About this guide

• This guide is intended to provide clarification on standard histologic terminology.

• Included are examples of different sample types, processes, and final results
  – Types of samples submitted by the investigator
  – Processes available
  – Final result depending on the process chosen

• Remember to always include a request/order form with every request. Failure to do so will cause delays in processing of your request(s).
Starting samples

• This section provides information on what your starting sample is.

• The starting sample is what you will submit to the histology lab for processing of your order/request.
Fixed and Unprocessed Tissues

• These are tissues that have been fixed, trimmed, and placed in tissue cassettes.
• These tissues are submitted to the histology lab in 70% ethanol.

• Please make sure that all containers are leak-proof and tightly sealed.
**Ensure tissue cassettes are clearly labeled with pencil or solvent-proof ink, and are placed in a tight-sealing, leak-proof container clearly identified with your name, date, PI, & sample IDs. Always include a request form!**

Images: https://cvmbsresearch.wordpress.com

Starting Samples
**Paraffin Tissue Blocks**

- These are tissues that have already been processed and embedded in paraffin (wax) to form a tissue block.
- These blocks should be submitted in a container or “zip lock” plastic bag.

**Please make sure that all containers are closed to avoid losing blocks in your submission.**
Paraffin Tissue Blocks

** Ensure tissue blocks are *clearly labeled*, and are placed in a *closed or sealed container* clearly identified with your name, date, PI, sample IDs. Always include a request form!

Unstained Slides

• These are slides that have been made from paraffin (wax) tissue blocks sectioned with a microtome, and are intended for later use such as routine, special, or immunostaining.

• These slides should be submitted in a plastic slide carrier that keeps slides separated.

• Please do NOT submit slides loose inside a container. This can result in the paraffin sections being scratched off the glass slide if the slides rub against each other.
Unstained Slides

** Ensure glass slides are *clearly labeled*, and are placed in a *container that keeps slides separated* and is clearly identified with your name, date, PI, sample IDs. Always include a *request form*!

Images: http://library.med.utah.edu/
Frozen OCT Tissue Block

- These are tissue blocks of frozen tissue than have been embedded in OCT (Optimal Cutting Temperature) medium.
- These blocks must remain frozen and not be exposed to thawing.

- Please contact the laboratory personnel for coordinating the transfer and handling of frozen OCT blocks.
Frozen OCT Tissue Block

** Ensure plastic OCT molds are *clearly labeled.*

** Please contact the lab personnel for the transfer and handling of OCT frozen tissue blocks.

Images: http://www.pathologyinnovations.com/
Slides from Frozen OCT Blocks

• These are unstained slides obtained from frozen OCT tissue blocks that can be used for a variety of processes including routine, special, and immunostaining.

• *Please contact the laboratory personnel for coordinating the transfer and handling of slides from frozen OCT blocks.*
Slides from Frozen OCT Blocks

**Please contact the lab personnel for the transfer and handling of slides from OCT frozen tissue blocks.**

Image: http://www.pathologyinnovations.com/
Services Offered and Request Types

• This section provides information on what types of histology services are available for you to request.

• Please be sure to always include a completed request form with your submission. Failure to submit your REQUEST FORM will result in delays.
Tissue Processing ONLY

- Processing involves a series of tissue dehydration, clearing, and paraffin infiltration steps.
- Processing prepares tissues for paraffin embedding.

**Final result:** Paraffin-infiltrated tissues in cassettes (but that have NOT been embedded into blocks).
**Tissue cassettes are processed in the tissue processor. After processing, tissues are infiltrated with paraffin and are ready for embedding.**

[http://www.blizard.qmul.ac.uk/](http://www.blizard.qmul.ac.uk/)  

Services, Requests, and Final Results
Tissue Processing and Embedding ("Blocking")

• This service includes embedding of previously-processed tissues into paraffin (wax) blocks.
• Paraffin blocks can then be sectioned with a microtome for making slides.

• **Final result:** Paraffin tissue blocks.
Tissue Processing and Embedding ("Blocking")

**Processed tissues are embedded in paraffin and made into paraffin tissue blocks that can be sectioned with a microtome.**

Images: http://tissuesampling.weebly.com/
https://liferaftgroup.org

Services, Requests, and Final Results
Recuts and Step Sections

- **Recuts** are sections made from paraffin blocks that have been previously sectioned.
- **Step sections** are recuts that are obtained a certain distance from the face of the block and from each other.
  - For example, you may order 3x 50um step sections. This means that the second recut will be 50um deeper than the first one, and the third recut will be 50um deeper than the second one.
  - These are also referred to as “levels” or “measured levels”

- **Final result:** Slides containing a paraffin tissue slice. Recuts or steps can be requested as stained or unstained slides (see “Unstained Slides” section next).
Recuts and Step Sections

** These are examples of serial or consecutive recuts. Paraffin blocks are sectioned with a microtome and then collected onto glass slides.


Services, Requests, and Final Results
Unstained Slides

• Unstained slides can be used for further routine, special, or immunostaining.

• Unstained slides can be requested as serial slides or step sections.
  – For example, you can request 5 unstained serial sections. This means that 5 consecutive sections will be obtained and placed on glass slides.

• Final result: Slides containing a paraffin tissue slice.

Services, Requests, and Final Results
Unstained Slides

**Images:** [http://library.med.utah.edu/](http://library.med.utah.edu/)  
**Services, Requests, and Final Results**
H&E Staining

- **Hematoxylin and eosin** (H&E) is the principal stain used in histology, and regarded as the “gold standard” for brightfield microscopy.
- H&E-stained slides provide a context in which to interpret specialized techniques such as special stains and immunostains.

**Final result:** H&E-stained slides.
H&E Staining

Images: http://emedicine.medscape.com/
http://www.istockphoto.com/

Services, Requests, and Final Results
Histochemical (Special) Staining

• Histochemical (special) stains aid in the visualization and/or identification of structures and/or substances in tissue sections.
  – *Examples*: lipid, intercalated discs in cardiac cells, metals and other cell accumulations, collagen, infectious elements, basement membranes, etc.

• **Final result**: *Various*

• **Please consult with the laboratory personnel for identification of the most appropriate special stain for your project and research needs.**

  Services, Requests, and Final Results
Histochemical (Special) Staining

** Masson’s Trichrome for collagen.

** Grocott’s methenamine silver (GMS) for fungi.

** Periodic acid Schiff (PAS) for mucins.

** Perls Prussian Blue for iron.

** Reticulin stain for reticulin fibers.

** Warthin-Starry silver for spiral bacteria.

Images: JG Vilches-Moure

Services, Requests, and Final Results
Immunostaining

- Immunohistochemistry (immunoperoxidase) assays are based on the principle of antibody binding used to identify specific antigens and antigenic determinants (epitopes) in tissue sections.
  - *Examples*: different cell types (e.g. B-cell v. T-cell, endothelial cells) cellular components (e.g. mitochondria), specific matrical components (e.g. collagen IV), etc.

- **Final result**: *Various*

- Please consult with the laboratory personnel for identification of the most appropriate immunostain for your project and research needs.
Immunostaining

Images: JG Vilches-Moure  

Services, Requests, and Final Results
Comparative Medicine

Animal Histology Services

• For additional questions or inquiries, please contact:

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