Frequently-Asked Questions: Surgical Pathology

What does the surgical pathology service do?
Surgical pathology is the discipline of examining tissue - at both the gross level (with the naked eye) and with a microscope - to discern hallmarks of disease. Veterinarians will remove samples of lumps, lesions, and suspicious organs from animals - usually through a surgical process - and submit those tissues for examination. Once specimens are received at the DCPAH, they undergo trimming, processing and sectioning in order to produce microscopic slides. Those slides are examined by a pathologist and a description of the microscopic changes, a morphologic diagnosis, and an interpretation of the findings are provided to the submitting veterinarian. In some instances, other procedures may be performed on the tissues to further define the disease process, and to aid in reaching a diagnosis. These procedures include the use of special antibodies (immunohistochemistry) or special staining techniques. For a detailed description on how we routinely trim tissues and evaluate them, go to the document “Standard Trimming Method” on the DCPAH CD or website: (http://animalhealth.msu.edu/Sections/Surgical_Pathology/WEBCD.SP.REF.004.pdf).

What do I need to know about sample submission?
The submission of a high-quality sample is a crucial component for a successful pathologic evaluation. In addition to the submission of well preserved samples of high diagnostic quality, it is equally important to provide a complete history. Furthermore, close contact with the pathologist reading the biopsy sample is instrumental to an optimum diagnosis and prognostic evaluation. At DCPAH, we strive to provide our clients with the highest quality service, and guarantee direct communication between our pathologists and our clients. We encourage our clients to consult with us by phone with regard to preparation of samples and additional testing available at DCPAH; as well as diagnoses and clinical implications. The most important facts about sample submission are summarized below:

**Fixation:**
- Place tissue in fixative as soon as possible.
- Fix tissues for 24-48 hours. Preferred fixative is 10% neutral buffered formalin. Tissue to formalin ratio should be 1:10. Specimens should be no thicker than 1 cm. If formalin is not available, the tissues should be refrigerated and shipped cold. Do not freeze.
- Tissues may also be fixed in formalin for 24-48 hours, removed from the solution, wrapped in formalin-soaked gauze sponges, and placed in a leak-proof plastic bag for shipment.
- Please contact the laboratory for special fixation considerations (alternative fixatives; fixation of globe, nail, hoof, etc.)
- To avoid freezing artifacts of the specimens in very cold weather, use an insulated shipping container, or substitute one part isopropyl alcohol in the formalin fixative.
- If the size or density of the specimen requires incision in order to ensure complete fixation, care should be taken to incise the specimen at the surface (i.e. haired skin surface in cutaneous masses) rather than at the deep/surgical margin.
- If needed (specimen is very large, requested margins, weird shape), describe or draw any identifying characteristics of the specimen (i.e. ink, suture, staple, scar, etc.); this step allows for communicating the orientation of the specimen between the clinician, histotechnician, and pathologist.
Specimen Information:
- Providing complete patient information will aid interpretation of lesions. This information will ideally include:
  - Patient signalment: species, breed, age, sex
  - Patient pertinent clinical history
  - Description, duration and distribution of lesion(s)
  - Previous biopsy information (accession number, copy of biopsy report, etc.)
  - Inking of specimen for margin evaluation (see below)
  - Number of tissues included in the submission
- Biopsy specimens should be accompanied by the appropriate DCPAH Necropsy - Biopsy submittal form. This form can be downloaded from our website (www.animalhealth.msu.edu/Submittal_Forms/), or can be ordered directly from the DCPAH preprinted with your clinic information (please see Product Order Form listed under Shipping Options on our website).

Additional Specimen Types:
- Histologic slides or tissue in paraffin blocks may also be submitted to the laboratory for biopsy examination (consultation), immunohistochemistry, or special staining.
- Our laboratory also offers GLP services for routine histology including evaluation by a pathologist and provides various types of special services (e.g. laser capture microdissection, in-situ hybridization, immunohistochemistry, electronmicroscopic preparation and evaluation etc.) for researchers and pharmaceutical companies.

How should I ship biopsy samples to the DCPAH?
Formalin fixation of the tissue precludes the need for rapid transport of specimens to the diagnostic laboratory. However, in order to facilitate receiving biopsy results in a timely manner and to allow for ancillary testing such as immunohistochemistry (fixation in formalin should be less than 2 days), the use of an overnight carrier service is recommended.

Does DCPAH work with commercial carrier services?
Federal Express overnight shipping is subsidized by the DCPAH. Once clients purchase Federal Express shipping materials from our laboratory, there is no additional charge from FedEx for this service. Also available to our clients are large and small standard USPS biopsy mailers. Please refer to the Shipping Options section of our website for further information regarding instructions for use of the biopsy mailers, and prices for the various types of mailers.

What is margin evaluation?
Besides offering routine diagnostic services, we also perform margin evaluation at a highly competitive price. Margin evaluation helps the veterinary surgeon determine whether a neoplasm was removed in its entirety, or - in cases with “dirty” margins - provides information as to where the neoplasm extends beyond the surgical margin. Such service is often refused by commercial laboratories due to the labor intensity and low income generated by margin studies. Margin studies require additional processing steps, including inking the lateral and deep tissue margins and diagramming the subgross specimen site selection. Our pathologists strongly encourage our clients to call us for a detailed explanation of this procedure. We are happy to provide in-depth training at our facility and explain the required steps at local veterinary meetings. For a detailed description on how to ink margins and how we evaluate them, refer to the document “Evaluation of Surgical Margins” on the DCPAH CD or website (http://animalhealth.msu.edu/Sections/Surgical_Pathology/WEBCD.SP.REF.001.pdf).
What other type of samples can I submit?
Although most veterinary practitioners are familiar with the submission of standard soft tissue specimens to pathology laboratories, processing and evaluating other sample types (bone, bone marrow, tooth, nail, hoof, eye, etc.) may require special consideration. Each of these specimen types requires a defined protocol for sample preparation, processing, and sectioning. We have developed specific protocols for each of the special samples described above (see attached). We are available to help our clientele prepare samples, and many of our pathologists attend veterinary medical association meetings to discuss disease trends in these specific system areas and answer technical and scientific questions. For a detailed description on how we evaluate special tissue samples such as digits, go to the document “Processing of Special Tissue Submissions” on the DCPAH CD or website (http://animalhealth.msu.edu/Sections/Surgical_Pathology/WEBCD.SP.REF.003.pdf).

Should I submit all removed tumor masses?
Oncologic pathology has always been one of the mainstays of the biopsy service. To provide an accurate diagnosis and avoid unpleasant surprises, every surgically removed mass should be submitted for pathologic examination. If an animal presents with multiple masses, each of these masses should be examined to guarantee an accurate prognosis.

Are there additional charges for multiple tumor masses in the same submission?
To provide our clients with high quality, price-competitive services, DCPAH will accept multiple biopsies that were taken at the same time from the same animal as a single case submission. Please be sure to indicate the individual tumor site and lesion description where possible. If the tissue specimens are to be submitted in the same formalin container, identifying individual masses through the use of: different colored inks; sutures; surgical staples; etc. is recommended. There will be only a small additional charge for two to three total specimens rather than a full biopsy charge for each additional tumor. An additional charge will be added for each additional two specimens. Please see our current fee schedule available on our website for prices.

Are there additional charges for other multiple tissue submissions?
Multiple tissue charges do not apply to cases in which multiple skin biopsies are being submitted for dermatologic conditions; or where multiple gastrointestinal biopsies are being submitted from the same animal. Only for cases submitted as “field necropsies”, that include multiple organs in the same submission, will there be an additional charge for a total of 4-5 tissues, followed by an additional charge for each 2-3 added tissues. Please see our current fee schedule available on our website for prices.

Why should I choose DCPAH for my surgical pathology needs?
Our surgical pathology service includes multiple pathologists with diverse expertise. This means that we internally consult on difficult cases and each case is reviewed by a pathologist with expertise in the area relevant to each sample. Specialized areas of interest include: tumor pathology, dermatopathology, ophthalmic pathology, diseases of the liver and gastrointestinal tract, reproductive pathology, respiratory pathology, renal pathology, neuropathology, and wildlife/zoo animal pathology. The primary strength of our service is our excellent group of pathologists, supported by a wide variety of diagnostic laboratory units with expertise in virology, bacteriology, toxicology, endocrinology, clinical pathology, parasitology, nutrition, and serology. This collaborative group provides comprehensive service far beyond the routine biopsy submission. The technical capabilities of our newly built diagnostic laboratory - in concert with the depth and quality of expertise provided by the scientists working in each of the sections - make DCPAH one of the premier institutions for veterinary diagnostic medicine in the US.
VETERINARY PATHOLOGY SPECIALISTS AT THE DCPAH:

- **Agnew, Dalen**, DVM, PhD, DACVP. Pathology of the reproductive tract and diseases of exotic animals
- **Fitzgerald, Scott**, DVM, PhD, DACVP. Pathology of the urinary tract and diseases of wildlife and avian species
- **Fulton, Richard**, DVM, PhD. Pathology of avian diseases
- **Kiupel, Matti**, Dr. vet. med, PhD, DACVP. Diagnostic Molecular pathology (IHC, in-situ, LCM), tumor pathology and ferret diseases
- **Mullaney, Thomas**, DVM, PhD, DACVP. Pathology of the liver and gastrointestinal tract
- **Patterson, Jon**, DVM, PhD, DACVP. Neuropathology
- **Smedley, Rebecca**, DVM, MS, DACVP. Tumor pathology, Pathology of bone
- **Steficek Barbara**, DVM, PhD, DACVP. Ophthalmic and dermatopathology
- **Williams, Kurt**, DVM, PhD, DACVP. Pathology of the respiratory tract

Can I submit frozen tissue samples?
The histology service offers the preparation of frozen sections and our pathologists can perform the microscopic evaluation of these sections. We have a state-of-the-art cryostat system with a tape-transfer system for higher quality sections. Frozen sections can be produced for research, but are also useful for fast turn-around and immunohistochemistry using antibodies that do not work in formalin-fixed sections (e.g. histiocytic diseases).

How do I contact the surgical pathology service?
During regular business hours, Monday through Friday 7:30 a.m. to 5:30 p.m., please call 517.353.1683. From 9:00 a.m. to 11:00 a.m. on Saturdays or for animal health emergencies outside of normal operating hours, please call 517.353.5275 for an automated answering system.