The Role of the University of Colorado Human Cardiac Tissue Bank (UC-HCTB) in the



Transomics for Precision Medicine (TOPMed) Program

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NHLBI Trans-Omics for Precision Medicine

Background

 Human cardiac tissue banks (HCTBs) are valuable yet high-cost undertakings restricted to a handful of academic medical centers.

• The University of Colorado Health Sciences Center Heart Tissue Bank has been maintained since 1984 and collects heart tissue and serum from patients receiving an orthotopic heart transplant or undergoing implantation of a left ventricular assist

Results

Table 1: Demographics of samples in the UC-HCTB

	Failing N = 591		Non-Failing N = 269	
	Ν	%	Ν	%
Age				
18-34	79	13.37%	45	16.73%
35-49	123	20.81%	84	31.23%
50-64	314	53.13%	103	38.29%
65+	75	12.69%	37	13.75%
Sex				
Female	128	21.66%	142	52.79%
Male	463	78.34%	127	47.21%
Race				
White	458	77.50%	234	86.99%
Black	57	9.64%	5	1.86%
Hispanic	54	9.14%	26	9.67%
Asian	14	2.37%	2	0.74%
Other	8	1.35%	2	0.74%

Figure 2: Comparison of tissue samples to Colorado transplants by race



device (LVAD).

- In 1993, the National Institutes of Health (NIH) Revitalization Act was passed and signed into law, mandating that federallyfunded clinical research prioritize the inclusion of women and minorities and requiring that researchers disclose the characteristics of their study populations when reporting results.
- In the event these populations are underrepresented in study cohorts in the areas of heart failure and transplant, we run the risk of further excluding an already-marginalized group from the benefits of scientific progress.
- Many publications describe the approach for establishing HCTBs, including optimal ways to harvest and store tissue, but very little has been published describing the demographic and clinical characteristics of HCTBs.

Objectives

Table 2: Diagnoses among samples in the UC-HCTB

Diagnosis	Ν	%
Ischemic Cardiomyopathy	230	26.74%
Idiopathic Dilated Cardiomyopathy	195	22.67%
Familial Cardiomyopathy	37	4.30%
Retransplant	33	3.84%
Other	23	2.67%
Valvular Cardiomyopathy	23	2.67%
Hypertrophic Cardiomyopathy	13	1.51%
Adult Congenital Heart Disease	11	1.28%
Chemotherapy-Related Cardiomyopathy	11	1.28%
Myocarditis	5	0.58%
Peripartum Cardiomyopathy	5	0.58%
Restrictive Cardiomyopathy	5	0.58%
Nonfailing	269	31.28%



- The goal of this project is to describe the demographics and diagnoses of the University of Colorado HCTB (UC-HCTB).
- We hope to contribute to the literature some insight into the study population available for translational cardiac research in hopes that other banks will follow suit to expand our understanding of the contents of HCTBs.
- We also compare the demographic characteristics of the samples in our bank to Colorado transplant statistics in order to identify potential gaps in our study population relative to the patient population affected by heart failure.
- We compare the gender distribution of samples within the tissue bank with those transplant data both in Colorado and in the U.S. since 1988 in 5 year intervals.
- Analyze and interpret data in collaboration with TOPMed

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Figure 1: Comparison of tissue samples to Colorado transplants by gender

Gender Distibution of Colorado Cardiac Transplants



- These data provide insight into the demographic makeup of the UC-HCTB and distribution of diagnoses available for study.
- When compared to cumulative OPTN Colorado transplant data since 1988, females are consistently less represented than are males in Colorado. The UC-HCTB reflects this trend with 67% Colorado Transplant data being male and 68% UC-HCTB being male.
- Black samples and Hispanic samples were more and less frequent in the UC-HCTB, respectively (Black 9.6% vs. 6.1%, Hispanic 9.1% vs. 13.3%).
- Transparent reporting by banks collecting similar tissue will reveal whether mismatches between demographics of transplanted patients and enrolled and banked tissues are present elsewhere, suggesting that under recruitment of women and minorities is a problem endemic in the field.

References

Demographic and clinical phenotype data were extracted from the UC-HCTB and data were analyzed using R 3.5.1 and RStudio 1.1.456.

Colorado transplant data was downloaded from the Organ Procurement and Transplantation Network website for comparative analysis.



. US Congress. National Institutes of Health Revitalization Act of 1993: Act to Amend the Public Health Service Act to Revise and Extend the Programs of the National Institutes of Health, and for Other Purposes Public Law Washington, DC; 1993. pp. 103–143.

2. OPTN data used in analyses is based on data current as of July 20, 2018 and is available at https://optn.transplant.hrsa.gov/.