



# Fred Hutch Program for Advancing Career Exploration (PACE)

2024

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# About Fred Hutch Cancer Center

- Established in 1975 as Fred Hutchinson Cancer Research Center
- Nonprofit organization that unites research and clinical care to prevent and eliminate cancer and infectious diseases
- Located in South Lake Union



**3**

**Nobel Prize Winners**

Researchers from Fred Hutch have been honored with the Nobel Prize in physiology or medicine.

**5700**

**Employees**

Collaborating across the globe, our dedicated, talented people are driven by an ambitious vision.

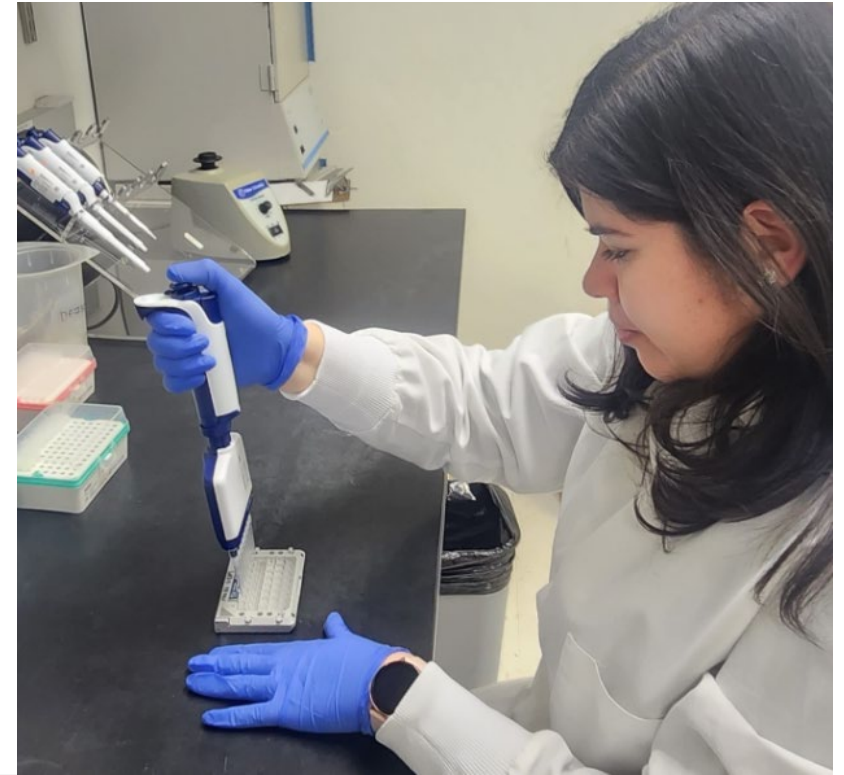
**16+**

**Acres of Campus**

Our beautiful South Lake Union campus features cutting-edge research facilities that promote cross-disciplinary collaboration.

# About Shared Resources

- Multimillion-dollar shared infrastructure that is accessible to members of Fred Hutch, the University of Washington and Seattle Children's offering cutting edge technologies and expertise that can help speed the process of discovery
- In addition to offering access to equipment and tools, the Fred Hutch Shared Resources help researchers design experiments, choose suitable equipment and tests, create customized tests and software, and analyze experimental results



**>12**

**Shared Resources  
Cores**

Our Consortium and scientific divisions manage another two dozen cores.

**>220**

**Specialized Staff**

Our shared resources are operated by experts in their fields.

**>90K**

**Square Feet**

Shared Resources cores are a significant Fred Hutch investment.

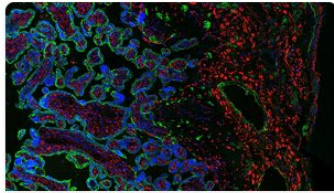


# Shared Resources Core



## Antibody Technology\*

Internationally recognized team that offers novel monoclonal antibody discovery, production and characterization services.



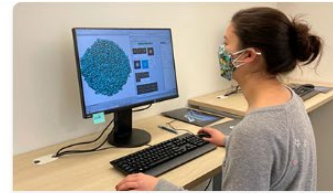
## Cellular Imaging\*

Provides light microscopy services that support both basic and preclinical projects.



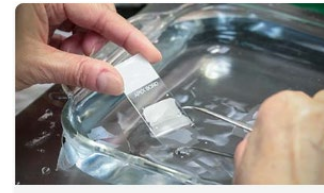
## Comparative Medicine\*

Enables high-quality science that proceeds with maximal efficiency, care and regulatory compliance.



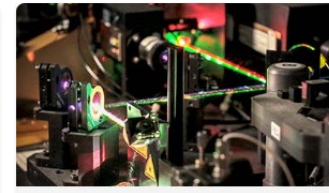
## Electron Microscopy\*

Offers electron microscopy services to resolve structures from cellular ultrastructure to molecular interactions.



## Experimental Histopathology\*

Provides a range of histology, histochemistry, immunochemistry and pathology services for human tissues and model organisms.



## Flow Cytometry\*

Offers top-of-the-line cell analysis and cell-sorting services, from single-laser benchtop analysis to mass cytometry and complex multi-laser cell sorts.



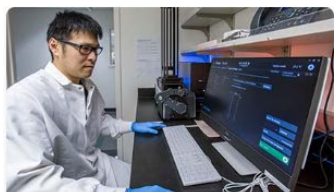
## Genomics & Bioinformatics\*

Provides integrated support to generate and analyze genomic data from DNA array, genetic analysis and high-throughput screening methods.



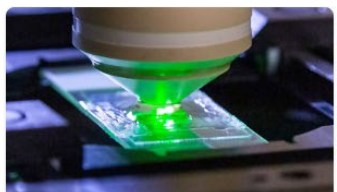
## Hutch Data Core

Helps investigators integrate, interpret and explore large and diverse datasets, drawing on deep expertise in computational biology, software engineering and cloud architecture.



## Immune Monitoring\*

Supports studies of cellular immunity, including assays of cell populations and responses in clinical trials.



## Preclinical Imaging\*

Provides state-of-the-art in vivo imaging technology and infrastructure to support basic and preclinical studies.



## Preclinical Modeling\*

Supports the development and maintenance of preclinical mouse models, including xenografts and genetically engineered mouse models.



## Proteomics & Metabolomics\*

Provides mass spectrometry and high-performance liquid chromatography services for the analysis of proteins and peptides, including metabolomics studies.



## Specimen Processing & Research Cell Bank

Processes blood, urine and buccal specimens, and offers DNA extraction and fingerprinting, specimen storage and B cell tissue culture.



## Therapeutic Products Program\*

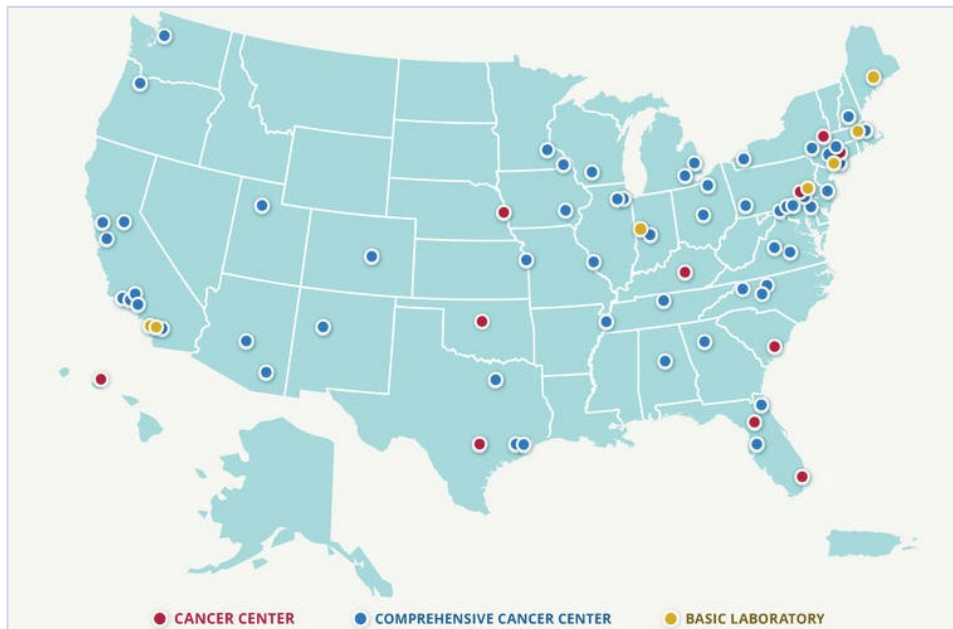
Offers development and manufacturing expertise for cell-based therapies for Phase 1/2 clinical testing.

# NCI-Designated Cancer Centers

The NCI Cancer Center Program was created as part of the National Cancer Act of 1971 and is one of the anchors of the nation's cancer research effort. Through this program, NCI recognizes centers around the country that meets rigorous standards for transdisciplinary, start-of-the-art research focused on developing new and better approaches to preventing, diagnosing, and treating cancer.

There are 72 NCI-Designated Cancer Centers:

- 56 Comprehensive Cancer Centers
- 9 Cancer Centers
- 7 Basic Laboratory Cancer Centers



<https://www.cancer.gov/research/nci-role/cancer-centers/find>

## CANCER CONSORTIUM

Consortium Partner Institutions



- Designated NCI Comprehensive Cancer Center in 1973
- Over 650 faculty leading research in basic science, clinical and translational research, and public health

# Consortium Clinical Research Operations

## Clinical Research Support (CRS)

### Clinical Trial Management System (CTMS) Program Office

- System support & training
- Data reporting & QC

### Compliance & Regulatory Affairs

- Monitoring & Auditing
- Training & education
- Policy management

### Study Startup & Financial Management

- Budgeting & contracts
- Award mgmt.
- Clinic implementation

### Trial Management

- Study coordination
- Data mgmt.
- Regulatory coordination

- CRS serves as the **central clinical trials office** for the Cancer Consortium
- Provides support **services from study development thru study closure** and reporting
- Performs **federal reporting and monitoring** required of an NCI-designated Comprehensive Cancer Centers
- Ensures quality and compliance through **training and oversight functions**

# About the Fred Hutch PACE

## Program Overview

- Designed for students from 2-year and 4-year colleges who are interested in pursuing careers in biomedical sciences
- Introduces students to a wide array of roles that don't require an MD or PhD
- Meet professionals to learn about their roles and career paths through scientific case studies
- Gain professional skills to prepare to apply for positions
- Benefits for participants include developing new professional networks and career resources



# About the Fred Hutch PACE Program (continued)

## Session Overview



### Introduction & Background

- Learn about the work/equipment
- Meet the people



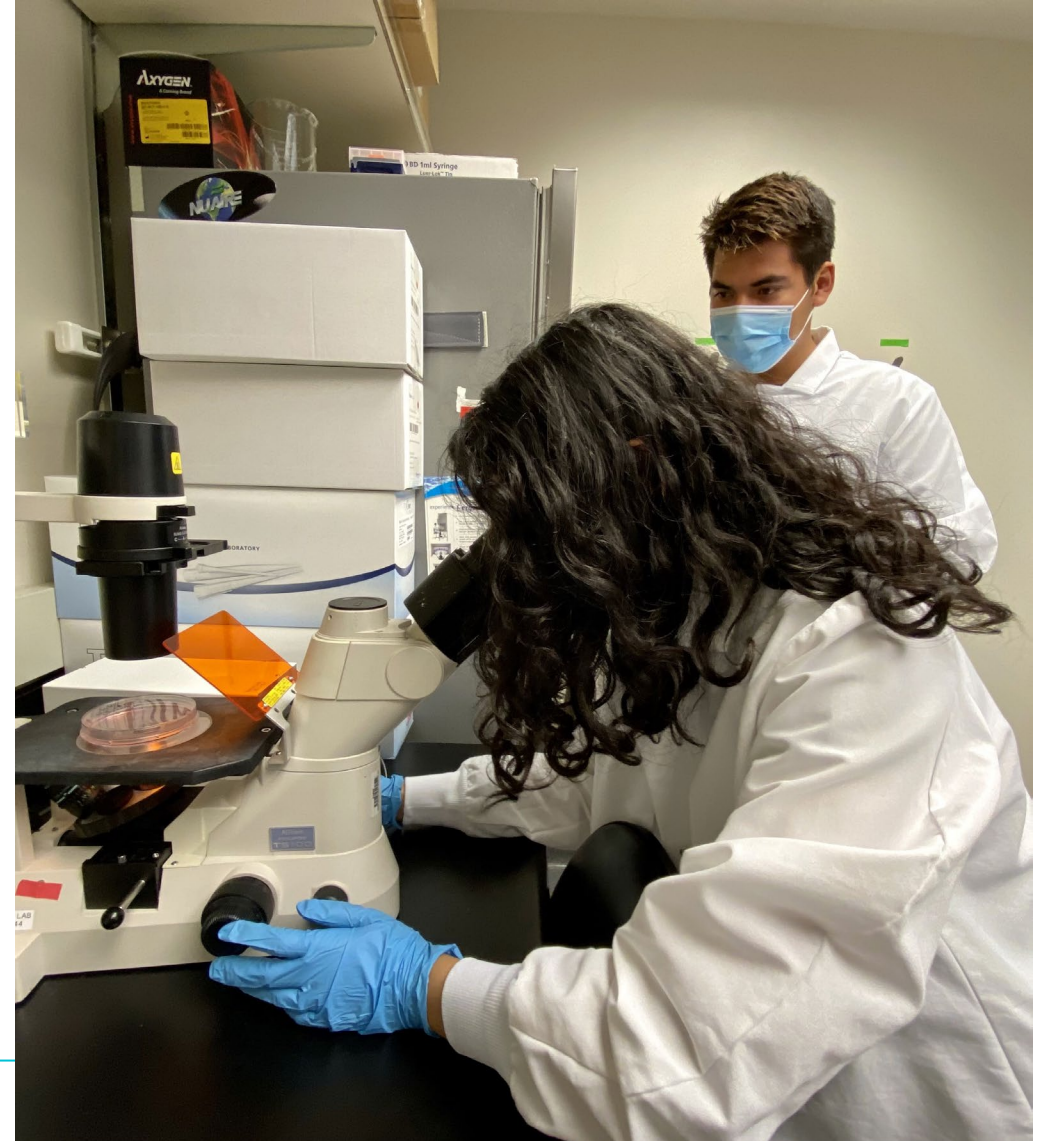
### Gain Hands-On Experience

- Work with equipment
- Work through a case study



### Professional Development

- Resume/LinkedIn development
- Speak with recruiters



# About the Fred Hutch PACE Program (continued)

## Schedule Overview

- 5 Wednesdays June 26- July 31  
(no session the week of July 4)
- 10am-1pm (3 hours/week)  
2 hours: Lab Sessions  
1 hour: Professional Development Sessions
- In-person at Fred Hutch

|        | Lab 1<br>Flow<br>Cytometry | Lab 2<br>Proteomics | Lab 3<br>Therapeutic<br>Products<br>Program | Lab 4<br>Pre-Clinical<br>Modeling /<br>Comparative<br>Medicine | Lab 5<br>Clinical<br>Research<br>Support |
|--------|----------------------------|---------------------|---|--|--|
| Week 1 | X                          |                     |   |  |  |
| Week 2 |                            | X                   |   |  |  |
| Week 3 |                            |                     | X   |  |  |
| Week 4 |                            |                     |   | X  |  |
| Week 5 |                            |                     |   |  | X  |

\* Sample schedule: labs may change year to year

## Compensation

- Participants will receive an award of up to \$300, based on attendance.

# About the Fred Hutch PACE Program (continued)

## Experiential learning through case studies

### FLOW CYTOMETRY

HUTCH ADVANCE SHARED RESOURCES PROGRAM, SUMMER 2022

**Who we are:**  
Michele Black, Amira Davis,  
Ben Janoschek, Erik Huynh,  
Nate Colven, Rebecca Reeves

**Before you arrive:**

- Please watch the [Intro to Flow Cytometry](#) video
- Then, draw a diagram of how a flow cytometer works (We don't expect this to be perfect! Do your best based on what you remember from the video)
- Please bring your drawing with you for your visit, along with questions you may have

**Once you're here:**

- We'll have stained cell samples and controls that we will run on the flow cytometer, using this experience to learn how these instruments work
- We will look for different immune cell populations in our data
- What major subsets of cells have we found today?

**After you leave:**

- Think about other applications of flow cytometry – what else could a researcher or clinician learn using these instruments?

### FLOW CYTOMETRY WORKFLOW:

Obtain single cells -- from patients, animal tissues, or frozen cell banks

**SAMPLE PREPARATION**

Prepare the cells for flow cytometry by staining them with fluorescently-labeled antibodies

**ACQUISITION**

Run the samples on the flow cytometer

The optics, fluidics, lasers and electronics work together to visualize cell populations

**DATA ANALYSIS**

Analyze the data, graph it and interpret it!

# Examples of Shared Resources Equipment

## Flow Cytometry



### **BD Biosciences: Symphone A5 Analyzers**

An innovative and customized cell analyzer with five lasers allowing up to 28 colors simultaneously. This cytometer enables users to analyze complex fluorochrome panels with high accuracy.

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### **Cytek Aurora**

A full spectrum high parameter cell analyzer equipped with 5 lasers and 64 detectors. The Aurora system delivers high-resolution data at the single-cell level to resolve the most challenging cell populations, such as cells with high autofluorescence or low levels of expression of key biomarkers, regardless of assay complexity.

# Examples of Shared Resources Equipment

## Electron Microscopy



### Talos L120C G2 (S)TEM

Versatile TEM and STEM microscope for 2D and 3D visualization of beam sensitive samples and materials using high contrast.

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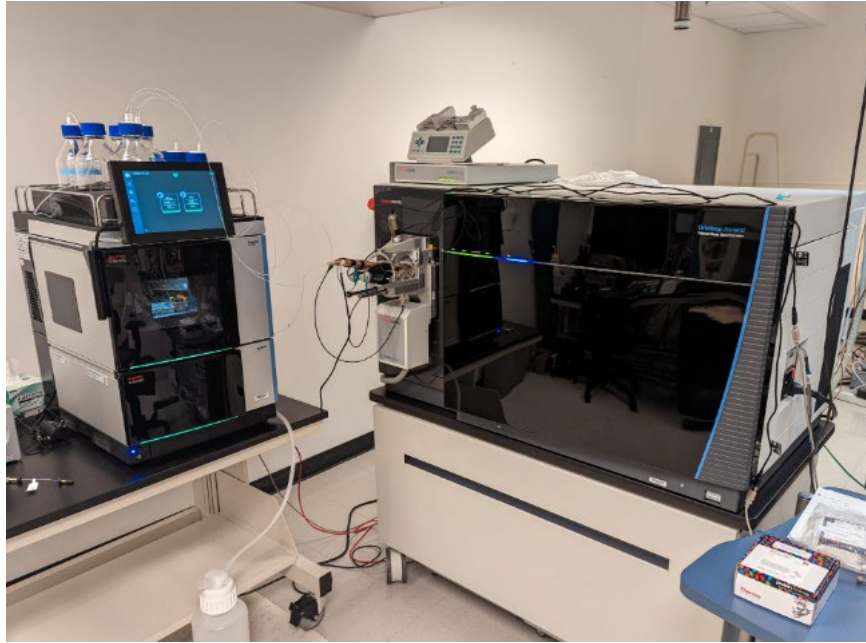
### Galacios 2 Cryo-Transmission Electron Microscope (cry-TEM)

A 200 kV microscope allows you to easily collect near atomic data from a broad range of biological targets. Suited for single-particle analysis, cryo-electron tomography (cryo-ET) and micro-electron diffraction (MicroED) applications.



# Examples of Shared Resources Equipment

## Proteomics / Metabolomics



### Orbitrap Ascent (Mass Spectrometer)

This system is primarily used for multiplexed quantification experiments, analysis of post-translational modifications, immunopeptidomics, and high-sensitivity label-free quantification experiments.



### Orbitrap Eclipse with FAIMS Mass Spectrometer

This system is primarily used for protein identification and quantification (SILAC, TMT, iTRAQ, label-free, spectral counting) of samples with very high complexity (e.g., lysates) and for global protein modification characterization (phosphoproteomics)

# About the Application

- Seeking applicants studying biology/biomedical sciences, and have an interest in pursuing science related careers
- Website: <https://www.fredhutch.org/en/education-training/hutch-advance/pace.html>

## Eligibility Requirements

- Enrolled in a two- or four-year college/university (part time/full time)
- Strong interest in pursuing a career in the biomedical sciences
- Available to attend all (or most) program days in person at Fred Hutch
- COVID vaccinations are not required at Fred Hutch, but all participants must advise if the vaccines were received. If received, proof of vaccination is to be submitted.

## How to Apply

- Complete the online application form, which includes two short-response essay questions and two recommendation letters. (additional information on the website)
- Proofread your application and essay answers carefully. You cannot go back into the system after you submit your application.



# Key Dates for Application



Application Due:  
**March 25, 2024 (11:59pm)**



Letter of Recommendations Due:  
**April 1, 2024 (11:59pm)**



Notification of Acceptance Status:  
**Early May**



If you have questions about the application process or the program, please send an email to [researchadmin@fredhutch.org](mailto:researchadmin@fredhutch.org)

Attn: Gordon Roble

# Shared Resources Opportunities- Check website for actual availabilities

- <https://www.fredhutch.org/en/research/shared-resources/job-openings.html>

| Position Title:                                  | Specialist I   | Specialist II   | Specialist III   |
|--|--|---|--|
| <b>Education and Relevant Experience (years)</b> |  |   |  |
| GED/ High School Diploma                         | 2-3+   | 7+  | 10+  |
| AA   | 1+   | 5+  | 8+   |
| BA   | 0  | 2-3+  | 5+   |
| MA   | 0  | 0   | 3+   |
| PhD  | 0  | 0   | 0  |
| <b>Research Support</b>                          |  |   |  |
| <b>Shared Resource Core specific</b>             | Entry level skills as required by specific Shared Resource                 | Strong mastery of skills to support specific Shared Resource                              | Expertise in skills to support research and specific shared resource core  |
| <b>Supervision</b>                               | Communicate day-to-day needs of the facility to their manager(s).          | Communicate issues/ needs of the facility to their manager(s) on an established schedule. | Communicate issues/ needs of the facility to their manager(s) on an established schedule but will be expected to perform most work autonomously. |
| <b>Equipment / Reagent Oversight</b>             |  |   |  |
| <b>Operation</b>                                 | Perform basic equipment operation and/or reagent preparation               | Perform advanced equipment operation  | Be an expert on some/all equipment within specific shared resource and serve as a resource for optimization of lab performance and efficiency.   |
| <b>Training and Education</b>                    |  |   |  |
| <b>Training</b>                                  | Lead training sessions and assist in development of new training materials | Lead training sessions and create new training materials                                  |  |
| <b>Administrative</b>                            |  |   |  |
| <b>Documentation</b>                             | Accurate documentation of laboratory activities                            |   |  |
| <b>Billing</b>                                   | Perform billing and some cost accounting                                   | Assist director / lead in billing and cost accounting                                     |  |

This is an abbreviated table outlining some job requirements and expectations within Shared Resource cores  
Fred Hutchinson Cancer Center

**Thank you!**

