

ILC Symposium 2023, Pittsburgh, PA

# BCRF ILC Legacy Project Lobular Breast Cancer Biobank

---

Jagmohan Hooda, PhD, MBA  
UPMC Hillman Cancer Centre, Pittsburgh, PA

# Honoring Leigh Pate

The woman who made the biorepository possible



- Leigh understood the lack of well-defined models for ILC research.
- Donation to BCRF - to establish a living Biorepository of ILC
- Overseen by UPMC Hillman Cancer Center and MSKCC

# Conflict of Interest

Nothing to Disclose

# The Team Making Leigh Pate's Vision a Reality

Collaboration between UPMC Hillman Cancer Center and MSKCC



Steffi Oesterreich,  
PhD  
UPMC Hillman Cancer  
Center



Adrian Lee, PhD  
UPMC Hillman Cancer  
Center



Jagmohan Hooda,  
PhD, MBA  
UPMC Hillman Cancer  
Center



Daniel Brown, PhD  
UPMC Hillman Cancer  
Center  
Institute of Precision  
Medicine (IPM)



Rohit Bhargava, MD  
Magee-Womens Hospital  
of UPMC



Priscilla F. McAuliffe,  
MD, PhD  
Breast Surgical  
Oncology, UPMC



Jorge Reis-Filho, MD,  
PhD  
MSKCC



Britta Weigelt, PhD  
MSKCC



# Leigh Pate's Legacy - Aims

Overcoming challenges in ILC research with Living Biorepository



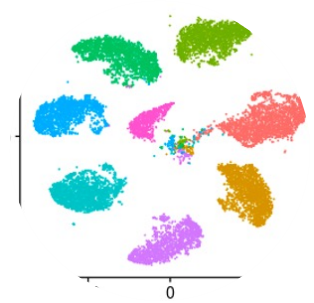
To collect ILC specimen together with clinicopathological data



To develop 3D patient derived organoids (PDOs) from ILC specimens



To perform bulk genomics on the ILC tumor specimen and the PDOs

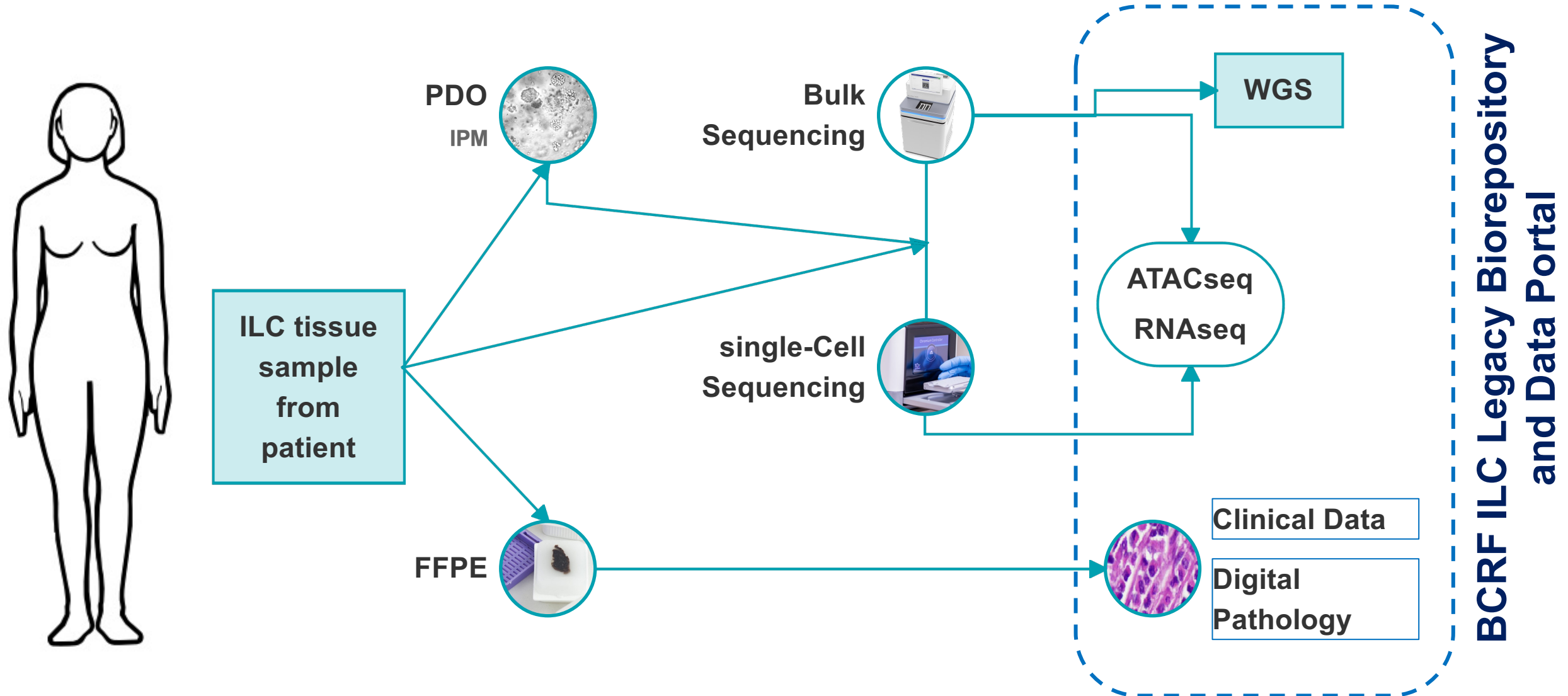


Single-cell sequencing on the ILC tumor specimen and the PDOs

Creating a living collection of organoids to augment our knowledge of invasive lobular breast cancer and to enable more accurate diagnosis and treatments.

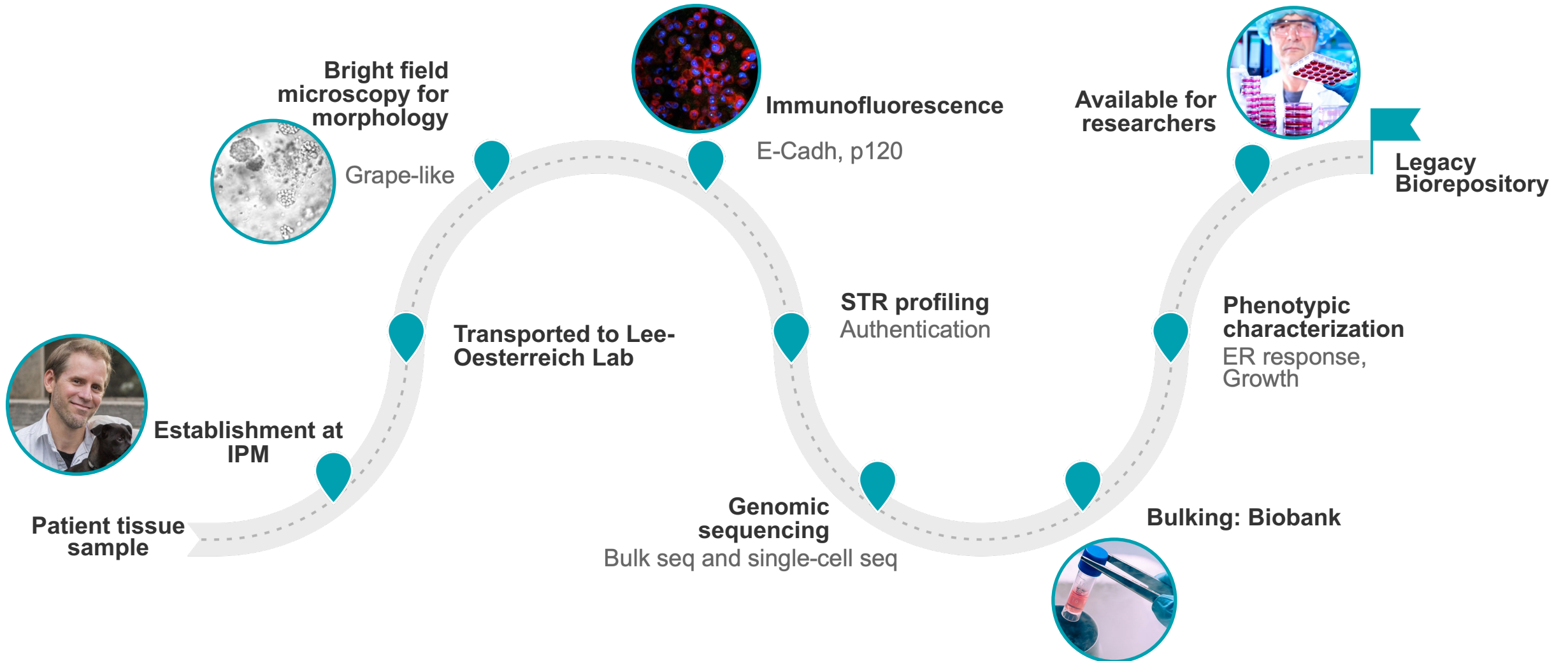
# Building a Biorepository for ILC Research: Leigh Pate's Enduring Impact

Generation of characterized organoid models



# From Tissue Sample to LIOs: The Journey of an Organoid

LIO: Legacy ILC Organoids



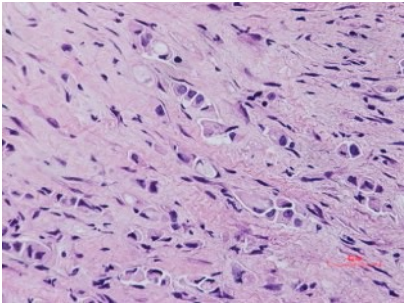
# Example Data and Advancement

---

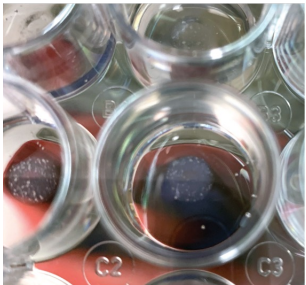
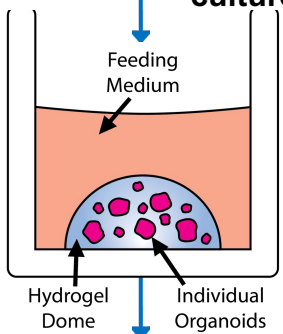


# Organoids show high similarity to originating tumor

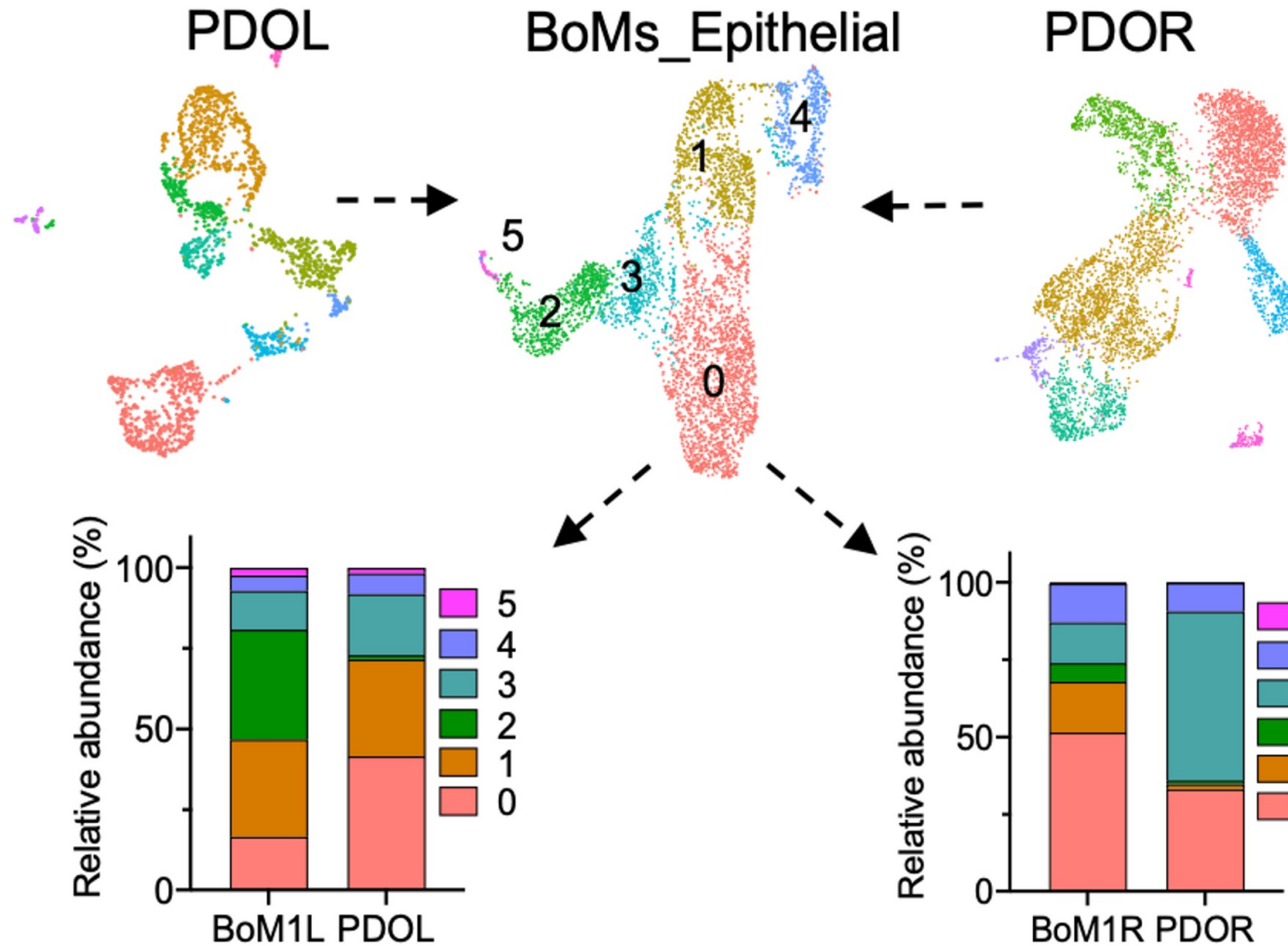
ILC bone metastasis



Organoid culture



Organoid development workflow



scRNAseq: Bone metastasis (BoM) and associated PDOs

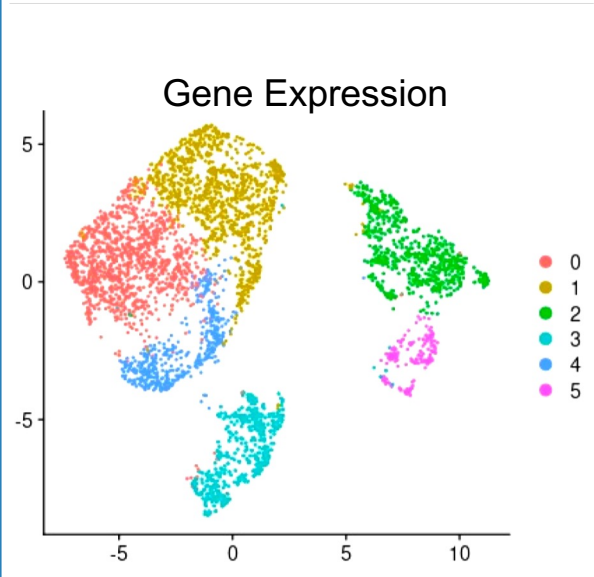
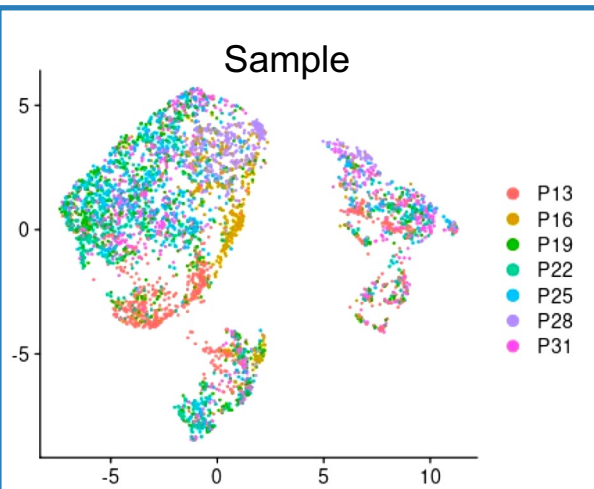
Case:

Primary: ER+/PR-/Her2-

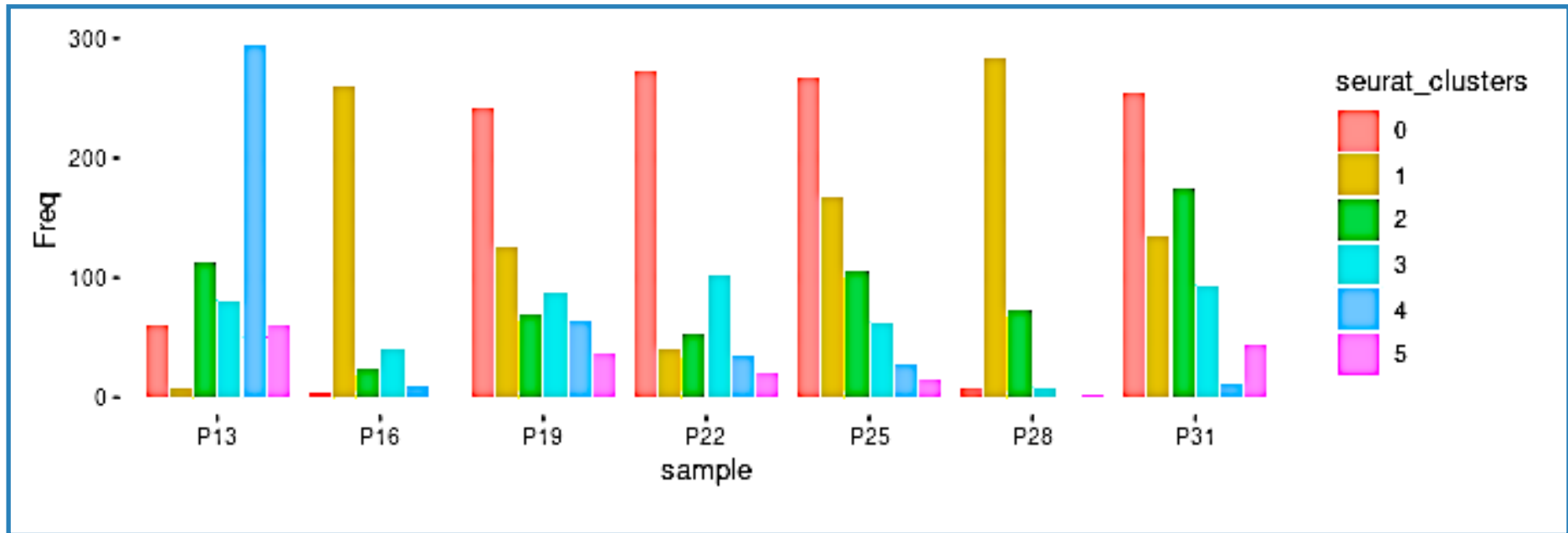
Metastasis      Adjuvant letrozole

Left Perivis (BoML)  
Right Tibia (BoMR)  
ER-; Mixed

# LIO Organoids: A promising model for ILC research



scRNAseq clustering



- LIO organoids maintain their stability over multiple passages, ensuring consistent research results.
- Single-cell RNA sequencing (scRNAseq) data confirms their genetic stability across various passages.

# One Year of Progress

21 PDO  
attempted

Development from 21  
patient tissue samples  
attempted

8 PDOs  
established

Rest are under  
development  
Some unsuccessful

16 IF: E-Cadh,  
p120

2 rounds of IF on 8  
and 3 rounds IF on 2  
PDOs

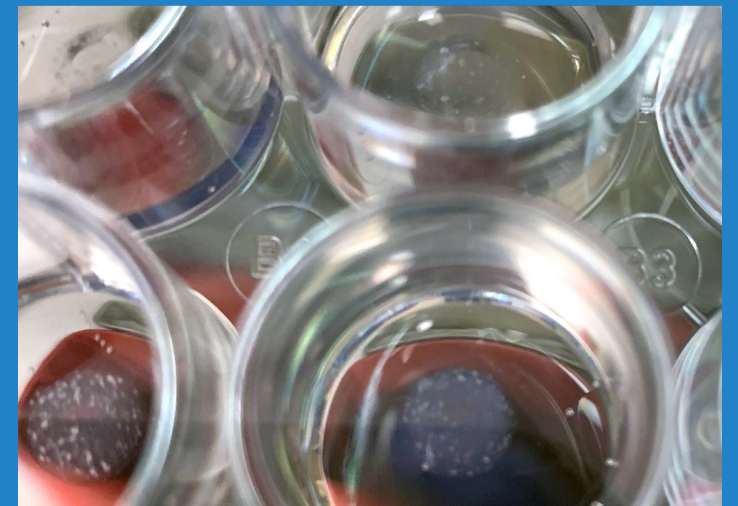
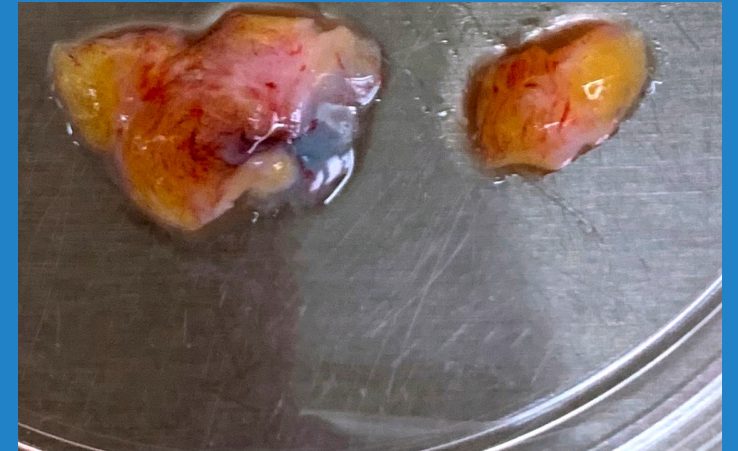
3 LIOs WES and RNAseq.

2 undergoing scRNAseq, scATACseq  
and WGS

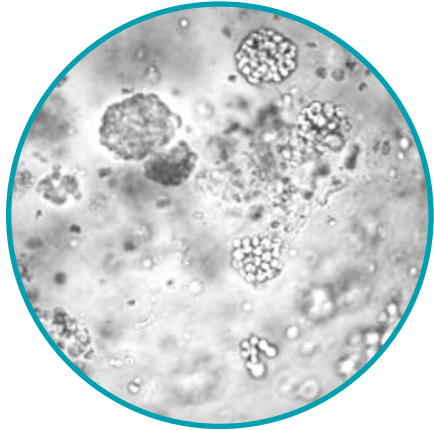
2 PDOs: long term passage  
scRNAseq

2 Digital pathology

Remaining organoid blocks under  
preparation for digital pathology



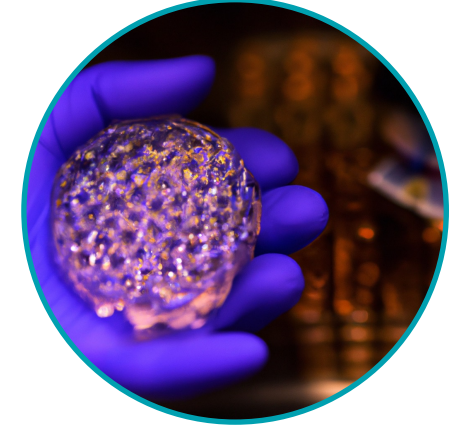
# Final Thoughts



**Organoids:** Powerful models unlocking ILC's secrets



**Leigh Pate's donation:** Paving the way for a living biorepository



**Committed to Leigh's legacy:** Progressing ILC research together

Leigh Pate's Legacy: Advancing ILC Research with Organoids



More info: [leeoesterreichlab.org](http://leeoesterreichlab.org)>Resources>BCRF ILC Legacy Project



Thank you

