

# Cancer Biospecimen Bank (CBB) Shared Resource

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## Overview

The CBB SR supports investigators with ethically collected, high-quality, easy to access normal and cancer tissue, blood and body fluid biospecimen samples that includes access to bioinformatic systems, demographics that include information on personal and family history, lifestyle factors, clinical interventions, processing and storage, custom services including tissue microarrays (TMAs), immunoperoxidase & fluorescent immunohistochemical methods for biomarker detection. Further, the LCC-CBB must be robust enough to pass review by the External Advisory Board, NCI site visitors, CCSG and other grant mechanism reviewers.

## Key Services

- Centralized, comprehensive biospecimen banking includes:
  - Diagnostic pathology support
  - Comprehensive informed consent process
  - Biospecimen bank devoted to collection and distribution of normal/cancer specimens including fresh tissue, blood, and other body fluids
  - Extensive supporting data from clinical record and self-reported health history
  - Participant identification, obtaining informed consent
  - Computer assisted tissue analysis services
  - Sample tracking, data-management, and interfacing with users
- Bidirectional flow from lab bench to clinic to stimulate translational research
- Tissue-based services, including microarray (TMA) and immunohistochemistry (IHC) and automated tissue image analysis
- Provide support for grant submissions & clinical trials

## Major Equipment /Technologies

- Arctus XT automated laser capture
- Olympus BX41 with CoolSnap Camera from Media Cybernetics and image Pro-Plus Software
- Agilent MX3005p quantitative real-time PCR system, BioRad iCycler
- Agilent BioAnalyser
- Aperio ScanScope CS, ImageScope software
- Dako automated IHC processor
- Microtome, cryostat
- Beecher tissue arrayer
- 40 cubic feet of 80 degrees Celsius freezer space

## Budget

- Estimated that 60-70% of operating budget will come from grants including CCSG (10-20%)
- Fees structure/Discount based on LCC Membership
- CCSG would provide salary support for:
  - Director (10-20%)
  - Staff pathologist(s) (~20-50%)
  - Facility Manager (100%)
  - Data Managers (100%)
  - Technicians (100%)
  - Recruitment Coordinators (100%)

## Key Personnel

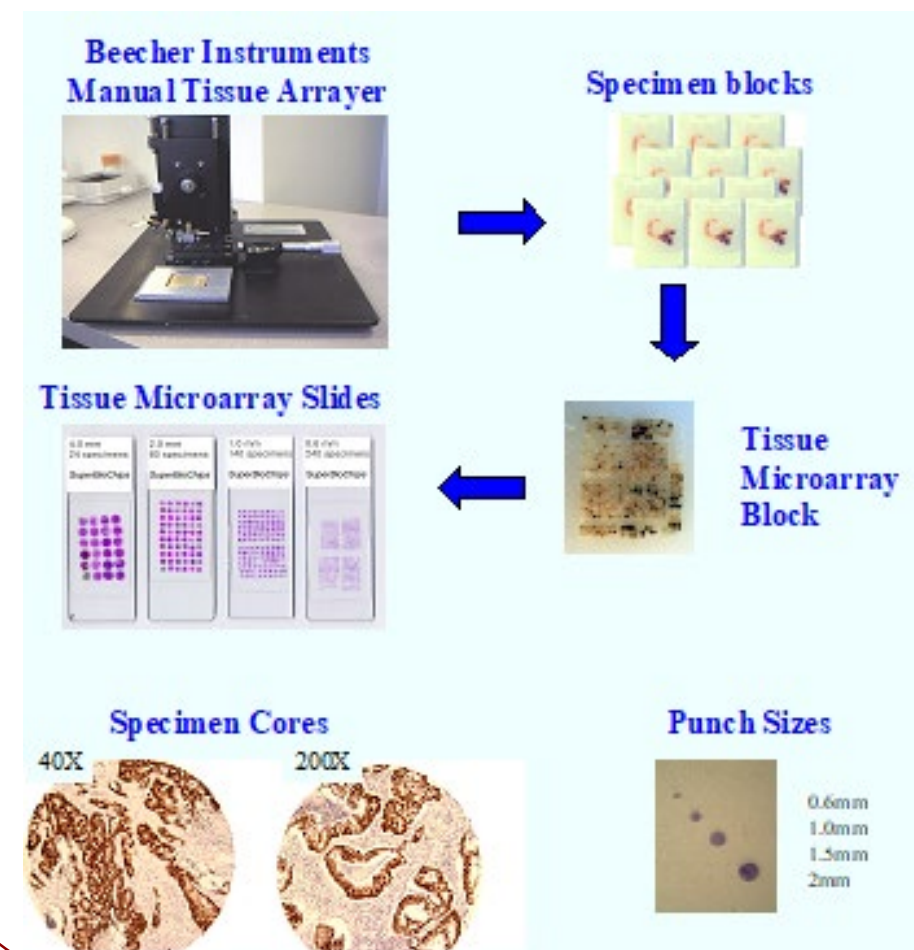
- Director/Facility Manager (TBN)
- 5 FTE (excluding faculty)
- 3 support staff

## Resources for Impact on LCC Research

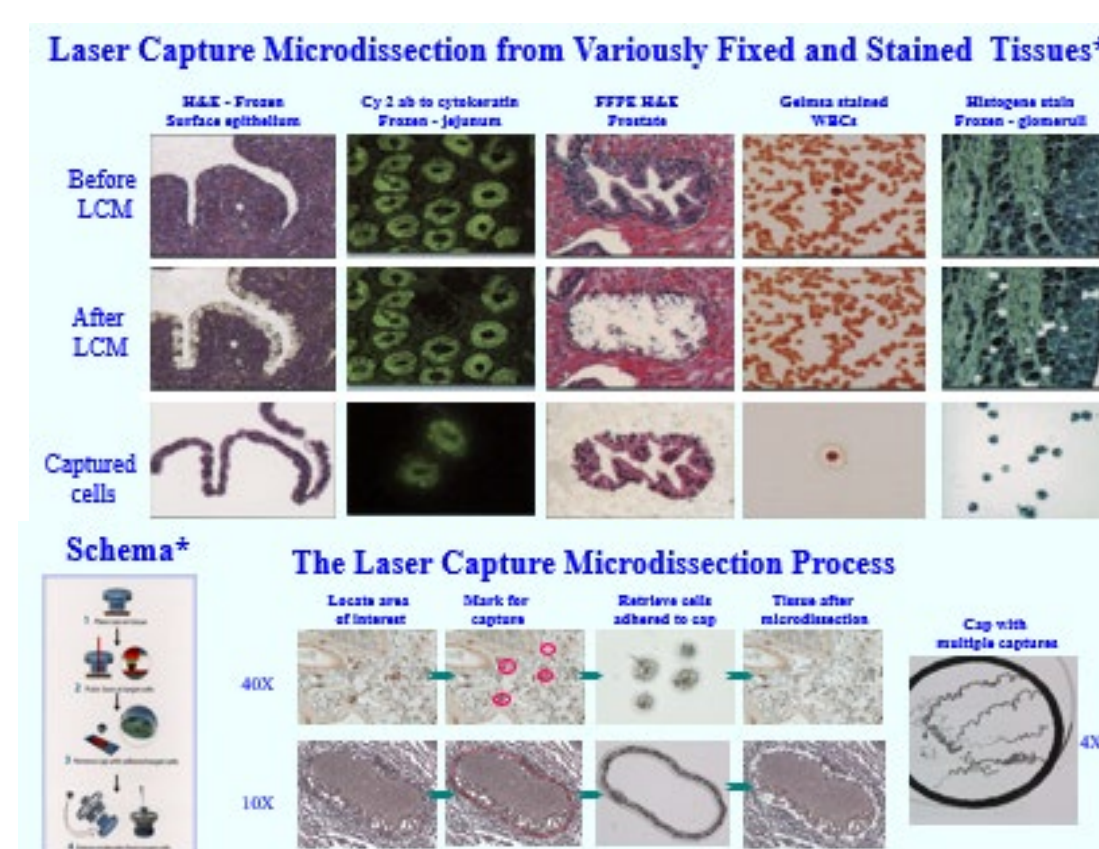
**2023: 3060 fresh-frozen cancer tissues available at RIH & CNE across all histologies**  
**>75,000 surgical specimen case accessioned (FFPE tissue available) in 2022**

### Tissue Microarrays

The Beecher Tissue Microarrayer generates slides that contain hundreds of individual tissues.



### Laser Capture Microdissection

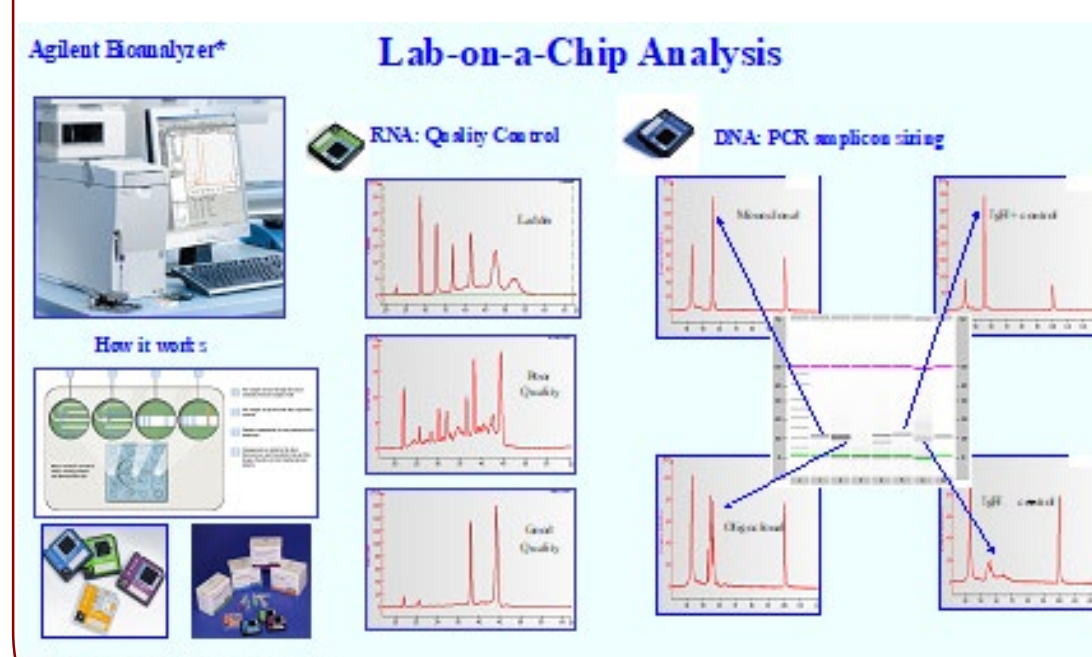


### Tissue Bank



- Frozen Specimens:** tissue is flash frozen in liquid nitrogen, before being stored in our -80C freezers
- RNA preserved frozen specimens:** fresh tissue is preserved with RNAlater to stabilize and protect cellular RNA then stored at -80C for layer cryo sectioning
- OCT blocks:** Fresh tissue frozen in cryomolds and stored at -80C for later cryo sectioning
- FFPE blocks:** fresh tissue processed in formalin and made into a paraffin-embedded block

### Lab on a chip Analysis



### Aperio Slide Scanning and Image Analysis



## 2022 - 2023 CBB Working Group

Bene Carneiro (Hem-Onc)	Jake Kurtis (Pathology)	Howard Safran (Hem-Onc)	James Sung (Pathology)
Liang Cheng (Pathology; Committee Co-Chair)	S. Mani (Pathology)	Andrew Schumacher (LOCR)	Jeremy Warner (Hem-Onc)
Patti Dubielecka (Hem-Onc)	John Reagan (Hem-Onc)	Attila Seyhan (LCC)	Evgeny Yakirevich (Pathology)
Sean Lawler (Pathology)	Murray Resnick (Pathology)	Robert Sobol (Pathology)	Wafik El-Deiry (LCC Director; Committee Chair) Shiyoko Cothren (LCC Admin)
Abbas Abbas (Thoracic Surgery)	Thomas Miner (Hepatobiliary Surgery)	Gayana Pareek and Dragan Goljanin (Urologic Surgery)	Matthew Vrees (Colorectal Surgery)
Aaron Maxwell (Interventional Radiology)	Sean Monaghan (Surgery)	Steve Toms (Neurosurgery)	Denise Connelly (Fox Chase Cancer Center Facility Director); Consultant

## Oversight

- LCC Associate Directors for Shared Facilities, Administration and LCC Director make final decisions on leadership, infrastructure investment or operational policies via oversight of LCC-CBB Director
- LCC-CBB Facility Advisory Committee evaluates current operations by assessing user concerns, needs and cost effectiveness
- LCC Facility Parent Oversight Committee review Advisory Committee's recommendations and make recommendations to the Director

## Workflow

Working in collaboration with pathologists, medical oncologists, surgeons and other hospital personnel. Trained LCC-CBB staff will be responsible for:

- Obtaining subject informed consent
- Collecting samples
- Assembling comprehensive clinical, pathological and demographic information
- Managing access database
- Managing limited tissue and prioritization

## Access and Prioritization

- Tissue Request Review Committee (TRRC) being established to review investigator requests for biospecimens. For tissue from a specific organ site or cancer type, input from the specialty stakeholders and decisions on prioritization considered by TRRC.
- LCC-CBB Facility Manager works with researchers to prepare requests once specimen availability is determined
- Access guidelines:
  - Priority 1: NCI/NIH funded LCC Members
  - Priority 2: Other funded LCC Members
  - Priority 3: Non-funded LCC Members (primarily junior investigators)
  - Priority 4: NC/NIH funded investigators outside of LCC
  - Priority 5: Other funded investigators outside of LCC
  - Priority 6: Non-funded investigators outside of LCC

## Interactions with LCC Shared Resources

- LCC organoid and single cell profiling SR
- Brown Genomics and spatial proteomics
- Mass spec
- LCC cytokine profiling core
- LCC drug screening core

## Future Plans

- Consolidation of existing tumor tissue/biospecimen banks
- Incorporation of emerging technologies such as AI, Digital Pathology
- Focus on how LCC-CBB addresses cancer disparities in Rhode Island and provide clues on environmental carcinogenesis
- Participation in NCI biospecimen research networks
- Rapid autopsy program development
- Industry collaboration
- Support NCI CCSG, P01, SPORE, U54, U01 grants