

Our Approach

Human Cell Lineage Atlas Facility (CLAF)

About CLAF

Full operation by 2029

Led by: GIBH, CAS

Location: Guangzhou International Bio-Island

Genotype

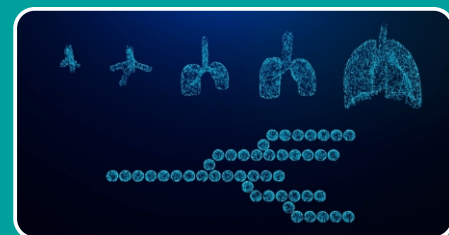
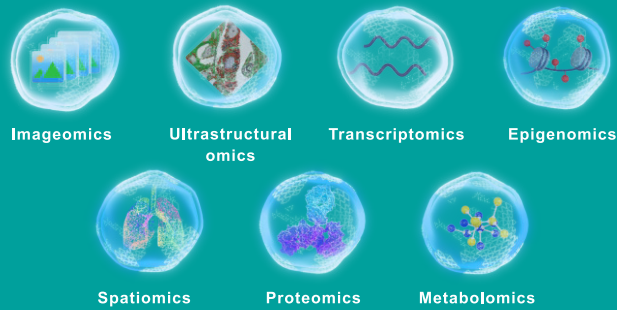
Epigenomics/Transcriptomics/Proteomics

↑ Correlation ↓

Phenotype

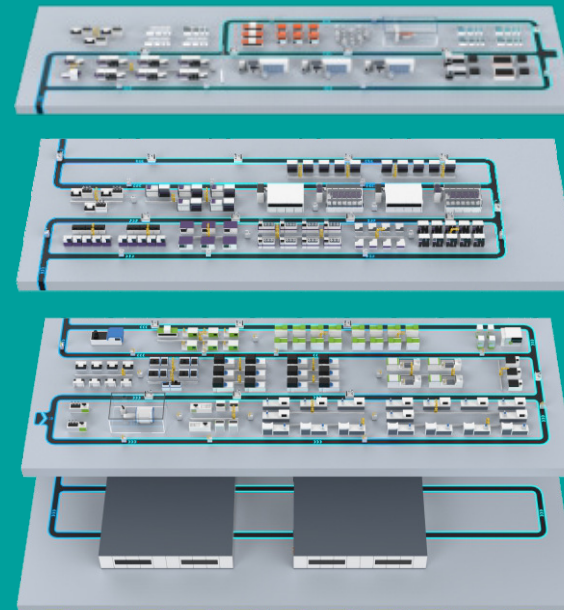
Imageomics/Ultrastructural omics

Seven Modalities



Deciphering Cell Lineage Systematically

With automated instruments and robots, CLAF captures seven modalities of spatiotemporal information at single-cell resolution:



A high-throughput lights-out laboratory

Sample Processing: automated embedding, sectioning, and storage of tissue and cell samples

Data Generation: high-throughput data collection through standardized, integrated instrumentation pipelines

Model Building: integration of multimodal data into unified digital models

Our Vision

CLAF will serve as an open global platform, partnering with research institutions, universities, hospitals, and industry worldwide. Together, we will advance discovery and translate science into solutions, bridging breakthrough research and real-world impact in healthcare and life sciences.



For academic institutions

- High-throughput sample analysis
- Large-scale, integrated omics data



For hospitals

- AI models for pathogenesis studies
- Predictive and prognostic markers for drug responses



For industry partners

- Drug target discoveries with cellular precision

CLAF

SOPs

AI models of cell lineages

Cell lineage reference atlas



HUMAN CELL LINEAGE ATLAS FACILITY

<https://claf.ac.cn>





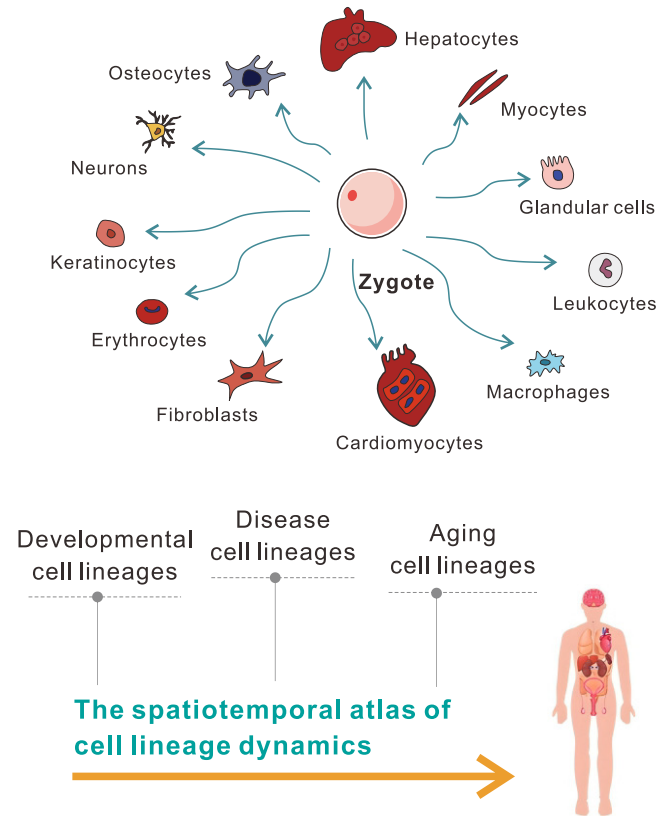
中国科学院广州生物医药与健康研究院
GUANGZHOU INSTITUTES OF BIOMEDICINE AND HEALTH CHINESE ACADEMY OF SCIENCES



Led by Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences, the Human Cell Lineage Atlas Facility (CLAF) is building "digital twins" of the human body using cellular data. This initiative underscores the Guangdong-Hong Kong-Macao Greater Bay Area's emergence as a global hub for biomedical innovation.

Cell Lineage

The human body comprises an estimated 40 trillion cells, all descendants of a single fertilized egg. Through proliferation, differentiation, and aging, the cells follow developmental paths known as cell lineages, the roadmap to understanding human biology.



Decoding these lineages holds the key to unlocking life's mysteries. As artificial intelligence reshapes biomedicine, CLAF stands at the forefront of this transformation.

Our Mission

CLAF will develop large-scale AI models for constructing virtual cells, virtual organs, and ultimately a virtual physiological human, by mapping the spatiotemporal evolution of cells throughout the human lifespan.

These models can simulate treatment responses in silico, prior to clinical administration, to optimize drug development, diagnostics, and precision medicine.

Chromosome state
Gene sequence
Gene transcription
Gene translation
Cellular metabolism
Cellular ultrastructure
Cellular interaction

 **Standardized Omics Data**

AI 

 **Digital Cell Models**

Large Cell Lineage Models 

**Disease prediction
Aging prediction
Drug target discovery
Clinical trial acceleration**