Cleveland Clinic

Lerner Research Institute

Service Name	Core	Contact	Description
2D-Gel-DIGE Analysis	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	2D gel of multiple samples in a single gel using different fluorescent stains
2D-Gel-Sypro Ruby Stain	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	2D gel of a single sample with fluorescent staining
3-D Microscope Imaging	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	"Optical sections" or "Z Stacks" of samples can be obtained on confocal microscopes. The stacks can be reconstructed with software that allows 3-D visualization and analysis.
Analysis Of Whole Blood CBCs	Hematology Analysis	Hematology Analysis Alan Pratt MT (ASCP) Manager Location:NE6-205 Phone:(216) 444-4299 pratta@ccf.org Fax: (216) 636-2070	Absolute and percent Reticulocyte Count (Retic)CBC plus white cell differential counts (CBC/Diff)CBC/Diff plus retic (CBC/diff/retic)CBC/ reticComplete Blood Count (CBC)
Antibody Titration	Immunohistochemistry	Immunohistochemistry Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Experimental determination of appropriate antibody concentration for optimal imaging
Antigen Conjugations	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	Peptide conjugation to KLH by a glutaraldehyde protocol
Bacteriological Media	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Media used for the growth of bacteria
Biohazard Waste Processing	Glassware Core	Glassware Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Live or contagious waste can be decontaminated by the autoclave process before disposal; this service is available through the glassware core.

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Buffers	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	A buffer is an aqueous solution that has a highly stable pH. (i.e. Phosphate and Tris Buffered Saline)
Capillary Sequencing	Genomics		The Genomics Core is equipped with an Applied Biosystems 3730xl DNA Genetic Analyzer and employs experienced, well-trained personnel to handle sequencing projects. Information on how to prepare and submit samples, how to access and interpret the results is given in more detailed web pages.
CD Spectroscopy	Molecular Biotechnology	Molecular Biotechnology Smarajit Bandyopadhyay Ph.D. Project Staff Location:NB2-37 Phone:(216) 445-7095 bandyos1@ccf.org Fax:(216) 444-9404	A Circular Dichroisms (CD) Spectropolarimeter (Model J-815 from Jasco) is a type of light absorption spectroscopy that can provide information on the structures of optically active biological macromolecules. CD spectra of proteins between 250 and 185 nm can be analyzed for different secondary structural types such as, alpha helix, parallel and antiparallel beta sheet, turn and other random structures.
Cell Culture Media	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	A growth medium to support the growth of cells (i.e. RPMI and DMEM)
Cell Culture Training	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Core provides training on good lab practice to new researchers. The training can be tailored to individual needs and includes aseptic technique and culturing and maintaining cell lines.
Clinical Research Unit		LaTasha Bolden, Dept. Manager Location: M51 Phone: (216) 445-8496 boldenL@ccf.org	Facilities and personnel to conduct clinical research studies. Pre-proposal consultations, protocol-specific nursing, pre-analytic lab, study coordination services.
Cloning	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	Limiting dilution cloning of five chosen hybridoma cell lines. Collection of media amples for screening by the investigator. Minimal scale up and preparation of frozen stocks (5 vials) of clones are completed by HCF. Includes labor and supplies. This phase goes 4-8 weeks. Freezing Cells Cells from culture expansion associated with mAb production can be frozen down for storage in Liq N2. The freezing media is 90% FBS:10% DMSO and the cells are at a concentration of 2-4 x 106 cells/ml.

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Confocal Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Laser-based confocal microscopes allow us to focus on a thin "optical section" within a sample, thus removing the out-of-focus light that comes from other layers of the sample. This offers not just a clearer image, but clarifies the signal penetration beyoud the cell surface. Both samples on slides and live samples can be examined.
Consultation	Flow Cytometry		All investigators are encouraged to meet with the Flow Cytometry Core technologists to discuss the experiment.
Critical Point Drying	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Process for drying a sample for scanning electron microscopy in a way that does not cause surface deformation
Cryogenic Storage	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Core can accommodate the storage of cryovials. The core offers this service to LRI researchers for backup storage of precious cell lines.
Cryosectioning	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Blocks of frozen tissue are cut onto slides with a cryotome.
Direct Mycoplasma Testing	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	This method uses an enriched agar to support the growth of colonies. Cells and supernatant are swabbed onto agar and incubated in a modular incubator chamber. Samples are viewed microscopically every other day for 2 weeks. Mycoplasma contamination is detected by the appearance of a “fried egg “-like growth.
EBV Transformations/ Separation Of Whole Blood	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Cell Core can provide immortalization of lymphocytes with the Epstein Barr Virus (EBV). The core will separate the whole blood, collect the lymphocytes, infect with EBV, and establish a cell line.
EDAX	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Determination of the elemental composition of an electron microscope sample
Electron Microscope (Scanning And Transmission)	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Use of electron beam (rather than photons of light) to scan the surface of or pass through a sample to achieve ultra-high magnification

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Elemental Analysis (with SEM)	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Determination of the elemental composition of an electron microscope sample
ELISA	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	We can perform antigen-capture or sandwich type ELISA's to measure antibody levels in tissue culture supernatant.
EM Sample Preparation	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	The preparation of a sample for cutting and staining that will allow for it to be observed in a transmission electron microscope
Endotoxin Testing	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Endoscan V software system uses Kinetic Turbidimetrics to provide quantitative Endotoxin results for in-process and end product samples. The assay sensitivity available for use is 0.06EU/mL using a standard curve of 5-0.05 EU/mL. The Second method uses an Endosafe-PTS- A rapid, point-of-use test system that utilizes Limulus Amebocyte Lysate (LAL) reagents in a test cartridge with a handheld spectrophotometer. The PTS can effectively be used to obtain fast; quantitative LAL test results in about 15minutes.
Eradication Of Mycoplasma From Cell Cultures	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The core will test for and eradicate mycoplasma from your cells. If mycoplasma contamination is present in your cultures the core will begin to eradicate using specialized antibiotics. This will take several weeks to complete. At the end of the treatment the core will provide clean cells growing in culture as well as several frozen vials.
FACS Applications	Flow Cytometry		ImmunophenotypingIntracellular stainingMolecular and cellular probe analysisApoptosis analysis and viability detectionDetection of soluble proteinsSortingAutomated cell counts
FBS- Heat Inactivated Or Regular	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Fetal Bovine Serum, the most widely used serum-supplement due to it's very low levels of antibodies and the fact that it contains more growth factors, allowing for versatility in many different cell culture applications.
Fluorescence Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D.	Microscopes with powerful lamps and special color filter cubes allow the imaging of fluorescently tagged

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		Staff, Core Director Location:NB1-46 ▯ ▯ Phone:(216) 445-3760 drazbaj@ccf.org	speciments — both on slides and in wells, dishes and flasks.
Freezing Cells	Hybridoma	Hybridoma Earl Poptic ▯ Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 ▯ ▯ Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	The Core will freeze back hybridomas in freezing media from actively growing cells.
Frozen Sectioning	Histology	Histology Judith A. Drazba Ph.D. ▯ Staff, Core Director Location:NB1-46 ▯ ▯ Phone:(216) 445-3760 drazbaj@ccf.org	Blocks of frozen tissue are cut onto slides with a cryotome.
Fusion Of Cells	Hybridoma	Hybridoma Earl Poptic ▯ Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 ▯ ▯ Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	Fusion of spleen cells from chosen mouse to myeloma cell line. Plating of fused cells and collection of media samples for screening by the investigator. Includes labor and supplies. This phase goes 4-6 weeks.
Gene Expression Profiling Services	Genomics		Clients provide the Core with arrays (human or mouse) and total RNA (minimum of 1 microgram, 10 ul @ 100 ng/ul). The Core will perform an RNA quality control step, process the RNA samples if they pass, hybridize to the arrays and produce relevant output files (at the Cleveland Clinic the Core can install the Illumina GenomeStudio software on a PC in your lab). Supported products: Whole genome gene expression arrays e.g. Whole-Genome Expression Beadchips for Gene Expression Analysis HumanHT-12 v4 Expression BeadChipMouseWG-6 v2 Expression BeadChip MouseRef-8 v2 Expression BeadChip
Genotyping Services	Genomics		Clients provide the Core with arrays (Infinium or GoldenGate) and DNA (generally 10 ul @ 50 ng/ul). The Core will process the DNA samples, hybridize to the arrays and produce relevant output files (at the Cleveland Clinic the Core can install the Illumina genomeStudio software on a PC in your lab). Supported products: (most) Infinium and all Goldengate products. E.g. ▯Core Array Family ▯ Omni array Family ▯Custom Genotyping
Glassware Services	Glassware Core	Glassware Core Carmel M. Burns ▯	Collection of glassware from labs daily Storage of sterile glassware Daily

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		Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	delivery and stocking of glassware in lab areas
Glow Discharge	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Removal of positive charge on an electron microscope grid to prevent dispersion of sample
High Throughput Sequencing Ilumina	Genomics		
Histology	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	The processing, embedding, cutting and staining of tissue for observation in a microscope
Image Analysis/ Quantitation	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Various software programs allow microscope images to be examined for data such as area, intensity, volume, velocity, trajectory, etc. as required for 2-D, 3-D, and time-lapse experiments.
Immuno EM / Immunogold Labeling	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Pre- and Post-Embedding Immunogold Labeling for transmission electron microscopy
Immunohistochemistry	Immunohistochemistry	Immunohistochemistry Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	This chemical technique allows us to visualize the expression levels and distribution of specific proteins within cells and tissues.
Indirect Mycoplasma Testing	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The core also uses a quick method to detect mycoplasma. This kit detects the four most common types of mycoplasma to contaminate cells. This is useful in determining the type of mycoplasma present.
Infrared Scanner (Odyssey)	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Infrared Scanning of gels, membranes, slides on Li-Cor Odyssey
Insect Cell Culture	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Core is equipped with a 27°C incubator that is an optimum temperature to support the growth of insect cells.
Insect Media	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager	Media for insect cell culture

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Integra Culture System	Hybridoma	Hybridoma Earl Poptic ▯ Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 ▯ ▯ Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	For production of mAb from cell lines This system is intended for production of 30-60mg of mAb per month in the smaller system and 100-200mg of mAb in the larger system. Ave. concentration is 1.5mg/ml. The production schedule ave. is 8 weeks.
Isothermal Titration Calorimetry	Molecular Biotechnology	Molecular Biotechnology Smarajit Bandyopadhyay Ph.D. ▯ Project Staff Location:NB2-37 ▯ ▯ Phone:(216) 445-7095 bandyos1@ccf.org Fax:(216) 444-9404	Isothermal Titration Calorimetry (ITC) is the gold standard for measuring biomolecular interactions. ITC ▯ simultaneously determines all binding parameters (n, K, δH and δS) in a single experiment – information that cannot be obtained from any other method. When substances bind, heat is either generated or absorbed. ITC is a thermodynamic technique that directly measures the heat released or absorbed during a biomolecular binding event. Measurement of this heat allows accurate determination of binding constants (KB), reaction stoichiometry (n), enthalpy (δH) and entropy (δS), thereby providing a complete thermodynamic profile of the molecular interaction in a single experiment. Because ITC goes beyond binding affinities and can elucidate the mechanism of the molecular interaction, it has become the method of choice for characterizing biomolecular interactions.
Isotope Enrichment Analysis	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. ▯ Director Location:NE1-251 ▯ ▯ Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	Determination of protein turnover rates by analyzing the degree of heavy ▯ isotope enrichment
Laboratory Testing	Laboratory Diagnostic Core	Laboratory Diagnostic Core Alan Pratt MT (ASCP) ▯ Manager Location:NE6-205 ▯ ▯ Phone:(216) 444-4299 pratta@ccf.org Fax: (216) 636-2070	Automated clinical chemistry assaysDrugs of Abuse/ ToxicologySpecific ProteinsMetabolicSpecial ChemistryFertility/ PregnancyTherapeutic Drug MonitoringELISA based testing
Large-scale Antibody Production	Hybridoma	Hybridoma Earl Poptic ▯ Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 ▯ ▯ Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	The Hybridoma Core uses a static cell culture system – the Integra Flask – to produce high concentration (>.5mg/ml) monoclonal antibodies. This can be done in serum-free or using ultra-low IgG/IgM serum. Yields can be as high as 100mg/month/flask.

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Large-scale Antibody Purification	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	We can purify up to 80mg of IgG from one sample using a protein G column
Laser Capture Microdissection	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Use of microscope and a laser to cut and collect individual cells or small sections of tissues or cultures.
LB Agar Plates	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Luria Broth agar plates are typically used as a growth substrate for the culture of bacteria. Selective growth compounds may also be added to the media, such as antibiotics. (i.e. Ampicillin and Kanamycin) Custom plates are also available.
LB Broth	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Luria Broth, a nutritionally rich medium used for the growth of bacteria
Light Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Samples can be viewed on a microscope by allowing light to pass through a sample (transmitted light) or to shine on it (incident light, as in fluorescence imaging).
Liquid Nitrogen Storage Of Cells	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	Storage for cloned cell lines. The stored cell lines must be mycoplasma free.
Live Cell Imaging	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Inverted microscopes allow the imaging of live cells in culture acquiring either still photos or time-lapse movies.
Method Development	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	It is essential to provide accurate, reliable, and consistent data in analytical services. Based on the need of investigators, we provide services for developing analytical methods using a) HPLC-UV, b) HPLC-Fluorescence, and c) LC/MS/MS for analysis of endogenous compounds

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			and xenobiotics in biological matrices like plasma, urine and tissues.
Methylation Services	Genomics		Clients provide the Core with arrays (Infinium HumanMethylation450) and DNA (10 ul @ 50-100 ng/ul). The Core will process the DNA samples, hybridize to the arrays and produce relevant output files (at the Cleveland Clinic the Core can install the Illumina GenomeStudio software on a PC in your lab). Bisulphite conversion can also be done in the Core Supported products: Infinium HumanMethylation450.
Molecular Weight Analysis	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	Determination of the molecular weight of a peptide or protein.
Mouse Injections	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	We will perform intraperitoneal injections of antigen into mice to elicit an immune response for the production of monoclonal antiodies.
Multi-Photon Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	A multi-photon microscope allows deeper penetration of light into a sample (up to 500um rather than the 100um of standard confocals) and can be used for tissue slices or anesthetized animals.
Mycoplasma Testing	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The core routinely performs a direct and an indirect method of testing for Mycoplasma. The following 2 tests are done in parallel.
Novel Compound Identification	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	Anyone isolating compounds from biological sources has an interest, first, in establishing the activity of compound, then its molecular weight, and finally, the compound's definitive structure. We provide services using HPLC for purification of the compound interested and LC/MS/MS for identifying the molecular weight of the compound and for producing structure confirmation if needed.
Nucleic Acid Quality/ quantity Assessment Agilent Bioanalyzer Chip, Nanodrop And Qubit Services	Genomics		Characterization of the integrity of RNA and DNA samples using Agilent Bioanalyzer chips. Samples may be destined for whole genome gene expression, genotyping, next gen

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			sequencing library preparation and sequencing. Sample quantification via Nanodrop and Qubit are also offered.
Nucleic Acid Shearing Covaris Services	Genomics		Nucleic acid fragmentation is a crucial first step in NGS sequencing workflow. Covaris S220 shears DNA without GC bias or thermal damage. The Adaptive Focused Acoustics™ (AFA) technology is firmly established as the fragmentation method of choice for NGS library generation.
Paraffin Embedding	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Placement of processed sample into wax block for sectioning
Peptide Synthesis	Molecular Biotechnology	Molecular Biotechnology Smarajit Bandyopadhyay Ph.D. Project Staff Location:NB2-37 Phone:(216) 445-7095 bandyos1@ccf.org Fax:(216) 444-9404	Peptides are complex molecules and each peptide sequence is unique with regard to its chemical and physical properties. Peptides are synthesized by the solid-phase method using Fmoc chemistry using a liberty peptide synthesizer(CEM Inc.) based on microwave technology and an Omega 396 multiple peptide synthesizer (Advanced ChemTech).
Plastic Embedding	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Special form of histological tissue preparation that uses plastic resin rather than paraffin
Polyclonal Antibody Production	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	This service will be offered on a limited basis depending on available housing. One rabbit per antigen. Includes animal purchase and board, 6 injections, 1 test bleed, 3 production collections, final bleed and labor for 120 days. Time course can be extended for additional fee based on animal board and labor charges. The goal is to provide a total of 100mls of serum, but this is not guaranteed. Allow 1-2 weeks for animals to arrive.
Post-translational Modification	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director	Identification of modification sites from either an in-gel or in-solution protein digestion

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Preclinical Research Facilities	Translational Research	Translational Research Alan Pratt MT (ASCP) Manager Location:NE6-205 Phone:(216) 444-4299 pratta@ccf.org Fax: (216) 636-2070	AFIC/ GCIC Operating Theater Two Theaters are Available
Preparing Your Samples For Mycroplasma Testing	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The cells should be grown without antibiotics for 3-4 days. Collect cells for testing by scraping the adherent cells and collecting about 5mls of cells and media. For suspension cells, grow without antibiotics and supply 5mls for testing.
Protein Identification	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	Identification of proteins from either a 1D or 2D gel band or from proteins in solution
Purifications	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	We can purify monoclonal or polyclonal antibodies using Protein G or an epitope specific affinity column
Quantitative Analysis	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	Quantitation at either the protein or modification level. Can be done using either label free methods or methods that include the incorporation of stable isotopes
Quarterly Testing Of DI Water	Glassware Core	Glassware Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	DI water from throughout the Lerner complex is tested for Endotoxins on a quarterly basis. Results are available in NB1-15.
Readout Systems - Using The Synergy4 Multi-detection Multi-plate Reader	Molecular Screening	Molecular Screening Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	General requirements Optimization Screening Data processing shRNA bank
Rodent Survival Surgery Procedure Room	Translational Research	Translational Research Alan Pratt MT (ASCP)	Two bays with surgical microscopes and machines to administer volatile

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Roller Bottle Cultures	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Core has the capability of producing large scale adherent cells cultured in either 850 cm” or 1750 cm” roller bottles grown on a roller apparatus in a 37°C warm room. This is a very suitable method when large amounts of cells are required. This method also works well with suspension cells.
Screening Chemicals	Molecular Screening	Molecular Screening Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	Stage I: establishment of the readout assay Stage II: primary screening Stage IV: optimizing hits, SAR
Sectioning	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	The cutting of embedded tissue onto slides (also "cryosectioning")
Serum Testing	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The core screens FBS from different sources for optimum cell growth. The batch that proves most compatible to a broad range of cell types is provided for LRI researchers.
Slide Scanning	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	A large region of interest - or even the whole surface of a slide - can be imaged on a special scanner.
Specialty And Custom Media	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	A custom recipe prepared according to researchers instructions or guidelines
Spinner Cultures Cells	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Useful for the production of large volumes of suspension cells. Vessels come in various sizes that are used in conjunction with a magnetic stirrer spinner base. The core can provide volumes from 100mls-10L.
Spinning Disk Confocal Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760	This technology for imaging live samples cuts down on photodamage in time-lapse experiments and allows three-dimensional imaging.

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		drazbaj@ccf.org	
Sputter Coating	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Samples for scanning electron microscopy are first prepared by depositing an ultra-thin layer of gold on the surface
Stereomicroscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	An automated dissecting microscope with color digital camera allows the imaging of large unmounted samples with brightfield and/or fluorescence illumination.
Sterility Testing	Cell Culture	Cell Culture Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	The Core offers sterility services using in-house prepared broths along with regular mycoplasma and endotoxin testing. Quarterly testing results are available.
Sterility Testing	Media Preparation Core	Media Preparation Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Verifying the sterility of our products or yours through QC broths, endotoxin and Mycoplasma testing
Sterilization And Autoclaving	Glassware Core	Glassware Core Carmel M. Burns Manager Location:NB1-25 Phone:(216) 444-5814 burnsc@ccf.org	Washing and Sterilization of all types of glasswareSterile Pipettes and Pasteurs Autoclaving of liquids and dry materialsWashing and Sterilization of special glasswareSterile Tips and custom tips available Sterile DI water
Storm 820 Phosphorimager	Molecular Biotechnology	Molecular Biotechnology Smarajit Bandyopadhyay Ph.D. Project Staff Location:NB2-37 Phone:(216) 445-7095 bandyos1@ccf.org Fax:(216) 444-9404	The Storm system is an optical scanner that produces digital images of radioactive or fluorescently labeled samples. The Storm 820 Phosphorimager is used only to scan a phosphor screen that has been exposed with a radioactive sample. Users will need to provide their own phosphor screen. One can analyze the results of a scan with ImageQuant TL which has been installed on the data acquisition computer. Storm 820 is located in NB-5, near the elevators. A sign-up log book is available next to the instrument.
Surface Plasmon Resonance (SPR)	Molecular Biotechnology	Molecular Biotechnology Smarajit Bandyopadhyay Ph.D. Project Staff Location:NB2-37 Phone:(216) 445-7095 bandyos1@ccf.org Fax:(216) 444-9404	Surface Plasmon Resonance (SPR) has been used to monitor macromolecular interactions in real time. The Biacore 3000 system is an instrument that uses SPR technology for measuring the interactions of macromolecules with each other, and with small ligands. One of the ligands is immobilized on carboxymethylated dextran over a gold surface, while the second partner (analyte) is captured as it flows over the immobilized ligand surface. Most ligands can be directly immobilized

Service Name	Core	Contact	Description
			onto the surface of the chip via amino groups, carbohydrate moieties, or sulfhydryl groups. Others are immobilized indirectly through the use of biotinylation of the ligand (such as biotinylated peptides or oligonucleotides), or through immobilized monoclonal antibodies (such as anti-GST). Typical amounts of a protein ligand needed for an immobilization reaction is about 1 µg. The immobilized ligands are remarkably resilient and maintain their biological activity.
Targeted Metabolomics	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	Small molecules (100-800 Daltons) have a variety of biological functions, serving as cell signaling molecules, as tools in molecular biology, and as drugs in medicine. Liquid chromatography on-line tandem mass spectrometry (LC/MS/MS) is the method of choice for small molecule quantitation because it provides accurate, reliable and consistent data and requires fewer specimens. We provide services using LC/MS/MS for quantitation of small molecules in complex biological matrices, such as plasma, urine and cell extracts.
Thick Sectioning (for EM)	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Thick sections in the 1-2 µm range can be stained and viewed in a light microscope to determine the right area of the specimen for ultra-thin sectioning.
Thin Sectioning (for EM)	Electron Microscopy	Electron Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	The embedded sample must be cut with a diamond knife into extremely thin slices for viewing in the electron microscope. Ultra-thin sections range from 50-100 nm in thickness.
Time-lapse Imaging	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Inverted microscopes allow the imaging of live cells in culture over a determined period of time and at set intervals, producing time-lapse movies.
TIRF Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Total Internal Reflection Fluorescence with a microscope using a laser and specially designed optics
Tissue Processing	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	The preparation of tissue for cutting and staining that involves dehydration and infiltration with paraffin or plastic

Service Name	Core	Contact	Description
Tissue Staining	Histology	Histology Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	Use of various dyes to render tissue visible and to mark particular features
Training	Flow Cytometry		The LRI Flow Cytometry Core offers training programs for Beginning and Advanced Flow Cytometer Operators.
Two-Photon Microscope	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	A multi-photon microscope allows deeper penetration of light into a sample (up to 500um rather than the 100um of standard confocals) and can be used for tissue slices or anesthetized animals.
Untargeted Metabolomics	Proteomics And Metabolomics	Proteomics And Metabolomics Belinda Willard Ph.D. Director Location:NE1-251 Phone:(216) 444-7170 willarb@ccf.org Fax: (216) 444-9404	The unbiased analysis of small molecules (100-800 Daltons) derived from a variety of biological matrices such as plasma, urine, and cell extracts can be performed in the Metabolomics Core. These experiments involve the extraction of the small molecule metabolites, a survey LC-MS/MS analysis, chromatographic alignment of the LC-MS data, and quantitative comparison of these metabolites across groups. The data is analyzed with two different methods. The first involves the identification and quantitation of all metabolites based on the observed m/z ratio and retention time. This analysis results in the identification of 500 to 1000 metabolites many of which are unnamed compounds. The second method of data analysis involves the comparison of the observed metabolites to an in-house metabolite library. This method of data analysis results in the determination of the relative abundance of 100's of named metabolites in these samples.
Western Blot	Hybridoma	Hybridoma Earl Poptic Manager, Hybridoma Core and Molecular Screening Core Location:NB1-25 Phone:(216) 445-6635 poptice@ccf.org Fax:(216) 445-0515	We will run the SDS PAGE gel, transfer and detect using investigator provided primary antibody plus ECL reagent.
Whole Slide Scanner (microscope)	Digital Imaging Microscopy	Digital Imaging Microscopy Judith A. Drazba Ph.D. Staff, Core Director Location:NB1-46 Phone:(216) 445-3760 drazbaj@ccf.org	A large region of interest - or even the whole surface of a slide - can be imaged on a special scanner.