A Brief Description of
UCLA Technology Center for Genomics & Bioinformatics

UCLA Technology Center for Genomics & Bioinformatics (UCLA TCGB) is a high-throughput and fully equipped genomics center. The TCGB drives innovative research by developing state-of-the-art NGS technologies, providing high-quality services, fostering interdisciplinary collaborations, and offering comprehensive support to maximize the scientific impact of UCLA investigators' research. Under the leadership of Director **Xinmin Li**, PhD, the TCGB has a highly trained team of 18 genomics and bioinformatics staff, including 9 PhD-level scientists. This Center houses cutting-edge genomics technologies with the latest advancements, including Novaseq X Plus, DNBseq T7, GridION, 10X single-cell system, BD Rhapsody single-cell system, 10X Visium, 10X Xenium, 10X Visium HD, GeoMx DSP, CosMx SMI and Stereoseq. Empowered by these recent innovations, the TCGB provides over 70 diverse genomics services, including bulk, single-cell, and spatial multiomics analyses, in a timely and cost-effective manner.

The TCGB has the following major instruments, bioinformatics tools, and big data management systems:

- Nucleic acids isolation and QC
  - MagNa pure compact automated nucleic acid isolation system
  - Biochain AnaPrep automated nucleic acid isolation system
  - Qiagen QIAcube HT automated nucleic acid isolation system
  - Applied Biosystems 7500 Fast Real-Time PCR System
  - Agilent 2200 Tapestation, Agilent 2100 Bioanalyzer, Fragment Analyzer, NanoDrop 8000, Qubit 2.0 Fluorometer, Qubit Flex Fluorometer, Plate Reader
- NGS, single-cell and spatial multiomics systems
  - Illumina NovaSeq™ X Plus Sequencing System
  - Complete Genomics DNBseq T7 sequencing system
  - Illumina NextSeq500
  - Illumina MiSeq sequencing system
  - Oxford Nanopore GridION long sequencing system
  - 10X genomics Single cell sequencing system (Chromium Controller, Chromium IX, Chromium Connect)
  - BD Rhapsody single cell sequencing system
  - 10X Visium/CytAssist spatial multiomics system
  - 10X Xenium
  - 10X Visium HD
  - Nanostring GeoMx DSP spatial multiomics system
  - Nanostring CosMx SMI spatial multiomics system
  - IntegenX Apollo 324 system (for Automated NGS library construction)

- Beckman Biomek i7 (for Automated NGS library construction)

- Bioinformatics
  - Partek Flow
  - BioTuring
  - Falcon Automated Genomic Analysis System
  - Illumina DRAGEN data analysis pipeline
  - Hoffman2 Linus clusters equipped with various genomic data analysis tools including Galaxy server
  - Lab-hosted data analysis server and data analysis tools including Partek Flow.
  - UCLA CASS data storage server & data delivery system
  - Hoffman2 data storage server
  - Amazon S3 unlimited data storage server & AWS

With the state-of-the art instruments, well-established data analysis and management systems, the TCGB offers more than 70 genomic services including:

- Automated DNA/RNA isolation & quality evaluation
- Whole genome sequencing
- Whole exon sequencing
- RNA-Seq/miRNA-Seq
- Methy-Seq/ChIP-Seq
- CLIP-Seq/ATAC-seq
- Oxford Nanopore sequencing
- Single-cell sequencing (3’ GEX, TCR/BCR, 5’GEX+ FB, 5’GEX+V(D)J, 5’GEX + TCR/BCR + FB, Multiome 3’GEX+ ATAC, BD Rhapsody Multiomics)
- Visium WTA, Visium WTA & Protein panels
- Xenium panels
- Visium HD WTA
- GeoMx WTA, GeoMx WTA & Protein panels
- CosMx 1000 Genrs, CosMx 1000 Genes & Protein Panels
- Data analysis
- Data analysis consultation & software tutorial
- Online data delivery & long-term data storage

These diverse capabilities enable UCLA investigators to tackle a wide range of complex and multifaced biological questions. Beyond services, the TCGB supports UCLA investigators through education, consultation, collaboration, and innovation. Since 2019, the TCGB has contributed to 166 cancer-related publications, 193 grant awards totaling approximately $277 million, and 21 patent applications. The TCGB has consistently demonstrated its capacity to make impactful scientific and intellectual contributions to UCLA's research and will continue to do so in the future.

Below are a few representative publications assisted by the TCGB:

Haghani A, *et al*. **Science**. 2023; 381 (6658): doi: 10.1126
Lu AT, *et al*. **Nature Aging** 2023 doi: 10.1038
Kalbasi A, *et al*. **Nature**. 2022 607(7918):360-365
Song K *et al***. Cancer Discov.** 2022 12(4):1046-1069
Kim YJ, *et al***. J Clin Invest**. 2021; 131(12)
Liu W, *et al*. **Nat Commun**. 2021; 12 (1): 3130
Janzen DM, *et al*. **Nat Commun**. 2020; 11: 2218
Calvanese V, *et al*. **Nature**. 2019; 576:281-286.

CONTACT US:

UCLA Technology Center for Genomics & Bioinformatics
CHS 38-123
650 Charles E Young Dr South
Los Angeles, CA 90095
Phone: (310) 206-3945
Email: sequencing@mednet.ucla.edu
Website: TCGB Website