Respiratory epithelial cells act as an anatomic barrier to invasion by inhaled aspergillus species, promote mucociliary clearance, and ingest inhaled conidia (spores). The ability of aspergillus species to survive within epithelial cells may enable evasion of host defence by phagocytes. Alveolar macrophages constitute the first line of phagocytic host defence against inhaled conidia. Peripheral-blood monocytes and neutrophils are subsequently recruited to sites of infection. After fungal germination (transformation from conidia to hyphae), neutrophils are the dominant host defence against hyphae, the tissue-invasive form of moulds. Natural killer cells are recruited to the lungs by chemokines early in experimental aspergillosis and play an important host-defence function (1, 2).

Acute invasive aspergillosis is a rapidly progressive, frequently fatal disease that occurs in highly immunocompromised persons. In contrast, chronic forms of pulmonary aspergillosis (e.g., chronic necrotizing pulmonary aspergillosis or fibrocavitary aspergillosis) typically occur in patients without severe immune impairment, progress over months to years, and require prolonged antifungal therapy. Aspergilloma is a fungal mass that develops in a pre-existing lung cavity. Medical therapy is of uncertain value for aspergillomas; in cases of persistent hemoptysis, surgical resection of the infected lung cavity, if feasible, is the definitive therapy (1).

Diagnosis of invasive aspergillosis remains difficult in that clinical manifestations are not specific; radiologic findings can be suggestive but none are pathognomonic, and cultures of respiratory samples lack

sensitivity. Histologic demonstration of invasive hyphae or a positive culture from a normally sterile environment (e.g., pleural fluid) represents proven invasive fungal disease. Newer antigen-based assays facilitate the diagnosis of probable invasive aspergillosis and can obviate the need for an invasive procedure. The diagnosis of probable invasive aspergillosis requires a combination of host factors (e.g., prolonged neutropenia and organ transplantation), compatible radiologic findings, and mycologic criteria (1).

In hematoxylin-eosin stained tissue sections, it is sometimes difficult to recognize fungal elements, and special staining methods are necessary to improve the detection of the hyphae. The most used methods for demonstrating hyphae in tissue sections are Grocott's method and periodic acid-Schiff. The cell walls of most fungi consist of chitin, a polymer of N-acetylglucosamine, polymers of D-glucose and D-mannose, and proteins and lipids (4).

The PAS stain, developed as a mucin stain, was reported to be a method of great value in the demonstration of fungi in tissue sections. The PAS reaction has greatly contributed to the histopathological diagnosis and study of fungi, but its staining of nonviable fungi in old lesions and of certain polysaccharide-rich microorganisms, e.g., Mucor, Actinomyces and Nocardia, has been unsatisfactory (5). Gridley (5) made the detection of fungi easier using chromic acid and Feulgen reagent, but this method was unable to detect organisms which were negative for the PAS reaction (5).

In Grocott's method, chromic acid reacts with glycolic and glucosamine groups in the polysaccharide chains in the hyphae walls by oxidizing them to aldehyde groups, thus breaking the chain. These newly formed aldehyde groups reduce silver nitrate to metallic silver as part of a silver-methenamine complex and visualize the locations of the aldehyde groups (4). After Methenamine Silver staining, the hyphal walls stain black. The septated hyphae, some branched at acute angles, are morphologically consistent with aspergillus species. However, other moulds can have a similar appearance, so culture or molecular-based analysis is required for a definitive diagnosis (1).

Grocott's method and its modifications are capable of detecting almost all fungi and polysaccharide-rich microorganisms including nonviable forms, Mucor, Actinomyces, Nocardia and Pneumocystis carinii. In these methods, however, the reaction in methenamine-silver nitrate solution occurs suddenly and progressively, and therefore heavy background staining is frequently caused by even a slight prolongation beyond the optimal reaction time. This heavy background staining makes it difficult to detect fungi and to observe the septal structure. It was also difficult to detect small numbers of fungi in sections, especially in collagen-rich tissue (5).

Tome et al (5) have modified the Grocott's method by replacing the Methenamine Silver solution with an ammoniacal silver solution (as used in the Reticulin technique) and found more consistent results without background staining. A disadvantage of this method is the length of time required in ammoniacal silver nitrate solution compared with methenamine-silver nitrate (30 minutes to 2 hours v 20-60 minutes).

Ozmen & Dorrestein (4) found, in their study of aspergillosis infection in turkey brains, that the Klüver-Barrera method for myelin (using luxol fast blue and cresyl violet) was an excellent staining technique for demonstrating fungi in tissues. They

showed that cresyl violet had a high affinity for fungi.

References

1. Segal (2009) NEJM Volume 360:1870-1884.
2. Stergiopoulou et al (2007) Am J Clin Pathol 127:349-355.
3. Cornell et al (2007) Genome Res 17: 1809-1822.
4. Ozmen & Dorrestein (2004) Biotechnic and Histochemistry,79 (2):95- 99
5. Tome et al (1988) Biotechnic and Histochemistry 63(1):53-57

Committee Members

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5 Reasons to Become a Histotech

Cindy Dubois, with the help of Histonet came up with the following list:

1. You get to dig into peoples' brains like no psychologist can.
2. Job security - no one else wants to work in the "human parts department".
3. It is never boring - "How did the patient get THAT in THERE?"
4. You get to do arts and crafts (Wax & Stains).
5. Most important - Providing quality care to patients.

"You will create a work of art everyday that may save or extend a life" *Pam Marcum*

Tom Truscott suggests that maybe the next five would be:

6. The pay is great,
7. The bosses are very caring,
8. The hours are flexible,
9. The equipment is top-notch,
10. The co-workers are brilliant.

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1 A4 page $100.00

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1 A4 page $300.00

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No Receipt for Membership Fees Paid?

When paying electronically It is essential for member identification that you complete the "***Reference ....***" with your ***name!***

We have received membership fees to our Credit Union account from two unidentified persons during early August. Should we wish to go down the track of "bank tracing" we are told the standard fee charged on an account is $20 per transaction and even then we may not be guaranteed of a name! Obviously it is not the way to go.

So, if you have paid and not yet received a Tax Invoice/Receipt for your 2010 subscription to the Histotechnology Group of NSW (either emailed to you if a legible address was given or, alternatively, by post) then please contact me on Ph: (02) 9520 5043 or by email eyepoint2@bigpond.com and I'll see what we can do. Who knows you just maybe one of those two mystery Members that we need!

Remember, **Name** for "**Reference..."** . The amount of $38.50 tells me it is an annual subscription/membership fee so those words are not that important to me. If writing cheques or sending electronically the bank requires the correct payee be nominated. ie ***Histotechnology Group of NSW*** or the payment/cheque may be rejected.

Thanks.

Lin Parkes – Hon. Treasurer

My piece about National Conference 2009

Hi there everyone,
Let me begin by thanking all of you for making this year's conference a success. It is not possible for me to thank everyone personally, so I am taking this opportunity to thank all participants, organizers, speakers and trade suppliers who have joined together on this occasion. What an excellent conference that we had in Adelaide! I think conferences are perfect for meeting people, sharing ideas and trying new things. It turned out to be a great experience for all of us. For those who haven't been- here it is.
As we all know the 4th National Histology Conference was held in May at Adelaide, South Australia. It is good to see that people are enthusiastic and passionate about participating more and more in educational programs such as conferences. It was a huge success with around 300 people attending the program.
There were a diverse range of topics, encompassing many areas of interest within our field and this was reflected in the mix of scientific and medical speakers. It was a privilege to have Dr JK Chan and Dr J Robin Warren as key note speakers. Dr Mark Clair's (Orthopedic Oncologist) talk on "What the surgeon is looking for from the histology report" highlighted the importance of histology reports as the means of communication between pathologist and other members of the medical team. Dr Phil Allen drew everyone's attention to the role of technologists. Histotechnologists are involved in specimen identification and accession, cut up, frozen sections, paraffin sections, histochemistry, immunohistochemistry and the handling of material for external consultation. Of these, specimen identification is one of the simplest but most important of the technologist's functions.
John Dore, who began his career as a junior technician and is now a member of the Biological Stain Commission (USA), took us on a journey from 1850 to 1950 to explore the development of dyes and their application and impact in medical diagnostics which aroused curiosity in the history of dyes and stains.
All other topics including 'The impacts of Histology activities on the Sewerage & Mains Water Systems", "Wildlife Pathology' and "The Importance of Histology in Forensic Science" were very educational and informative. The poster competition received good support with around 18 entries. Trade suppliers were once again outstanding.
Last but not least everyone had fun and really enjoyed the guitar solo by David Jones.
Experiencing the "best on offer" with an exclusive tour of one of the finest wine producing areas-the Barossa Valley with magnificent stone architecture and boutique wineries, all encapsulated in a peaceful rural setting was very refreshing and exhilarating.
Some of our colleagues enjoyed venturing into a beer lover's paradise at the Cooper's Alehouse. The Cooper's family has been making beer in South Australia almost since they found water here. Most of us enjoyed the range of ales in the showcase bar at the Cooper's Ale House.
The conference dinner was really great with delicious cuisine and drinks. Acoustic Juice (the band) was superb and very entertaining.
We all had such fun seeing everyone and really enjoyed ourselves.
I am hoping you are really looking forward to the next one- Well folks, more fun ahead!!

Bharathi Cheerala
Douglass Hanly Moir Pathology

Brown Adipose Tissue

Everyone is familiar with white adipose or fat tissue, which provides insulation and, by storing triglyceride, serves as an energy depot. Many mammals also have brown adipose tissue, which also stores triglyceride, but has the unique ability to generate heat.

Brown adipose tissue is sometimes mistaken for a type of gland, which it resembles more than white adipose tissue. It varies in colour from dark red to tan, reflecting lipid content. Its lipid reserves are depleted when the animal is exposed to a cold environment, and the colour darkens. In contrast to white fat, brown fat is richly vascularized and has numerous unmyelinated nerves which provide sympathetic stimulation to the adipocytes.

Adipocytes in brown fat contain plenty of mitochondria. A very rich capillary supply and the cytochromes found in the mitochondria give the tissue its characteristic colour. A protein (UCP-1 or thermogenin) found in these mitochondria decouples the oxidation of fatty acids from the generation of ATP. Instead, these cells generate heat.

Brown fat is most prominent in newborn animals. In human infants it comprises up to 5% of body weight, and then diminishes with age to virtually disappear by adulthood. The location of the brown fat reflects its heat-generating function. It is located in the axilla (armpits), between the shoulder blades, in the region of the neck and along large blood vessels. The heat generated by the brown fat warms the blood which supplies nearby organs or which re-enters the trunk from the limbs.

Histologically:

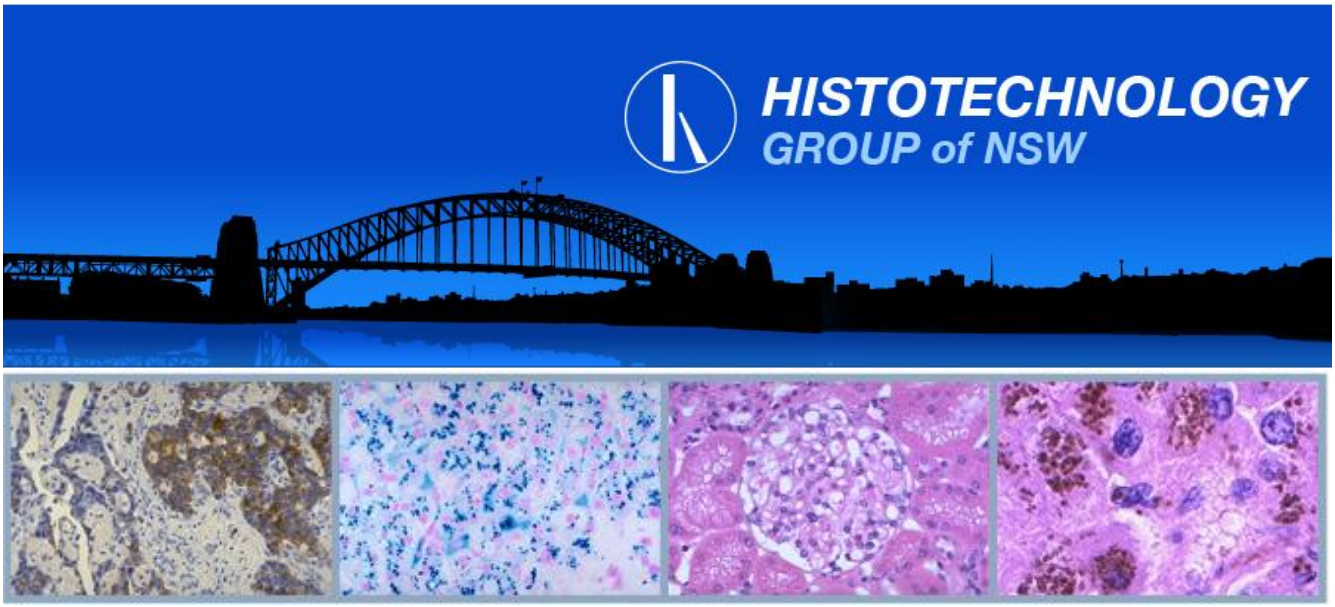
- White adipocytes have a scant ring of cytoplasm surrounding a single large lipid droplet. Their nuclei are flattened and eccentric within the cell.
- Brown adipocytes are polygonal in shape, have a considerable volume of cytoplasm and contain multiple lipid droplets of varying size. Their nuclei are round and almost centrally located. There is also an abundance of blood-filled capillaries. Electron microscopy shows brown adipocyes to be rich in mitochondria.

Hibernomas are benign soft tissue tumours, composed of brown fat. In 1914, Gery coined the term hibernoma because of the tumour's resemblance to brown fat found in hibernating animals. Hibernomas are more common in women and are predominantly seen in adults, with a peak incidence during the second and third decades of life. The tumour usually presents as a slow-growing painless mass in the areas having remaining brown fat, such as the scapular and interscapular regions, axilla, chest wall, and perirenal areas. However, hibernomas have also been reported in the thigh and popliteal fossa, which are usually devoid of brown fat.

Grossly, the tumours are encapsulated. Multivaculoated cells with small central nuclei are common to all types of hibernomas. Variants of hibernomas (typical, myxoid, lipoma-like, and spindle cell) were based on the tinctorial quality of the hibernoma cells, the nature of stroma, and presence of spindle cell component. Typical hibernomas are more common, consisting of pale or eosinophilic granular cytoplasm. The myxoid variety has multivacuolated cells separated by acellular myxoid stroma. The lipomatous variety usually has univacuolated cells, and the spindle cell variety have spindle cells with thick bundles of collagen. Immunohistochemically, most of the hibernomas show S-100 positivity and the spindle cell variety shows positivity for CD34.

References

Mounasamy et al (2005) Clinical Orthopaedics and Related Research 446: 291–296
Klass (1997) Bioessays 19:215
Kuroshima (1993) Japan J Physiol 43:117



Web Site Report

Our new Website is operational. Take the time to have a look and pass the word on to your colleagues.

The Website has been constructed with a number of sections:

Home --- Home Page.
About Us --- History of the group.
Committee --- Details of the committee.
Scientific Meetings --- Details of forthcoming/proposed meetings.
Links --- Links to other State Groups/organisations and meetings.
News --- News items.
Contact us --- Method of enabling enquiries and comments to be forwarded to the committee.
Membership --- Information on becoming a member and membership form.

On the home page is a login for members to access our Histograph newsletter and other information. This is still under construction.

We would welcome feedback and comments on the present format and suggestions on items that could be added.

Trevor Hinwood.

Histotechnology Trivial Facts

Lori Disher (Histonet 14/4/09) remembers a supervisor telling her that if you took a hard boiled egg and sectioned it at 2 microns you would have enough sections to cover a football field. Is this true or not even close?

Raymond Koelling (PhenoPath Labs, Seattle) remembers that while in Grad school taking microanatomy and pathology classes, he heard two ?facts:

1. The surface area of all the alveoli in the lungs of an adult is between 40-70 square meters. That seems reasonable in having a 40-70 square meter surface (where all gas exchange takes place) represent all the gas exchange in lungs. Have seen that figure numerous times so while can't test it, can believe it.
2. The other one that I also can't test and is hard to believe is that the sum total length of all vessels (large and small, artery and vein down to every single capillary) in one adult measures about 100,000 kilometers (62,000 miles).

The 2 micron sectioned egg he doesn't believe:

1. There are 25,400 microns in an inch.
2. A two inch long egg is about 50,000 microns long.
3. At 2 microns per section that is about 25,000 egg sections.
4. Even if each section is 2 square inches (that's generous since each end isn't close to 2 square inches in area), that is 100,000 square inches.
5. At 1,296 square inches per square yard, that's about 40 square yards which is far short of a football field (100 yards x 53 yards).
6. If you calculate the volume of a "solid rectangle" covering a football field that is 100 yards x 53 yards x 2 microns and of course converting all to yards or microns, the answer is a specific volume.
7. If you take the volume of an ellipsoid which is four thirds times pi times a times b times c with a, b and c being the length of the 3 axis of the ellipsoid, and using approximate measurements for the egg, he come up with far , far less volume in egg than in the "rectangular solid" covering football field.
8. This is a classical calculus definite integral washer problem. Whether this egg as an ellipsoid is scalene, oblate or prolate, integrating volume over the limits of integration gives me much, much less volume than is needed to cover a football field 2 microns thick.
9. He has tried all three methods and converted everything to microns or yards using scientific notation (6 calculations).
10. Every time he came up somewhere close to the area of 2 micron slices covering approximately 1/100 of the football field.

So either his maths is all wrong, or this is a humungous, enormous ostrich and not a chicken egg.

Annual General Meeting - Treasurer's Report

REPORT FOR FINANCIAL YEAR 1/07/2008 – 30/06/2009

1) Sydney Credit Union Account # 94099

Opening Balance @ 1/7/2008	..	$ 32,997.97	Cr.
Receipts 1/7/08 – 30/6/09	..	$ 12,662.70	
		$ 45,660.67	
Payments 1/7/08 – 30/6/09	..	$ 11,826.81	
Closing Balance @ 30/06/2009	..	$ 33,833.86	Cr

Held in:	Sydney Credit Union		
	S4 Business A/c # 94099	..	$ 11,920.79
	Term Deposit # 94099 I80	..	$ 21,913.07
			$ 33,833.86

I am pleased to report that contrary to the world experiencing a financial crisis our finances have remained in the black – no red ink here, just!

Having said that paid-up members were significantly less than in other years at just 101 in total including five Trade memberships and of course the Life Members would be in addition to this. A recruitment campaign is underway to boost the numbers again and maybe a gentle nudge to your fellow histotechnologists to join us or a reminder to the old ones to renew could be quite timely! New members give fresh ideas and remember conferences and Christmas functions are all good fun too, even for those of us who are not involved in the physical world of histopathology!

In regard to Tax Invoices/Receipts my preference is to email them to you. Please remember though to do this we need a legible current email address. If you have completed the 2010 membership form we thank you but if not it is available from our new website – just fill in the spaces and send! Bingo, we get it and it is legible!! Also, if you think you have not received your receipt please check your Junk Mail box just in case …..

Having said that I am pleased to summarise a few of the more prominent areas of the Accounts for the year:

Leica Microsystems very kindly donated $1800 by way of sponsorship for our last Christmas meeting held here at the North Ryde RSL Function Centre on 5/12/2008. Over 50 people enjoyed a great night – good venue, food, drinks, camaraderie, trivia and a trip to the stars and beyond and, for once, it was not run at a loss! It was a fun night and one of the best we have had.

Through the year a number of scientific meetings were held at the premises of Douglass Hanly Moir Pathology. DHM provided a conference room for us at no charge and we provided the food and beverages. All meetings were fairly well attended interesting and with good speakers.

Adamstown RSL was the venue for a country scientific meeting held on 1 November, 2008 with 26 in attendance. Our Newcastle members appreciated the 'hometown' meeting and a small loss incurred was offset by the benefit it provided.

Once more Tony Henwood has done a great job producing the *Histograph*. Overall, he has managed to persuade his loyal Advertisers to continue with us thereby offsetting the costs with advertising revenue. No easy task but his persuasive powers must know no bounds!

There are always ongoing annual costs for the Group like Storage facilities, Insurances, our new Web site, printing, postage, stationery, computer costs, etc., etc. but the labour involved is donated free by your committee. In addition Douglass Hanly Moir Pathology has allowed the committee the use of a meeting room at their Giffnock Avenue premises for the past year free of charge. It is conveniently located for most of the committee members and a great cost saving to us. We once again sincerely thank DHM.

Last but not least BAS Statements for the past 12 months have been lodged on time. In addition the previous outstanding ones have also been filed with the Tax Office. We have now met all of our GST obligations to date. Information to enable the preparation of Income Tax Returns from 2004 onwards is still with our accountant. Unfortunately, I am advised those are not yet completed.

The financials for the 12 months ended 30 June, 2009 have been produced in detail and are available for your perusal tonight.

Lin Parkes
Hon. Treasurer

Job Vacancy

Histopathology Technician/Scientist

Experienced staff are sought for part-time/full-time positions in a growing dermatopathology laboratory in southeast Sydney near Eastgardens Shopping Centre.

Laboratory management experience an advantage.

Enquiries: Dr Kerry Crotty: kcrotty@cpcpath.com.au or (02) 9661 6100.

Ammoniacal Silver - Safety Concerns

The following text is extracted from Carleton's Histological Technique, 4th ed., 1967, pp136, by R.A.B. Drury and E.A. Wallington. The reference at the end gave anecdotal evidence of several explosions. It also documented that ammoniacal silver solutions with metallic deposits, whether on the glassware (silvering) or floating on the surface are very dangerous as the silver material is the explosive compound (silver azide, I believe). Leaving silver solutions in sunlight apparently increases its formation, but refrigeration and the dark do not stop it forming. Silver solutions should be made up just before use and discarded immediately after, unless keeping them for a specified period is required by the technique. In that case, it might be advisable to consider changing techniques. The sodium chloride solution referred to was 20% aqueous, to ensure an excess (Bryan Llewellyn Histonet).

"Finally, all users should be made aware of the potentially explosive properties of ammoniacal silver solutions. Serious accidents have occurred from the misuse of this reagent, although receiving little publicity. Stewart Smith (1943) described such as accident, Nauta and Gygax (1951) warned of the dangers and Wallington (1965) gave accounts of several accidents, explained the probable cause of the explosions and offered advice on safety. This is as follows:

1. All ammoniacal silver solutions should be prepared immediately before use, in clean vessels and not in 'silvered glassware' which is especially dangerous. Flexible plastic containers offer greater safety. The recommendation of Lendrum (1947) to coat staining jars with black paper, bound with strong tape (for storage of solutions) might lessen the effect of an explosion but would not prevent (at least) subsequent blackening of person and surroundings.
2. Solutions should never be exposed to sunlight.
3. Any unused reagent should be immediately inactivated by the addition of excess dilute hydrochloric acid or a solution of sodium chloride, and discarded. Refrigeration does not prevent formation of the explosive compound.
4. All new staff and students should be instructed in the above.

Reference: Wallington, E. A., (1965) Journal of Medical Laboratory Technology, v22, p220

But as Nick Kirby (Histonet) comments: Although there is a theoretical risk of explosion, the very fact that you don't see headlines saying "Technician blown up by silver solution" suggests that most of the so called "evidence" is anecdotal. In fact most of the so called "evidence" seems to stem from an era when general safety conditions in labs were considerably less than they are today, so it was more likely a combination of factors rather than this single one.

The same is true for other substances such as Picric acid which is also supposed to be explosive, but you have to dry it out and hit it with a very heavy object like a moving express train to get it to do anything.
As with all these things a risk assessment should be completed as to how you use the substance and a means of safely using it should be devised.
We keep ammoniacal silver in the fridge for several days with no problems, although it must be said that it always works better if you make it up fresh each time.
If you precipitate the silver out of the solution and keep it you then have to consider the toxicity of the residue, where you store it and the fact that it is much more difficult to dispose of the solid residue safely than the dilute liquid one.

HISTOTECHNOLOGY GROUP of NSW

ABN: 63 128 868 343
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I wish to become a member of the Histotechnology Group of N.S.W. and enclose

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******Reference: **[Name – for member identification]**

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