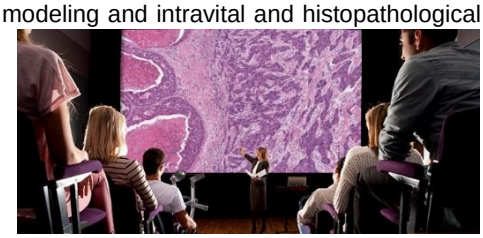
Cornell University
Stem Cell Program
Stem Cell Modeling & Phenotyping Core

The Stem Cell Pathology Unit

Services We offer comparative pathology services and whole slide digital imaging and analysis. Our services are open to all investigators working in any area of biomedical research. As a part of Cornell's Stem Cell Modeling and Phenotyping Core (CSCMP), the Stem Cell Pathology Unit provides a critical link between animal modeling and intravital and histopathological analyses. Our Pathology Services can help you strengthen your research by providing accurate interpretations of novel findings and validation of model systems.



Animal Phenotyping The Stem Cell Pathology Unit offers comprehensive animal phenotyping with an additional focus on the assessment of stem cell niches. Stem cells and their niches play essential roles in the development, maintenance and regeneration of organs and tissues. Stem cell defects are frequent causes of diseases, and stem cell niches are frequently affected during pathological conditions. Histological evaluation of stem cell niches, as a part of routine phenotyping, offers an extra value for all investigators, independent of their immediate involvement in stem cell research.

Project Planning When you are in the process of experimental design, we can help you to select or design the most appropriate genetically modified animals for your needs. Our pathologists offer guidance on the selection of tissue fixatives suitable for your particular studies, and we advise on the most optimal set of tissues to be collected during necropsy. Our pathologists are also available for joint consultations with other CSCMP units:

The Stem Cell and Transgenic Core Facility
Director, John Schimenti, Ph.D.
transgenics.vertebrategenomics.cornell.edu
A resource for the generation and utilization of ES cells, iPS cells, genetically-modified mice, cryopreservation, rederivation of mouse strains, and genome editing.

The Stem Cell Optical Imaging Unit
Director, Warren Zipfel, Ph.D.
stemcell.cornell.edu/scp-mpcoreOptUnit.cfm
Services include high resolution live mouse microscopy and in vitro cell imaging.

Whole Slide Digital Imaging & Analysis

The Stem Cell Pathology Unit offers digital slide preparation for both brightfield and fluorescent samples. To keep costs low, we train users to scan their own slides. Image viewing software, image analysis algorithms and 1 month of image storage are free for registered users.

Preparation of Digital Slides Leica/Aperio ScanScopes capture precise high-resolution images of entire brightfield and fluorescent specimens on glass slides. The resulting digital slides allow for the highly efficient evaluation of histological and cytological materials without the need for of a microscope. Furthermore, free ImageScope software allows for the preparation of publication quality images without an expensive digital camera.

- Slides are scanned at giga-pixel resolutions
- Brightfield eSlides are 24-bit color, up to a 40X magnification
- Fluorescent eSlides can have up to 4 channels, up to a 40X magnification
- Whole slide image analysis

Slide Scanning

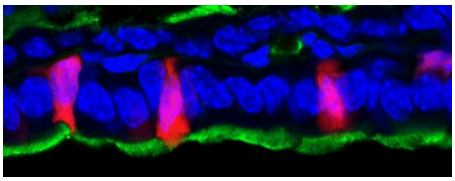
Bright-field & Fluorescent ScanScope Scanning	For scanning and analysis of slides, please contact us at stemcellpath@cornell.edu for rates.

Pathology Services

Murine necropsy & tissue collection (no histopath)	$40 /animal
Complete murine necropsy (includes histopath up to 12 H&E slides with final report)*	$100 /animal
Complete necropsy of wild-type littermates	$40 /animal
Embryo evaluation up to GD 11 (requires parallel evaluation of wild-type littermate)	$40 /embryo
Embryo/Fetus evaluation after to GD 11 (requires parallel evaluation of wild-type littermate)	$60 /embryo
Histopathology slide review with report, 1-2 slides	$25 /slide
Histopathology slide review with report, 3 or more slides	$35 /slide
Histopathology review with report generation	$50 /hr
Slide consultation, no report	$6 /slide

*Murine necropsy for phenotyping will include collection of the following tissues: Heart, tongue, thymus, thyroid gland, lymph nodes, salivary glands, lung, trachea, esophagus, heart, liver, spleen, kidneys, adrenal glands, ovaries/testes and epididymides, uterus and vagina/prostate, seminal vesicles, coagulating glands and bulbourethral glands, clitoral gland/preputial gland, urinary bladder, urethra, mammary glands, stomach, duodenum, pancreas, jejunum, ileum, cecum, colon, skin, brain and pituitary gland, eyes, Harderian glands, bone, bone marrow, teeth, pharynx, nasal cavity. Spinal cord/vertebral column upon request. Does not include the costs for processing specimens or the preparation of sections.

We work closely with investigators to determine the optimal sets of tissues to be examined in each animal. We also offer discounted fees for projects including our pathologists as collaborators.



Please email us at stemcellpath@cornell.edu regarding pricing for non-murine animal models and collaborative options.

Image Analysis Algorithms

Brightfield

Positive Pixel Count	Calculates the contribution of each stain at every pixel location in the image.
Color Deconvolution	Separates the image into different layers, corresponding to your stains.
Cytoplasmic Staining	Measures intensity and provides the percentage of cells containing stain.
Membrane Analysis	Detects membrane staining for individual cells and identifies the intensity and completeness of the staining.
Nuclear Analysis	Detects nuclear staining, and intensity.

Fluorescent

Cyto-Nuclear FL	Designed to measure both cytoplasmic and nuclear intensity on a cell-by-cell basis.
Object Colocalization FL	Capable of measuring object properties & determining colocalized objects.
Microvessel FL	Designed to count vessels & measure vessel properties.
Area Quantification	Quantifies multiple florescent dyes on an area basis.

Core Personnel

The Director of the Stem Cell Pathology Unit:
Alexander Nikitin, MD, PhD
Professor of Pathology

Pathology:
Andrew Miller, DVM, Dipl. ACVP
Assistant Professor

Teresa Southard, DVM, Dipl. ACVP, PhD
Assistant Clinical Professor

Slide Digitization:
Chris Pelletier
Research Support Specialist

Contact Information

For Questions and Additional Information:
Website: stemcell.cornell.edu/PathUnit.cfm
Email: stemcellpath@cornell.edu

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