6 Biostatistics Shared Resource

UCI Chao Family Comprehensive Cancer Center

LEADERSHIP & MISSION

Min Zhang, MD, PhD[2]
Director

Wen Pin Chen, MS
Manager

BSR provides a centralized resource of expertise for the experimental design and analysis of basic, translational, clinical, and population-based cancer research

- Initiates active participation during grant preparation in the areas of cancer etiology, genetics, detection and prevention
- Partners on research design, qualitative and quantitative protocol features
- Incorporates existing and develops new statistical methods
- Provides guidance on sample size requirements

SERVICES, TECHNOLOGIES & EQUIPMENT

Study Design, Data Analysis & Interpretation
- Study design and sample size calculations
- Data management and quality control
- Data analysis, interim analysis, findings, missing data

Develop & Maintain Statistical Quality Control Procedures
- Statistical review of research protocols and grant preparation
- Protocol evaluation for clear objectives, background and purpose
- Elements for evaluation include drug information, staging criteria, eligibility, stratification or randomization schemes, treatment plan, monitoring and toxicities and dosage modification, and criteria for evaluation and endpoint definitions

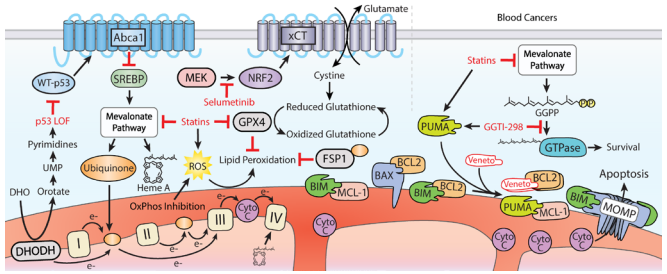
Omics Data Analysis
- Genomic (SNP, WGS, WES) data analysis (including GWAS, PheWAS)
- Transcriptomic (bulk/single cell RNA-seq) including eQTL
- Epigenetics (ChIP-seq, ATAC-seq)
- Single-cell multi-omics
- Functional (pathway GO)
- Metabolomics

Consulting
- Bioinformatics; Database; Machine Learning; Statistical genetics & genomics

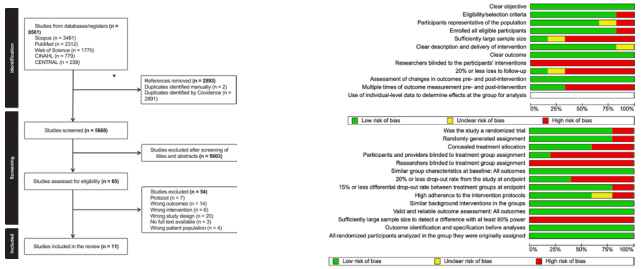
Research Computing
- HIPAA-compliant computation, cloud
- Setup/run intensive jobs
- Programming assistance
- Database design & management

RESEARCH HIGHLIGHTS

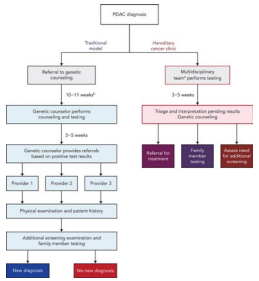
Control of leukemia cell survival by mevalonate pathway



Interventions to mitigate cancer-related financial hardship

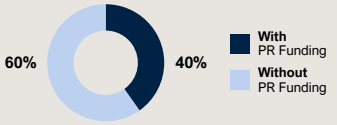


Heredity Cancer Clinics Improve Adherence to NCCN



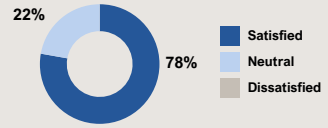
IMPACT & KEY METRICS CY2024

CFCCC MEMBER UTILIZATION



Used by **33** Unique CFCCC Member Labs
14% Overall Usage by CFCCC Members

CFCCC USER SATISFACTION

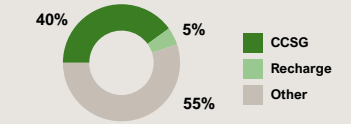


27% Response Rate

$3.1M Supported CFCCC Members Receive 6 New Cancer-relevant Grants (Total Direct Costs)

15 Support Led to New Cancer-Relevant Publications **(20%)** in IF ≥ 10 Journals)

BASE SR FUNDING



$348,779 Annual Budget

TRAINING

- Annual NCI-funded summer workshop on “Big Data Training for Cancer Research”
- Regular need-based workshops on basic statistical analysis, workflow for sequencing data analysis, FAIR computational workflows on the cloud, and more

FUTURE PLANS

- **Community Engagement/Catchment Area**: Expand new services to facilitate interdisciplinary collaborations in catchment area
- **Equity, Diversity & Inclusion**: New machine learning methods to improve analysis of data from URM populations
- **Education & Training**: Organize regular seminar series

Internal Advisory Committee

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

Jeremy Harris, MD
Assistant Professor
Radiation Oncology

Danh Nguyen, PhD
Professor
Internal Medicine

Ritesh Parajuli, MD
Assistant Clinical Professor
Hematology Oncology

Sora Park Tanjasiri, DrPH, MPH
Associate Director
CE & Cancer Health Equity, CFCCC

MEMBERS

- The internal advisory committee includes experts in melanoma, breast cancer, radiology, community outreach and statistician
- **Member Responsibilities**: Provide suggestions and recommendations to improve BSR operation and address BSR needs. Attend annual meeting and participate in discussions to shape aims and goals of BSR
- **Selection Process:** Nominated, expressed interest, or invited with necessary expertise, commitment, and willingness to support BSR's initiatives and utilization of BSR services yearly
- **Appointment Terms***:* 3 years

FREQUENCY
Annually

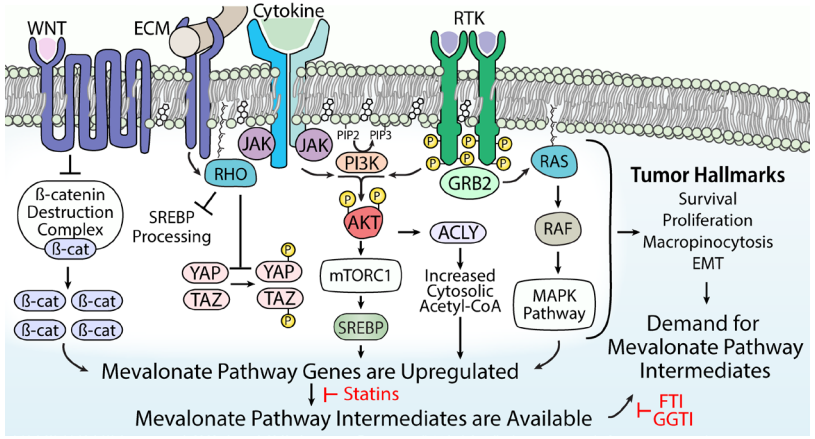
FUNCTION
Review, discuss, address and advise on BSR needs, services and operation policy

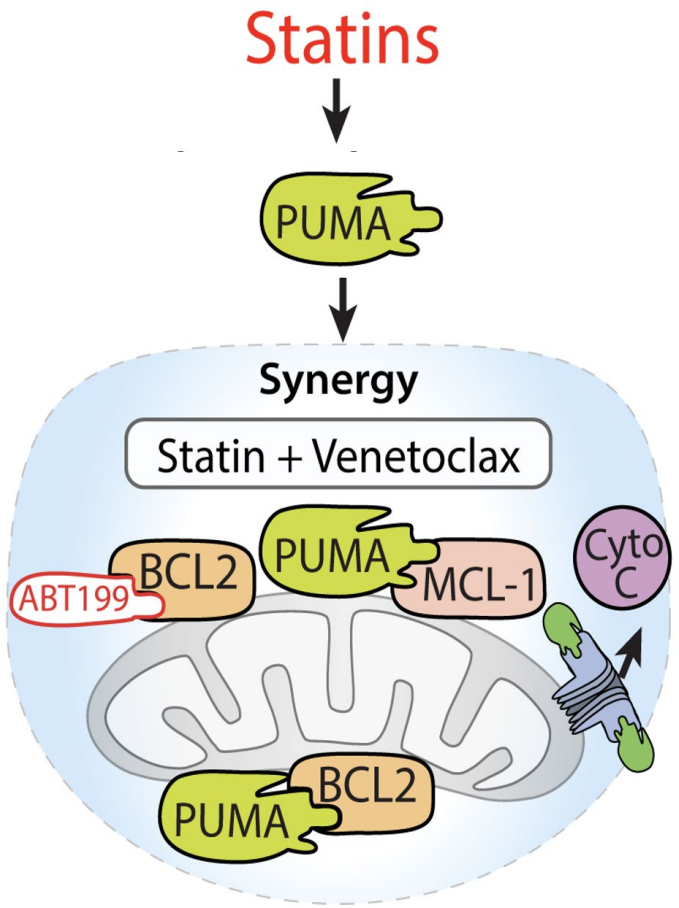
AUTHORITY
Provide recommendations to BSR and CFCCC leadership

MAIN

Control of leukemia cell survival by the mevalonate pathway

- The mevalonate biosynthetic pathway is a cancer dependency in leukemia, particularly in AML
- Statin drugs that inhibit the mevalonate pathway are well-tolerated, relatively low-cost drugs that have potential to be repurposed to improve treatment of AML
- A statin drug called pitavastatin has highly potent cytotoxic activity in AML cells, even those with high-risk features like loss of p53
- This projects investigates the mechanism of statin action to identify biomarkers for personalized cancer medicine





CATCHMENT AREA RELEVANCE

Investigators


Brem, MD


Fruman, PhD


Zhang, MD, PhD

CFCCC Investments

SHARED RESOURCE

DOT

FUNDING
2017, 2018
2022

PROGRAMS

Outcomes

PUBLICATION
Fruman, Trends in Cancer, 2021
PMC8137523

GRANTS DBG-24-1319247-01-IBCD
NCT04512105
DOD submitted

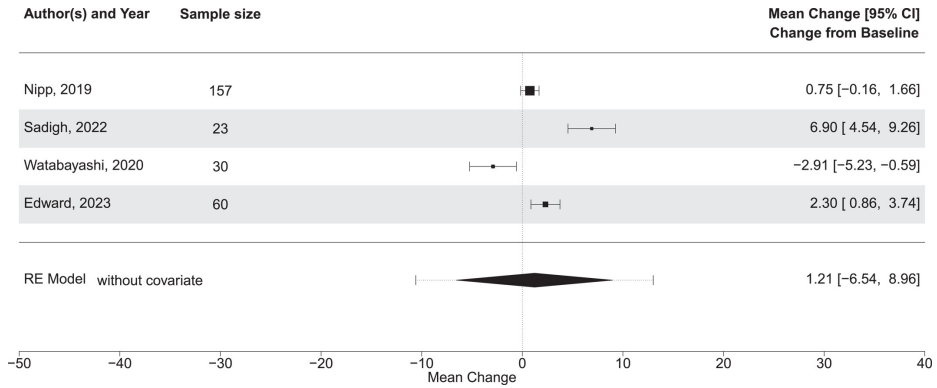
IMPACT Findings will provide insight into mevalonate pathway addiction in leukemia and guide biomarkers for advancing targeted therapies through pitavastin/venetoclax clinical trials to improve patient outcomes

MAIN

Interventions to mitigate cancer-related medical financial hardship

A systematic review and meta-analysis

- PubMed, Cochrane, Scopus, CINAHL, and Web of Science were searched for articles published in English during January 2000 – April 2023
- Two independent reviewers selected prospective clinical trials with an intervention targeting and an outcome measuring financial hardship
- Financial worry improved in only 27.3% of 11 studies
- Four studies (373 participants; 37% male, mean age, 55.88 years) assessed the impact of financial navigation on financial worry using the comprehensive score of financial toxicity (COST) measure (score range, 0-44; higher score = lower financial worry)
- The intervention of significantly changed COST score when pre-invention COST was ≤ 14.5



CATCHMENT AREA RELEVANCE

Investigators

Sadigh, MD

Ziogas, PhD

CFCCC Investments

SHARED RESOURCE

FUNDING
2024

PROGRAMS

Outcomes

PUBLICATION
Rashidi, Cancer, 2024 PMID 3878809

GRANTS R01CA272680*

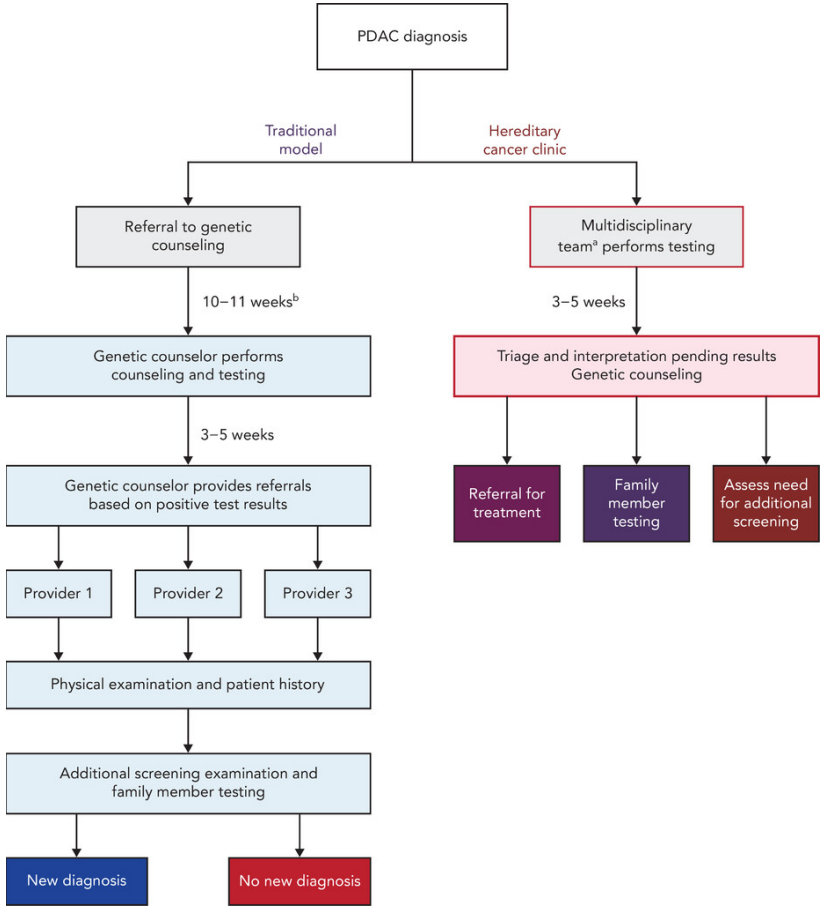
*Supported research

IMPACT | Effective financial navigation reduces financial distress in high-risk cancer patients

Heredity cancer clinic improves compliance

Compliance boosted with NCCN pancreatic cancer testing

- The 2018 changes to the NCCN guidelines recommending germline testing for all patients with PDAC significantly increased genetic counseling referral rates at this academic medical center
- The implementation of a heredity cancer clinic further boosted compliance with guidelines



CATCHMENT AREA RELEVANCE

Investigators


Valerin, MD, PhD


Cho, MD


Dayyani, MD, PhD


Lee, MD


Chen, MS


Zell, DO, MPH

CFCCC Investments

SHARED RESOURCE

DOT

PROGRAMS

Outcomes

PUBLICATION

Rosso, Journal of the National Comprehensive Cancer Network, 2024 PMC11462954

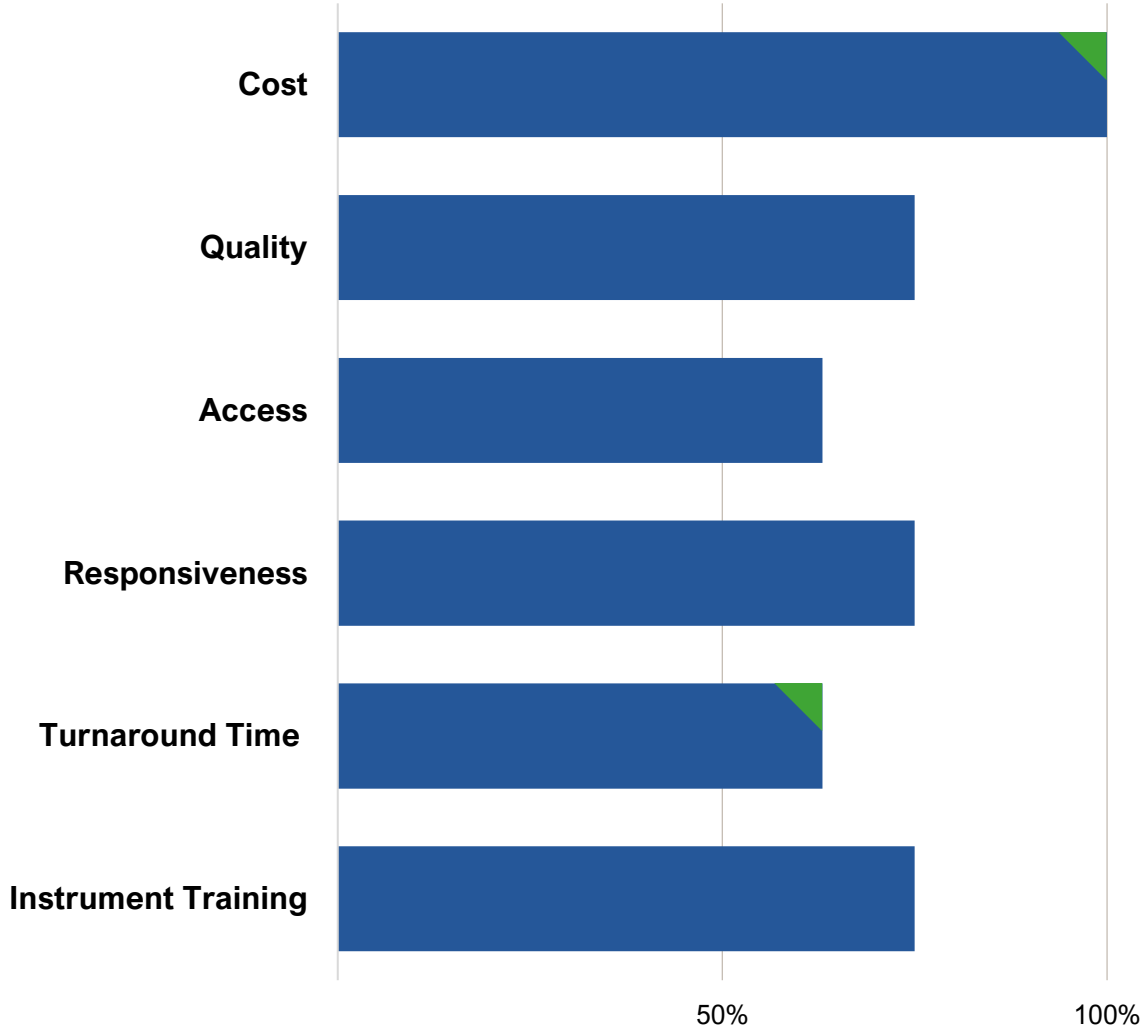
GRANTS R50CA285412

IMPACT | UCI's compliance with updated NCCN germline testing guidelines rose significantly, boosted by a hereditary cancer clinic, eliminating outdated screening biases for PDAC patients

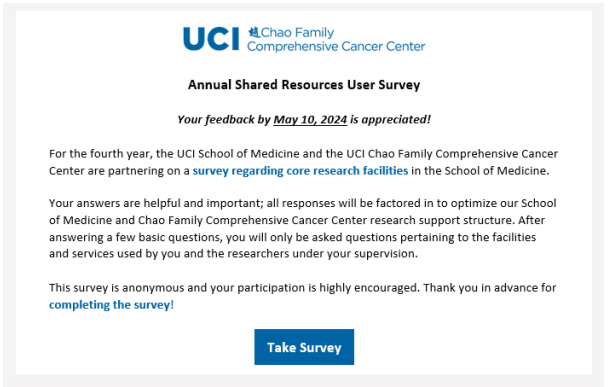
MAIN

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!**

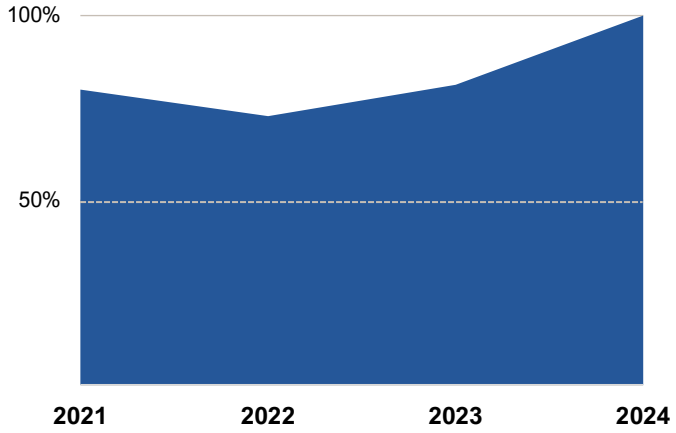
Take Survey

NEXT

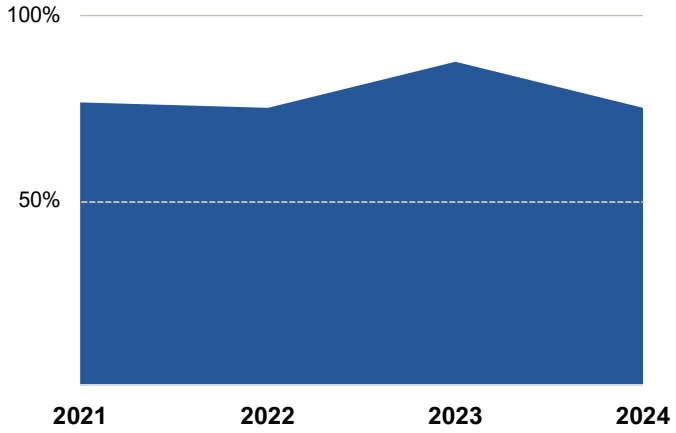
Annual Core Research Facilities Survey

Excellent + Good

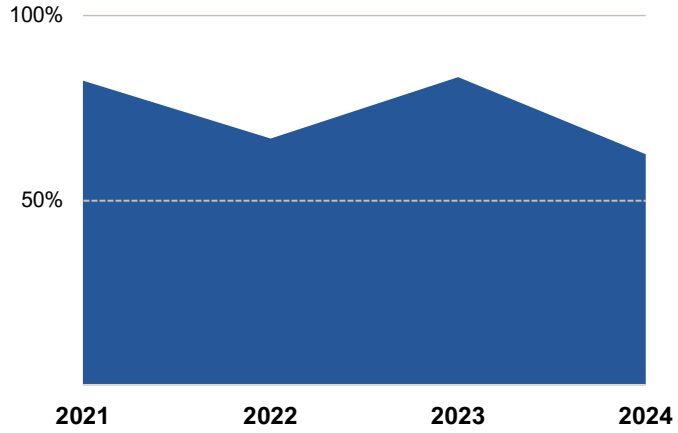
COST



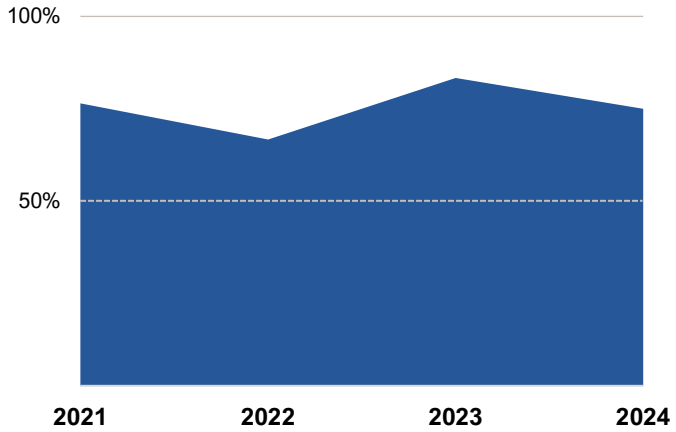
QUALITY



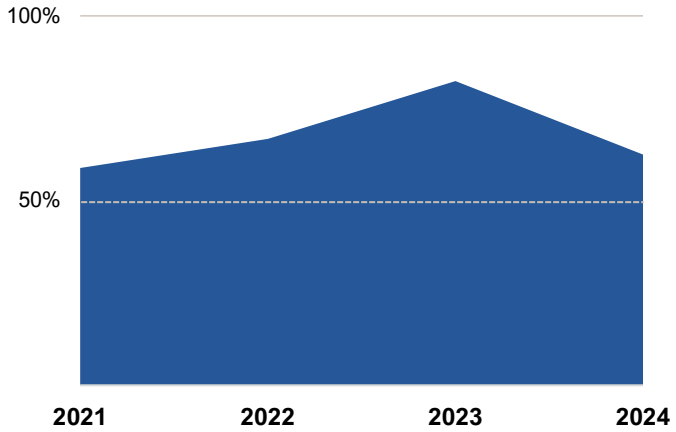
ACCESS



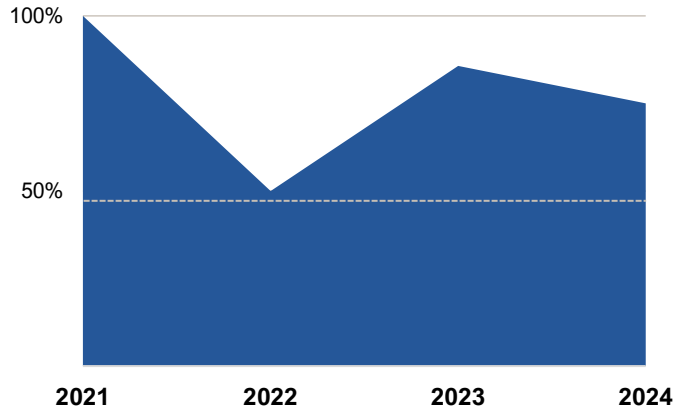
RESPONSIVENESS



TURNAROUND TIME



INSTRUMENT TRAINING



MAIN

Selected 2024 Publications

CFCCC INVESTIGATOR(S)	PROGRAM	JOURNAL	YEAR
Christine McLaren, PhD Fa-Chyi Lee, MD Farshid Dayyani, MD, PhD Jason Zell, DO, MPH Jennifer B Valerin, MD, PhD	CC BIDD SPT CC SPT	J Natl Compr Canc Netw	2024
Daniela Bota, MD, PhD	BIDD	Neuro-oncology	2024
Christine McLaren, PhD Xiaolin Zi, PhD	 CC	Clin Transl Med	2024
Argyrios Ziogas, PhD Gelareh Sadigh, MD	CC CC	Cancer	2024
Farshid Dayyani, MD, PhD Fa-Chyi Lee, MD	SPT BIDD	Oncologist	2024
Helen Ma, PhD Pankaj Gupta, MD Wendy Cozen, PhD	CC SPT CC	Blood Adv	2024

MAIN