



Shared Resources

Centralized access to specialized scientific expertise,
consultation and other cancer research services

UCDAVIS
COMPREHENSIVE
CANCER CENTER



The Shared Resources of the UC Davis Comprehensive Cancer Center provide the cancer research community with centralized access to specialized scientific expertise, consultation and assistance, infrastructure and instrumentation necessary to conduct leading-edge scientific research that focuses on beating cancer.

In cooperation with other core service units at UC Davis, the Shared Resources provide a variety of *in vitro* (molecular, chemical, genetic, cellular) and *in vivo* (animal models, imaging) laboratory and research support (biostatistics, biorepository) products and services in support of experimental and translational cancer research. Through special funding arrangements, cancer center members receive subsidies for and/or priority access to these resources, although anyone can use the services and resources for their research. The Shared Resources are intended to facilitate research activities of all cancer center members, and to help them obtain extramural grant funding and publish high-profile and peer-reviewed cancer research.

For rates and additional information, please visit cancer.ucdavis.edu/research



Biorepository

Accredited by the College of American Pathologists, the Biorepository Shared Resource (BRSR) provides well-characterized, high-quality, de-identified specimens with annotated data for clinical and basic science research purposes. The biorepository functions as a centralized tissue bank to provide researchers access to cancer and non-cancer-related specimens (fresh/frozen tissue, paraffin blocks/sections and fluids), procured and stored using international standards of best practices and protocols compliant with the Office for Human Research Protection.

SERVICES

- Fresh/frozen tissue including tumors and non-tumor tissue
- Biological fluids such as blood, bone marrow and urine
- Routine histology; processing, embedding and sectioning of fixed wet tissue; H&E stained paraffin sections; unstained paraffin sections; special stains
- Immunohistochemistry (IHC) with commercially available/validated antibodies; validation/optimization of new investigational antibodies; IHC on tissue microarray (TMA) sections
- Immunofluorescence
- Custom and disease-specific tissue microarrays for investigators
- Consultative services; limited annotated data; extensive annotated data; pathologist consultation, interpretation and annotated images
- Biospecimen storage for investigator initiated studies. LN freezer, -80°C freezer
- Access to clinical formalin-fixed paraffin-embedded (FFPE) blocks

LOCATION/CONTACT

Biorepository office/lab: UC Davis Medical Center, 2315 Stockton Blvd., 2nd Floor, Room 2P524, Sacramento, 95817
Histology lab: Pathology Building, 4400 V St., Sacramento, 95817
916-734-3026



Flow Cytometry

The Flow Cytometry Shared Resource (FCSR) provides access to state-of-the-art flow and tissue cytometry, cell sorting and single cell genotyping and qPCR for researchers at UC Davis and industry partners. Expert staff can assist investigators with cell-sorting applications, experimental design, instrument operation and data analysis.

SERVICES

- Cell sorting (up to six populations labeled with up to 16 colors)
- Single-cell cloning and deposition into multi-well plates
- Analytic cytometry (one- to 24-color analysis of fluorescently labeled cells)
- Preparation for single-cell cDNA amplification
- Apoptosis assays
- Cell proliferation assays
- DNA content for cell-cycle distribution and RNA flow cytometry
- Fluorescence resonance energy transfer
- Intracellular calcium levels
- Mitochondrial membrane potential
- Phosphorylation state detection
- Single-cell genotyping and real-time qPCR
- Experiment design and trouble-shooting consultation
- Annual subscription access to FlowJo software
- Assistance with data analysis and instrumentation training

LOCATION/CONTACT

UC Davis campus
3425 Tupper Hall, Davis, 95616
Lab: 530-752-7205
Office: 530-754-9611

bmclaughlin@ucdavis.edu

jvandyke@ucdavis.edu

Sacramento campus
Institute for Regenerative Cures
2921 Stockton Blvd., Suites 1670 and 1681,
Sacramento, 95817
Lab: 916-703-9307

bmclaughlin@ucdavis.edu

jvandyke@ucdavis.edu

Mouse Biology

The Mouse Biology Shared Resource (MBSR) offers services and procedures for using mutant mice and mouse models for basic and translational cancer research. Assembled from cancer research-relevant components of the UC Davis Mouse Biology Program, the MBSR provides scientific expertise, technical assistance and training, specialized and unique capabilities, and dedicated infrastructure for mouse embryo manipulation, genome mutagenesis, husbandry, production and phenotyping, and PDX/PET services. These capabilities are essential for supporting contemporary preclinical studies using laboratory mice to understand mechanisms and pathways of cancer, assess drug and intervention strategies, and test new hypotheses that advance research to beat cancer

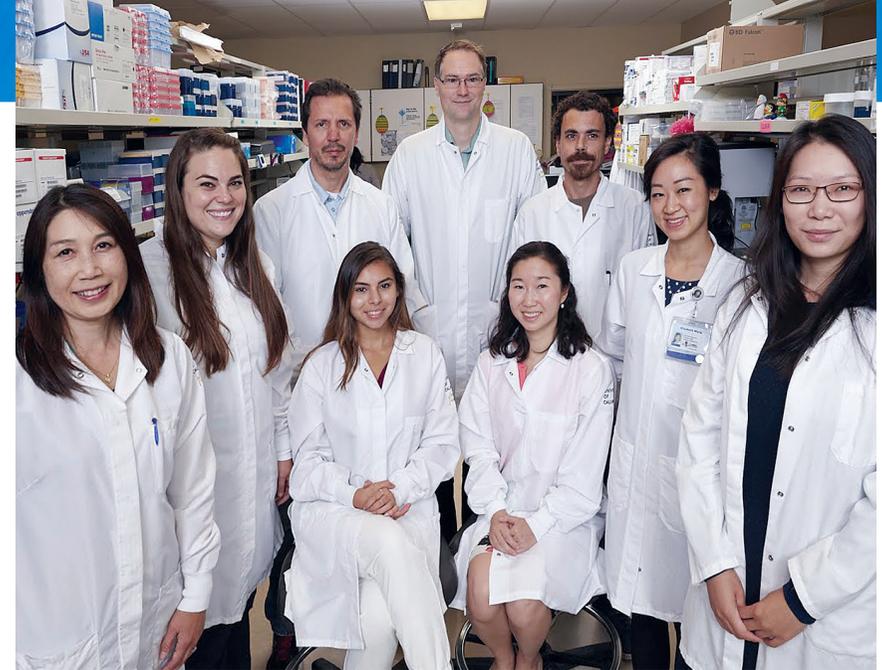
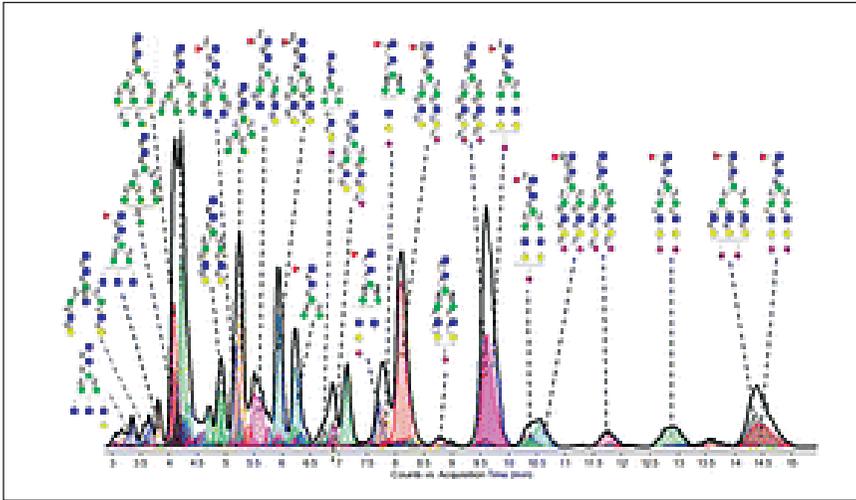
SERVICES

- Genetic manipulation and genome editing (CRISPR/Cas9) of mice and mouse embryonic stem cells
- Gross and microscopic pathology and histopathology
- PDX and PetDX modeling
- Whole body phenotyping and immunophenotyping
- Pharmacokinetics and pharmacodynamics
- Advanced surgical procedures
- Specialized care, colony management and transport of mice
- Gnotobiotic resources and services for microbiome testing and manipulation
- IVF/ICSI and germline phenotyping

LOCATION/CONTACT

2795 Second Street, Suite 400, Davis, 95618
530-754-MOUSE (530-754-6687)

MBSR@ucdavis.edu



Biostatistics

The Biostatistics Shared Resource (BSR) provides expertise in the design, analysis and reporting of cancer-related studies, including basic, translational, clinical and population-based research. Our affiliated faculty and staff work with investigators from the earliest stages of study planning. We are especially committed to mentoring early-career cancer researchers.

SERVICES

- Statistical expertise for the robust and efficient design of new studies, including sample size and power calculations and analytic plans
- Statistical advice and analysis support for cancer center studies, meeting reproducible research standards from preparation of data sets for analysis through statistical procedures to reporting and publication
- Development of research on statistical methodology relevant to cancer center research goals
- Statistical consultation to the Scientific Review Board, the Clinical Trials Quality Assurance Committee and cancer center senior leadership
- Education and mentoring in necessary biostatistical knowledge and skills

LOCATION/CONTACT

Department of Public Health Sciences, Davis, 95616
 Kristy LeClair, kleclair@ucdavis.edu

Immune Monitoring

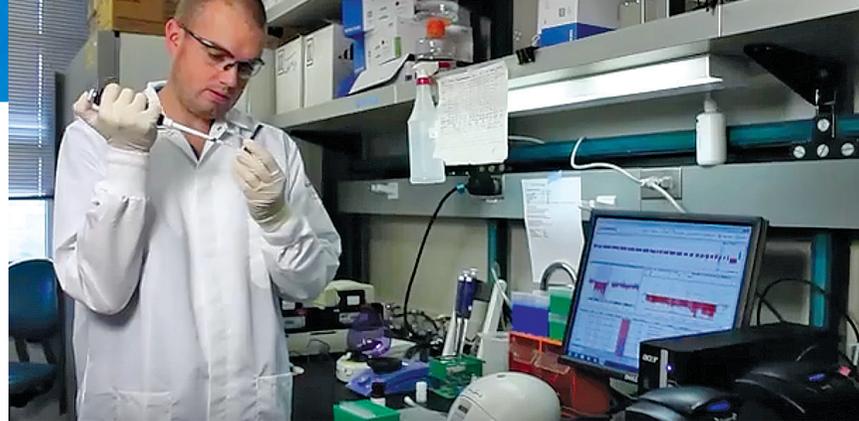
The Immune Monitoring Shared Resource (IMSR) was established to provide scientific support to investigators conducting clinical studies in humans, preclinical studies in animals and/or studies in veterinary medicine. It is well suited to conduct the immunology-based assays needed to monitor patients in clinical immunotherapy trials, but the IMSR also offers a variety of different molecular and cellular assays for investigators in different fields, including custom assays designed to meet specific needs. Investigators at any of the University of California campuses, as well as outside investigators in industry and academia, are encouraged to contact us.

SERVICES

- Multi-color immune phenotyping by flow cytometry
- Luminex-based multiplexing (cytokines and chemokines) assays
- T-cell repertoire analysis
- Digital and multiplex quantitative real-time PCR assays
- Next-generation sequencing library preparation and data analysis for immune-targeted transcriptome monitoring
- Microbiome analysis
- Consultancy on immune assay design

LOCATION/CONTACT

Institute for Regenerative Cures
 2921 Stockton Blvd., Suite 1630, Sacramento, 95817
 916-734-2156



Combinatorial Chemistry and Chemical Biology

The Combinatorial Chemistry and Chemical Biology Shared Resource (CCCBSR) provides a high throughput screening platform for users to discover unique chemical probes against biological targets using various one-bead one-compound (OBOC) and one-bead two-compound (OB2C) combinatorial libraries. The CCCBSR interacts closely with resource users on optimization of the lead compounds via focused libraries and standard medicinal chemistry techniques. In addition, the CCCBSR provides custom synthesis of telodendrimer-based micellar nanoparticle platform for efficient drug delivery.

SERVICES

- Hands-on user training to perform library synthesis and screening
- Providing pre-made OBOC and OB2C combinatorial libraries
- Design, synthesis and screening of custom-made combinatorial libraries
- Screening of the pre-made combinatorial libraries against targets provided by users
- Sequencing and structural determination of the positive hits from library screening
- Re-synthesis of compounds (peptides, peptoids and small molecules) in on-bead and soluble form for *in vitro* and *in vivo* evaluation
- Providing telodendrimer-based nanomicelles for nanoformulation and *in vivo* delivery of hydrophobic drugs
- Providing instrumentation and support for SPR molecular binding studies with BiaCore 3000
- Full consultation service
- Providing polyvinyl alcohol (VPA)-based nanomicelles for loading or conjugation of drugs
- Preparation of peptide microarray using microfluidic synthesis technology

LOCATION/CONTACT

Oak Park Research Building, Suite 2301, Sacramento, 95817
 916-734-0902 or 916-734-0905
rwliu@ucdavis.edu

Genomics

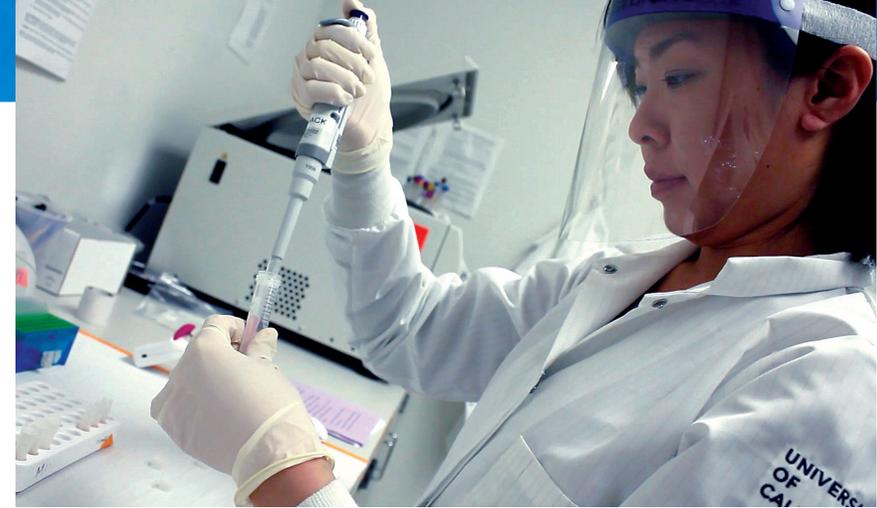
The Genomics Shared Resource (GSR) provides expertise and comprehensive services to accomplish virtually every application of next-generation sequencing and microarray-based genomics research, including gene expression profiling, mutation/variant analyses, copy number analysis, epigenomics and metagenomics. In addition to standard applications, this includes the development of custom protocols and extensive data analysis and integrative bioinformatics support. The GSR also provides a wide range of services for translational and clinical genomics research.

SERVICES

- RNA/DNA isolation and quality analysis
- Affymetrix GeneChip and Agilent SurePrint Microarrays
- Next-generation sequencing
- Sequencing library preparation for all applications: RNA-Seq, small RNA-Seq, ChIP-Seq, exome, whole-genome, microbiome
- Targeted sequencing panels
- Metagenomic sequencing
- NanoString nCounter analyses
- Quantitative PCR validation and panels
- Translational and clinical genomics: tumor specimens, blood, FFPE tissue, laser-capture microdissection, pathology support
- Specialized sample preparation: circulating tumor DNA, blood, cell-free, low input, single-cell, exosomal RNA
- Data analysis and bioinformatics
- Consultation: experimental design, troubleshooting, logistics, manuscript preparation, grant proposal assistance

LOCATION/CONTACT

UC Davis Medical Center
 Research III, Room 3200D
 4645 2nd Ave., Sacramento, 95817
 916-703-0366
mpsr@ucdavis.edu



In vivo Translational Imaging

The In vivo Translational Imaging Shared Resource (IVTISR) provides access to a broad range of *in vivo* imaging technologies including molecular imaging, optical imaging, quantitative physiologic and anatomic imaging, and unique capability for whole-body PET/CT scanning in humans and animals. It also provides targeted imaging probes and tracers as well as expertise in planning, executing and analyzing *in vivo* imaging studies. The resource can support imaging studies in humans, rodents, and in larger animals such as cats and dogs with spontaneous cancers.

SERVICES

- Initial consultation and study design
- Investigator training for unassisted imaging (CMGI)
- Assisted scanning
- Radiopharmaceuticals and development
- Animal handling, anesthesia and physiologic monitoring
- Data processing and archival
- Image analysis
- Scheduling and data management
- Other laboratory work
- Quality control of instruments
- Pilot small-grant program to obtain preliminary data (CMGI)

LOCATIONS/CONTACT

Center for Molecular and Genomic Imaging
 Genome and Biomedical Sciences Facility, Davis, 95616
cmgiimaging@ucdavis.edu
imaging.bme.ucdavis.edu
 530-754-8960

Center for Imaging Sciences
 UC Davis Veterinary School, Davis, 95616
 Allison Zwingenberger, azwingen@ucdavis.edu
 Rich Larson, rflarson@ucdavis.edu

Molecular Pharmacology

The Molecular Pharmacology Shared Resource (MPSR) provides services to support the development and implementation of clinical trials at the UC Davis Comprehensive Cancer Center. The MPSR conducts preclinical modeling of novel anti-cancer agents to test hypotheses and develop the scientific rationale required for translation of laboratory concepts into clinical trials, including the assessment of DM/PK/PD properties. The MPSR also oversees high-quality collection, processing and analysis of clinical specimens (typically but not exclusively blood specimens) for pharmacokinetic and correlative studies from clinical trial patients.

SERVICES

- Protocol and study development: Specimen collection protocols and language; development of hypotheses and objectives for translational studies; development of novel biomarker assays; HIPAA compliance; budget development
- Specimen acquisition: Collection and processing of specimens; specimen log-in, de-identification and storage; provision of periodic updates on specimen accrual to study PI
- Specimen analysis: Coordinate or perform specimen biomarker analysis; data synthesis and analysis
- Preclinical modeling: Novel agent activity, synergism testing, target validation; models include cell lines, traditional xenografts and patient-derived xenografts (PDXs)
- DM/PK/PD: Investigate DM/PK/PD properties of new anticancer agents, as well as potential DDIs

LOCATION/CONTACT

UC Davis Comprehensive Cancer Center
 4501 X Street, Suite 3016
 Sacramento, CA 95817
 916-734-1566, aimyu@ucdavis.edu
 916-734-0821, axmartinez@ucdavis.edu



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2279 45th St.
Sacramento, CA 95817

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