



LABORATORY SERVICES

LABORATORY SERVICES STORAGE SERVICES BIOBANKS BIOETHICS & GENETIC COUNSELING



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MAYO CLINIC
BIOSERVICES

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: **Our Mission:** To provide world-class Biorepositories
: and state-of-the-art Biospecimen Processing and
: Storage with a focus on quality and service.

- > **INFRASTRUCTURE SUPPORT:** The laboratory's information technology systems and other infrastructure are configured based on specific-study needs. This aids in specimen collection, transportation, processing, shipping, storage and billing.
- > **CONSULTATION:** The trained laboratory staff is available to meet with the study team to consult on study-specific services needed. The consultation can include specimen collection, aliquoting strategy, storage, as well as provide sample requirements for downstream analysis.
- > **ACCESSIONING:** Specimens accessioned in the laboratory are tracked with the Research Laboratory Information Management System (RLIMS), so that each specimen is associated with patient data. This accessioning serves as a front door for routing of specimens for downstream services, which includes core laboratories focused on gene expression, genotyping, next-generation sequencing, proteomics and cytogenetics.
- > **DNA PURIFICATION:** DNA can be purified from fresh or frozen whole blood, white blood cells, frozen or paraffin-embedded tissue, cultured cells, buccal cells, cell-free DNA extraction from plasma and saliva collected in an Oragene kit. Total and double-stranded DNA is quantified using a Trinean spectrophotometer, and the concentration and volume are tracked in RLIMS.
- > **RNA PURIFICATION:** RNA can be purified from whole blood collected in a PAXgene Vacutainer, frozen or paraffin-embedded tissue, and cultured cells. The RNA is quantified using a spectrophotometer, with the quality determined using an Agilent Bioanalyzer. The concentration, volume and RNA integrity number are tracked in RLIMS.
- > **IMMUNOSTAINING:** Automated immunostaining is performed on Leica Bond and Dako Autostainer instruments using a variety of antibody detection chemistries, including DAB and NovaRED for use with brightfield microscopy and secondary antibodies conjugated to fluorophores for immunofluorescence microscopy.
- > **BLOOD AND BODILY FLUID PROCESSING:** Blood and bodily fluids can be centrifuged and fractionated manually or by automation. Reagents can be added to the resulting fractions, which can then be stored at ambient temperature or frozen.
- > **DIGITAL IMAGE CAPTURE AND ANALYSIS:** Whole tissue slides and tissue microarray slides are scanned, and the virtual slide can be accessed via the Mayo Clinic intranet. The images are stored on server space in a Mayo Clinic institutional server facility. Mayo manages user access to the server space and also stores, backs up and archives the resulting image data files.
- > **TISSUE HANDLING:** External site paraffin blocks can be re-embedded in new paraffin prior to sectioning. Frozen samples that are too small and thin to be handled and sectioned without the use of mounting media can be placed in base molds and snap frozen in optimal cutting temperature (OCT). Fresh tissues can also be snap frozen using a Histobath cryobath, either with or without OCT per the investigator's instructions. Heterogeneous frozen tissue blocks are enriched by physically dissecting the tissue pieces while keeping the tissues frozen. The use of pathologist-marked, H&E-stained tissues as a reference improves the percentage of either tumor or benign tissue preserved in the frozen samples.
- > **TISSUE MICROARRAY CONSTRUCTION:** Tissue microarrays are constructed on a semi-automated platform, the Alphelys MiniCore. Individual arrays made on the MiniCore system can be constructed with as many as 360 cores of 0.6-millimeter diameter or 187 cores of 1-millimeter diameter. Additionally, tissue microarrays with up to 60 cores of 2-millimeter diameter can be manually created.
- > **FROZEN AND PARAFFIN SECTIONING:** Frozen tissues are sectioned using Leica cryostats, and paraffin tissues are sectioned using Leica microtomes. These sections can be mounted on slides for hematoxylin-eosin (H&E) staining, immunohistochemistry, in-situ hybridization or laser-capture microdissection. Cut cryosections can also be placed in microcentrifuge tubes for subsequent extraction of protein or nucleic acids.
- > **CUSTOM DEVELOPMENT AND OPTIMIZATION OF NEW ANTIBODIES:** Antibodies are optimized through a variety of antigen retrieval techniques, including heat treatment with citrate buffers at various pH, heat treatment with EDTA or digestion with proteases. Antibody concentrations are titrated to achieve the best signal-to-noise ratio. When possible, positive and negative control tissues and peptide competitions are included to validate the resulting staining.

CONTACT US

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