5 Experimental Tissue Resource

UCI Chao Family Comprehensive Cancer Center

LEADERSHIP & MISSION


Robert Edwards, MD, PhD
Director


Wendy Cozen, DO, MPH
Co-Director


Delia Tifrea, PhD, MBA
Manager

ETR supports the research mission across UC Irvine and the campus research community and assists investigators with:

- Tissue procurement
- Tissue processing
- Histopathology interpretation

SERVICES, TECHNOLOGIES & EQUIPMENT

- Fresh and FFPE Tissue Procurement and Interpretive Histopathology Consultation
- Tissue Histology and IHC services
- Mouse Pathology services and consultation on mouse models of human disease
- Biorepository/tissue banking services, including a user-searchable deidentified database of archival tissue

EQUIPMENT

Learn more about available state-of-the-art equipment

INVENTORY

FFPE (Surgical + Biopsy): **328,987**

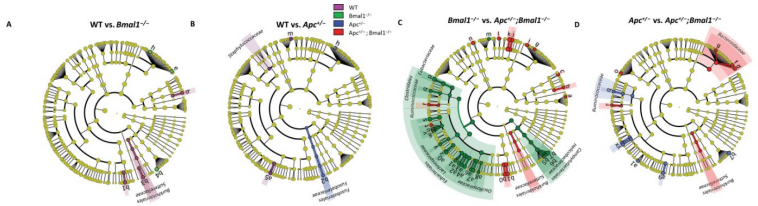
Frozen Tissue: 5,682

SUPPORT PROVIDED (Annual)
65% cancer-related

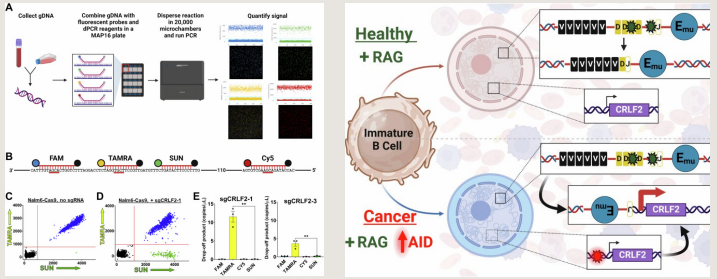
- Clinical trials **97**
- Individual patients **1,348**
- Investigator-initiated trials **8**
- Basic research projects **43**
- ETR consultation for database, IRB, sample collection, protocol review **84**
- TMA **10**

RESEARCH HIGHLIGHTS

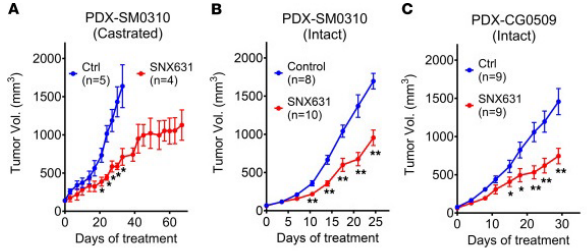
Circadian disrupts gut microbiome & barrier in CRC



Latin American Health Disparities in Ph-like ALL

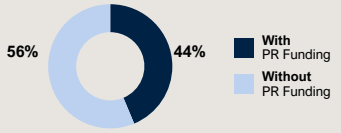


CDK8/19 inhibition reverses castration resistance of PCa



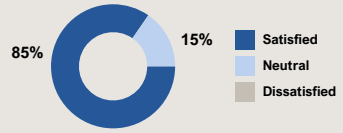
IMPACT & KEY METRICS CY2024

CFCCC MEMBER UTILIZATION



Used by **76** Unique CFCCC Member Labs
31% Overall Usage by CFCCC Members

CFCCC USER SATISFACTION

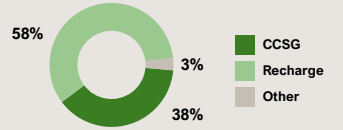


17% Response Rate

$11M Supported CFCCC Members Receive 19 New Cancer-relevant Grants (Total Direct Costs)

13 Support Led to **12** New Cancer-Relevant Publications **(23%)** in IF ≥ 10 Journals)

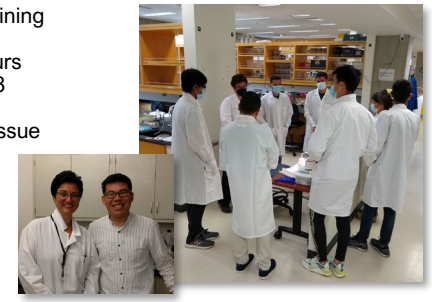
BASE SR FUNDING



$442,074 Annual Budget

TRAINING

- Histology processig: in-person training and observership – 5 hours
- Ventana scanning training – 6 hours
- Mouseaorta dissection 3 users – 3 hours
- Complete mouse necropsy and tissue processing - 4 hours



FUTURE PLANS

- Build ETR service presence at UCI Health - Irvine campus
- CAP accreditation
- Multiplex IHC and IF using Ventana Discovery
- Customized EPIC cohort discovery with automated samples identification and retrieval from sample inventory-greatly expand access to specimens

Internal Advisory Committee

Wendy Cozen, DO, MPH
Interim Associate Director
Pop Sci & Cancer Control, CFCCC

Sherif Rezk, MD
Professor
Pathology

Robert Edwards, MD, PhD
Director
ETR, CFCCC

Jessica Sheldon, CIP
Director
Human Research Protection

Anand Ganesan, MD, PhD
Program Co-Leader
BIDD, CFCCC

Delia Tifrea
Manager
ETR, CFCCC

Angela Fleischman, MD, PhD
Program Co-Leader
SPT, CFCCC

Edwin Monuki MD, PhD
Chair & Professor
Pathology

FREQUENCY
As needed

FUNCTION
Allocate specimens based on merit and study benefit to enhance cancer-related research at UCI

AUTHORITY
Decision power on research tissue release priority

MAIN

Services, Technologies & Equipment

Routine Histology Services and Equipment

- Leica Peloris Tissue processor, microtome, Leica CM3050 Cryostat, Ventana Discovery automatic stainer






- -80C and LN2 freezers
- Freezerworks SUMIT biobanking inventory program
- Ventana DP200 high-speed digital slide scanner
- TMA Grand Master- 3DHISTECH


NEXT

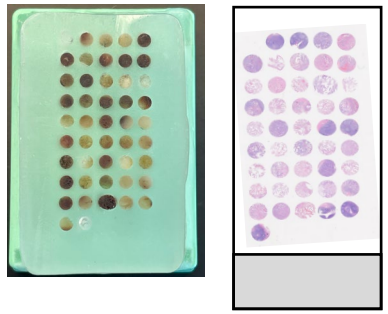
Featured Technology

TMA Grand Master – 3DHISTECH

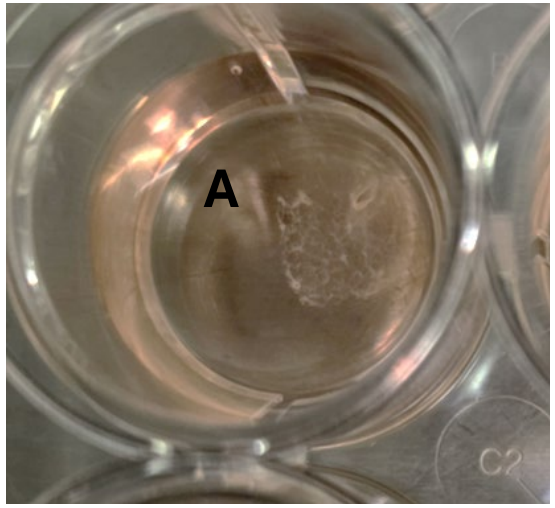
Available core/block (core diameter)

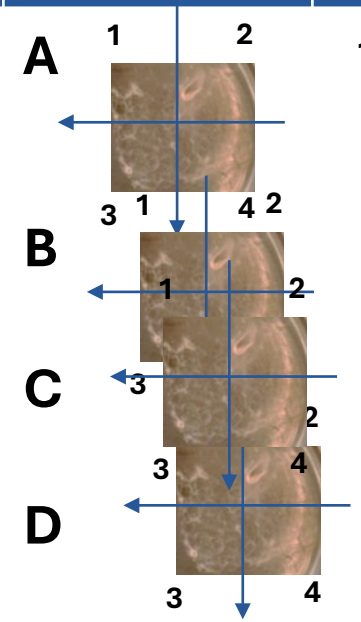
- 558 - (0.6 mm)
- 286 - (1 mm)
- 135 - (1.5 mm)
- 84 - (2 mm)

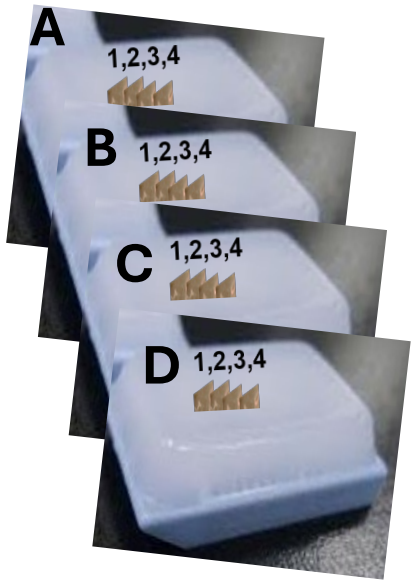
Feasible for proteomics ***nanoString***- GeoMx DSP

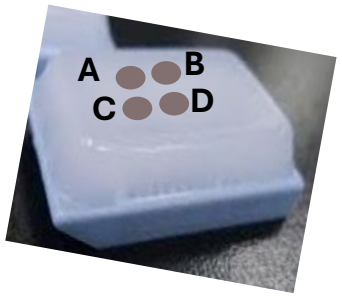


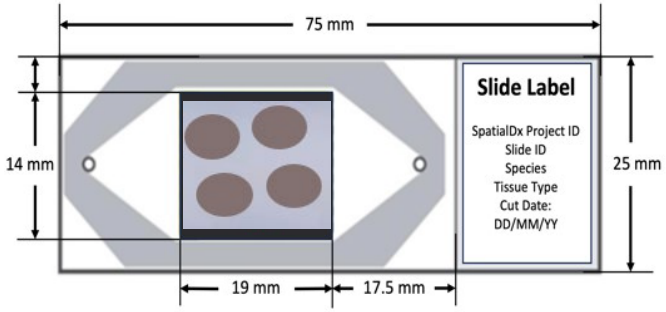
150 microns thick lung Tissue cultured	Formalin fixed cut in 4	Stacking	Paraffin embedding	Custom TMA	High-plex Single-Cell Spatial Omics











MAIN

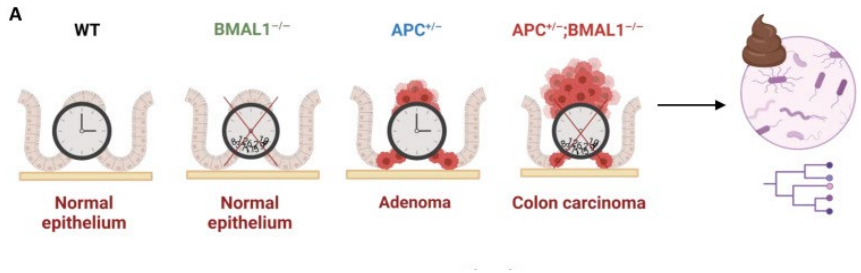
Inventory

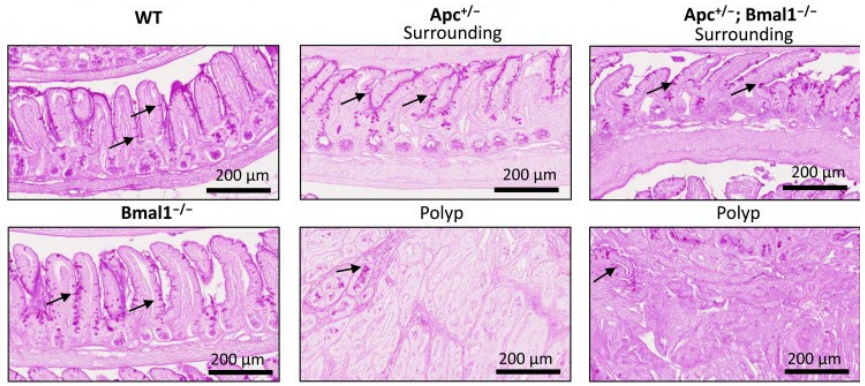
TISSUE	SURGICAL RESECTIONS FFPE (5 years)	BIOPSIES FFPE (5 years)	FROZEN Tissue
Brain	589 (326)	3,006 (1,297)	644
Colon	2,204 (956)	23,352 (13,546)	259
Pancreas	875 (266)	398 (211)	98
Breast	5,808 (2,505)	1,211 (354)	118
Uterus	899 (547)	237 (99)	219
Ovary, Adnexa	1,671 (712)	206 (77)	280
Prostate	1,858 (602)	377 (239)	735
Kidney	1,180 (422)	169 (78)	295
Bladder	535 (288)	1,308 (513)	29
Lung	285 (130)	177 (133)	36
Total		**328,987**	**5,682**

MAIN

Circadian clock disrupts gut microbiome & barrier in CRC

- Circadian Disruption & CRC Progression: Mice with disrupted intestinal circadian rhythms exhibited a significant increase in tumor burden compared to controls
- Microbiome Alterations: Clock disruption led to notable changes in gut microbiota composition, including a decrease in beneficial bacteria and an increase in potentially harmful species
- Metabolic Pathway Changes: There was a significant alteration in microbial metabolic pathways, particularly those related to nucleotide and amino acid metabolism
- Impaired Gut Barrier Function: Mice with disrupted clocks showed reduced expression of tight junction proteins, leading to increased intestinal permeability
- Therapeutic Implications: These findings suggest that maintaining circadian rhythm integrity could be crucial for gut health and may offer a potential avenue for colorectal cancer prevention





CATCHMENT AREA RELEVANCE

H/Lat

Investigators


Masri, PhD


Pannunzio, PhD


Seldin, PhD

CFCCC Investments

SHARED RESOURCE

DOT

FUNDING
2024

PROGRAMS

Outcomes

PUBLICATION
Fellows, Science Advances, 2024
PMC11430476

GRANTS R01CA259370
R01CA244519

IMPACT The circadian clock is important for maintaining both intestinal permeability and bacterial homeostasis, and these factors could be important for the pathogenesis of CRC

MAIN

Latin American Health Disparities in Ph-like ALL

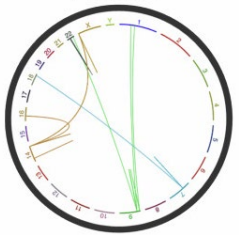
Latin American ancestry linked to high risk and treatment refractory ALL

- Chromosomal translocations between *CRLF2* and *IGH* occur in over 60% of Ph-like ALL cases
- *CRLF2-IGH* translocations occur at a higher rate in people with Latin American ancestry
- We found that activation-induced cytidine deaminase (AID) is a causal factor in translocations
- Latin American patients with Ph-like ALL have more AID-induced mutations genome-wide

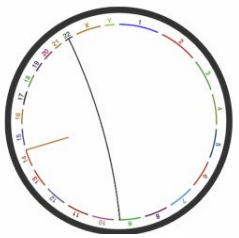
Long-Read DNA Sequencing Shows High Level of Genome Instability in Ph-like ALL

	hg38 Genomic Coordinates	
Locus	**Ph-Like-4**	**Ph+-2**
IGH	chr14:105,856,341-105,873,004	chr14:105,856,341-105,873,004
CRLF2	chrX:1,206,101-1,230,261	No Structural Variant
BCR	chr22:23,282,759-23,300,199	chr22:23,282,759-23,300,199
ABL1	No Structural Variant	chr9:130,839,992-130,845,657
IKZF1	chr7:50,333,391-50,338,511	No Structural Variant
	chr7:50,297,986-50,323,897	No Structural Variant
JAK2	chr9:5,085,952-5,104,396	No Structural Variant
	chr9:5,016,355-5,034,799	No Structural Variant
CDKN2A	chr9:21,966,752-21,996,324	No Structural Variant
TCR	chr14:21,942,101-21,956,635	No Structural Variant

Ph-Like-4

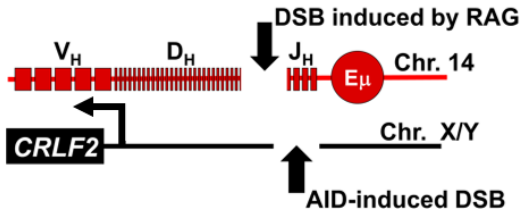


Ph+-2



De-Identified Material Collected from ALL Patients, UCI

Sample	Age	Sex	Ethnicity	Genetics/FISH Findings	Source	% Blasts
Ph-Like ALL[1]						
Ph-like-1	60	M	Hispanic	*CRLF2* and *IGH* Rearrangement[2]	BM	95
Ph-like-2	24	M	Hispanic	*CRLF2* and *IGH* Rearrangement[2]	BM	95
Ph-like-3	70	F	Hispanic	*CRLF2* and *IGH* Rearrangement[2]	BM	95
Ph-like-4	54	M	Hispanic	*CRLF2::IGH*[3]	PB	90
Ph-like-5	31	F	Hispanic	*P2RY8* and *CRLF2* Rearrangement[2]	BM	62
Ph-like-6	46	F	Hispanic	*P2RY8* and *CRLF2* Rearrangement[2]	BM	50
Ph-like-7	70	M	Hispanic	*P2RY8::CRLF2*[4]	PB	59
Ph-like-8	26	M	Hispanic	*P2RY8* and *CRLF2* Rearrangement[2]	PB	90
Ph-like-9	29	M	Asian	*CRLF2* and *IGH* Rearrangement[2]	BM	56
Ph-like-10	75	M	White	*CRLF2* and *IGH* Rearrangement[2]	PB	91
Ph-Positive ALL						
Ph+-1	64	M	Hispanic	*BCR::ABL1*	BM	95
Ph+-2	44	M	Hispanic	*BCR::ABL1*	BM	90
Ph+-3	78	F	Asian	*BCR::ABL1*	BM	90
Ph+-4	50	F	Asian	*BCR::ABL1*	BM	90
Ph-Negative ALL						
ALL-1	48	M	Hispanic	Negative for *BCR::ABL1*, *IGH*, *CRLF2*, *MYC*, and *KMT2A* Rearrangements	PB	73
ALL-2	61	M	Hispanic	*KMT2A::AFF1*	BM	80



CATCHMENT AREA RELEVANCE

H/Lat

Investigators


Pannunzio, PhD


Fleischman, MD, PhD


Seldin, PhD


Quintero-Rivera, MD


Masri, PhD


Tanjasiri, DrPH, MPH

CFCCC Investments

SHARED RESOURCE OBC GRT HUB ETR

DOT

FUNDING 2021

PROGRAMS

Outcomes

PUBLICATION

Rangel, Nature Communications, 2024
PMC11283463

GRANTS R37CA266042*
R01CA276470

*Supported research

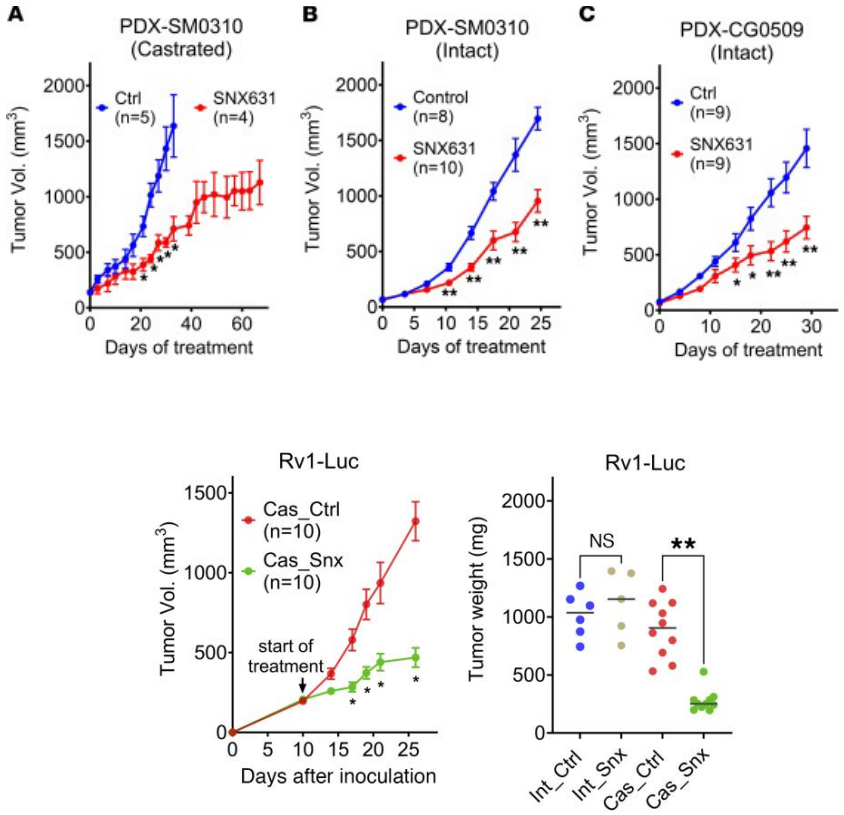
IMPACT | Demonstration that aberrant, off-target AID activity is a causal factory driving *CRLF2-IGH* translocations in populations with Latin American ancestry (Hispanic and Latino)

MAIN

CDK8/19 Inhibition Reverses Castration Resistance of PCa

Both Kinases are upregulated in castration-resistance prostate cancer (CRPC)

- CDK8/19 Upregulation: CDK8/19 expression is significantly higher in CRPC tumors
- Restoring Androgen Sensitivity: CDK8/19i treatment suppressed tumor growth in 3 AR-positive PDX models derived from PCa patients, at least 2 of whom failed ADT and chemotherapy. Interestingly, the effect of CDK8/19 inhibition in one of these models was associated with the suppression of intratumoral blood supply, indicating a stromal effect of MKI
- Tumor Regression & Cures: Combining prolonged CDK8/19 inhibitor treatment with castration not only suppresses CRPC xenograft growth but also induces tumor regression and, in some cases, leads to cures. Combined CDK8/19 inhibition and castration lead to complete tumor regression in 40% of mice



CATCHMENT AREA RELEVANCE

Investigators

Zi, PhD

CFCCC Investments

SHARED RESOURCE

DOT

FUNDING
2020 COE

PROGRAMS

Outcomes

PUBLICATION
Li, Journal of Clinical Investigation, 2024
PMC11093614

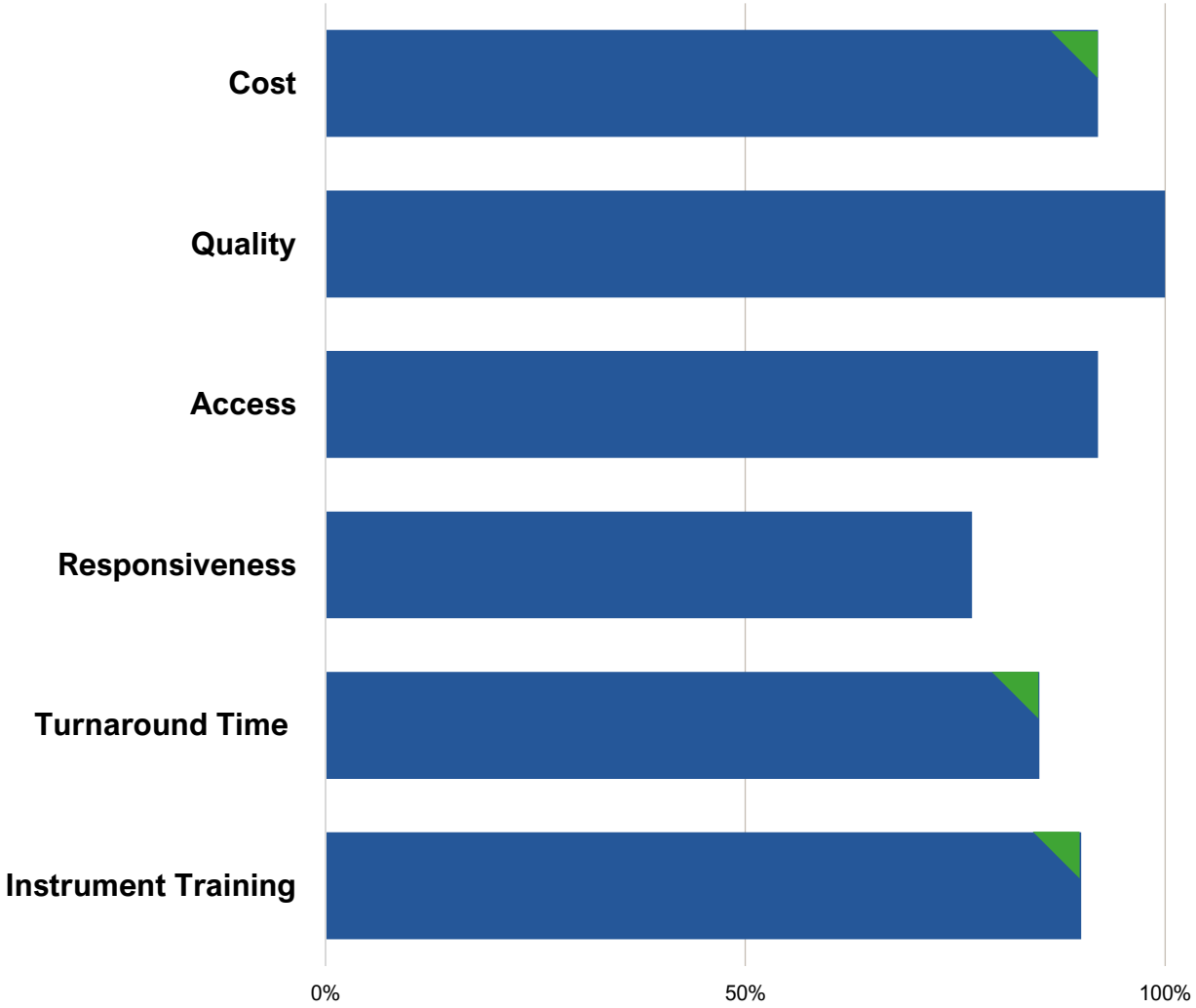
GRANTS HT9425-24-1-0656

IMPACT Results support the development of mediator kinase inhibitors as a new class of drugs for the treatment of CRPC that is resistant to currently available therapies

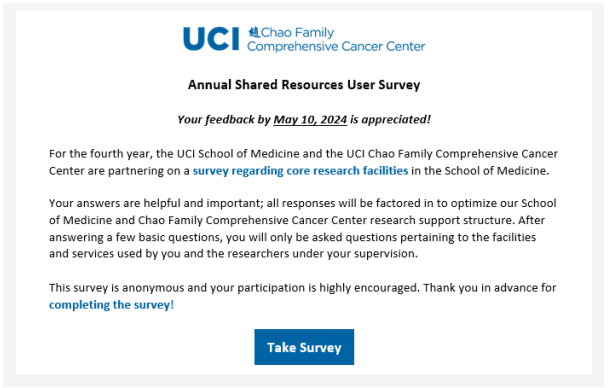
MAIN

2024 Annual Core Research Facilities Survey

Excellent + Good (No scores below average received) Improved since 2021



SURVEY PROMOTION



UCI Chao Family Comprehensive Cancer Center

Annual Shared Resources User Survey

Your feedback by May 10, 2024 is appreciated!

For the fourth year, the UCI School of Medicine and the UCI Chao Family Comprehensive Cancer Center are partnering on a **survey regarding core research facilities** in the School of Medicine.

Your answers are helpful and important; all responses will be factored in to optimize our School of Medicine and Chao Family Comprehensive Cancer Center research support structure. After answering a few basic questions, you will only be asked questions pertaining to the facilities and services used by you and the researchers under your supervision.

This survey is anonymous and your participation is highly encouraged. Thank you in advance for **completing the survey!**

Take Survey

Research Insider

UCI School of Medicine

Office of Research

2024 Core Facilities Survey

UCI School of Medicine and the UCI Chao Family Comprehensive Cancer Center are partnering on a survey regarding core research facilities in the School of Medicine. Your answers are helpful and important; all responses will be factored in to optimize our research support structure. After answering a few basic questions, you will only be asked questions pertaining to the facilities and services used by you and the researchers under your supervision. This survey is anonymous. For questions, contact **Claire Brainard Draper**. Please complete the survey by **May 10, 2024**.

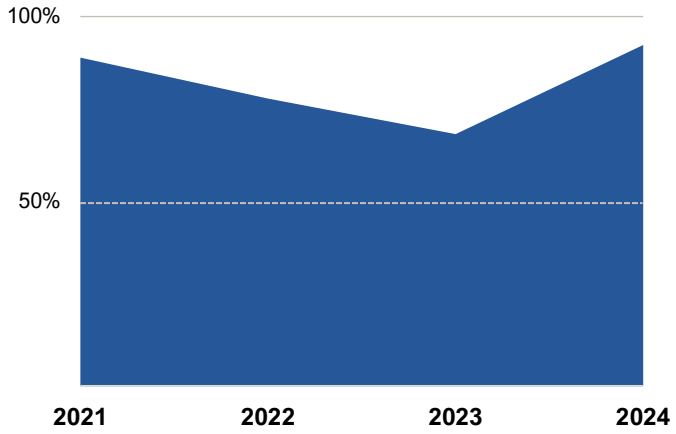
Complete Survey

NEXT

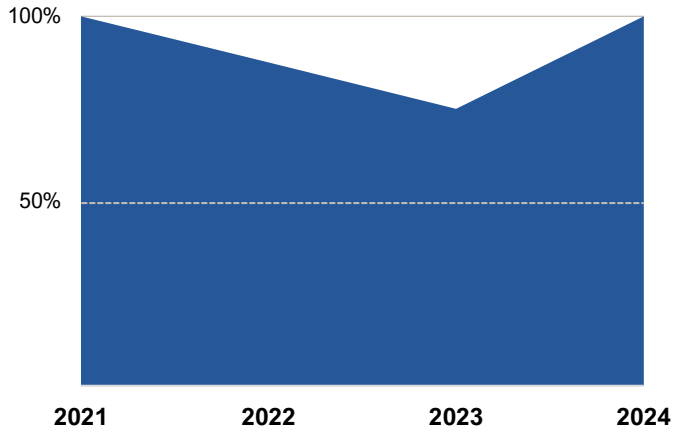
Annual Core Research Facilities Survey

Excellent + Good

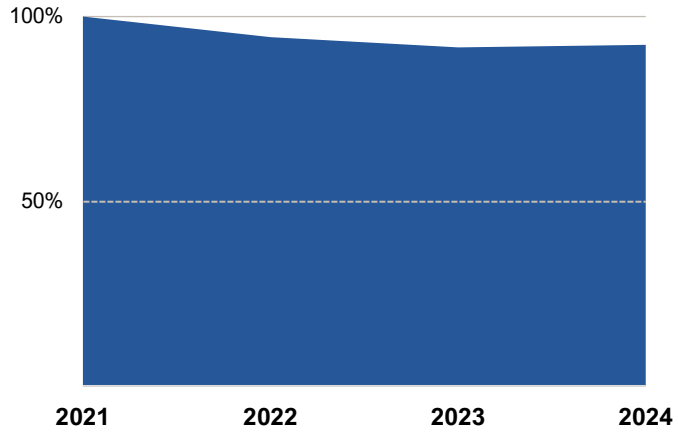
COST



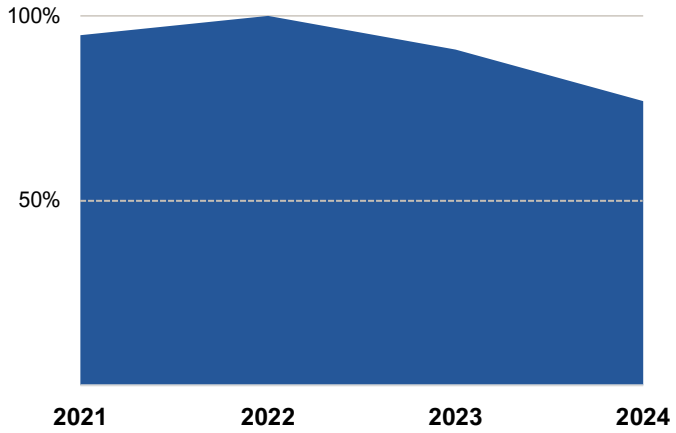
QUALITY



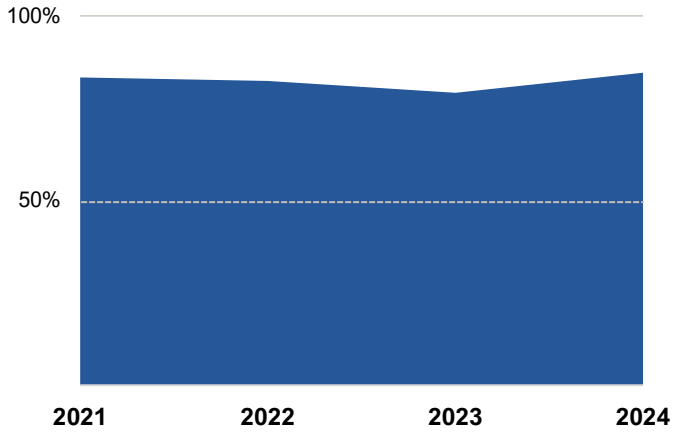
ACCESS



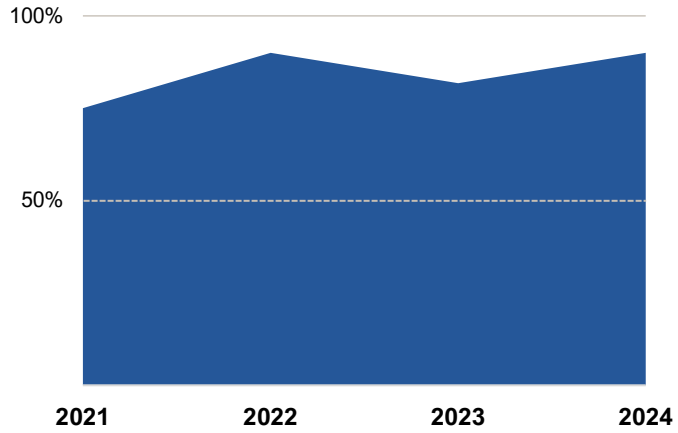
RESPONSIVENESS



TURNAROUND TIME



INSTRUMENT TRAINING



MAIN

Selected 2024 Publications

CFCCC INVESTIGATOR(S)	PROGRAM	JOURNAL	YEAR
Marcus Seldin, PhD Nicholas Pannunzio, PhD Selma Masri, PhD	SPT	Science Advances	2024
Oliver Eng, MD Jennifer Valerin, MD Sora Tanjasiri, DrPH, MPH Marcus Seldin, PhD Selma Masri, PhD Angela Fleischman, MD, PhD Nicholas Pannunzio, PhD	BIDD SPT CC SPT SPT SPT SPT	Nature Communications	2024
Xioalin Zi, PhD	CC	The Journal of Clinical Investigation	2024
Xioalin Zi, PhD	CC	Clinical and Translational Medicine	2024
Edward Uchio, MD Xioalin Zi, PhD	CC	Molecular Cancer Therapeutics	2024
Vahid Yaghmai, MD Zhuoli Zhang, MD PhD	BIDD	American Journal of Cancer Research	2024
Aimee Edinger, VMD, PhD Cholsoon Jang, PhD Gina Lee, PhD	BIDD SPT SPT	iScience	2024

MAIN