Volume 54 / March 27th, 2021

TISSUEPAPER

Histotechnology Group of Queensland

President's Report- Mark Bromley

Greetings histopepes! Welcome to the first newsletter of 2021, a year that hopefully will be a lot better than the last one! It is also the first newsletter for a long time to have a different photograph accompanying the Presidents report, one nowhere near as good looking as it has been for many years I'm afraid!

The first thing I wish to do is to raise a large glass of something delicious and toast Jerres for the stellar job he has done as President of the HGQ for the last 6 years. I'm sure you will join me in thanking him for a job truly well done! I was looking back through the archived newsletters and saw volume 37, June 2015 and the picture of him accompanying his Secretarial Report… oh how time ravages! Thankfully whilst he has stepped down from the President role to spend more time with his newly expanded family, he hasn't left the committee altogether, and will still be keeping an eye on the new incumbent to make sure he doesn't break anything.

I also wish to thank the 2020 committee members who did step down entirely, Greg Bowlay, Michelle Goddard and Chino Ho Suen. An organisation such as the HGQ simply cannot function without the selfless contribution for committee members like you. So thank you once again.

In This Top Issue :

And now to welcome the 2021 committee. We have some eager new blood, Jonathan Boyle from TPCH joins us and takes over form me as Treasurer, and we have Maddison Burrows from QUT, Sharee Durdin from QML, Sara Konwisarz, also from TPCH and Samantha Arandelovic from Mater.

Hopefully 2021 will see us released somewhat from the restrictions of COVID. We have already had the first face to face Committee meeting since early 2020, and plan on some more face-to-face scientific meetings after the success of the AGM late last year. As the vaccine is (slowly!!) rolled out, I hope to see the Trivia night back on the cards again, along with hopefully another workshop. At this stage, the National Conference in Sydney looks like it will go ahead in 2022. Here's to looking forward to what 2021 has on offer for us.

Committee Members

Role	*Name*	*Company*
President	Mark Bromley	SNP
Secretary	Amanda Marsden	PQ-PAH
Treasurer	Johnathan Boyle	PQ-TPCH
Newsletter	Sharee Durdin	QML
Newsletter	Melissa Hillas	Mater
Social Events	Emma Hughes	SNP
Workshops	Chris Cazier	QUT
Workshops	Maddison Burrowes	QUT
Scientific Meetings	Brett Harrison	Trade
Scientific Meetings	Lloyd Blundell	Trade
Trade	Samantha Arandelovic	Mater
Website	Jerres Alcober	PQ-TPCH
Social Media	Sara Konwisarz	PQ-TPCH

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Newsletter: newsletter@hgq.org.au
Trade: trade@hgq.org.au

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Want to do a birthday shout out?

Have a photo you want to share?

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We are always looking for contributions of scientific articles and news, or if you have improvements and techniques that make a difference in your lab!

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Acronyms are everywhere!

Mark Bromley, SNP

"I present to you the longest and frankly the most tongue twisting of them, the ACCMLSW"

Acronyms are everywhere! They pervade every aspect of communication, from formal scientific journals through to the TGIF I typed on messenger earlier today. With the explosion of online communication over the last 20 years has come a simultaneous tsunami of acronymization, some are relevant to our daily lives, and others, IMHO, not!

But there are three acronyms that have recently come to the fore. They hold particular relevance for us in Histoland, yet many of us humble citizens of Microtomyville remain blissfully ignorant of them as they sneak up behind us. Two of them are eager to trip us up when we least expect it. And then there is the third, standing knight like between them and you, sword drawn ready to protect you as you have your back turned, unaware of their impending approach. The intent of this article is to shine a torch squarely in their faces of all three, so we can all be aware of them, what they do, and how they can be of use to us.

Firstly, I present to you the longest and frankly the most tongue twisting of them, the ACCMLSW, the imaginatively and romantically named Australian Council for the Certification of the Medical Laboratory Scientific Workforce. Just rolls off the tongue like molasses. So, what on earth is the ACCMLSW?

Certification is defined as the formal recognition of the knowledge, skills and experience of an individual demonstrated by the achievement of standards identified by a profession. *Licensure*, or *registration* as it would be called in Australia for health professionals, is legislated certification.

In most countries around the world medical scientists and technicians are either certified or on many cases registered in an attempt to ensure an appropriate skill level is maintained within the profession. Australia has up until now been an exception to this. The Australian Government has long rejected the need for registration of medical scientists. However industry bodies have long believed the complete opposite, and in the absence of compulsory registration, deemed that some form of certification was desirable. So, in 2017, a joint AIMS/AACB (shame on you if you don't know the first of those! and you can look the second up yourself, I'm not doing all of the work!) sponsored project was set up to explore potential models for a national professional certification scheme for the

medical laboratory scientific and technician workforce within Australia. The outcome of the project was the framework of a voluntary certification scheme, and a company was formed to administer it. That company is the Australian Council for the Certification of the Medical Laboratory Scientific Workforce, or ACCMLSW. Whilst the certification scheme is voluntary, I'm sure employers will increasingly view it favourably in resumes, and I expect eventually only hire certified staff. So first thing on your to-do list is to check out the ACCMLSW website, www.ACCMLSW.wildapricot.org (I kid you not…) get familiar with certification and what it involves, and decide for yourself if you want to become certified (you do!) because it's coming, and you don't want to be left on the shelf.

"I predict we'll all need to utilise some form of CPD registration and validation process at some point in the future"

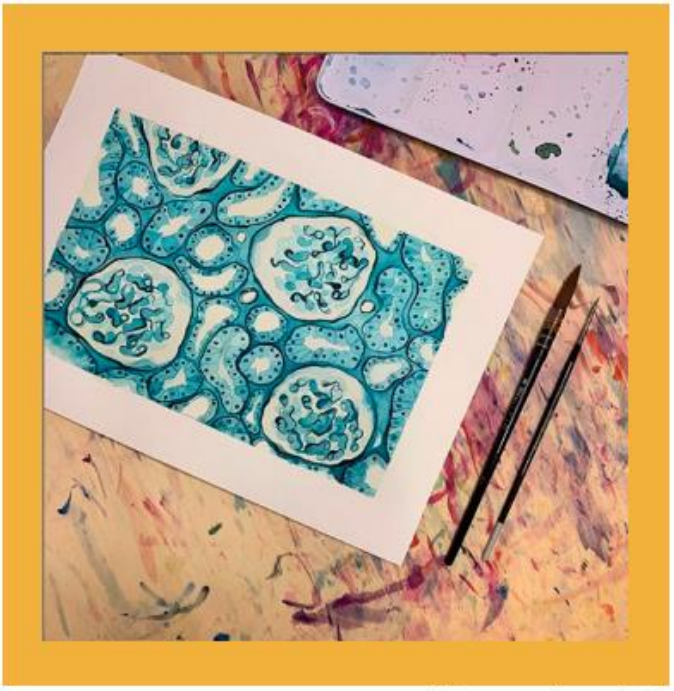
Part of the ACCMLSW certification process involves continuing education, both doing it and documenting that you have done it. This makes for a nice segue into our next acronym, APACE. For those who haven't heard of APACE, it stands for Australian Professional Acknowledgement of Continuing Education. Not quite as laryngeally challenging as the ACCMLSW, but it still doesn't quite evoke tingly feelings of gooey joy. Continuing education is something that isn't done well across the majority of Australian histology laboratories, or indeed by the majority of those of us working within them. There is the biannual National Histology conference, and of course the fantastic scientific meetings and presentations put on by your HGQ, but for most of us that's as far as it goes, and we certainly don't record having done any of it. But, denizens of formalinville, I can assure you that it will become increasingly important. NATA (shouldn't have to look that one up unless you're a fresh faced, rosey cheeked newbie graduate, and trust me, you'll get to know what NATA means pretty quickly!) are focusing more and more on the continuing education aspect of ISO 15189 (don't bother with that one unless you suffer with insomnia or have aspirations in Quality Management) and NPAAC regulations (National Pathology Accreditation Advisory Council, the part of the Department of Health that comes up with many of the rules labs have to abide by) both of which mandate Continuing Personal Development (CPD) requirements for laboratory staff. So workplaces are going to look fondly on those who do it and record it. Then there's your certification, which will need it too. So check out APACE, which is the AIMS scheme for recording and certifying continuing personal development activities. I predict we'll all need to utilise some form of CPD registration and validation process at some point in the future, for like certification, it's coming round the corner, not because you necessarily want it to, but because what you do want (a job!) will make you want to do it. So https://www.aims.org.au/apace is where to go and become familiar with it. Entirely up to you of course if you want to make use of it, but be aware of it lest it sneaks up and bites you on the derriere at some point in the future. Horses, water & drinking and all that… HWD!!

Finally we get to the warm fuzzy bit, the cosy fluffy acronym that has your back, the one that is keeping a beady eye on the other two, and anything else that tries to sneak up on the innocent and happy residents of the Waxlands, the HGA. I'll say that again. HGA! Just rolls of the tongue! Ok, back on track…

The Histology Group of Australia. For many eons there have only been state based histology groups like the HGQ, the HGVT (Victoria and Tasmania), the HGNSW (guess!) HGSA (duh!) and the HGWA (YAY! you got it!). Cast your minds back to earlier when we were talking about the ACCMLSW, and how that project was started in 2017 to come up with how it would work. It was actually an organisation called Human Capital Alliance that were tasked with the job, and they asked all of the various national organisations representing medical scientists for their input; AIMS (been there before!), AACB (you were meant to look that one up yourself) NPAAC, HGSA (that's the genetics people, not the Histo Group of SA), ASM (micro), THANZ (vampires) ASC (cyto) bla bla bla.. BUT! There was no national group for histopepes! so we were just forgotten about. It wasn't until the run-up to the excellent National Conference in Adelaide put on by the real HGSA, not those pesky DNA obsessed chromosome heads that stole the acronym for themselves, that word of this movement reached histoears. It was at that conference that representatives from the committees of the five state groups came together and drank wine. Oh! and we formed the HGA too. It was formed with the view of having a national body representing the histology and histotechnology community that could then engage with the ACCMLSW to make sure that your voices are heard moving forward. The HGA constitution was written and it became an incorporated association soon thereafter, and is now an ACCMLSW member association, with representatives on the ACCMLSW committee and its Board of Directors. So go and check out www.NationalHistologyGroup.org.au and see what's there. It's early days yet, the website isn't super flash, mainly because I made it and there is a reason I don't work in IT land! But the fundamentals are in place and the HGA has an exciting future representing you and your interests at the national level. It's got your back! An on that note I'll leave you in peace with one last acronym- TTFN!

The Art of Histology

The importance of histology has proven to be such an essential part of anatomical pathology, that we never think to look at slides from an artistic approach. Here is a small gallery of histology inspired art pieces, to help stimulate creativity.

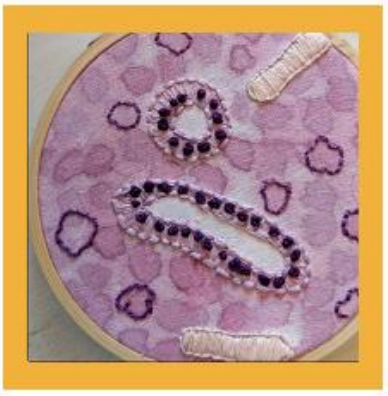


kidney watercolour painting inspired by a silver stain, showing basement membranes @lamellipodium

superficial spreading melanoma of the skin @artbydalma

watercolour painting of colon @histoqueenofhearts @lamellipodium

Epididymis H&E painting @lamellipodium



hand embroidery of submandibular gland @h.and.embroidery

Happy Histotechnology Professionals Day

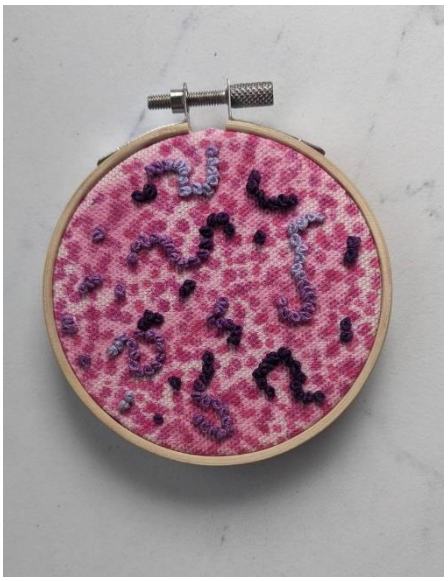
MARCH 10th 2021

Touching lives one slide at a time

Meet the artist - HandEmbroideryCo

1.What is your background?

I'm a dental-scientist in training! I'm in a DMD/PhD program - currently in my 7th year. For my PhD, I studied the microbes that live in and on the human body.



2.What inspired you to create your artwork?

I love studying histology and microbiology and I've always found there to be such beauty in both. A lot of people think of human anatomy or microbiology as totally gross so I want to show how beautiful and incredible they can be - even the parts you can't see!

3.WWhat type of artwork do you do?

I do embroidery! Hand-stiched and inspired by my favorite microbes, histology slides, and other science goodies.

4. Where has your art travelled to?

I think the furthest is the UK! I've sent pieces all around North America and into England and Ireland.

5. Where can we purchase your creative work?

On my Etsy page or via a message to @h.and.embroidery on Instagram. On my Etsy, I only generally ship within North America but if you send me a message we can work something out!

Meet the artist - LamellipodiumArt

1.What is your background?

I am a 27 years old first year resident training in pathology. I live and work in Germany. Besides that I am also an artist and my work is inspired by what I see under the microscope.

2.What inspired you to create your artwork?

I have always been interested in both: medicine and science. Combining these two topics was always something I aimed to do. I started learning about Histology and Pathology in Medschool and started to include it in my work. Everything I see through the microscope and learn about the human body and its diseases, is a huge source of inspiration for my work. Looking through the microscope is like looking into a different universe and on this special beauty of nature. It is hard to describe this Beauty to anyone who isn't working in the field and it might sound a bit weird when I say I think that skin warts are really beautiful.

3.WWhat type of artwork do you do?

Most of my last years work are watercolor paintings. I do also use gouache and acrylics sometimes. I painted a mixture of histology and pathology microscopic including a 100 days project for which I painted a slide every day. I also turn my art into postcards and scrunchies (hair bands) which have been very popular. I really enjoy turning my work into little perks for histology enthusiasts and healthcare professionals.

4. Where has your art travelled to?

My work has traveled all around the world by now, actually to all continents when I think about it, and I am so grateful for all the support I've been receiving. I send a lot of parcels to the United states but also to Canada, South America, Australia and Asia!

5. Where can we purchase your creative work?

You can find me and my current work on Instagram @lamellipodum or find me at my website lamellipodium-art.com. You can purchase prints, scrunchies and original Art from Etsy, my shop is called LamellipodiumArt.

Save the Date

Date: 22nd April
Scientific Meeting 1st
Venue: Zoom meeting

Date: 24th June
Scientific Meeting 2nd
Venue: TBA

Date: 2nd- 4th July
RCPA Annual Scientific Meeting
International Convention Centre, Sydney

Date: 19th Aug
Scientific Meeting 3rd
Venue: TBA

Date: 30thAug- 1st Sept
AIMS NSM
Venue: Pullman Albert Park Melbourne

Date: 21st-23rd Sept
Conference – AIMS SPC
Venue: TBA

Date: 21st Oct
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Venue: TBA

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An Informal Look at Formalin

Evva Järvinen and Danni O'Shaun

Formalin is our basic fixative in histology—used ubiquitously across the world for its convenience, safety and simplicity. Granted, it is not as easy as all that (it is not actually safe, convenient or simple) but it is better than the alternatives right now.

Formalin is created by dissolving formaldehyde gas in water. Formaldehyde is a simple carbon atom with two hydrogens and a double bonded oxygen: H_2CO.

This simple structure is found all across the natural world and even across the natural universe (astral formaldehyde has some unique properties which make it useful for astronomers when measuring things like interstellar cloud densities and carbon isotopic ratios). In the biological world, it is found everywhere within and without the body (which is good as it means our bodies can process it easily in low doses).

None of this is surprising upon reflection—it is a simple carbon molecule made from common ingredients and it would be surprising if it were *not* found in places with high carbon, oxygen and hydrogen levels.

The simplicity means it has uses as a building block for larger carbon compounds such as resins and plastics. It is also used as a biocide, in photography and many other industries. It is synthesised from methanol oxidation and is among the top twenty-five chemicals produced in the world. So, it is found all across the unnatural world as well as the natural one.

The reactivity is useful but causes problems for us. In large amounts, it is toxic. The jury is leaning towards calling it a carcinogen (and localities around the world are beginning to ban/limit its use in various practices). A shot glass amount of ingested formalin concentrate has been known to kill. Unscrupulous food manufacturers have used it to extend the shelf-life of foods. Formaldehyde gases can be emitted from a variety of treated products such as plywood and all of you know (we hope) that it should never be kept/used anywhere near decalcification solutions (HCl ones in particular).

Histologically, we use it as a fixative. Diluted in water, H_2CO binds to the H_2O to form methylene glycol (and polymers):

$HCHO + H_20 \rightarrow CH_2(OH)_2$

Very little actual formaldehyde is present in the solution but is formed by the reverse dehydration reaction as the formaldehyde binds to

proteins during fixation (remember Le Chatlier's Principle from high school chemistry?). The fixation itself is a matter of cross-linking proteins and is reversible in water. Formalin penetrates the tissue quickly due to its small size and then forms bridges between the amino groups.

This cross-linking takes considerably longer than the penetration but can be accelerated using heat or microwaving. When microwaving, best results are achieved if the tissue is left to soak in formalin for a time before microwaving. Microwaving immediately can cause patchy results. Be sure to have excellent extraction before heating formalin.

*An important note: *Household microwaves should **not** be used in a laboratory* for obvious reasons of reliability and safety. The College of American Pathologists have specifically denounced this in their guidelines for microwave processing. *

There are various types of formalin fixative. The variations are usually to reduce formalin pigment. If formalin solutions drop in pH, they can cause black formalin pigment/hematin precipitation on the slide. Usually this is from formaldehyde oxidising to formic acid. Buffered solution of formalin are used to prevent pH falls.

Formalin pigment can be removed after the fact by soaking unstained slides in saturated picric acid alcohol (or alkaline alcohol) for half an hour then washing until the yellow picric acid is removed. Washing the tissue for 24 hours in running water will also work.

The basic formula for formalin is not at all difficult to understand:

Formalin is used as a 10% solution of 40% formaldehyde (in the form of mostly methylene glycol and its subsequent oligomers) which is created by taking a 2.5 litres of a stock 32% solution and diluting it up to 20 litres (thus making a 12.5% solution) resulting in a 4% solution of 10% formalin.

Paraformaldehyde can be used if the above is too complicated.

Some Common Formalin Solutions and Uses:

These are just a few of the myriad of options for formalin fixation.

<u>10% Formalin</u>

2000mL 40% Formaldehyde

18000mL Distilled Water

This is not buffered so expect formalin pigment. It is also hypotonic so expect tissue changes.

<u>10% Neutral Buffered Formalin</u>

2000mL 40% Formaldehyde

18000mL Distilled Water

80g Sodium dihydrogen phosphate, monohydrate ($NaH_2PO_4*H_2O$)

130g Disodium hydrogen phosphate, anhydrous (Na_2HPO_4)

The commonly used formalin in most laboratories to avoid formalin pigment. Usually made from a stock solution.

<u>10% Formal Saline</u>

2000mL 40% Formaldehyde

18000mL Distilled Water

180g Sodium Chloride

May produce formalin pigment.

<u>10% Neutralised Formalin</u>

2000mL 40% Formaldehyde

18000mL Distilled Water

Magnesium Carbonate to excess

This will avoid formalin pigment, but it must be used fresh as it will acidify over time.

Alcoholic Formalin

2000mL	40% Formaldehyde
13000mL	Ethanol
5000mL	Distilled Water

A good intermediate step between formalin and ethanol in the tissue processors. Also good for fatty tissue and makes hard to find lymph nodes more palpable before dissection.

Formal Acetic Alcohol

8000mL	Ethanol
1000mL	Acetic Acid
2000mL	40% Formaldehyde
9000mL	Distilled Water
180g	Sodium Chloride

A fast-acting fixative and helps when searching for lymph nodes (see alcoholic formalin). Can cause formalin pigment.

Other variations exist such as Calcium Formalin (to preserve phospholipids), Formalin Ammonium Bromide (CNS tissue), Carnoys (to find lymph nodes) et cetera. And there are other fixatives than formaldehyde but formaldehyde is, by far and away, the most commonly used.

Formalin is our primary fixative in histology and it is simple enough to use and understand. It is not perfect and is somewhat tricky to use properly and safely but, on the whole, it is a good fixative and will suffice until better options emerge.

Agency for Toxic Substances and Disease Registry, Medical Management Guidelines for Formaldehyde, 2009, https://web.archive.org/web/20091208101423/http://www.atsdr.cdc.gov/MMG/MMG.asp?id=216&tid=39 (Accessed 17.03.2021).

Bancroft, JD and Cook, HC, *Manual of Histological Techniques and Their Diagnostic Application*, Churchill Livingstone, 1994.

Carson, F and Hladik, C, *Histotechnology: A Self-instructional Text*, 3rd edn., American Society for Clinical Pathology Press, 2009.

Harrison, PTC, An ethanol-acetic acid-formol saline fixative for routine use with special application to the fixation of non-perfused rat lung, *Laboratory Animals* (1984) 18. pp325-331.

Horobin, R, *Histochemistry*, Gustav Fischer, 1982.

Kok, LP and Boon, ME, *Microwave Cookbook for Microscopists*, 3rd edn., Coulomb Press Leyden, 1992.

Leica Biosystems, Fixation and Fixatives - Popular Fixative Solutions, 2021, https://www.leicabiosystems.com/knowledge-pathway/fixation-and-fixatives-4-popular-fixative-solutions/#:~:text=Formol%20acetic%20alcohol,-Formulation&text=A%20faster%20acting%20agent%20than,into%2095%25%20ethanol%20for%20processing (Accessed 17.03.2021).

Stains File, Fixatives Compared By Ingredients, 2019, https://stainsfile.info/prepare/fix/fixative-ingredient.htm (Accessed 17.03.2021).

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