Scalable Patient-Derived Organoid Platform: Next-Generation Solutions for Drug Discovery and Precision Medicine

Principal Investigator: Prof. Michael Chan, CEO, C2iTech Limited
Co-Investigators: Prof. Leo Poon and Prof. Malik Peiris, School of Public Health

Technology

- **Patient-derived organoids** from minimal clinical samples across respiratory, oncology, and infectious disease
- **Patented lung sampling-to-organoid method** for nasopharyngeal, nasal, airway, and alveolar tissues
- **Repurposing leftover tumor biopsies** after NGS for functional drug sensitivity to standard-of-care and targeted therapies
- Culturing stage automated at our **Cell Processing Facility (CPF) in HKSTP** with digital QC and secure data integration
- Next-generation **3D-printed human airway using personalized organoids** in collaboration with CyFuse

Stage of Development

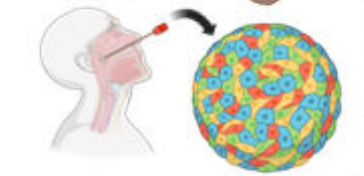
- **Paid pilots in HK** with sampling via the HKU Teaching Hospital network
- **Culturing stage automated** at CPF; further automation planned with Hitachi and RorzeLS
- **Culture media product** with Novoprotein targeting pilot production in H1 2026
- Supporting HK cohort for a **cancer organoid drug sensitivity test-kit** for NMPA Class III IVD submission and later HK MDACS listing
- Protoype with CyFuse for a **3D-printed personalized airway graft**
- **Outstanding Project Award**, 2025 Shanghai-HK Project Innovation Awards; **Incu-Bio Programme (2025-2029)**

Key Advantages

- **Human-relevant data** and faster decisions versus legacy 2D cells and animal models; models retain structure for histopathology
- **Multi-indication coverage** with a growing biobank for repeat testing and longitudinal studies
- **Automation-ready production** with traceable quality and scale
- **Actionable reports** that integrate drug response, toxicity, genomics, and for cancer the OFP biomarker
- Personalized airway graft prototype with CyFuse designed to **reduce rejection and restore organ-level function for future transplant**
- **Human-relevant alternative to animal studies**, aligned with the FDA Modernization Act 2.0

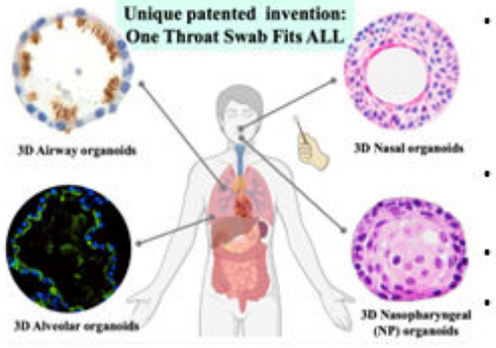
Opportunities

- **Drug screening and advisory panels** for hospitals, pharma, biotech, and CROs
- **Organoid biobanking** for patients, healthy donors, and population studies
- **Post-pilot commercial rollout** with NF Health in HK and Chinese Mainland
- **Joint Organoid Facility** with Imperial College London for protocol and data harmonization and joint research, including organoid-on-a-chip and lung-gut axis.
- **OEM production and distribution** with Novoprotein, and **oncology regulatory pathway** with Jingke
- Future **regenerative airway applications** with CyFuse, creating a path from screening to transplant



Clinical sampling: tumor biopsy. Repurposed post-NGS tissue for cancer organoids.
Clinical sampling: airway swab/brush. Patented method for nasal, nasopharyngeal, airway, alveolar.
Patient-Derived Organoid (PDO). 3D model preserving native tissue architecture.
Genomic profiling. NGS panels.
Functional drug testing. Standard of care and targeted therapy for prognosis.

Intellectual Property



- **Patent on sampling-to-organoid methods** for lung tissues (CN117511844A, HK20096415A, US20240043812A1)
- Trade secrets in culture media, process automation, and analytics
- Data assets and biobank as proprietary resources
- Trademarks for organoid culture media

C2i TECH

Dr. Rachel Ching
hhching@hku.hk
39179975

HKU Med
LKS Faculty of Medicine
The University of Hong Kong
香港大學李嘉誠醫學院