SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Osudu, Agaram Village, Villianur commune, Kuduppakkam Post, Pudhucherry-605 502

Date:13.05.2020

From

Dr.K.C.Malika Arjuna
Professor and Head,
Department of Anatomy,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical College
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Micro Anatomy Tissue processing and H & D staining

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: Micro Anatomy Tissue processing and H & D staining for first year M.B.B.S to 21 December 2020. We solicit your kind permission for the same.

Kind Regards

Dr.K.C.Malika Arjuna

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: **Dr. Rajasekar**

The HOD: **Dr.K.C.Malika Arjuna**

The Expert: **Mr.N.Anandramajayan**

The committee has discussed about the course and is approved.

Dean

(Sign & Seal)

Subject Expert

(Sign & Seal)

HOD

(Sign & Seal)

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
Sri Lakshmi Narayana Institute Of Medical Sciences
PONDICHERRY - 605 502.

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

07.06.2020

Sub: Organising Value-added Course: Micro Anatomy Tissue processing and H & D staining . reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing **"Micro Anatomy Tissue processing and H & D staining "**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before July to Augest 2020. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content

Course Proposal

Course Title:

Micro Anatomy Tissue processing and H & D staining

Course Objective:

1. Introduce the students to tissue processing
2. To learn basic principles of H& D staining
3. To learn the basic skills involved in H& D staining

Course Outcome:

Knowledge on the various aspects of histological tissue processing and the prospects of research

Course Coordinator: Dr.Mallika Arjuna

Course Faculties with Qualification and Designation:

1. Dr. B Rajesh, M.Sc., Ph.D, Professor/Anatomy
2. Mr.N.Ananramajayan, M.Sc, Assistant Professor/Anatomy

Course Curriculum/subtopics with schedule (30 hours)

Sl.No	Date	Topic	Time	Hours	Faculty Name
1.	15.9.20	Introduction to micro anatomy	4-5p.m	1	Dr. B Rajesh
2.	16.9.20	microscope	4-5p.m	1	Mr.N.Anandaramajayaan
3.	17.9.20	Various reagent and it properties-1	4-5p.m	1	Dr. B Rajesh
4.	18.9.20	Various reagent and it properties-2	4-5p.m	1	Dr. B Rajesh
5.	19.9.20	Tissue fixation	4-5p.m	2	Mr.N.Anandaramajayaan
6.	20.9.20	Procurement of tissues	4-5p.m	1	Dr. B Rajesh
7.	21.9.20	Dehydration of tissue	4-5p.m	1	Dr. B Rajesh
8.	22.9.20	Tissue processing	4-6p.m	2	Mr.N.Anandaramajayaan
9.	23.9.20	Instrument used for tissue processing	4-6p.m	2	Dr. B Rajesh
10.	24.9.20	Preparation of hematoxylin	4-6p.m	2	Mr.N.Anandaramajayaan
11.	25.9.20	Preparation of eosin	4-6p.m	2	Dr. B Rajesh
12.	26.9.20	Preparation of different grades of solutions	4-6p.m	2	Mr.N.Anandaramajayaan
13.	27.9.20	Procedure of block preparation	4-5p.m	1	Dr. B Rajesh
14.	28.9.20	Principle of staining	4-5p.m	1	Mr.N.Anandaramajayaan
15.	29.9.20	Procedure for staining	4-5p.m	1	Mr.N.Anandaramajayaan
16.	30.9.20	Mounting slides	4-6p.m	2	Dr. B Rajesh
17.	1.10.20	Preservation and labeling of slides	4-6p.m	2	Mr.N.Anandaramajayaan
18.	2.10.20	Special staining	4-5p.m	1	Dr. B Rajesh
19.	3.10.20	Photography of slides	4-6p.m	2	Mr.N.Anandaramajayaan

20.	04.10.20	Recent advancements in micro anatomy	4-6p.m	2	Dr. B Rajesh
			Total Hours	30	

REFERENCE BOOKS/ARTICLES:

1.Text book of histology -Inderbir Singh

2.Tissue processing by bancraft

VALUE ADDED COURSE

1. Name of the programme & Code

Micro Anatomy Tissue processing and H & D staining and AN MA01

2. Duration & Period

(30 hrs)from September 2020– to October 2020

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short notes's - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

Once – September 2020– to October 2020

8. Summary report of each program year-wise

Value Added Course- September 2020– to October 2020					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	AN MA 01	**Micro Anatomy Tissue processing and H & D staining and AN MA01**	**Dr.RAJESH.B** **N.ANANDARAMAJAYAN**	1st MBBS	20 (September 2020 - to October 2020)

9. Course Feed Back

Enclosed as Annexure- V

PROFESSOR & HOD
DEPARTMENT OF ANATOMY
PONDICHERRY - 605 006

RESOURCE PERSON

COORDINATOR

FUNDAMENTALS OF TISSUE PROCESSING AND STAINING

BIHER SLIMS

Specimen Processing

Introduction

Microscopic analysis of cells and tissues requires the preparation of very thin, high quality sections (slices) mounted on glass slides and appropriately stained to demonstrate normal and abnormal structures.

Most fresh tissue is very delicate and easily distorted and damaged, and it is thus impossible to prepare thin sections from it unless it is chemically preserved or "fixed" and supported in some way whilst it is being cut. Broadly there are two strategies that can be employed to provide this support.

1. We can freeze the tissue and keep it frozen while we cut our sections. These sections are called "frozen sections".
2. Alternatively we can infiltrate our tissue specimen with a liquid agent that can subsequently be converted into a solid that has appropriate physical properties which will allow thin sections to be cut from it. Paraffin wax is such an agent. This produces so-called "paraffin sections".

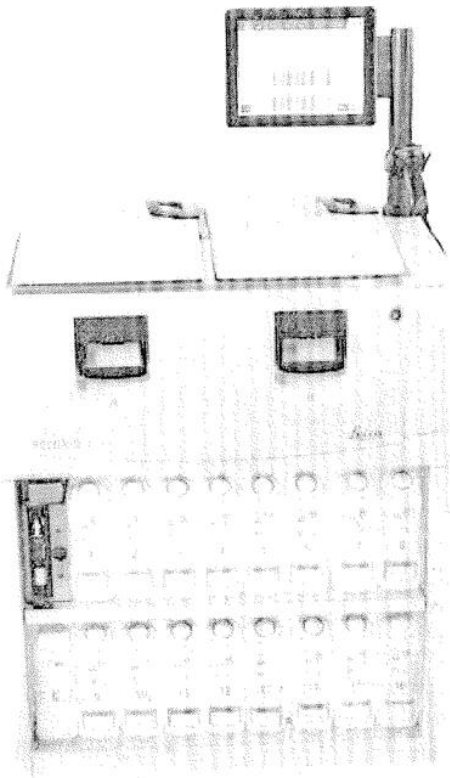
Introduction

"Tissue processing" describes the steps required to take animal or human tissue from fixation to the state where it is completely infiltrated with a suitable histological wax and can be embedded ready for section cutting on the microtome.

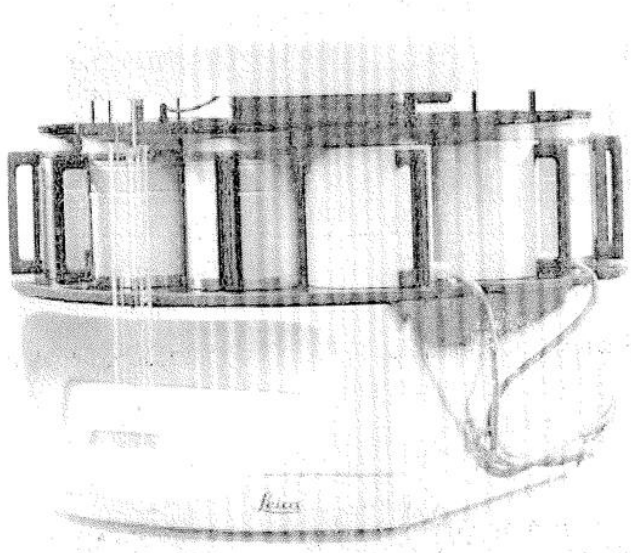
Tissue processing can be performed manually (hand processing), but where multiple specimens must be dealt with it is more convenient and much more efficient to use an automated tissue processing machine (a "tissue processor"). These devices have been available since the 1940's[1] and have slowly evolved to be safer in use, handle larger specimen numbers, process more quickly and to produce better quality outcomes. There are two main types of processors, the tissue-transfer (or "dip and dunk") machines where specimens are transferred from container to container to be processed, or the fluid-transfer (or "enclosed") types where specimens are held in a single process chamber or retort and fluids are pumped in and out as required. Most modern fluid-transfer processors employ raised temperatures, effective fluid circulation and incorporate vacuum/pressure cycles to enhance processing and reduce processing times.

Modern enclosed tissue processor

Modern enclosed tissue processor



"Dip and dunk" processors are still a good option for smaller labs.



The importance of tissue processing

Most laboratory supervisors would emphasise to their staff the importance of tissue processing. It is worthwhile to stress that use of an inappropriate processing schedule or the making of a fundamental mistake (perhaps in replenishing or sequencing of processing

reagents) can result in the production of tissue specimens that cannot be sectioned and therefore will not provide any useful microscopic information. This can be disastrous if you are dealing with diagnostic human tissue where the whole of the specimen has been processed ("all in"). There is no spare tissue. There is no diagnosis. There is however a patient to whom an explanation has to be provided.

Although mechanical or electrical faults occasionally occur in tissue processors, processing mishaps where tissues are actually compromised, mainly occur because of human error. It is important to emphasise the value of proper education and training for those carrying out tissue processing and the need to apply particular care when setting up a processor for any processing run.

Overview of the steps in tissue processing for paraffin sections

1. Obtaining a fresh specimen

Fresh tissue specimens will come from various sources. It should be noted that they can very easily be damaged during removal from patient or experimental animal. It is important that they are handled carefully and appropriately fixed as soon as possible after dissection. Ideally fixation should take place at the site of removal, perhaps in the operating theatre, or, if this is not possible, immediately following transport to the laboratory.

2. Fixation

The specimen is placed in a liquid fixing agent (fixative) such as formaldehyde solution (formalin). This will slowly penetrate the tissue causing chemical and physical changes that will harden and preserve the tissue and protect it against subsequent processing steps.[2] There are a limited number of reagents that can be used for fixation as they must possess particular properties that make them suitable for this purpose. For example tissue components must retain some chemical reactivity so that specific staining techniques can be applied subsequently.[3] Formalin, usually as a phosphate-buffered solution, is the most popular fixative for preserving tissues that will be processed to prepare paraffin sections. Ideally specimens should remain in fixative for long enough for the fixative to penetrate into every part of the tissue and then for an additional period to allow the chemical reactions of fixation to reach equilibrium (fixation time). Generally this will mean that the specimen should fix for between 6 and 24 hours. Most laboratories will use a fixative step as the first station on their processor.

Following fixation the specimens may require further dissection to select appropriate areas for examination. Specimens that are to be processed will be placed in suitable labelled cassettes (small perforated baskets) to segregate them from other specimens. The duration of the processing schedule used to process the specimens will depend on the type and dimensions of the largest and smallest specimens, the particular processor employed, the solvents chosen, the solvent temperatures and other factors. The following example is based on a six hour schedule suitable for use on a Leica Peloris™ rapid tissue processor.

3. Dehydration

Because melted paraffin wax is hydrophobic (immiscible with water), most of the water in a specimen must be removed before it can be infiltrated with wax. This process is commonly carried out by immersing specimens in a series of ethanol (alcohol) solutions of increasing concentration until pure, water-free alcohol is reached. Ethanol is miscible with water in all

proportions so that the water in the specimen is progressively replaced by the alcohol. A series of increasing concentrations is used to avoid excessive distortion of the tissue.

A typical dehydration sequence for specimens not more than 4mm thick would be:

1. 70% ethanol 15 min
2. 90% ethanol 15 min
3. 100% ethanol 15 min
4. 100% ethanol 15 min
5. 100% ethanol 30 min
6. 100% ethanol 45 min

At this point all but a tiny residue of tightly bound (molecular) water should have been removed from the specimen.

4. Clearing

Unfortunately, although the tissue is now essentially water-free, we still cannot infiltrate it with wax because wax and ethanol are largely immiscible. We therefore have to use an intermediate solvent that is fully miscible with both ethanol and paraffin wax. This solvent will displace the ethanol in the tissue, then this in turn will be displaced by molten paraffin wax. This stage in the process is called "clearing" and the reagent used is called a "clearing agent". The term "clearing" was chosen because many (but not all) clearing agents impart an optical clarity or transparency to the tissue due to their relatively high refractive index. Another important role of the clearing agent is to remove a substantial amount of fat from the tissue which otherwise presents a barrier to wax infiltration.

A popular clearing agent is xylene and multiple changes are required to completely displace ethanol.

A typical clearing sequence for specimens not more than 4mm thick would be:

1. xylene 20 min
2. xylene 20 min
3. xylene 45 min

5. Wax infiltration

The tissue can now be infiltrated with a suitable histological wax. Although many different reagents have been evaluated and used for this purpose over many years, the paraffin wax-based histological waxes are the most popular. A typical wax is liquid at 60°C and can be infiltrated into tissue at this temperature then allowed to cool to 20°C where it solidifies to a consistency that allows sections to be consistently cut. These waxes are mixtures of purified paraffin wax and various additives that may include resins such as styrene or polyethylene. It should be appreciated that these wax formulations have very particular physical properties which allow tissues infiltrated with the wax to be sectioned at a thickness down to at least 2 µm, to form ribbons as the sections are cut on the microtome, and to retain sufficient elasticity to flatten fully during flotation on a warm water bath.

A typical infiltration sequence for specimens not more than 4mm thick would be:

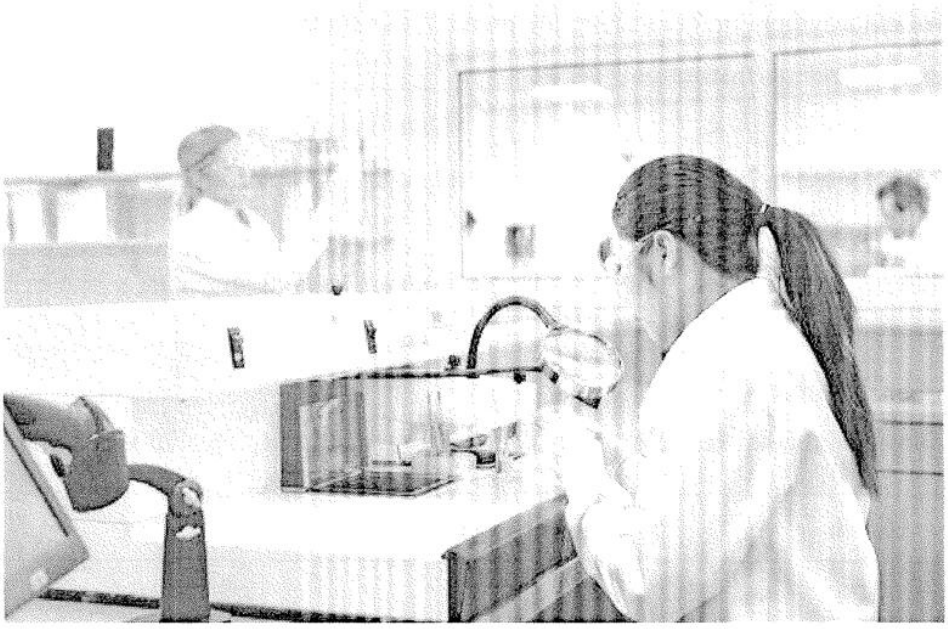
1. wax 30 min
2. wax 30 min
3. wax 45 min

6. Embedding or blocking out

Now that the specimen is thoroughly infiltrated with wax it must be formed into a "block" which can be clamped into a microtome for section cutting. This step is carried out using an "embedding centre" where a mould is filled with molten wax and the specimen placed into it. The specimen is very carefully orientated in the mould because its placement will determine the "plane of section", an important consideration in both diagnostic and research histology. A cassette is placed on top of the mould, topped up with more wax and the whole thing is placed on a cold plate to solidify. When this is completed the block with its attached cassette can be removed from the mould and is ready for microtomy. It should be noted that, if tissue processing is properly carried out, the wax blocks containing the tissue specimens are very stable and represent an important source of archival material.

Loading specimens into a tissue processor

Embedding



"Xylene-free" processing

Although xylene is used widely as a clearing agent for tissue processing it is a toxic reagent and some laboratories prefer to use less-toxic alternatives such as isopropanol or other xylene substitutes. For this method to be successful higher wax temperatures are required so that isopropanol can be eliminated from specimens during infiltration.

The effect of tissue processing on specimens

High-quality tissue processing is critical for accurate diagnosis

The combined effects of fixation and processing is to harden the tissue and it is inevitable that shrinkage will also occur. It has been estimated that tissues shrink as much as 20% or more by the time they are infiltrated with wax[4]. Notwithstanding these effects, sections prepared from optimally processed tissues will consistently show excellent morphological

detail which allows comparisons to be made between specimens and accurate histopathological diagnoses to be determined.

In theory and in practice the paraffin blocks that will be easiest to section contain relatively homogenous tissue of uniform soft consistency (such as kidney), which, when infiltrated with wax, have a consistency similar to that of solidified wax alone (not containing tissue). Tissues of a dense or fibrous nature, or a specimen where both hard and soft tissue are present in discrete layers can pose more of a challenge because parts of them are not so well supported by the solidified wax. Differential shrinkage of the various elements in these blocks during fixation and processing contributes to the problems that might be experienced when they are being sectioned.

References

1. Clayden EC. *Practical section cutting and staining*. Edinburgh: Churchill Livingstone, 1971.
2. Hopwood D. Fixation and fixatives. In Bancroft J and Stevens A eds. *Theory and practice of histological techniques*. New York: Churchill Livingstone, 1996.
3. Carson FL. *Histotechnology*. 2nd ed. Chicago: ASCP Press, 2007.
4. Winsor L. Tissue processing. In Woods A and Ellis R eds. *Laboratory histopathology*. New York: Churchill Livingstone, 1994:4.2-1 - 4.2-39.

Steps to Better Processing and Embedding

From patient to pathologist, preparing tissue specimens for histological examination requires care, skill and sound procedures. This guide provides practical advice on best-practice techniques and simple ways to avoid common errors.

Tips for better tissue processing and embedding are highlighted in this guide. We hope each step provides a valuable reminder of good histology practice, and helps with troubleshooting when unacceptable results do occur.

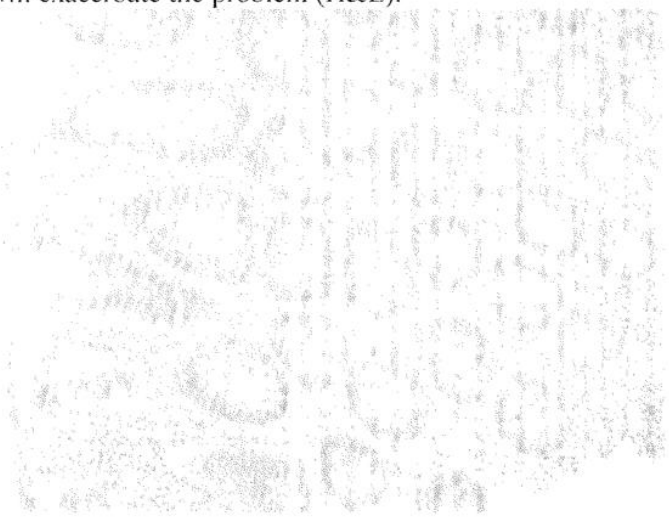
Step 20 - Use an Appropriate Schedule

An appropriate schedule is chosen for the tissue type and size.

An inappropriate schedule is chosen. For example, a very long schedule for a small endoscopic biopsy or a very short schedule for a large, fatty breast specimen.

This micrograph of a small area of subcutaneous tissue from a large, fatty specimen shows the effects of under-processing. The fibro-fatty tissue is poorly supported and therefore fragmented while the epithelial tissue of the glands shows a lack of nuclear definition and peculiar staining due to retained solvent (H&E).

This endoscopic biopsy has been over-processed and has become very brittle. As a consequence many fine cracks are visible through out the section. Poor microtomy technique will exacerbate the problem (H&E).



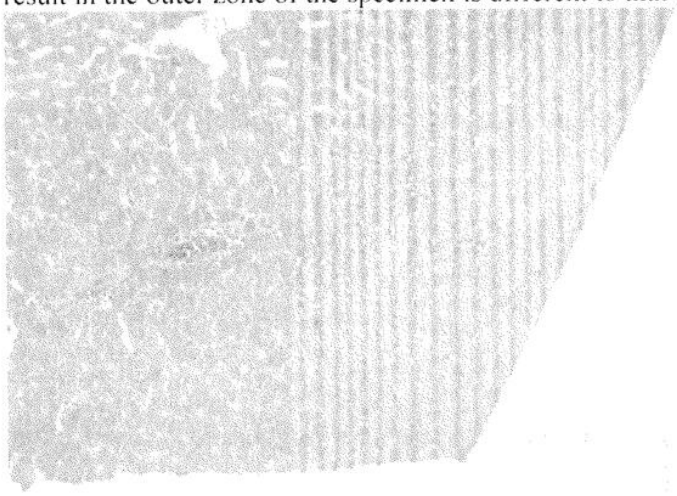
Step 21 - Provide Additional Fixation

For optimal processing and good morphology tissue should be well fixed before processing. Where specimens are incompletely fixed additional formalin fixation is provided in the processing schedule.

Incompletely fixed specimens go directly into alcohol producing zonal fixation (formal in fixation for the outside of the specimen. alcohol fixation for deeper areas).

This micrograph shows the effects of zonal fixation on a section of a marrow aspirate (H&E). In the upper left portion the red cells are intact where as in the lower part they are hemolyzed.

This micrograph shows a low power view of liver stained with a trichrome stain. The staining result in the outer zone of the specimen is different to that of the inner.

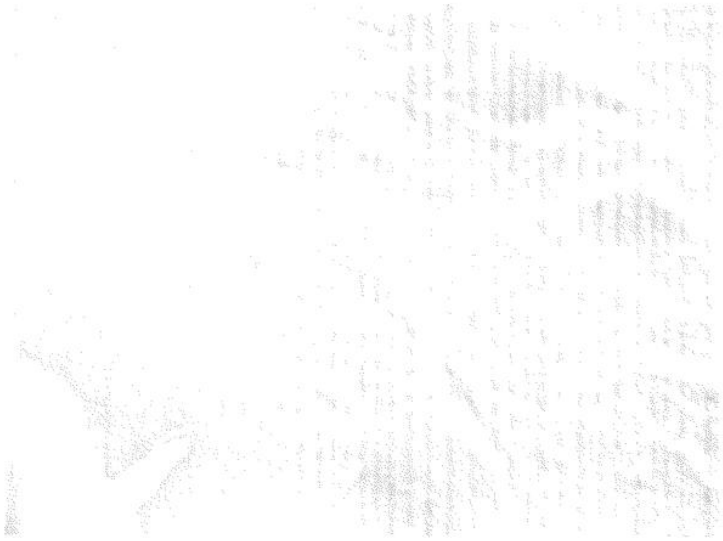


Step 22 - Maintain Reagent Quality

Processing reagents are replaced strictly according to established guidelines (ideally using are agent management system in an advanced tissue processor such as Leica Biosystem's PELORIS).

Guide lines for there placement of processing reagents are ignored, meaning that ineffective, contaminated or diluted reagents are used (e.g "out-of-threshold" warnings from the PELORIS reagent management system are ignored).This can cause poor processing quality.

In this section – from a large skin specimen – the poor preservation of the dense collagen is due to inadequate processing. In this case we believe it was due to the use of heavily contaminated reagent swell "out-of-threshold".

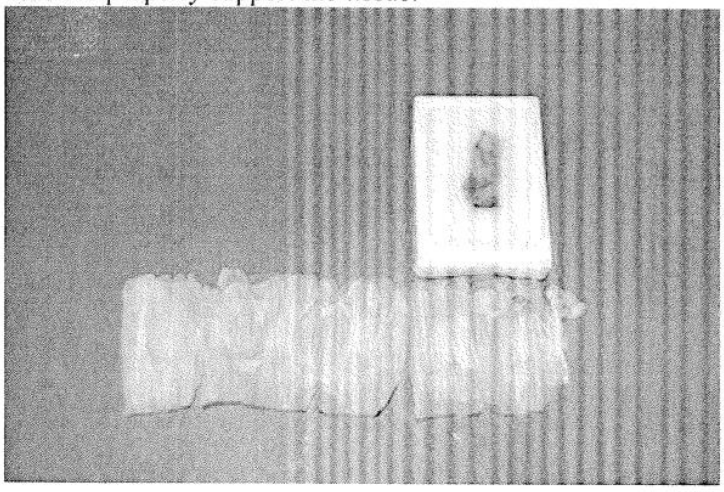


Step 23 - Use High Quality Wax

High quality wax is used for infiltration and especially for embedding (blocking out) to ensure high quality blocks that are easy to cut.

Cheap, poor quality wax from little-known sources is used for infiltration and embedding. Poor quality wax produces blocks that are difficult to cut.

A ribbon of sections was slowly cut from this block while the block was cold. The sections show considerable compression despite the low temperature used. Here the poor quality wax failed to properly support the tissue.

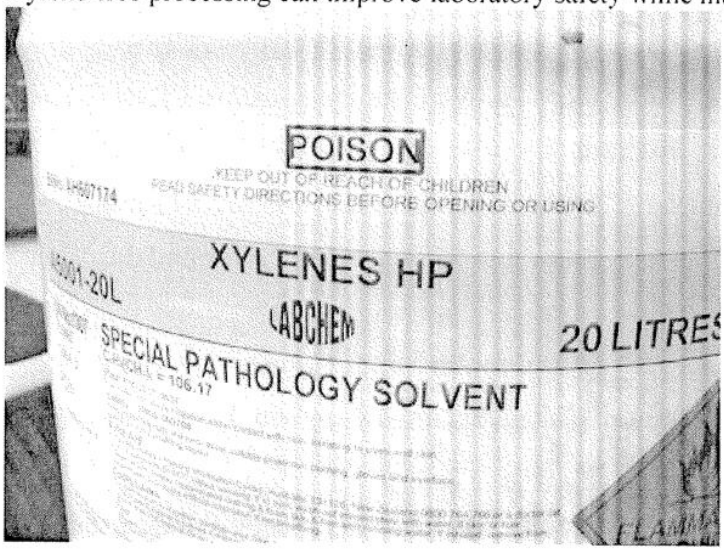


Step 24 - Avoid Hazardous Reagent

Where possible, xylene-free protocols are used (such as those available when using Leica Biosystems' PELORIS). This provides a safer laboratory environment without compromising processing quality.

No consideration is given to the health effects of xylene use. The possibility of using alternatives has not been considered.

Xylene-free processing can improve laboratory safety while maintaining quality.



Step 25 - Orientate Specimens Carefully

Specimens are carefully orientated. Competent grossing ensures flat surfaces on most specimens. Staff performing embedding have ready access to each specimen description and are appropriately trained.

Orientation is incorrect. This can result in loss of tissue as re-embedding is required. Some poorly prepared specimens require extensive trimming on the microtome to obtain a full-face section.

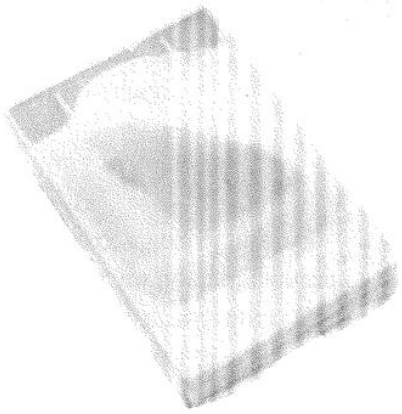
This endoscopic biopsy has been orientated incorrectly and shows only the superficial level of the mucosa.

Step 26 - Choose an Appropriate Mold

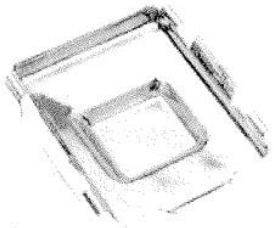
A mold of suitable size is always chosen for each specimen.

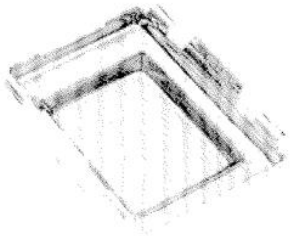
The same mold size is used for every specimen. Often the tissue touches the edge of the mold.

The mold used for this specimen was too small. The specimen is in contact with the edges of the block and may therefore be difficult to section.



Molds of different sizes are available for a variety of specimen sizes.



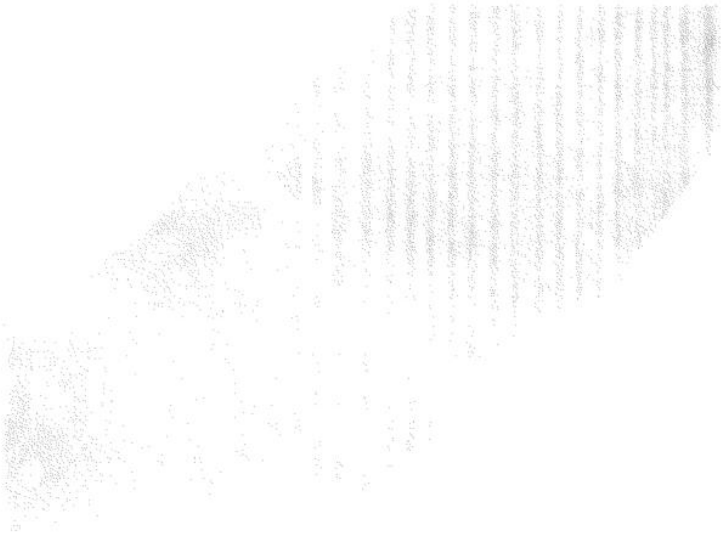


Step 27 - Handle Specimens Gently

Specimens are handled gently during embedding.

Specimens are handled forcefully during embedding to make them lie flat in the mold. Some tissue can be fractured by this process.

An H&E stained section of spleen which was fractured during embedding in an attempt to make the specimen lie flat on the base of the mold.



Step 28 - Avoid Excessive Heat

Before handling tissue, forceps are heated to the point where the wax just melts.

Forceps are heated well beyond the melting point of wax. This can cause local heat damage and a change in morphology in the area close to the contact point.

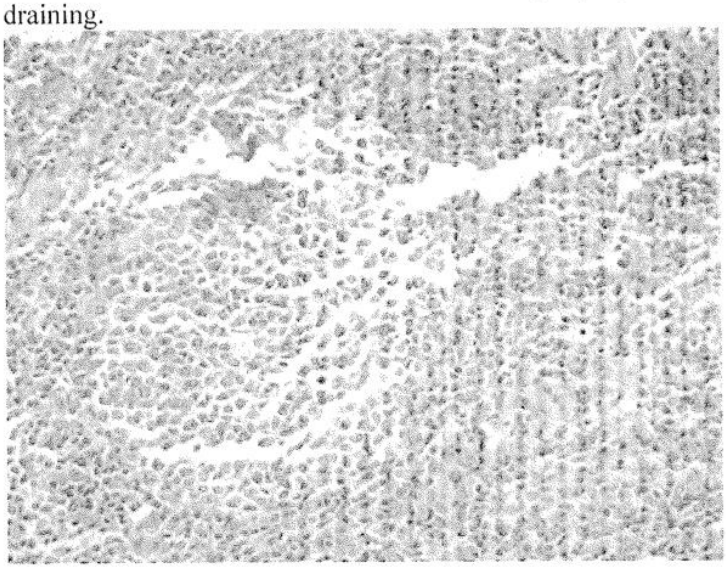
This micrograph shows the surface of a section of liver (H&E). Extreme local damage (making the tissue almost unrecognizable) has been caused by the application of heat to the tissue during embedding.

Step 29 - Check Temperatures Regularly

The temperature of the embedding center hot plate and wax reservoir is regularly checked.

The temperature of the embedding center hot plate is never checked. Even at this stage of processing specimens can be damaged by excessive local heat.

This lymph node was damaged by over-heating of the embedding center hot plate. Note the shriveled, pyknotic nuclei and extensive cracking. Cracking like this can also be caused by flotation on a water bath that is too warm, or by drying on a hot plate without sufficient draining.

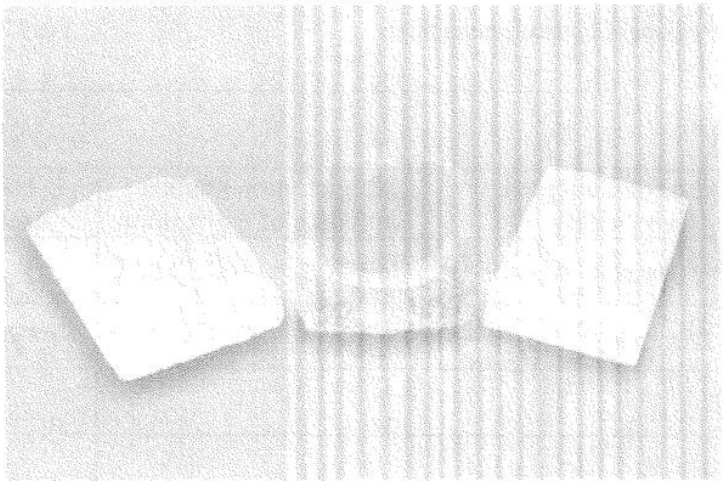


Step 30 - Do Not Over-fill Molds

Molds are filled to an optimum level and do not overflow.

Molds are over-filled, requiring scraping of the back and edges of the cassette prior to microtomy. Over-filled blocks may sit unevenly in the microtome chuck causing instability that may lead to the tissue becoming damaged during microtomy.

Priorities are important when delivering specimens to the laboratory. This is particularly so when frozen sections are involved.



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LIST OF PARTICIPANTS

Sl. No.	Registration Number	Name of the Student
1	U15MB271	BHALA KUMARAN .S
2	U15MB272	CHELLAMARIAPPAN. S
3	U15MB273	CIBIBALAA. D
4	U15MB274	DEEPIKA DIVYA KUMARI. B
5	U15MB275	DEEPIKA PRIYADHARSHINI. B
6	U15MB276	DEVANAND .M
7	U15MB277	DEVANATHAN. R
8	U15MB278	DHANA PRIYA .P
9	U15MB279	DHANALAKSHMI. M
10	U15MB280	DHANUSH .R
11	U15MB281	DHANUSH KODALI
12	U15MB282	DHIVYA KUMARI .P
13	U15MB283	DIVYA .S
14	U15MB284	DIVYA DHARSHINI .N
15	U15MB285	EVANGELINE PRETTY .G
16	U15MB286	EZHILARASI. R
17	U15MB287	FATHIMA BANU. A
18	U15MB288	GAYATHRI .M
19	U15MB289	GOGUL SUGAN. K
20	U15MB290	GOKULA KRISHNAN. E

Annexure II

VALUE ADDED COURSE

Micro Anatomy Tissue processing and H & D staining and AN MA01

List of students Enrolled – September 2020– to October 2020

Sl. No.	Registration Number	Name of the Student	Signature
1	U15MB271	BHALA KUMARAN .S	
2	U15MB272	CHELLAMARIAPPAN. S	
3	U15MB273	CIBIBALAA. D	
4	U15MB274	DEEPIKA DIVYA KUMARI. B	
5	U15MB275	DEEPIKA PRIYADHARSHINI. B	
6	U15MB276	DEVANAND .M	
7	U15MB277	DEVANATHAN. R	
8	U15MB278	DHANA PRIYA .P	
9	U15MB279	DHANALAKSHMI. M	
10	U15MB280	DHANUSH .R	
11	U15MB281	DHANUSH KODALI	
12	U15MB282	DHIVYA KUMARI .P	
13	U15MB283	DIVYA .S	
14	U15MB284	DIVYA DHARSHINI .N	
15	U15MB285	EVANGELINE PRETTY .G	
16	U15MB286	EZHILARASI. R	
17	U15MB287	FATHIMA BANU. A	
18	U15MB288	GAYATHRI .M	
19	U15MB289	GOGUL SUGAN. K	
20	U15MB290	GOKULA KRISHNAN. E	

RESOURCE PERSONS **COORDINATOR**

1.

3.

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

Micro Anatomy Tissue processing and H & D staining

SHORT ANSWER QUESTIONS

Course Code: AN MA01

I. ANSWER ALL THE QUESTIONS : (10X2=20 marks)

1. Define dehydration
2. Dewaxing
3. Tissue fixation
4. Wax bath
5. Tissue processing
6. Procedure for preparation of haematoxylin stain
7. Procedure for preparation of Eosin stain
8. Mounting slide
9. Staining procedure
10. Diamond pencile

DEVANATHAN.
U15MB277

Micro Anatomy Tissue processing & H&E Stain

1. Removal of Water from tissue is called Dehydration — 2

2. Removal of Wax from the tissue is called Dewaxing it is done using Xylene. — 2

3. Live tissue or Death tissue is to be fixed by fixative (10% formaldehyde with H_2O) — 2

4. Wax Bath used to melt the wax & process the tissue to wax mould — 2

5. Preparation of tissue for Death tissue to Slide process is called tissue process — 2

6. Slide are mount with DPX

15

2

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

Deemed to be University under section 3 of the UGC Act 1956

CERTIFICATE OF MERIT

This is to certify that _____EZHILARASI.R_____ has actively participated in the Value Added Course on **Micro Anatomy Tissue processing and H & D staining** held during September 2020– to October 2020 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under Sec 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that _____DEVANATHAN. R_____ has actively participated in the Value Added Course on Micro Anatomy Tissue processing and H & D staining held during September 2020– to October 2020 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

RESOURCE PERSON

COORDINATOR

Annexure 5

Student Feedback Form

Course Name: Micro Anatomy Tissue processing and H & D staining

Subject Code: AN MA01

Name of Student: DEVANAND **Roll No.:** U15MB276

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance:

Sl. No.	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

NIL

Signature of Student

Annexure 5

Student Feedback Form

Course Name: Micro Anatomy Tissue processing and H & D staining

Subject Code: AN MA01

Name of Student: DHANALAKSHMI.M **Roll No.:** U15MB279

We are constantly looking to improve our classes and deliver the best training to you.

Your evaluations, comments and suggestions will help us to improve our performance:

Sl. No.	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

NIL

M. Dhanalakshmi

Signature of Student

Date: 31-10-2020

From

Dr.K.C.Mallika Arjuna
Professor and Head,
Department of Anatomy,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry - 2.

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences,
(BIHER University),
Puducherry - 2.

Sub: Completion of value-added course: Micro Anatomy Tissue processing and H & D staining and AN MA01– Reg.

Dear Sir,

With reference to the subject mentioned above, the Department of Anatomy has conducted the value-added course on **Micro Anatomy Tissue processing and H & D staining and AN MA01**during September 2020– to October 2020 for 1st year MBBS Students (2020-2020 Batch). We solicit your kind action to send certificates for the participants whose list is attached with this letter.

Kind Regards,

Encl: Participants List