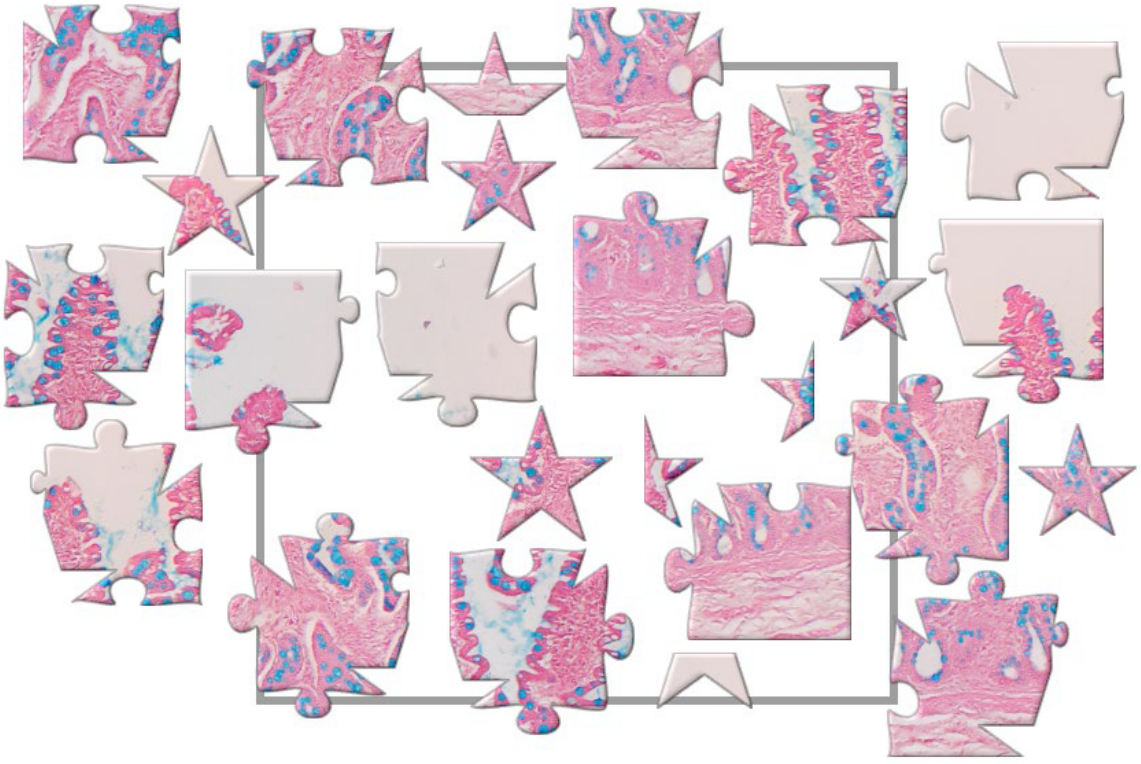
HISTOTECHNOLOGY

SOCIETY OF NSW

HISTOGRAPH

Newsletter No.1 2024



April

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Chairperson's Report

'HISTO2024' is approaching fast! Have you registered?

Recent events

The RCPAQAP kicked off our year with a webinar presented by Zenobia Haffajee 'A journey with the Royal College of Pathologists Australasia quality assurance program.' Thanks, Zenobia, for an excellent presentation and to the RCPAQAP for sponsoring the event. In March we had the pleasure of hosting a webinar with our friends from the NSW Health Pathology, Forensics and Analytical Science Services team. Thank you to Dr David Hambly, Dr Lena Quinto and Dr Lené Burger for the engaging presentations on Hypertrophic cardiomyopathy, Pulmonary embolism and Forensic biochemistry through the looking glass.

2024 Webinar schedule released

- **Sat 27th April** 'Bowel cancer by the skin of your teeth,' Dr Esther Myint and 'Hodgkin Lymphoma,' Dr Kenneth Lee, Douglass Hanly Moir Pathology Register Here
- **Thurs 24th Oct** Annual General Meeting + Surgical Cut-up Presentation, Carlee Hill, NSW Health Pathology Register Here
- **Sat 23 Nov 2024** Surgical Cut-up Presentation, Joanne To, NSW Health Pathology Register Here

Did you know webinars are recorded for members? **histonsw.org.au/educational-webinar-recordings/**

REGISTER NOW FOR EARLY BIRD PRICING! HISTO2024 National Conference

If you have not yet registered for HISTO2024 yet you have one month left to access early bird prices. Discover how Histotechnology and Histopathology are making a difference in the world around us. We have presenters from New Zealand, the Philippines, Queensland, Victoria, Western Australia, New South Wales, and others that hold Australasian roles. Join us over two days for insightful sessions that explore the latest advancements, practical techniques, impactful research, and fascinating case studies. We also have a limited number of practical workshop places left on the Friday. Don't miss this opportunity to network with and learn from the amazing community in which you belong.

More information on the pages to follow, register now to secure your spot!

Enjoy the read!

Warm regards,

Leah Simmons
Chairperson of the Australasian Association of Histology and Histotechnology
Chairperson of the Histotechnology Society of NSW
Chairperson@histonsw.org.au

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Early bird prices end
5th May 2024

Australasian Association of Histology and Histotechnology

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HISTOTECHNOLOGY 10th NATIONAL CONFERENCE August 2024

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9th - 11th Aug 2024

Darling Island, Sydney
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Click or scan for Registration & more info!

Early bird prices end 5th May 2024

Australasian Association of Histology and Histotechnology

9th - 11th Aug

Doltone House,
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Sydney, Australia

HISTOTECHNOLOGY

10th NATIONAL CONFERENCE

August 2024

Day 1

Friday 9th

Workshops

8:30am - 4:00pm

Welcome Reception

6pm - 7.30pm

Day 2

Saturday 10th

Presentations

9am - 5pm

Exhibition

8.15am - 4pm

6pm - 6.30pm

Gala Dinner

6.00pm - 11pm

Day 3

Sunday 11th

Presentations

9am - 1.30pm

Exhibition

8.30am - 1.30pm

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HISTOTECHNOLOGY

10TH NATIONAL CONFERENCE PROGRAM

Friday Practical Workshops, August 9, 2024z

Cracking the Tissue Code: Strategies for Mastering Tissue Recognition - Leah Simmons

Unlocking the Art and Science of Staining - Jacky Jongkryg

Saturday Plenary Presentations, August 10, 2024

Advancing Education: Progress on the Royal College of Pathologists Cut-up Course - Rick Farquharson

Colonic samples: From polypectomy to proctocolectomy - Michael Bushe Jones

The future is now, are you ready? Histology's Journey through Lean Workflows, Automation, AI, and Human Expertise - Corinne Hill

Muscle biopsy histologic technique in the evaluation of neuromuscular disease - Louie Berlin Cadao

Intersecting Horizons: The Convergence of Medical Research, Precision Medicine, Digital Pathology, and Anatomical Pathology - Madeline Gough

Beyond the Slides: Exploring Ancillary Allies in Histopathology – Dr Joanne Y. To

Why Margins Matter: The Patient's Journey - Leah Simmons

Sunday Plenary Presentations, August 11, 2024

Real Intelligence: The Future of AI in Histopathology Workflows - Clinical Assoc. Prof. Fiona Maclean

Cutting Edge Conversations: A Surgical Cut-up Panel Q&A - Corinne Hill + Clinical Assoc. Prof. Fiona Maclean + Michael Bushe Jones + Joanne Y. To + Rick Farquharson

Deciphering Clues: Unravelling Forensic Histology Cases - Dr Sairita Maistry

External Quality Assurance (EQA) Makes a Difference - Zenobia Haffajee

Histopathology in Congo - Mark Bromley

Register Now for Early Bird Pricing!

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Australasian Association of Histology and Histotechnology

HISTOTECHNOLOGY

10th NATIONAL CONFERENCE PRESENTERS

Tauranga, New Zealand

The future is now, are you ready? Histology's Journey through Lean Workflows, Automation, AI, and Human Expertise

Corinne Hill BSc MSc FFSc RCPA

- Service Lead, Anatomical Pathology, Pathlab

Australasia & New South Wales, Australia

Advancing Education: Progress on the Royal College of Pathologists Cut-up Course

Rick Farquharson BAppSc

- Cut-Up Coordinator, Histology, Douglass Hanley Moir Pathology
- Royal College of Pathologists Cut-up Course Working Group
- Committee Member, Histotechnology Society of NSW

Manila, Philippines

Muscle biopsy histologic technique in the evaluation of neuromuscular disease

Louie Berlin Cadao RMT CBP

- Chief Medical Technologist and Biosafety officer of St Luke's Medical Center Global city.
- President, Philippine Society for Histotechnology (PSH)
- National Board of Trustee of Philippine Association of Medical Technologist (PAMET)
- National Auditor, of Biorisk Association of the Philippines (BRAP)

Queensland, Australia

Intersecting Horizons: The Convergence of Medical Research, Precision Medicine, Digital Pathology, and Anatomical Pathology

Madeline Gough

- Medical Scientist in Anatomical Pathology at Mater Pathology, Mater Health Services, Brisbane, QLD
- PhD Candidate with the Faculty of Medicine, University of Queensland and Mater Research Institute

Australasia & New South Wales, Australia

Why Margins Matter: The Patient's Journey

Leah Simmons BMedLabSc (Path) CMLS

- Chairperson, Australasian Association of Histology and Histotechnology (AAHH)
- Chairperson, Histotechnology Society of NSW (HTSNSW)
- Associate Director of Scientific and Technical Training, NSW Health Pathology
- Charles Sturt University External Advisory Committee Member

New South Wales, Australia

Beyond the Slides: Exploring Ancillary Allies in Histopathology

Dr Joanne Y. To BSc MBBS(Hons)

- Anatomical Pathology Registrar, NSW Health Pathology
- Adjunct Associate Lecturer, School of Medical Science, University of New South Wales

Australasian Association of Histology and Histotechnology

HISTOTECHNOLOGY

10th NATIONAL CONFERENCE PRESENTERS

Australia & New Zealand

Cutting Edge Conversations: A Surgical Cut-up Panel Q&A

Clinical Assoc. Prof. Fiona Maclean + Dr Joanne To + Corinne Hill

Michael Bushe Jones + Rick Farquharson

Australasia & New South Wales, Australia

Real Intelligence: The Future of AI in Histopathology Workflows

Clinical Associate Professor. Fiona Maclean BAppSc, MBBS (Hons), FRCPA, GAICD

- Pathology Director, St Leonard's Lab, Douglass Hanly Moir Pathology
- Pathologist at Franklin.AI - making solutions to assist Histopathology diagnosis
- Clin. Assoc. Prof., Depart. of Clinical Medicine, Faculty of Medicine & Health Sciences, Macquarie University
- Chapter author 'Sternberg's Diagnostic Surgical Pathology' and 'Histology for Pathologists'

Australasia & Western Australia

Colonic samples: From polypectomy to proctocolectomy

Michael Bushe Jones MSc, BSc

- Senior dissectionist, Australian Clinical Labs, Perth WA
- Sessional Academic, Curtin Medical School, Curtin University
- Vice chair, Histology group of Western Australia and Committee Member
- Australasian Association of Histology and Histotechnology Committee Member
- Royal College of Pathologists Australasia Cut-up Course Working Group Member
- Sessional Academic, School of Molecular, Medical and Forensic sciences, Murdoch University
- Laboratory Medicine Course Advisory Committee Member, Murdoch University

New South Wales, Australia

Deciphering Clues: Unravelling Forensic Histology Cases

Dr Sairita Maistry

- Senior Forensic Pathologist, Forensic Medicine Sydney, Forensics and Analytical Science Service

Australasia

External Quality Assurance (EQA) Makes a Difference

Zenobia Haffajee

- Senior Scientist, Anatomical Pathology, Royal College of Pathologists Australasia Quality Assurance Programs

Queensland, Australia

Histopathiology in Congo

Mark Bromley

- Senior Scientist, Histology Department, Sullivan Nicolaides Pathology

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Presenters and topics subject to change

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Upcoming Events

Sat 27th April	'Bowel cancer by the skin of your teeth,' Dr Esther Myint and 'Hodgkin Lymphoma,' Dr Kenneth Lee, Douglass Hanly Moir Pathology Register Here
Fri 9th Aug	Conference workshops in Sydney Register Here
Sat 10th – 11th Aug	National Conference, Darling Island, Sydney Register Here
Thurs 24th Oct	Annual General Meeting + Surgical Cut-up Presentation, Carlee Hill, NSW Health Pathology Register Here
Sat 23rd Nov	Surgical Cut-up Presentation, Joanne To, NSW Health Pathology Register Here

*Dates, type of event, and topics subject to change

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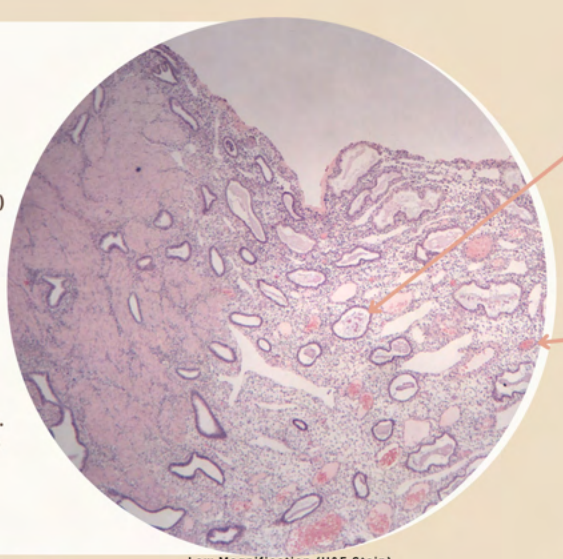
Endometrial Carcinoma

What is endometrial carcinoma? What kind of changes can I expect? What is happening in my body?

Normal Endometrium[3]

This is an image of a normal endometrium during the secretory phase/onset of menstruation.
During the typical 28 day cycle (May vary between people) the endometrium will go through 5 endometrial changes (phases);
Menstrual - The shedding of dead endometrial tissue and usually occurs between day 1-5.
Proliferative - The endometrial walls are grown back, with the new glands and cells produced, this usually happens days 6-14.
Ovulatory - This is when the egg is released from the ovaries, and it travels to the fallopian tubes on days 14-16.
Secretory - This usually occurs days 16-25 and is when the endometrial glands fill with fluid.
Premenstrual - This involves necrosis (death) of th endometrial cells in preparation of the shedding of the endometrial lining, this occurs days 25-28.



Secretory phase is characterized by these glands filled with fluid

This endometrium also has these pouches of blood, showing the onset of menstruation

Low Magnification (H&E Stain)

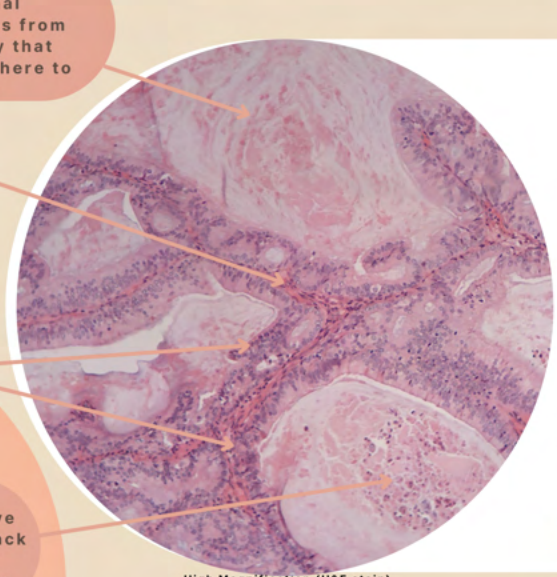
The endometrium has a high turn over of cells, allowing for an increased chance of mistakes when the cells replicate. This makes the uterus at an increased risk for cancerous cells to occur and then also develop into a tumour as there are large amounts of resources in the endometrium due to the bodies preparation for pregnancy (e.g. blood, energy, nutrients, nerves)

Mucosal discharge: Normal secretions from the body that have no where to go

Blood

Cancerous cells: Tumour cells

Necrosis: Dead cells that have been killed due to lack of resources and drainage due to the tumour cells



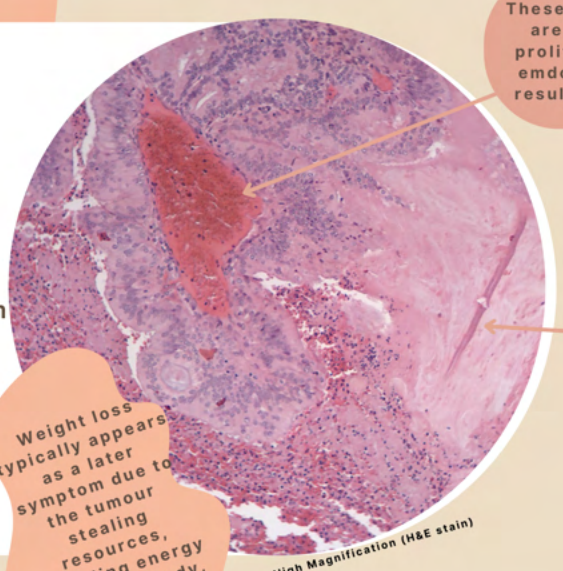
High Magnification (H&E stain)

Endometrial carcinoma[2]

Endometrial carcinoma is the uncontrolled growth of endometrial cells/tissue. It is one of the most common cancers to affect the reproductive organs, with it accounting for 95% of uterine cancers diagnosed and uterine cancer being the 10th most diagnosed cancer in Australia.

Signs and Symptoms[1]

- Abnormal vaginal bleeding or discharge (Bleeding in-between periods or a change in blood or discharge during menstruation)
- Pelvic pain and/or abdomen pain
- Painful Intercourse
- Painful urination
- Weight loss (This is usually a symptom that occurs later)
- Feeling a mass (Tumour)(This is also usually occurs later) (3)

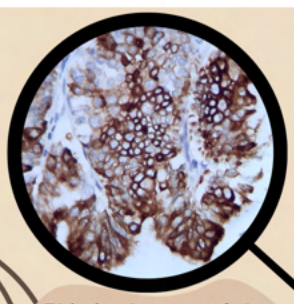


Blood: These blood pouches are caused from proliferation of the emdometrium, this results in abnormal bleeding

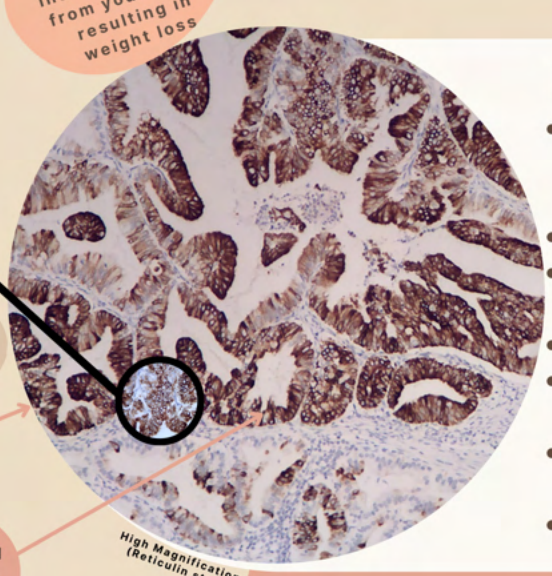
Myometrium (muscular layer in uterus): In more advance or different subtypes of uterine cancer, the tumour can spread here.

Weight loss typically appears as a later symptom due to the tumour stealing resources, including energy from your body, resulting in weight loss

High Magnification (H&E stain)



This is close up of the endometrial glands which have enlarged. The cells in the glands have become more fibrous, this makes the tissue harder.



This type of stain (reticular) highlights the fibres (muscular) present in the endometrium.

Abnormal shape and size of endometrial glands

High Magnification (Reticulin stain)

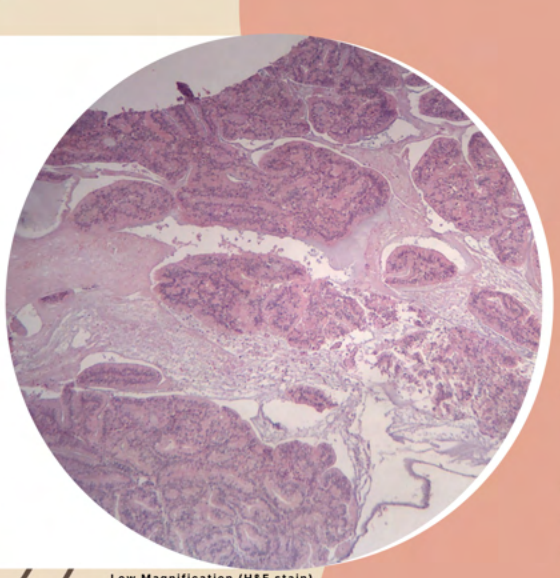
Risk factors[5]

- Family history (Of endometrial, breast and/or ovarian cancer
- Obesity
- Early menses (Starting menstruation before 12yr)
- Late menopause
- Never having children/Infertility
- Hormonal imbalance/hormone therapy (excess oestrogen)
- Diabetes

Early menses, late menopause and never having children increase the length of time there is increased oestrogen present within the body/uterus. One of the ways these risks can be reduced by going onto a progesterone or combination based birth control.6

Treatments[7]

- Surgery - This option involves the combination or some of these surgeries; a hysterectomy, bilateral salpingectomy (removal of both fallopian tubes) and an oophorectomy (removal of the ovaries). This is the most common treatment.
- Radiotherapy - Targeted external radiation. This usually occurs after surgery to remove any remaining cancerous cells
- Chemotherapy - the use of chemotherapy medication
- Hormone therapy - the use of hormone blockers e.g. an oestrogen blockers to help control the growth of the cancer.



Low Magnification (H&E stain)

Diagnosis[4]

A diagnosis can be achieved via a couple different tests, these include;

- Blood test
- Transvaginal ultrasound
- MRI
- CT scan
- Endometrial biopsy(A small section of tissue is taken from the endometrium)
- Hysteroscopy (A camera is inserted into the uterus through the vaginal canal)

Student Poster References:

Author: J. Howard, University of Newcastle

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Eponyms in Decalcifying Solutions

Tony Henwood, Retired, formally Principal Scientist, Histopathology, the Children's Hospital at Westmead, NSW, Australia

Calcified tissues can cause angst to a microtomist, so the removal of calcium is really, really useful. For better or worse, we humans like to give our names to things. Gray (1954) lists over 50 different decalcifying solutions. I searched for the first use of decalcifiers in histology and from what I can gather, Busch (Arch. f. milt. Anat., xiv, 1877, p. 481) reported the use of hydrochloric acid to decalcify bones in 1877, see figure 1 (Lee 1904). You have probably noted many eponyms in histotechnology, especially when referring to decalcifying solutions. Here are some of them, with formulae and recent papers on their use:

Perenyi's Fluid (1882)

40 ml 10% nitric acid, 30 ml absolute ethanol, 30 ml 0.5% chromic acid (Charman & Reid 1972, Choube et al 2018).

Culling (1957), in his opinion, found that Perenyi's fluid produced better results than Von Ebner's through Sanjai et al (2012) reported that Perenyi's fluid scored poorly in staining and soft-tissue integrity compared to neutral EDTA, 5% Trichloroacetic acid and formic acid. Similar results were reported by Khangura et al (2021).

Von Ebner's Solution (1902)

15 ml conc. hydrochloric acid, 175 g sodium chloride, distilled water to 1,000 ml (Choube et al 2018).

In 1902, Von Ebner was involved in elucidating the growth lines in the dentine of teeth (as observed with polarised microscopy and confocal microscopy). They represent the amount of dentine matrix produced by odontoblasts (dentine-producing cells) (Ebner 1902, Schwartz et al 2001).

Von Ebner's solution is still in use, especially for decalcifying teeth (Khan et al 2022).

Jenkins Fluid (1921)

Absolute alcohol 73 ml; water 10 ml; chloroform 10 ml, glacial acetic acid 3 ml, hydrochloric acid (conc.) 4 ml (Jenkins 2021, Charman & Reid 1972, Choube et al 2018).

Post-decalcification treatment involves rinsing in absolute alcohol (Charman & Reid 1972). This fluid has not recently been reported in the literature.

De Castro's Fluid (1925)

De Castro's decalcification fluid was prepared by adding 30 ml concentrated nitric acid to 670 ml distilled water, and then 300 ml absolute ethanol was slowly added (Stefanović et al 2017).

Fernando de Castro (1896-1967) was a student of Santiago Ramón y Cajal and an experienced histotechnologist. He supervised scientists such as Howard W. Florey. De Castro developed this decalcifying solution, as well as a silver impregnation technique to demonstrate nerves in decalcified bone (Hurrell 1937, Ros-Bernal & De Castro 2020).

Eponyms in Decalcifying Solutions - continued

Evans and Krajian Solution (1930)

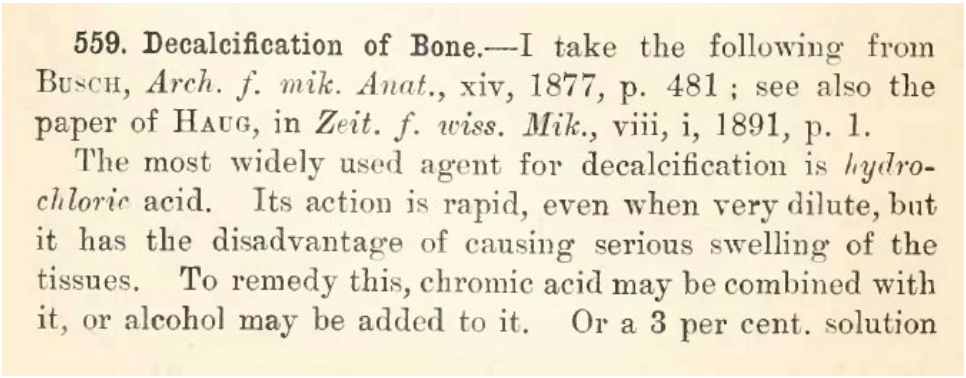
The Evans and Krajian solution was described in 1930 and uses equal parts of 85% (stock) formic acid and 20% sodium citrate (Evans & Krajian 1930).

The addition of sodium citrate to its composition was suggested by Evans and Krajian (1930) to neutralize the trend of formic acid to increase specimen volume during the decalcification process (Mattuella et al 2007).

Gooding and Stewart's Solution (1932)

Formic acid (conc.) 100 ml, formalin 50 ml, water 850 ml (Bhardwaj et al 2021).

Gooding and Stewart's solution is the decalcifying fluid used in the regularly cited Hammersmith Protocol for Trephine processing (Naresh et al 2016). Formalin has been suggested to protect the tissue from acid damage. Unlike the others in this list, this solution is still preferred by the Royal College of Pathologists for decalcifying bone trephine biopsies (Ramsay et al 2017).



559. Decalcification of Bone.—I take the following from Busch, *Arch. f. mik. Anat.*, xiv, 1877, p. 481 ; see also the paper of Haug, in *Zeit. f. wiss. Mik.*, viii, i, 1891, p. 1.

The most widely used agent for decalcification is *hydrochloric* acid. Its action is rapid, even when very dilute, but it has the disadvantage of causing serious swelling of the tissues. To remedy this, chromic acid may be combined with it, or alcohol may be added to it. Or a 3 per cent. solution

Figure 1 Excerpt from the "Microtomist's Vade-Mecum" (1904) page 322.

Morse Solution (1945)

In 1945 Morse modified the Evans Krajian method: 1 part diluted stock formic acid i.e. 90% diluted 1:1 with water for 45% formic acid plus 1 part 20% sodium citrate. The formic acid content in Morse's solution is half the concentration of formic acid in Evans/Krajian solution (Morse 1945). It is often used for decalcifying teeth and has recently been used in several studies (Widbiller et al 2021, Bumalee et al 2022).

Richman, Gelfand & Hill Solution (1947)

Combine equal parts of the 8% hydrochloric acid solution and the 8% formic acid solution before use.

Richman, Gelfand & Hill described this solution in 1947. They used an electrolytic bath to accelerate decalcification. The method involves passing a direct current between electrodes immersed in acid, the specimen for decalcification being attached to the positive pole. Theoretically, the process of migration from the specimen of the positively charged calcium ions is accelerated by the presence of the positive field around the electrode (Lucas 1952, Cook & Toghill 1952)).

Pawlak et al (2016) and Kalaska et al (2017) used this electrolytic technique on rat tibias to determine the association between peripheral kynurenine pathway metabolites and bone strength. Interestingly, both of these papers originate from the same institute in Poland!

Eponyms in Decalcifying Solutions - continued

Kristensen's Fluid (1948)

Formic acid (8 N), 50 ml; sodium formate (1 N), 50 ml (Kristensen 1948).

The Kristensen method is based on a mix of formic acid and its sodium salt, sodium formate. It has a higher pH (2.2) and is used for larger bone fragments which need longstanding decalcification (Radonic et al 2021). Radonic et al (2021) showed that decalcification in Kristensen did not lead to a decrease in DLL3 immunostaining intensity.

Plank-Rychlo Solution (1952)

Aluminium chloride 70g, Formic acid 50ml, 37% hydrochloric acid 85ml, Distilled water 100ml (Mukai et al 1986).

Tan et al (2020) found Plank-Rychlo decalcifying fluid to be most suited to a quicker examination owing to its well-distributed and high-speed decalcification. Mukai et al (1986) found this decalcifier to be quite deleterious to tissue structure after 2 days.

Recent reports using the Plank-Rychlo solution include Norose et al (2022), Oda et al (2022), Tsutsumi et al (2023) and Tharnmanularp et al (2024).

It appears the difficulties of sectioning bone have been around for a long time and many histotechnologists have attached their moniker to their preferred decalcifying solutions. As yet, I have not, which is a good thing!

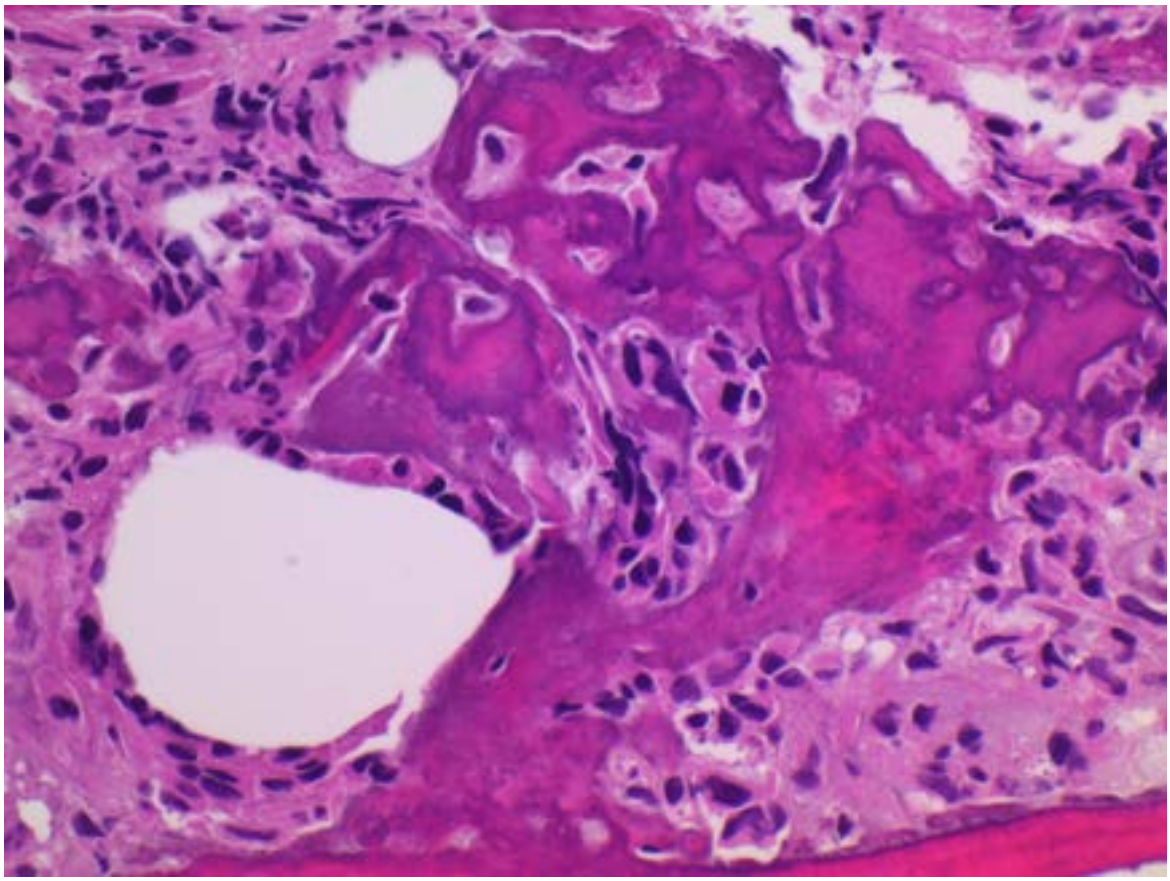


Figure 22 Bone resection decalcified using a Formic acid solution (similar to Gooding and Stewart's) stained H&E, x40. Note a fine powdery deposit of calcium, staining blue with hematoxylin, indicating optimal decalcification. Strong nuclear staining, evidence of cell borders, balanced eosin staining, and lack of scoring artefact are evident.

Eponyms in Decalcifying Solutions - continued

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Eponyms in Decalcifying Solutions - continued

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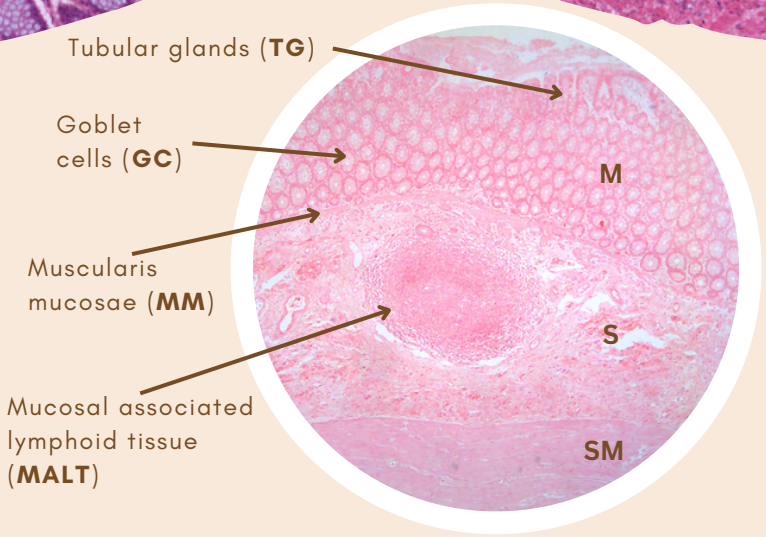
Colorectal Adenocarcinoma

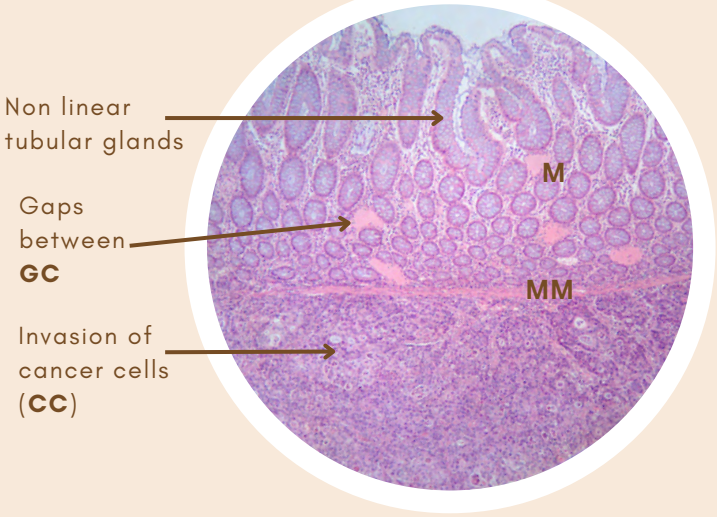
- Cancer of the bowel originating in glandular tissue
- Most common type of colorectal cancer



Normal anatomy

Distinct, well-defined layers: Mucosa (**M**), Submucosa (**S**), Smooth muscle (**SM**)

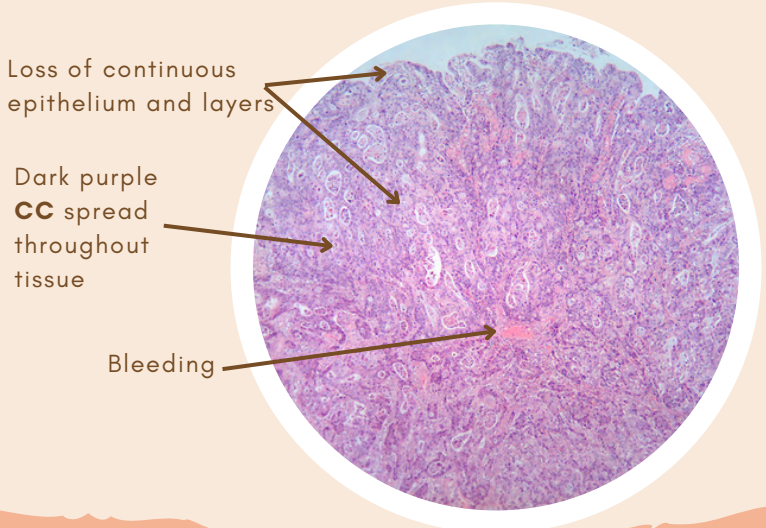
- **TG**- long straight tubes in **M**, contains cells that absorb water.
- **GC**- rounded and tightly packed glands in **M**, produces mucous which aids stool passage.
- **MM**- muscle layer beneath **M**, jiggles the glands and promotes mucous secretion.
- **S**- connective tissue, supports the functioning **M**.
- **MALT**- normal accumulation of immune cells in **S** that surveys for danger.
- **SM**- moves stools along the tract.



Dysplasia

Abnormal growth or development of cells.

- Slight changes in cellular structure and organisation.
- **TG** starting to appear irregular, less straight.
- **GC** are less round and less packed.
- Changes in number and maturity of cells.
- **CC** from another area have invaded **S** and **SM.**
- **MM** in this region is still intact.
- Overall normal absorptive and mucous secreting functions still occur.



Adenocarcinoma

Abnormal, excess replication of immature cells.

- Complete loss of tissue organisation, layers absent.
- **CC** replicate rapidly and are immature, cannot perform mucous secreting or water absorption functions.
- Loss of **TG** results in inability to absorb water, causing diarrhoea.
- Destruction of **SM** and loss of **GC** result in inability to move stools, results in constipation symptoms.
- Bleeding in the tissue, presenting as bloody stools.
- Formation of tumour due to invasion of **CC** into all layers of tissue, causing pain.

Extra Information

Risk factors

- Increasing age
- Male gender
- Smoking
- Alcohol consumption
- Red meat consumption
- Family history
- Obesity
- Diabetes
- Inflammatory bowel disease
- Low fibre diet

Prevention

- Exercise
- Diet
- Screening

Cut-up Case Study: Pulmonary Mucormycosis

Case history: 73 Year old, Female

Clinical indication: Necrotic middle + upper lobe segments ?Abscess ?Fungus ?other

Specimen collection method: Lung resection received fresh.

Tissue type: Right Upper Lobe

NPAAC complexity classification: Non-complex

Cut-up technique / grossing pattern: Representative sections.

Macroscopic description

The specimen consists of two segments of lung, both with stapled margins weighing 223.3g in aggregate in the fixed un-inflated state. The smaller segment measures 107x81x32mm and the larger measures 133x47x42mm both in the inflated state. The pleural surface of each is covered with haemorrhagic and fibrinous exudate. The cut surface of each segment shows diffuse and florid consolidation and congestion with a cavity in the smaller segment measuring 10mm in maximal dimension. Each segment also has adherent adipose tissue measuring 66x38x15mm and 42x36x23mm respectively which show areas of possible necrosis.

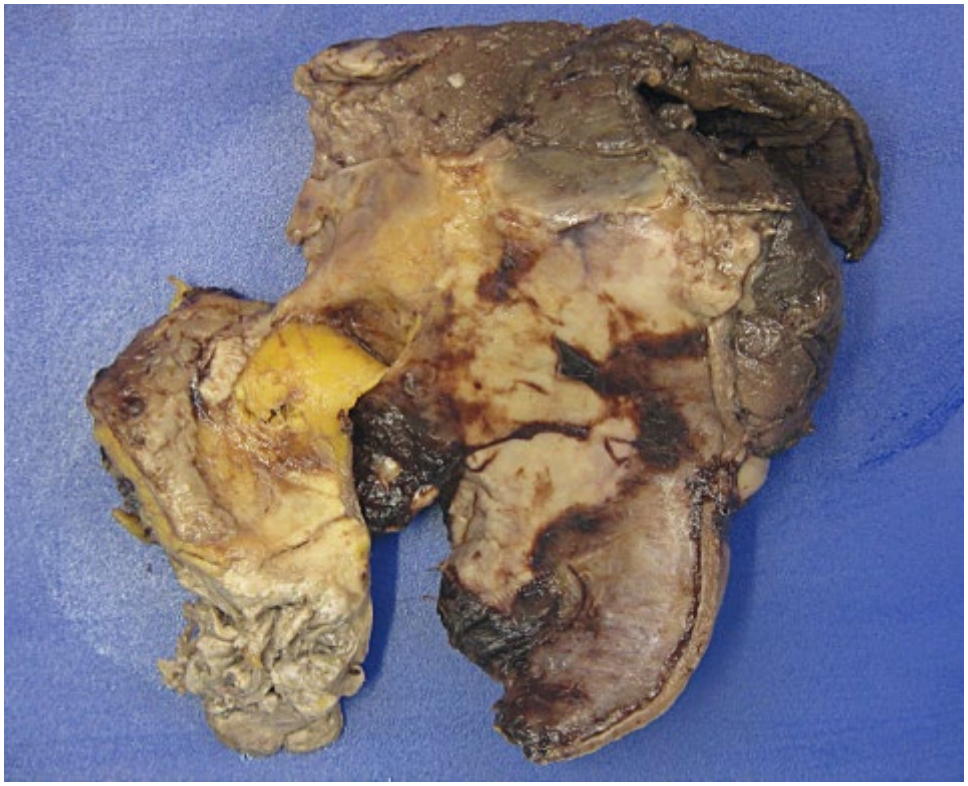


Figure 1 Macroscopic photo of the larger segment of lung received.

Cut-up Case Study - continued

Block key:

Representative sections. (Blocks A to G - smaller segment: (A - bronchial resection margin, B - vascular margin, C and D - cavity, E and F - areas of consolidation, G - adherent adipose tissue), H to K - larger segment: (H to J - areas of consolidation and exudate, K - adherent adipose tissue)

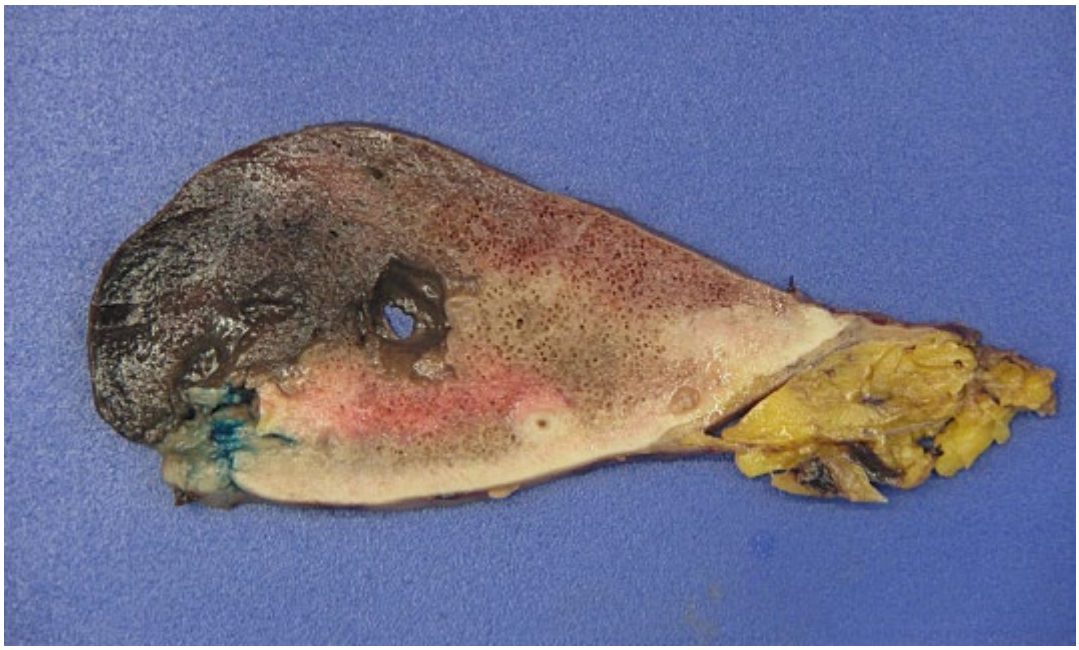


Figure 2 Representative section of the larger segment of lung.

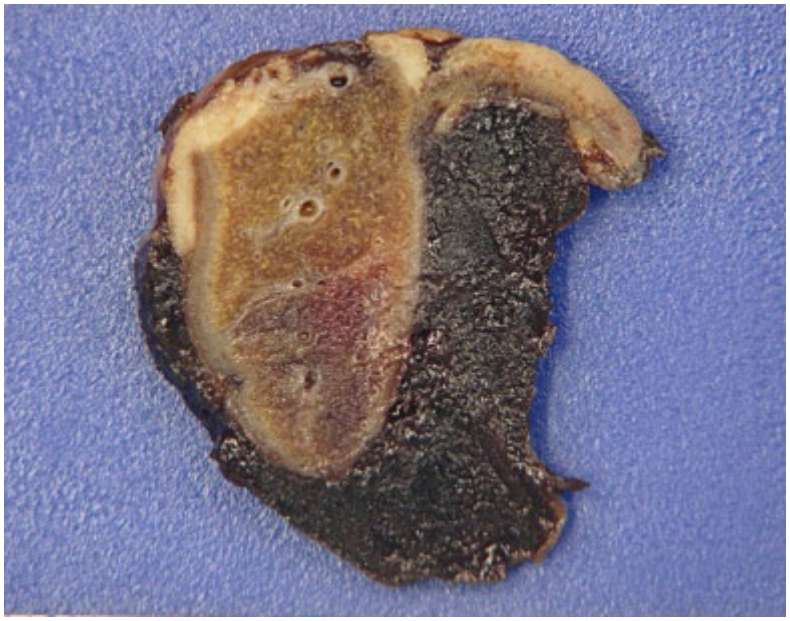


Figure 3 Representative section of the smaller segment of lung.

Cut-up Case Study - continued

Microscopic:

The portions of lung tissue show extensive parenchymal necrosis, with cavitation and peripheral abscess formation. Necrotic lung tissue contains colonies of broad, nonseptated right angle branching fungal hyphae, that appear somewhat twisted and folded, the morphology of which is consistent with mucormycosis (highlighted on GMS, PAS and D PAS stains. ZN/Wade Fite stains negative).

There is invasive growth, with frequent angioinvasion, associated with vascular thrombosis and extensive pulmonary infarction. Necrotic tissue at the bronchial and vascular resection margins contains fungal hyphae (smaller segment).

The larger tissue fragment shows prominent pleural fibrinosuppurative exudate and overlying adherent fatty adhesion exhibiting extensive membranous fat necrosis. Subpleural viable alveolar spaces contain balls of fibrin and proteinaceous secretions. Necrotic lung tissue adjacent to partially infarcted bronchovascular hilar structures contains fungal hyphae.

Comment: Pulmonary mucormycosis is a relatively rare pulmonary fungal disease, typically seen in immunocompromised or diabetic patients.

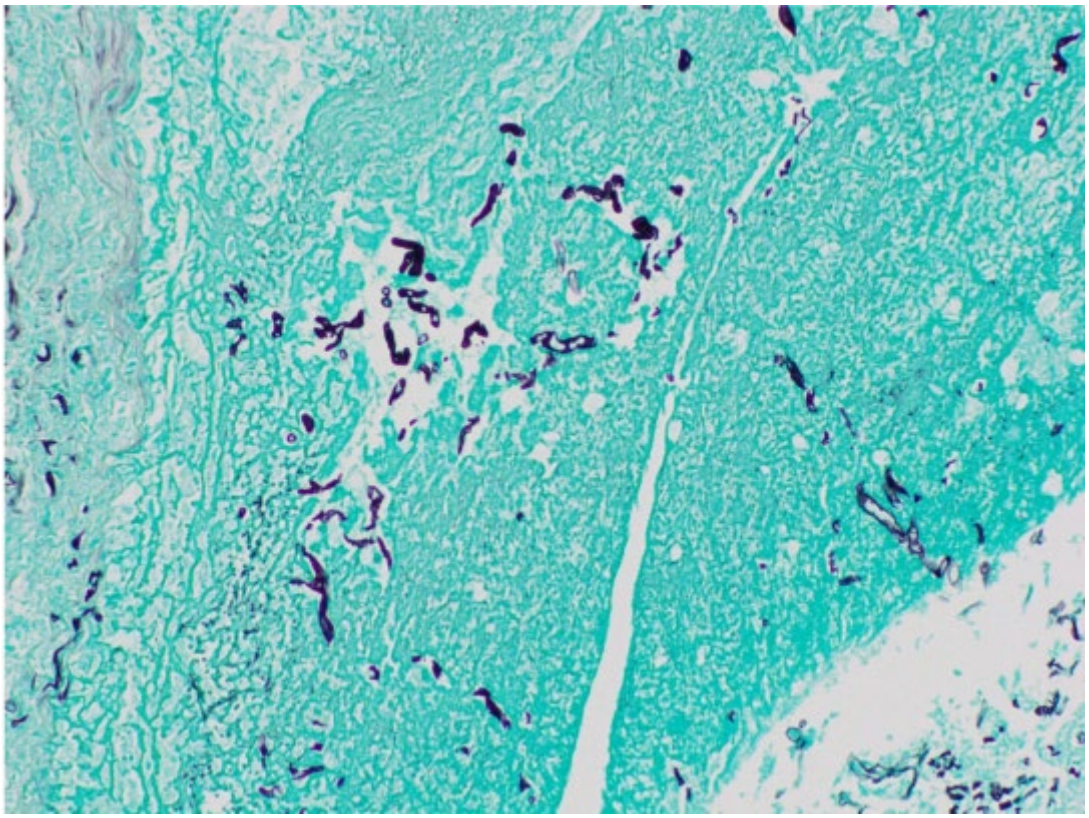


Figure 4 GMS stain demonstrating fungal hyphae stained black.

Cut-up Case Study - continued

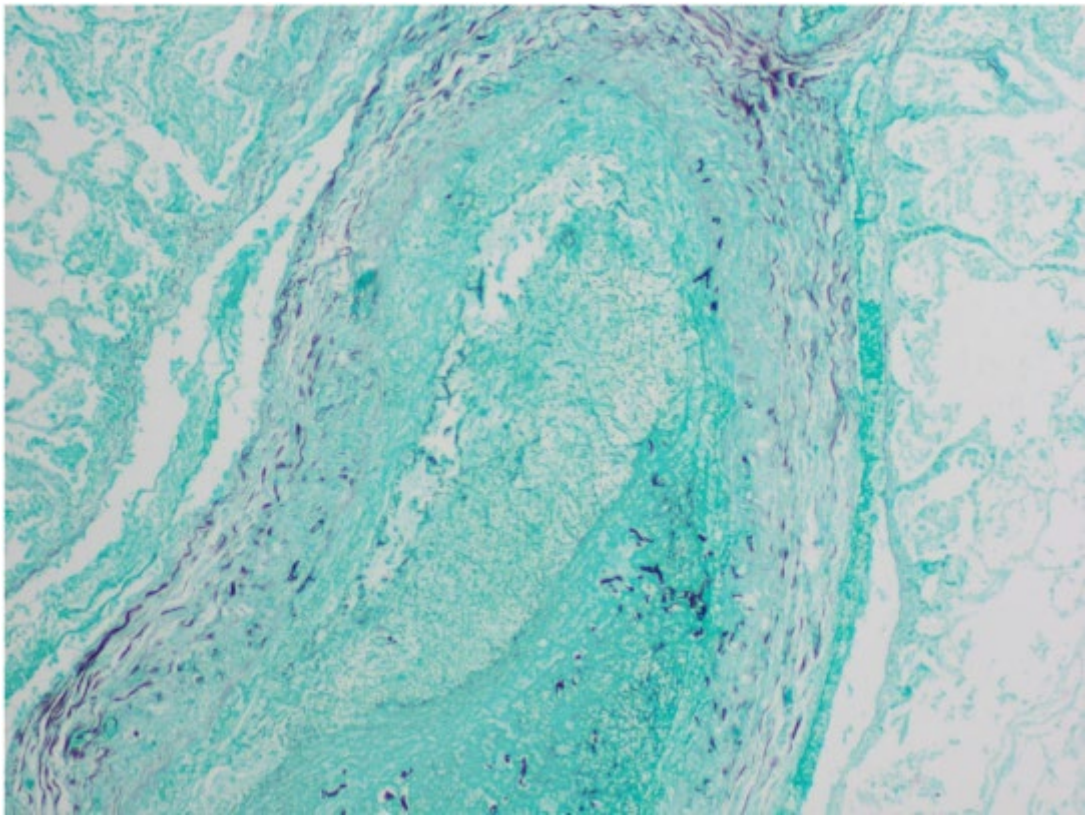


Figure 5 GMS stain demonstrating fungal hyphae stained black.

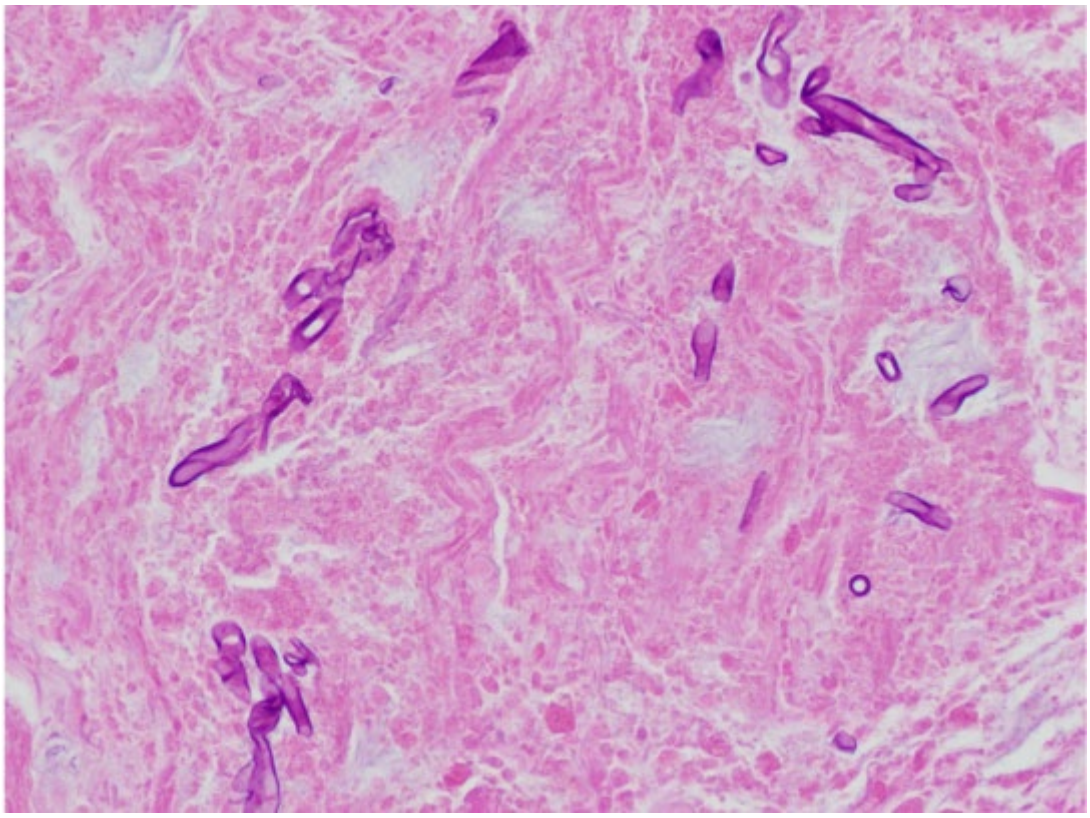


Figure 6 PAS stain demonstrating fungal hyphae stained magenta.

Cut-up Case Study - continued

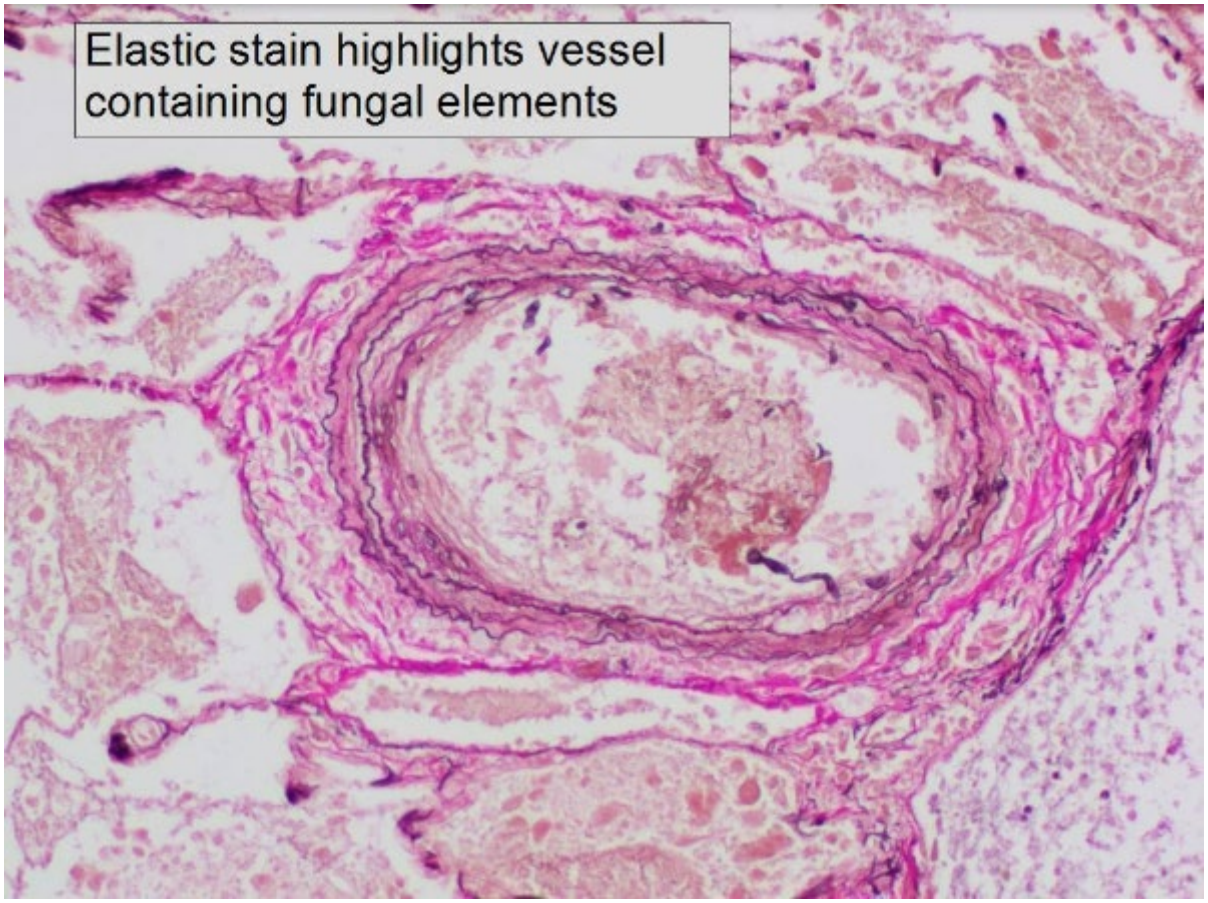


Figure 7 VVG stain demonstrating elastic fibres of blood vessel containing fungal hyphae. Both stained black.

Diagnosis:

Right Upper Lobe segments

- Extensive pulmonary necrosis with angioinvasive fungal hyphae, consistent with Pulmonary Mucormycosis

Case provided by: Virginia Mills, DHM Pathology

RCPAQAP Cut-up manual: Respiratory and Chest - Lung

Edited by: Jacky Jongkryg

Student Poster References:

Author: A. Chen, University of Newcastle

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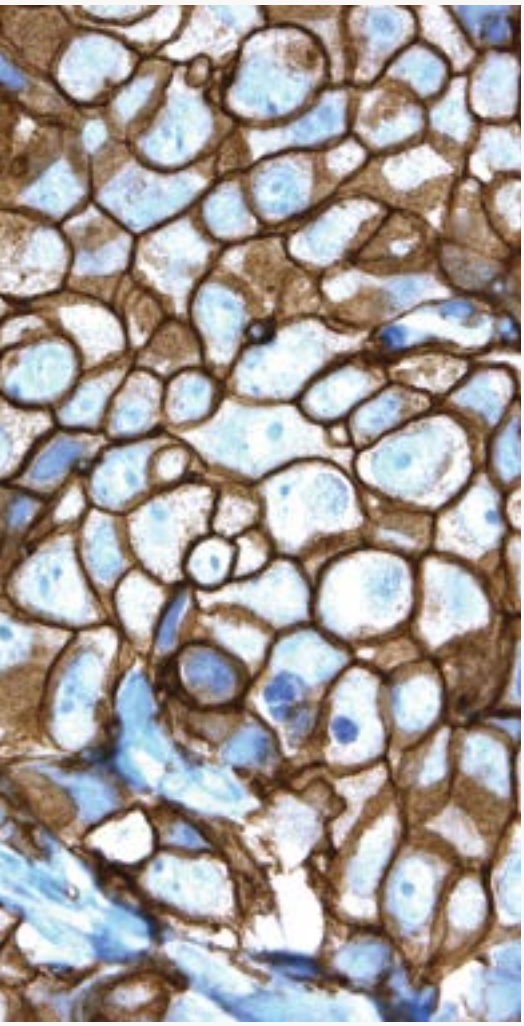

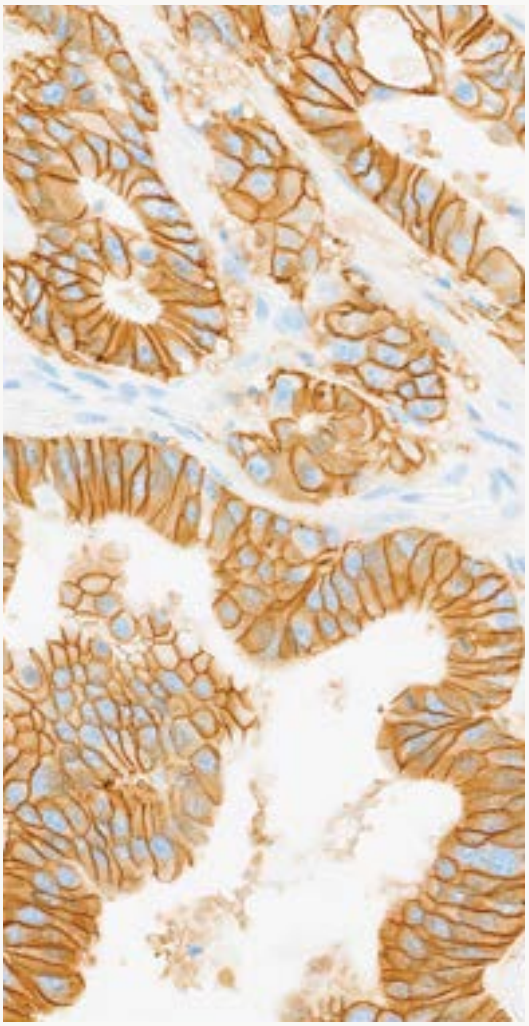

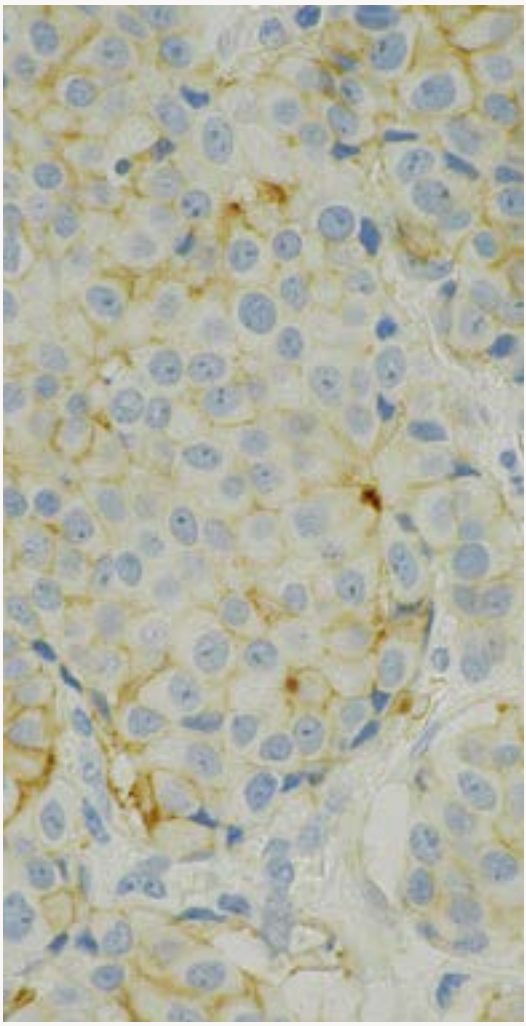

^ Roche data on file. PATHWAY/VENTANA anti-HER2/neu (4B5) Rabbit Monoclonal Primary Antibody Package Inserts, 2022 and 2019.

* Collectively refers to VENTANA® HER2 (4B5) Rabbit Monoclonal Primary Antibody RxDx, VENTANA anti-HER2/neu (4B5) Rabbit Monoclonal Primary Antibody, and PATHWAY anti-HER2/neu (4B5) Rabbit Monoclonal Primary Antibody

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My Histo Journey: Sara Khan

Name: Sara Khan

Why I love Histo? I am always fascinated by what the world of Histo has to offer. There is always something new to learn in this underrated field of pathology. I enjoy every step of a sample's journey in histopathology from specimen reception to satisfyingly sectioning high-quality sections to staining and examining the pretty shades of pink and purple that highlights different components of a tissue sample with their own unique patterns depending on the tissue type. Every stained slide under a microscope can tell a lot about a patient's story and it is a key component to a pathologist giving their patient the correct diagnosis for a life changing treatment. It makes my day when I know I can help make a difference to a patient's life and their future.

What was your very first job? My very first job was working at a Thai restaurant that unfortunately shut down during the COVID lockdowns. I worked as a waiter, setting up the restaurant, taking orders from customers, handling delivery orders, food prepping and maintaining the cleanliness of the restaurant. I loved seeing customers leaving the restaurant with a happy face and visiting again.

Where did your relationship with Histo begin? I discovered my passion for Histo when I was studying my Diploma of Laboratory Technology (Pathology) in TAFE Ultimo where I first heard about this subject for the first time. I would always get excited whenever Histo was next in my timetable knowing that I had what felt like the best teachers anyone could have and they've made every class worthwhile, enjoyable, and valuable. I was provided with plenty of training for all the special stains, tissue recognition when assessing the stained slides, embedding orientation, quality control, microtomy and sectioning. They would make sure we complete each process to a high standard, and it always made me feel accomplished at the end of each class. There was always something new to do in every class, especially with the special stains that appear beautifully under the microscope, that's when I knew I absolutely love Histo.

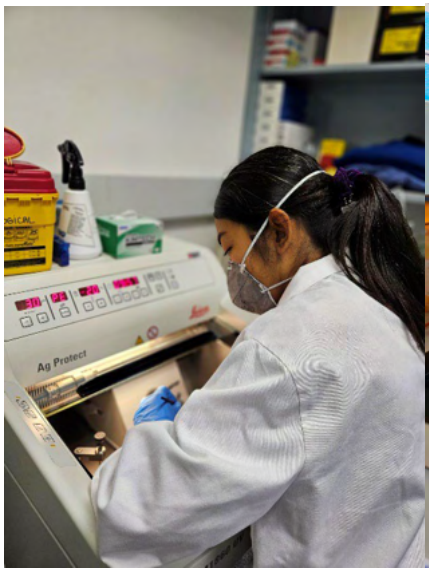
What is your current job role? My current job role is working as a ProCan Histopathology Research Assistant at Children's Medical Research Institute. ProCan is a research program about developing a library of information on all types of cancer from all around the world to advance scientific discovery and enhance clinical treatment worldwide. My role is to complete specimen reception on all samples that come through to ProCan from collaborators with suitable cancer sample cohorts, section both FF and FFPE tissues onto histopathology or telomere slides with thin sections for pathology assessment or Alternative Lengthening of Telomeres (ALT) and into small barocycler tubes with thick curls for quantitative proteomic analysis. These are examples of how histopathology can be utilised for multiple purposes in a research laboratory. The histopathology slides get H&E stained, filed, and scanned to create a pathology assessment for the pathologist. I also liaise with the proteomics team to get a better understanding of their needs.

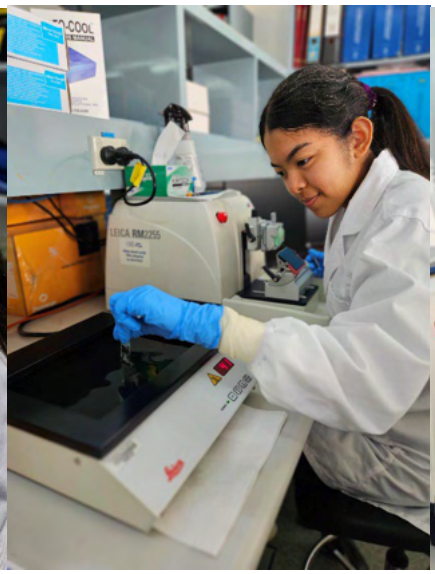
My Histo Journey: Sara Khan – continued

How did you get to where you are now? It started during my studies in TAFE, developing great connections with classmates, helping them out when completing tasks and actively working together to achieve outstanding results. Two years after completing my diploma, I was contacted by a classmate telling me a histopathology position was open for application and she reached out to me because she remembered me helping her out in our histology classes. I didn't realise my help made a difference to someone; kindness goes a long way. After my wonderful classmate Ruby reached out to me, I have also reached out to my Histo teacher to help check my application for the role. Not long after I submitted my application, I was offered an interview. Ruby was very sweet, supportive, and kind as she gave me guidance what it was like to work for this position and any other questions that I had for her. I have also asked my Histo teacher if I could practice my sectioning skills again and she gladly allowed me to visit her Histo lab at TAFE. I went to TAFE a couple of times to ensure that my sectioning skills were still on par to be prepared for the job if I was offered the position. A week after the interview, I received a call from my present boss saying that I will more than likely receive an offer. I was elated after receiving the offer the week after.

Career highlight(s): It has been an amazing experience so far working in ProCan and a year hasn't even passed by yet. I had the opportunity to attend the ProCan retreat where everyone collaborated and worked together on improving, implementing new ideas for ProCan, celebrating the achievements and milestones that ProCan has accomplished so far. The Annual Meeting of Committees was another event where CMRI celebrates and thank the committees for contributing to CMRI and making all our research possible through their funding. I was also grateful to take part in the Clinical Proteomics Symposium that was about incorporating quantitative proteomic analysis into the mainstream clinical use. I'm proud to say that I work here and love what I do, there are many more amazing opportunities to come and I'm excited to see what the future holds for ProCan.

Advice for newcomers to the industry: My advice for newcomers is to engage with your classmates, form connections with them, you'll never know if they will help land you a job offer in the future. They can be strong personal references in your resume. Always reach out for help, not only can it make you stand out, but it shows that you are willing to try and put in the effort and that you present yourself as worthy and passionate of the position you're applying for.



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DENSITY METERS	✓	✗	✗
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CYBER SECURITY FEATURES	✓	✗	✗
HISTOCORE I-SCAN	✓	✗	✗
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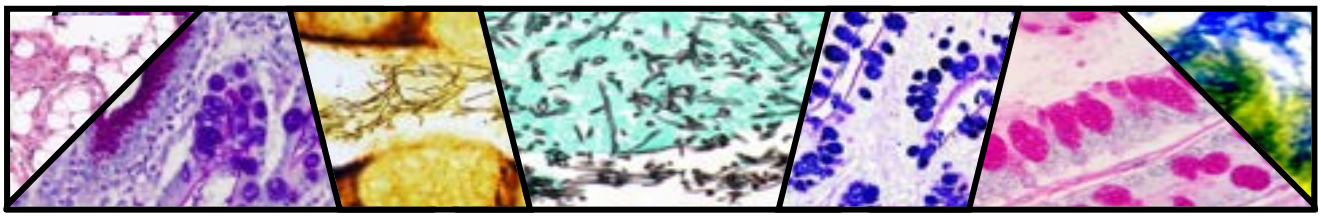

The Histochemical Chronicles: The Notebook 5

Author: Mike Rentsch

Laboratory Assistant to Medical Laboratory Scientist; On the bench 1969 to June 2019.

The best methods of improving our techniques and knowledge, comes from learning from our mistakes and trying to explain aberrant results. The Histochemical Chronicles are a sample of these experiences captured in my personal notebooks between 1979 and 2019.

1982 - 2018: Non Toxic Mayers Haematoxylin

1982 Issue

Having used all general laboratory stocks of Chloral Hydrate, I requisitioned sufficient to make another batch of 1 Litre Mayers Haematoxylin. The requisition was refused as we did not have a S4 Poison license, despite having no issue obtaining this material or other scheduled items in the past (incl. antibiotics for making media). The new Chief Pharmacist, advised my Lab Manager to obtain our own Licence which was going to take some time, as it required site inspection, records etc.

Consultation

Discussion with our Pathologist[1] suggested we modify the formula and base it upon Lillie Mayer Haematoxylin but using the same dye content as for the Chloral Hydrate based Mayers. We initially tried two variants, using a ratio of mordant to dye as suggested in a reference to G Gills work on Cytological stains made in Prof R.D. Lillie's text[2]. These are outlined in Table 1 below.

Ingredient	Variant 1 McLachlan's Alum Hematoxylin	Variant 2 McLachlan's Alum Hematoxylin	Variant 3 Rentsch's Haematoxylin
Aluminum Sulphate	17.5gm	-	-
Aluminum Ammonium Sulphate	-	25gm	-
Potash of Alum BP	-	-	25gm
Haematoxylin Certified	2gm	2gm	2gm
Distilled water	700ml	700ml	700ml
Glycerol USP/BP	300ml	300ml	300ml
Sodium Iodate	0.2gm	0.3gm	0.3gm
Glacial Acetic Acid	20ml	20ml	
Citric Acid BP/AR	-	-	1.5gm

Table 1 Three Haematoxylin Variants. 1 and 2 also available on "Stains File" site as McLachlan's Alum Haematoxylin with permission given. Variant 3 discussed under heading '2018' below.

Results

Both variants appeared to produce identical results i.e. blue nuclei with no background or collagen staining. Both solutions were stable and still useable after 12 months. The intra-nuclear detail was more defined with variant no 2 and appeared crisper. As this solution was only being used as a counterstain, I felt that this small difference was insignificant. Variant no 2 was adopted and remained in use until 1987.

In 1989 Variant no 1 was selected as Mayers No.1 by Australian Biostain.

2014

Variant no 2 was amended to use Citric Acid AR/BP/USP instead of Acetic Acid, at the rate of 1.5gm/Litre based upon the recommendation of Mr. B. Sinai[4]. It was found that variant 1 and 2 were producing background staining after 12 months and were getting a vinous odour; this is most likely due to esterification with the acetic acid but would be significantly reduced with the use of Citric acid being a weaker acid[4].

2016

Due to the high cost and availability of Ammonium Alum, I decided to use Potash of Alum which was readily available in 25kg lots and available in BP (pharmaceutical grade) specification which far exceeded the GPR (guaranteed pure reagent grade) of Ammonium Alum. Results appeared identical to Variant 2.

2018

As part of our retained Quality Control (QC) samples and QC testing, counterstaining of PAS with Mayers No 2 still showed good nuclear staining and specificity beyond its expiry date of 2 years. This experience was to be used later to formulate Rentsch's Haematoxylin. Variant 3 showed no background after 2 years c/w slight background in Variant 2.

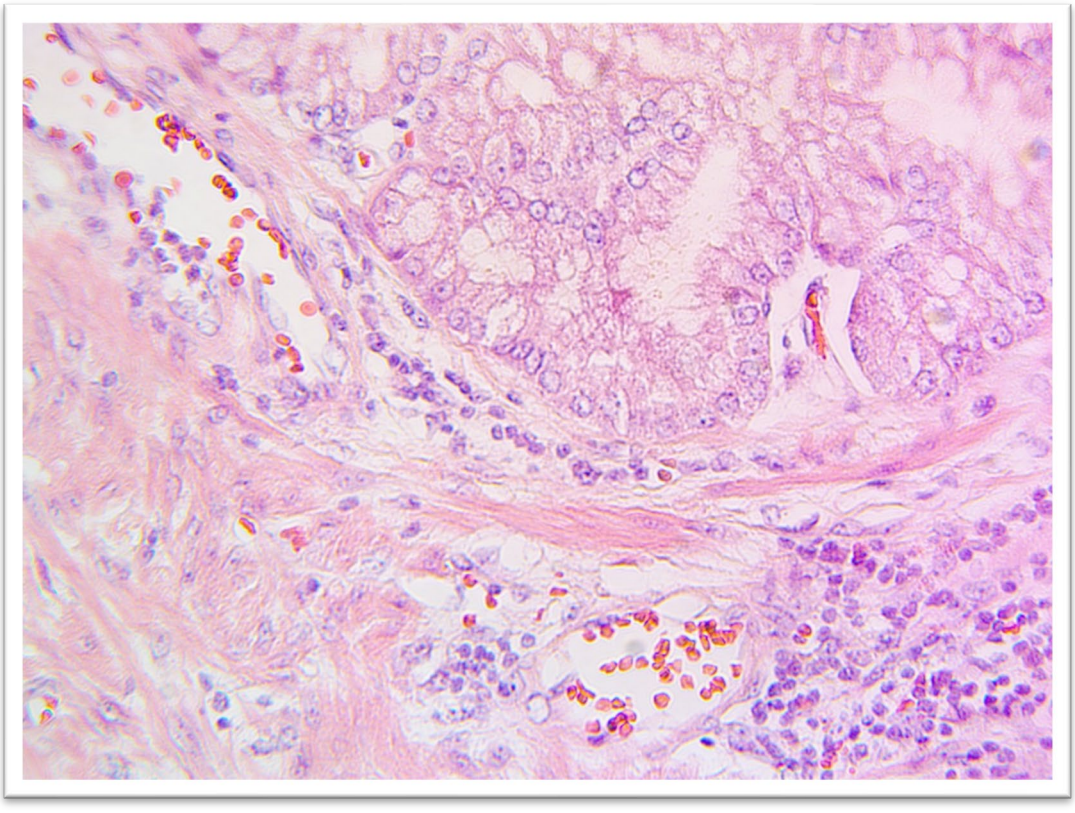

Figure 1Variant 3. H&E Small Bowel. Staining time 2 mins, counterstained 0.2% Alc. Eosin Phloxine 30 secs.

The Histochemical Chronicles - continued

Conclusions

Because Variant 1 was so easy to formulate and no Chloral Hydrate was necessary, this is an ideal formula for small labs and those without a S4 Poison License. The shelf life for unopened stain is reasonable i.e. 2 years or more but is further improved both in cost and availability using Variant 3.

The variety of alums that can be used with similar results, means that most labs will have the necessary ingredients in the laboratory. Citric Acid is much safer and easier to use as it is a crystalline free flowing solid. Sodium Metaperiodate and Potassium Iodate may also be effectively substituted for Sodium Iodate without any alteration in mass.

While these non-toxic variants of Mayers, are generally used as counterstains, they can be used for routine H&E's as well; but I am unsure of the slide capacity of these formulae.

Notes:

- When adding the glycerol volume, do it as the final step, as this will ease any issues you would otherwise experience with inaccuracy due to viscosity, and add up to your final line. Remember the graduations on conical flasks are approximate only, and any error created is marginal, as the glycerol only serves as an antioxidant and is present in considerable excess.
- When preparing volumes less than 3-5 Litres, accuracy when weighing the Iodate is critical and a balance accurate to at least three decimal places ±0.002 is required.

From the personal journal of Author

Mike Rentsch, Stain tech

Edited by Leah Simmons and Bill Sinai

[1] Dr H.K.I. McLachlan FRACP Personal communication

[2] R.D. Lillie

[3] Bryan Llewellyn, University of Arizona. Personal communication.

[4] Personal communication Sect. Head Anatomical Pathology Westmead Hospital.

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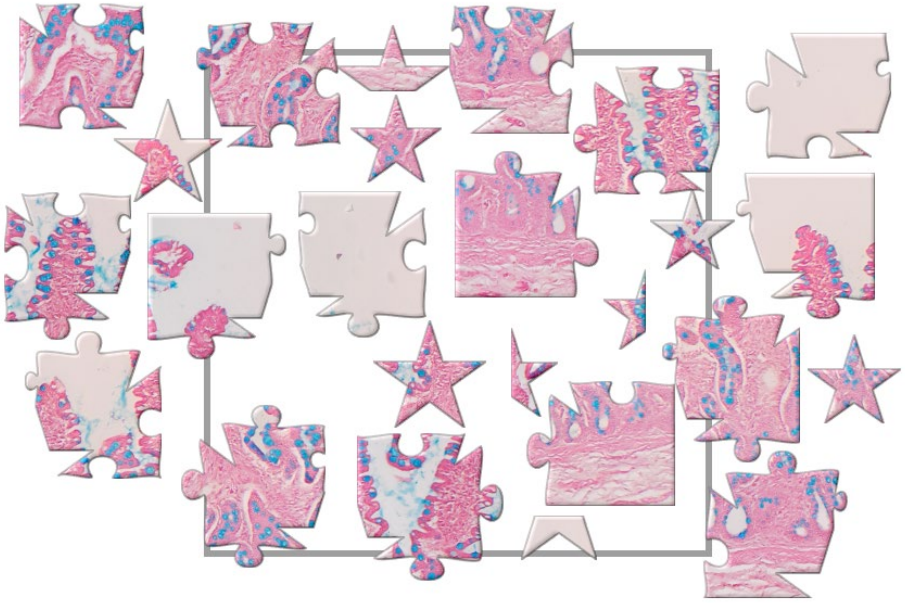
Puzzle: Piece it together

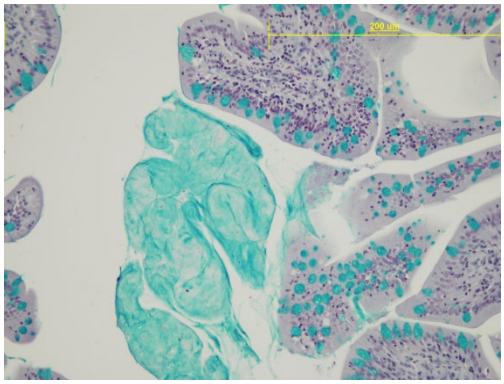


Click the puzzle or link to attempt the digital puzzle.

How many pieces need to be in place before you can identify the stain, tissue, and cells staining blue?

Answers in next edition.

Answers from previous edition:



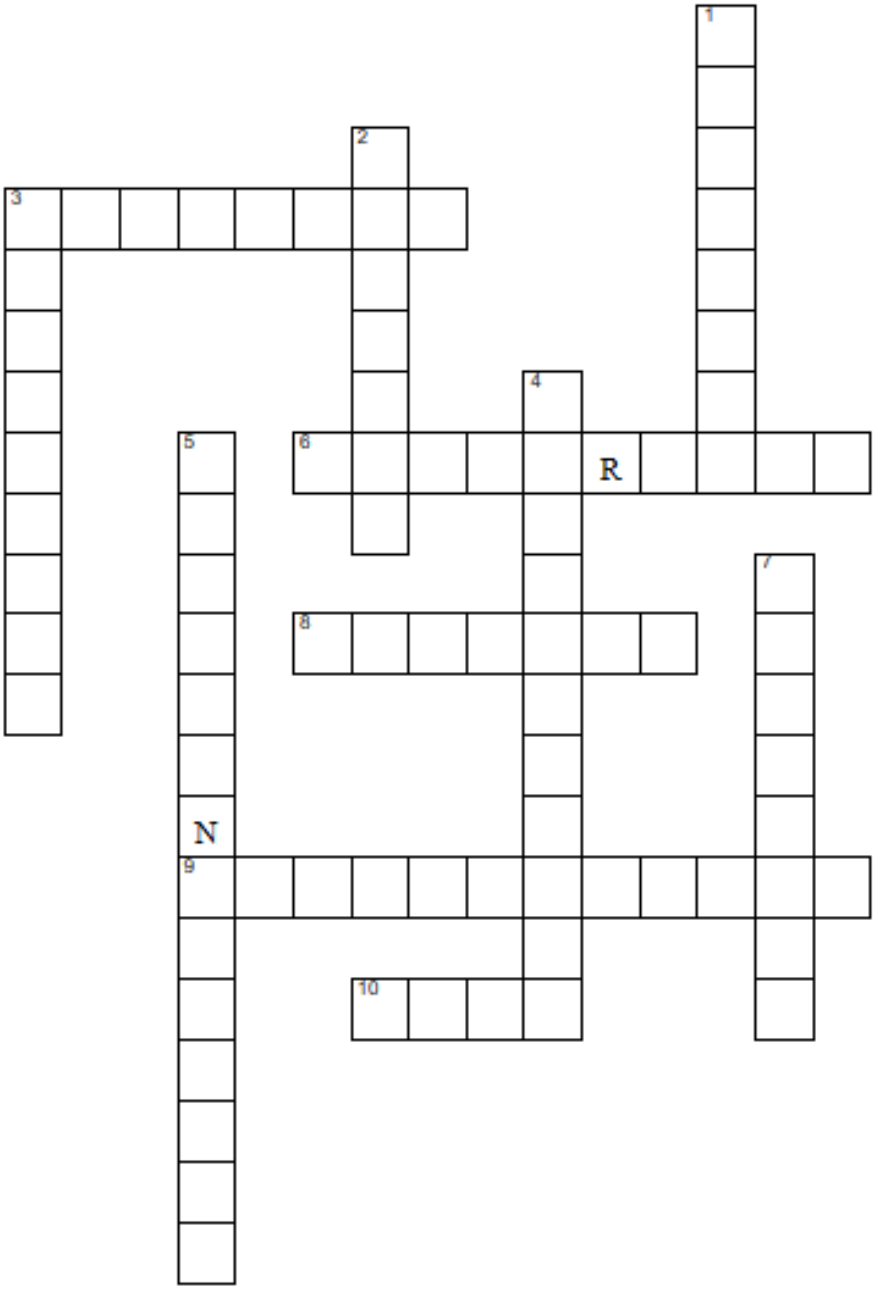
Stain: Alcian Blue (AB)

Tissue: Intestine

Organism: Barramundi

Did not attempt the puzzle? – here is the link again.

Crossword: Know your Anatomy!



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7. Pineal gland location

Answers on page 39

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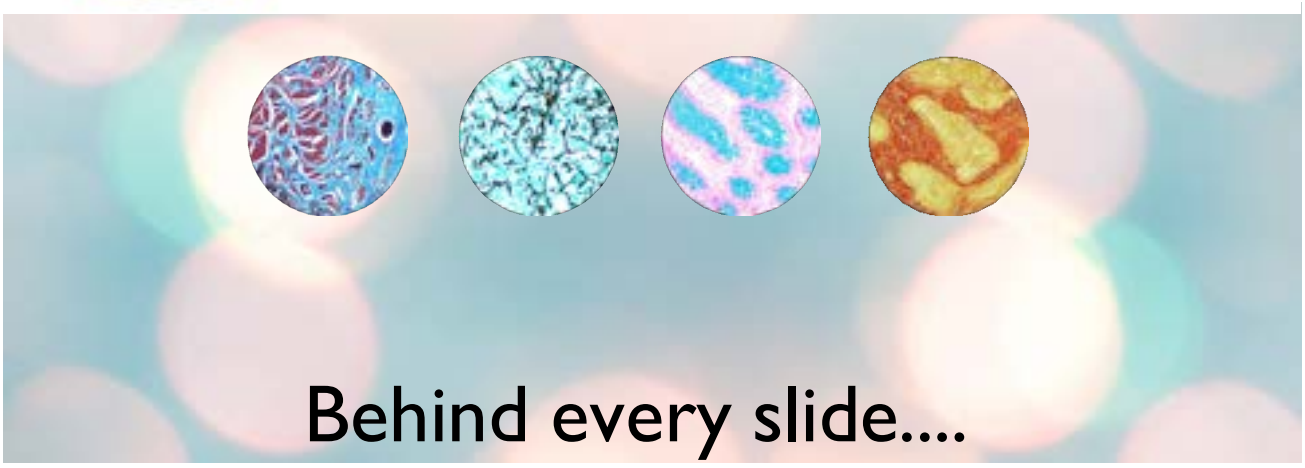
Histotechnology Professionals Day

HISTOTECHNOLOGY
SOCIETY OF NSW



Histotechnology Professionals Day

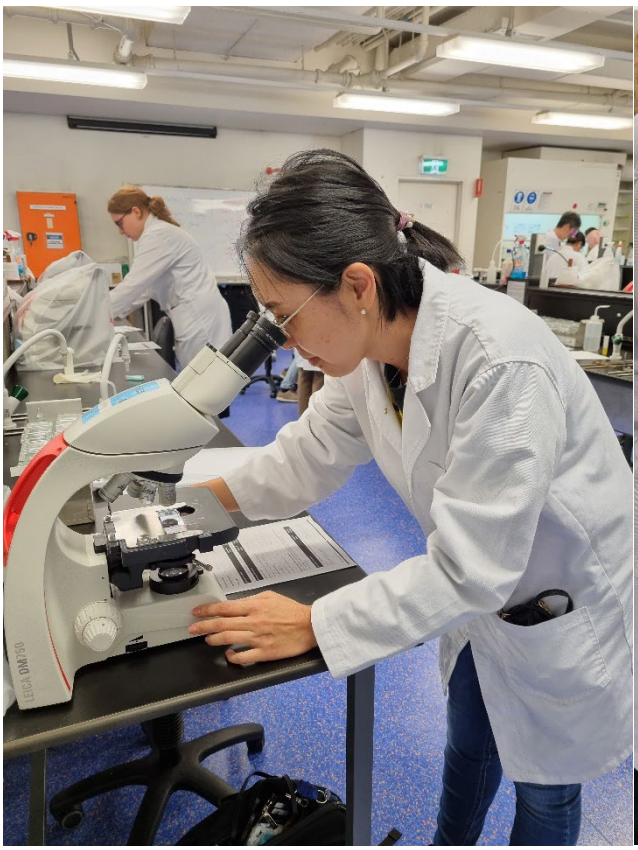
10th March 2024

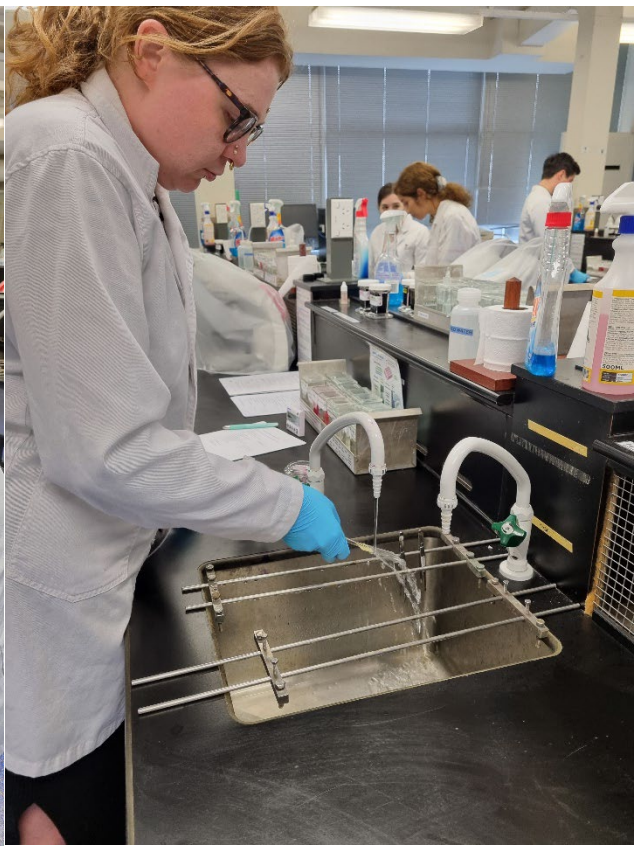
Histotechnology Professionals Day is a day to raise awareness of the importance of Histotechnology in the diagnosis of disease and to celebrate the incredible people within the industry internationally.

Use the day to show your love of Histology and acknowledge the hard work, passion, and dedication of the people in your lab, company or learning institution.

It also happens to coincide with the "International Day of Awesomeness". Coincidence? I think not.

Here are some pictures of the Certificate IV and Diploma TAFE students at the Ultimo campus, celebrating HPD 2024 by embedding, cutting, and staining in their Histo classes.





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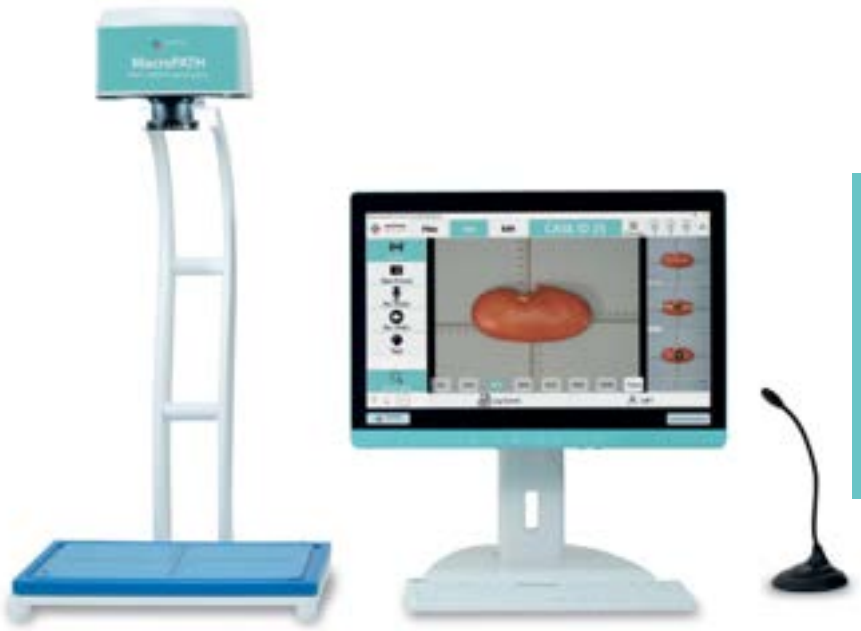

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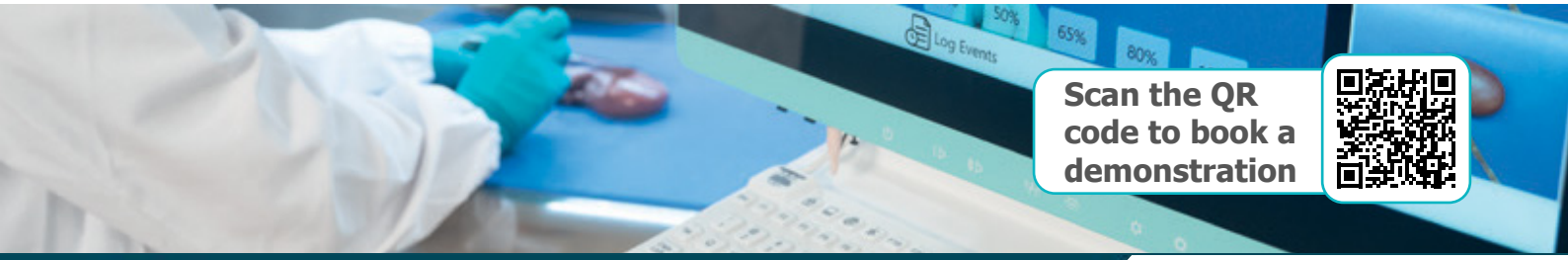

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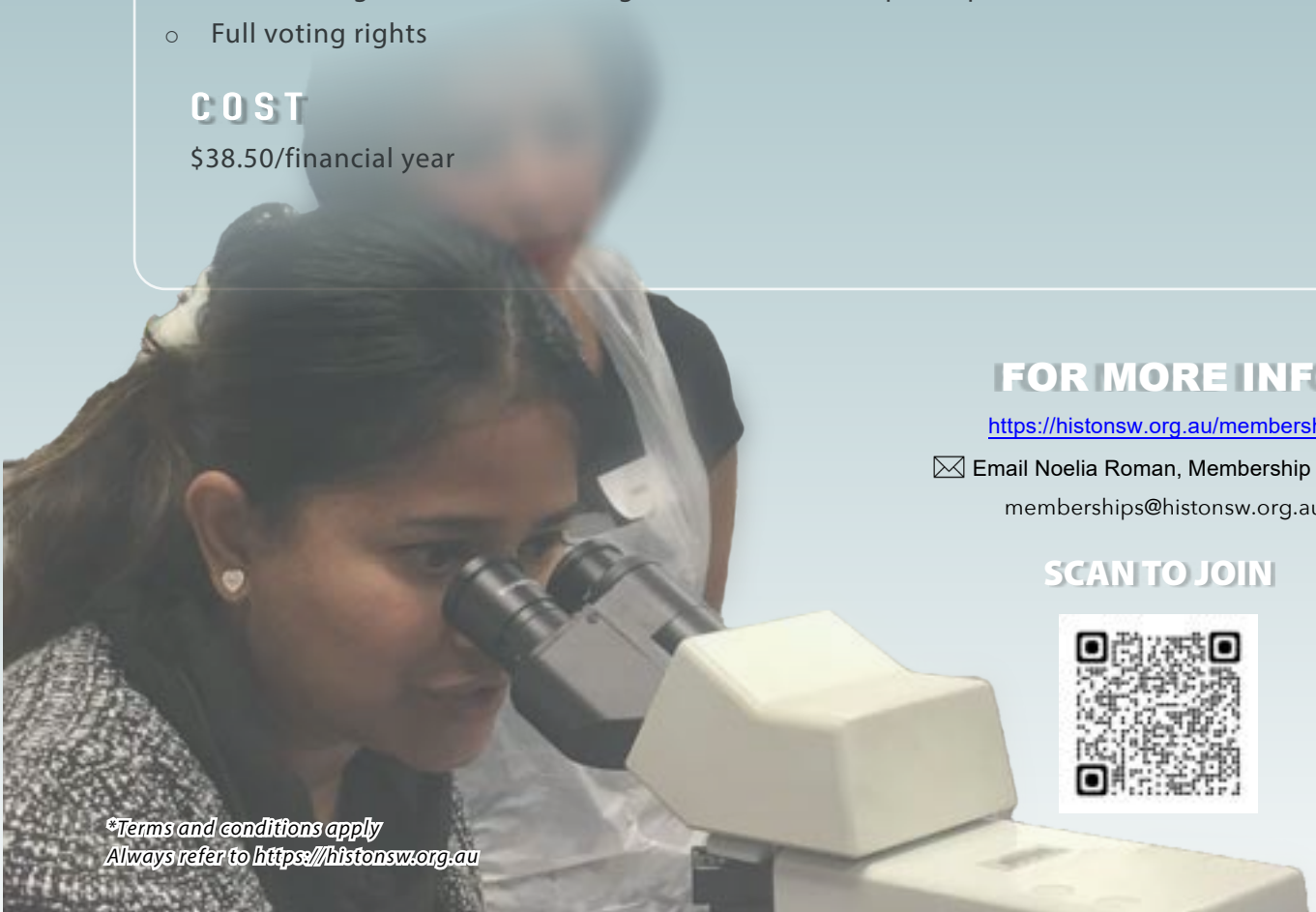

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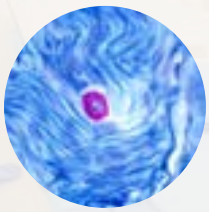

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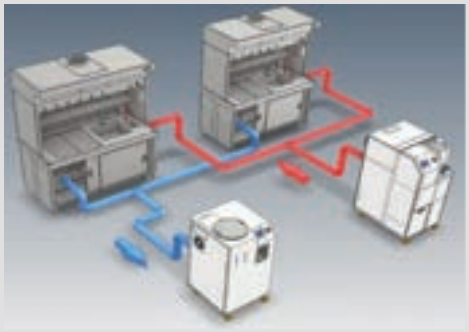

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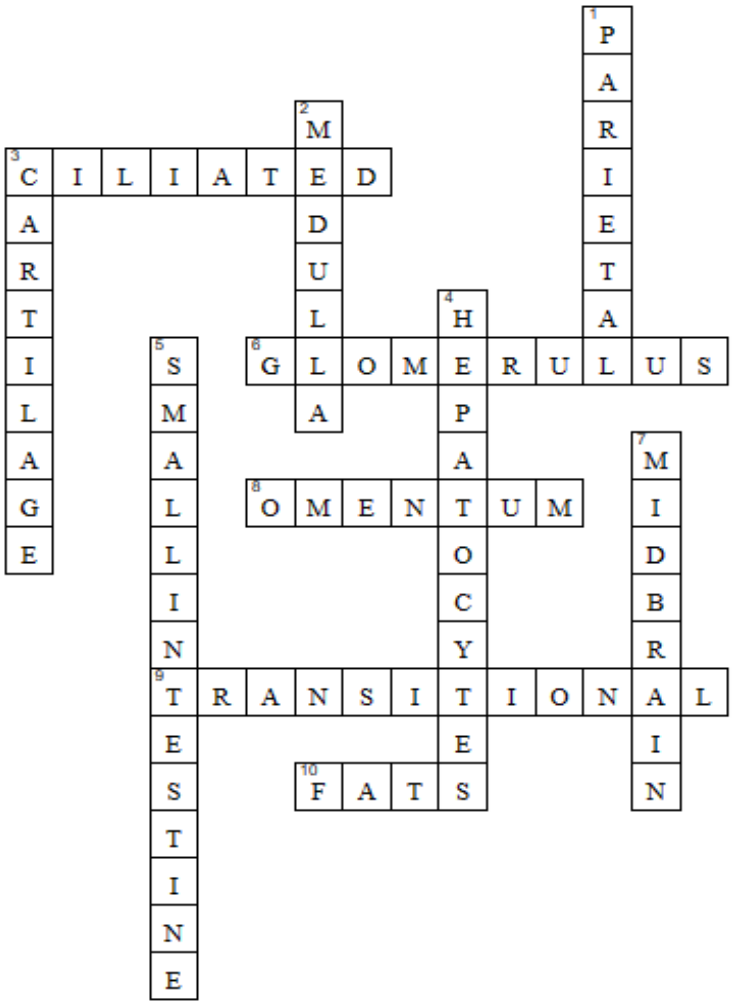
Crossword Answer Key



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Committee Meetings

Most meetings are scheduled for the first Monday of each month starting at 6 pm with some exceptions. These dates may change from time to time.

If you wish to contact the committee, make suggestions, or ask questions please feel free to contact the society's secretary secretary@histonsw.org.au

If you would like to submit any content to future editions of the Histograph, please feel free to email the society's editor editor@histonsw.org.au

Thanks for reading! 😊