What in the world is Histotechnology?

Karen Stiffler, MA, HTL
Program Director for Histotechnology
The Basics of Histology

**Histology**: the study of body tissues

"histo" is from the Greek "histos" meaning tissue

**Histotechnology**: technical histology concerned especially with preparing and processing histological specimens
What are some uses of Histology?

1. Diagnosis for treatment
   
   **Histopathology**: study of **diseased** tissue in microscopic detail.

2. Education

3. Forensic examination

4. Autopsy
What is the purpose of Histology?

To investigate the difference between normal (healthy) and abnormal (diseased) tissue.

It is often used to detect cancer but it can also be used to test for diseases such as those caused by bacteria, parasites or fungi.
Where does the tissue go?

1. The surgeon or other physician removes a piece of tissue (biopsy).
2. The tissue is taken to the grossing room.
3. Pathology Assistant or Resident writes a description and cuts it appropriately.
4. Then comes the role of the HISTOTECHNICIAN! (to be continued...)
5. Once histotechnician performs their job, the slide is ready to go to the Pathologist for diagnosis.
6. Through the work of this team, the patient can receive the appropriate treatment as needed.
What does a histotechnician do?

Pathology Processing: Tissue

- Cutting the tissue
- Fixation & Processing
- Tissue embedding in paraffin
- Microscopic evaluation
- Slide staining
- Block cut to make slides
General Steps

To give an overview of the histological process from accessioning of the tissue sample to slide distribution.

Accession ➔ Gross Examination ➔ Fixation ➔
Tissue Processing ➔ Embedding ➔ Sectioning ➔
Staining ➔ Slide Distribution
General Terms

**Accessioning**: to give a unique number to each patient

**Gross examination**: using the naked eye to obtain diagnostic information

**Fixation**: the technique of preserving a specimen for microscopic study

**Tissue processing**: preparation of tissue to a form that will be able to be embedded
**Embedding**: tissue sections are placed in molds and hardened; allows for correct alignment and orientation of tissues

**Sectioning**: using a microtome to cut thin ribbons of tissue to be placed on slides

**Staining**: gives contrast to the tissue and highlights particular features
Step 1: Accessioning

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3. The information listed on the request form is entered into the computer. This includes patient history along with a description of the site of origin.
Step 2: Gross Examination

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3. If any masses are found they are also measured as well as the distance from the mass to the specimen edge (where the surgeon cut it out).
Step 2: Gross Examination

4. The pathologist cuts the tissue into small slices with a scalpel, examines it, and then places it in a cassette.
Step 3: Fixation

1. **Fixative**: a chemical that preserves a specimen for microscopic study.
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2. The cassette needs to be immediately placed in a fixative so it won’t be degraded. The volume of fixative should be 15-20 times the size of the tissue.
Step 3: Fixation

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   - penetrates the tissue rapidly
   - causes less shrinking
   - permits most special stains
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4. Fixation is generally complete in about 1 hour per mm of tissue. Small biopsies will thus take 1-2 hours to fix. Larger tissue may take 5-10 hours or more.
Step 4: Tissue Processing

Once tissue is fixed it must be processed to a form that will be able to be embedded (usually in paraffin) and then cut into thin microscopic sections.
Step 5: Embedding

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4. Cassettes with tissue are now called blocks.
Step 6: Sectioning

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   Using a microtome, the block is cut into until the entire surface of the tissue can be seen.

2. Block is placed in an ice-water bath for easier sectioning.
Step 6: Sectioning

3. The block is put back on the microtome and a ribbon is cut. A ribbon of 4-6 sections (for small biopsies) is placed on a flotation bath at about 40°C.
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4. The ribbon is placed on a slide and then put in a slide rack for subsequent staining.
Step 7: Staining

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3. Slides are coverslipped to prevent damage to the tissue.
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Special stains:

Examples:
- carbohydrates
- microorganisms
- connective tissue
- nerves
Step 8: Slide Distribution

1. Once slides have been stained they are organized into slide folders.
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3. The slide folders are taken to the pathologist for viewing under a light microscope.
Microorganisms
Why become a histotechnician?

• Are you interested in a career in health care but would rather work behind the scenes?
• Becoming a histotechnician may be the route for you!
• There are currently many job opportunities in hospitals, clinics, dermatology offices, independent and research laboratories.
Lakeland’s Histotechnology Program

• 2 year program leading to an Associate of Applied Science degree in Histotechnology
• Nearly 50% of required **general education** courses can be taken online. Histology courses are all on campus.
• The program combines basic science, general education, laboratory techniques and clinical laboratory experiences.
• Small class sizes allow students to receive personal attention from faculty.
Training

- Students gain hands-on training in a simulated hospital laboratory on campus.
- We also provide you with 16 weeks (480 hours) of clinical training at area labs. Examples include:
  - Cleveland Clinic Foundation
  - University Hospitals
  - Metrohealth

Many students get jobs at their clinical sites after graduation!
ASCP Certification

• Students are eligible to sit for the ASCP Board of Certification HT exam upon graduation.

• Students can get a job immediately upon graduation and take the exam within a year of employment.

• Students with a bachelors degree in biology or chemistry may be eligible to take the HTL exam to provide even more career opportunities.
Additional info

• National Society for Histotechnology
  http://nsh.org/what-histotechnology

• American Society for Clinical Pathology:
  https://www.ascp.org/content

http://www.lakelandcc.edu/web/about/histotechnology-departments