



Leadership



Suzanne Sandmeyer, PhD
Director
Genomic Technologies



Remi Buisson, PhD
Assistant Director
GRT Hub SR



Melanie Oakes, PhD
Manager
Technical Operations



Jenny Wu, PhD
Director, Bioinformatics
Transcriptomic Analysis



Ivan Chang, PhD
Bioinformatics Engineer
Data Sharing

Mission

To put emerging nucleic acid technologies into the hands of CFCCC investigators and enable bioinformatics analysis through consultation, training and collaboration.

GRT Hub provides:

- Guidance and education throughout the entire experimental process, including experimental design, data analysis and publication.
- In-house staff with professional expertise in genome wide molecular technologies.
- Bioinformatics Consulting Service for experimental design and data analysis staffed by PhD-level scientists experienced in bioinformatics.

Services

- INSE Illumina iScan beadarray:** linkage analysis, copy number variants, epigenetics
- Illumina NovaSeq X Plus:** whole human genomes, deep sc sequencing
- PacBio Revio:** whole genome seq, structural variants, scRNA isoforms
- BioNano-Saphyr 2:** long-range optical mapping; structural variants
- Library preparation:** single cell, multi-omic, HiFi, Me-seq, etc
- NanoString nCounter:** digital quantification of known nucleic acid targets
- 10X Genomics ChromiumX:** scRNA-seq; scATAC-seq; multiome; VD(J) typing
- Parse Biosciences:** split-seq; reduced cost for 100,000-1 M cells
- Mission Bio Tapestri:** scDNA and protein typing; tumor lineage mapping; CNV
- Bruker Isoplexis:** monitoring single cell secreted proteins, e.g. cytokines
- Digital PCR:** Bio-Rad ddPCR, ThermoFisher Quantstudio Q
- Nanostring GeoMx and 10x Visium:** spatial transcriptomics on fixed or fresh
- Data visualization portals:** Publicly accessible web interactive dashboards enabling visual exploration of processed data

Instruments & Research Supported

Epigenome



Iscan: methylome, CNV

Lineage Tracing



Tapestri

Secretome



SC Cytokines: IsoSpark

Digital PCR



Absolute Q

1 | Sequencing: RNA, DNA, multi-omics

Short read



NovaSeq X Plus 30X
human genome:

Long read

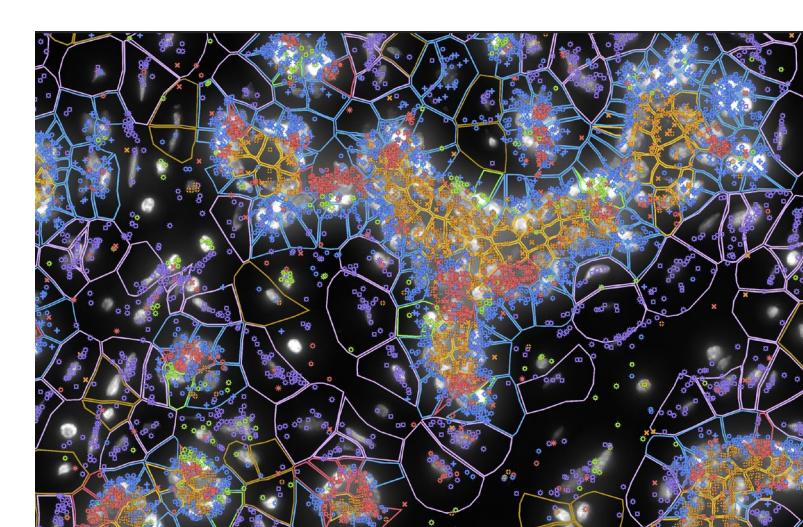


Revio:
long-read, 30X
human genome;
single cell isoform

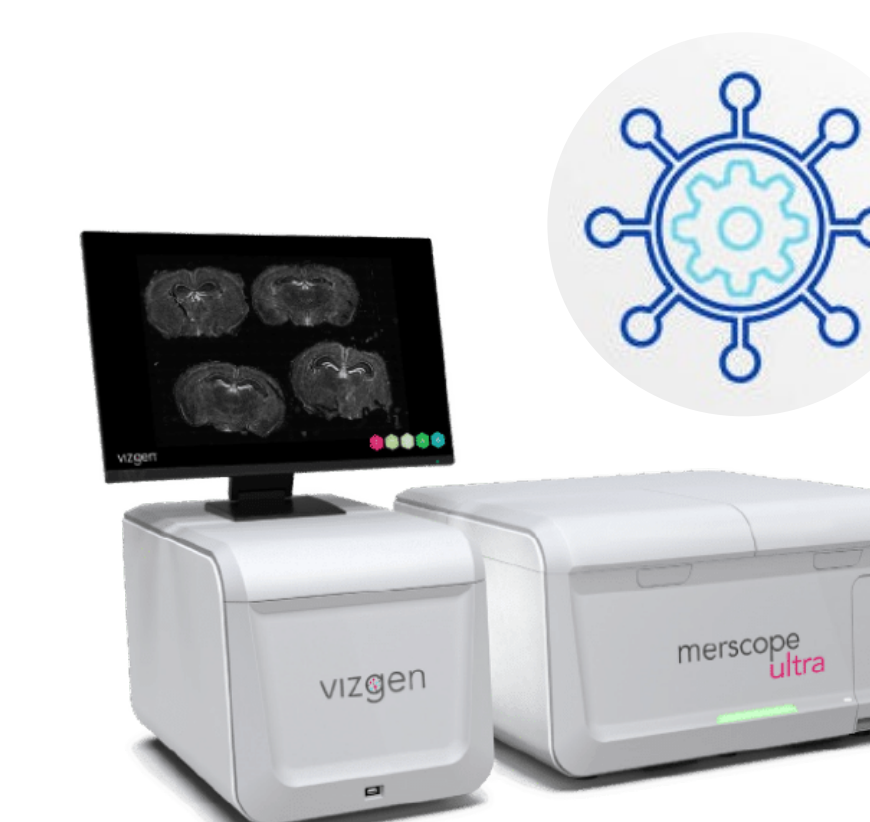
2 | Sub-Cellular Spatial: FFPE & FF



Xenium:
Segmentation staining;
5000 probes;
post analysis proteomics



Kessenbrock/Lawson
Breast Tissue by Xenium

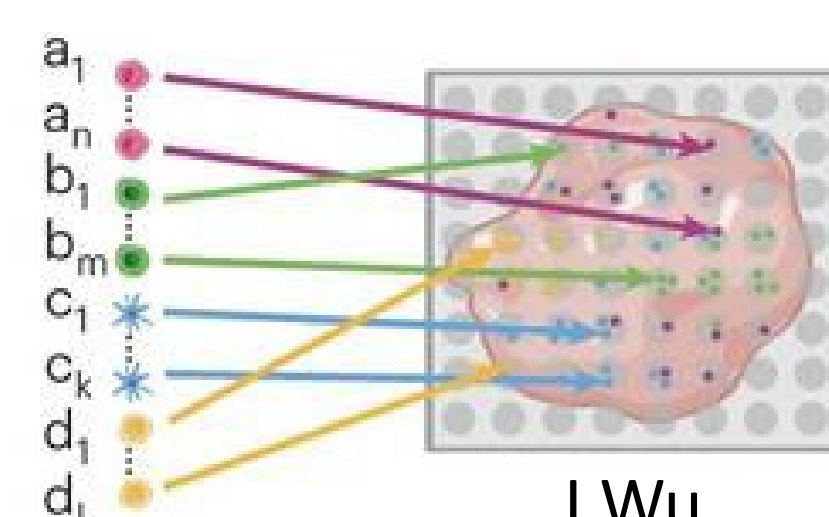


MERFISH Ultra
10,000 probes
3 cm * 3 cm

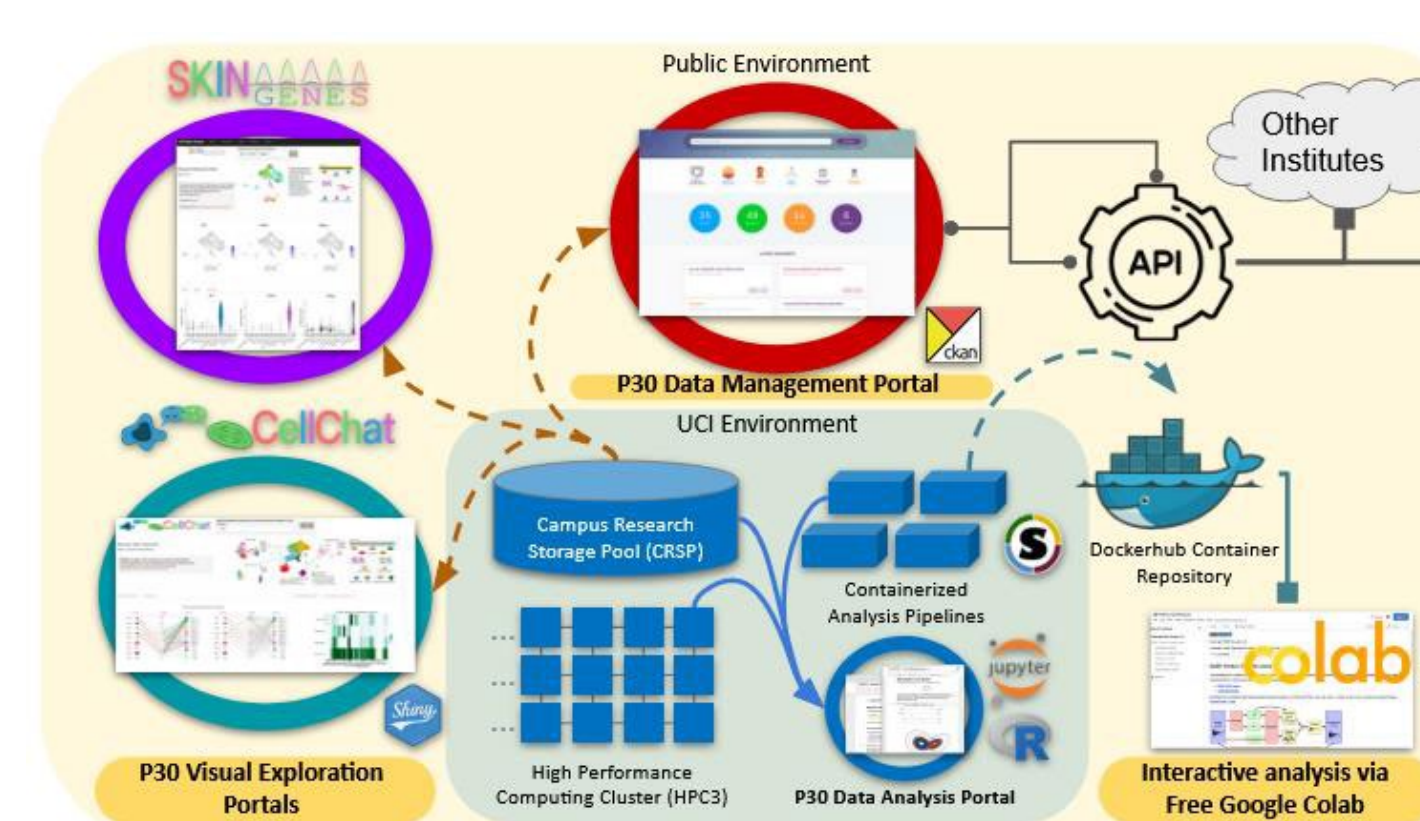
3 | Analysis and Data Sharing

Workshops

Analysis



Portal Development



I Chang

User Costs

Instrument	Application	Sample	Reagents	Additional cost
iScan Infinium Methylation	Infinium Methylation Screening	Single DNA prep	\$90/sample	\$425 BeadArray
Tapestri	Lineage analysis of cell populations	DNA & Single cell DNA & Protein	\$2,500/sample	\$595/sample
IsoSpark	Cytokines		\$850/sample	\$130/instrument use
Parse single cell	Single cell multiplex seq lib	100,000 cells	\$9,800/48 samples	\$1,404 staff processing
10X single cell	Single cell multiplex seq lib	20,000 cells	\$1,500/sample	\$435 first, \$140/sample add
Visium<CytAssist FFPE	Low res clinical slide spatial discovery	6.5*6.5mm	\$1,600 slide	\$686/slide
Xenium	Subcellular resolution	12*11mm	\$892 with cell segmentation	\$825/run instrument

Plans

- Expand clinical genomics and epigenetics studies**
 - Increase **awareness of clinical community** with targeted tech discussions for clinical departments
 - Increase availability of technology that provides **personnel and automated support for clinical investigators** who lack these recourses
 - Increase **economic and technical feasibility of human genome sequencing**
 - Participate in clinically focused program grant applications
- Focus on and expand analysis of Hub data products**
 - Expand bioinformatic staff (underway) support** for analysis of GRT Hub products
 - Repeat and record introductory **workshops** and expand advanced topics
 - Implement **commercial pipelines** to supplement in house analysis
 - Build data sharing and data portal resources to foster collaborations
 - Collaborate with **CFCCC Statistics SR for population studies**
 - Increase recharge rate and throughput** for bioinformatics sustainability
- Establish emerging technologies in GRT Hub eo enable insights into biological systems**

Publications

CFCCC Investigator	Program	Published Journal	Year
Buisson, R	SPT	<i>Nat Com</i>	2024
Buisson, R; Tinoco, R	SPT BIDD	<i>Nat Com</i>	2023
Eng, OS; Valerin, JB; Tanjasi, SP; Seldin MM; Masri, S; Fleischman, AG; Pannunzio, NR	SPT BID CC	<i>Nat</i>	2024
Hughes, C	BIDD	<i>JoVE</i>	2023
Nie, Q; Lander, AD; Ganesan, AK	SPT BIDD	<i>BioRxiv</i>	2024
Pannunzio, NR; Seldin, MM; Marazzi, I; Marangoni, F; Lawson, DA; Kessenbrock, K; Masri, S	SPT	<i>Nat Immun</i>	
Sworder, BJ; Wager, LE	SPT	<i>Cell Stem Cell</i>	2024