
Innovate the way we see life



Tomocube



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Prologue

Chapter 1. Why Holotomography(HT)

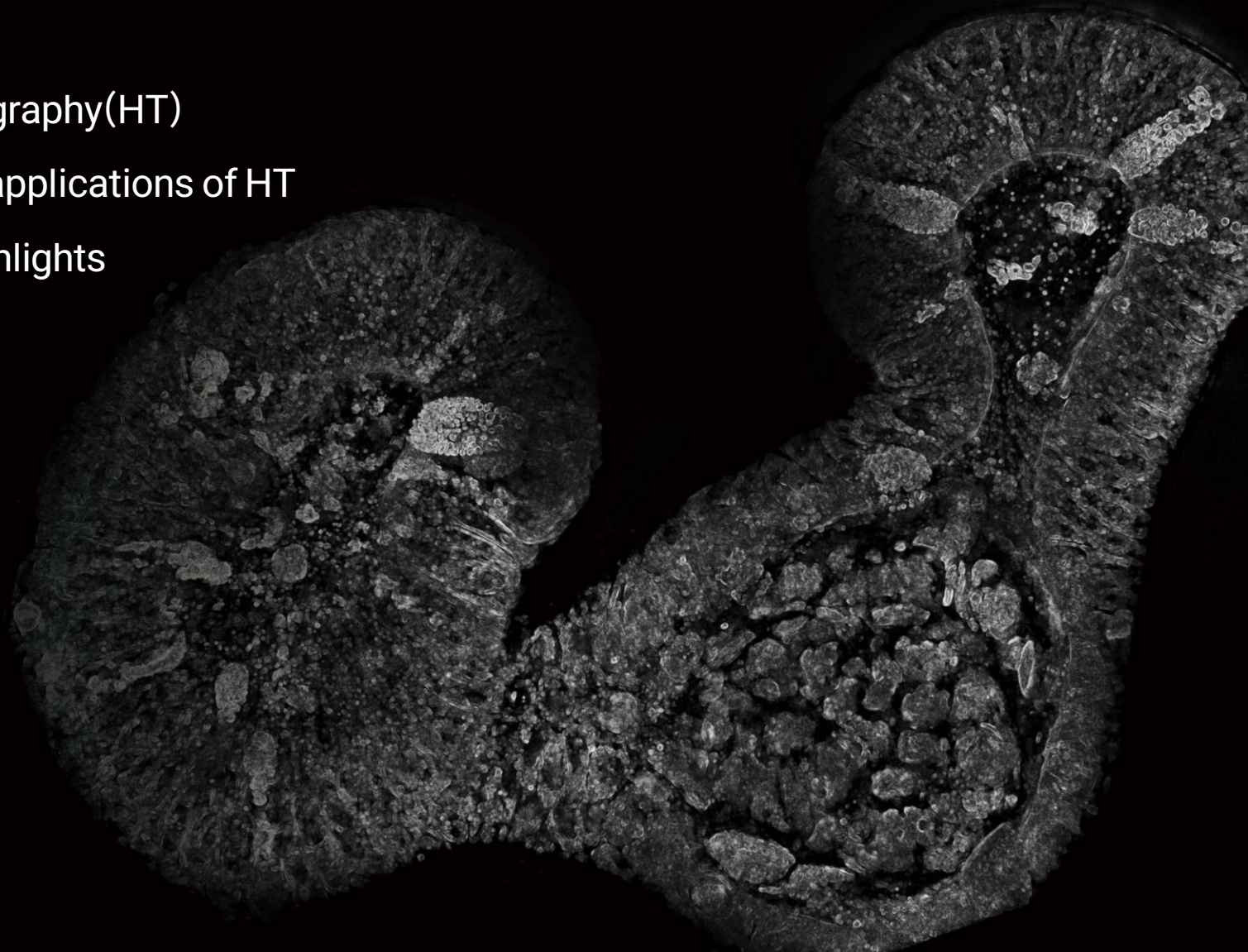
Chapter 2. Expanding the applications of HT

Chapter 3. Investment Highlights

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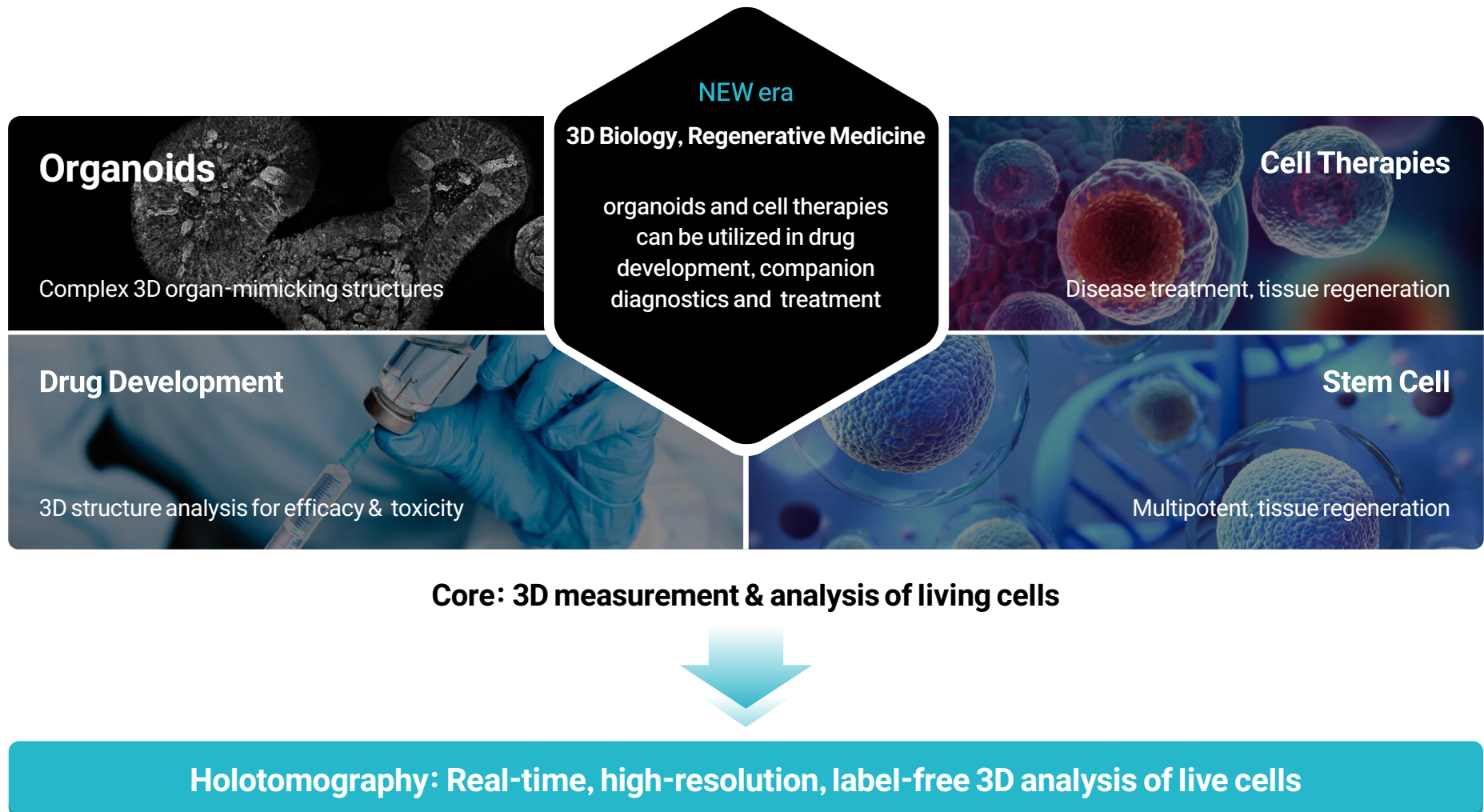


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Paradigm Shift in Cell Analysis

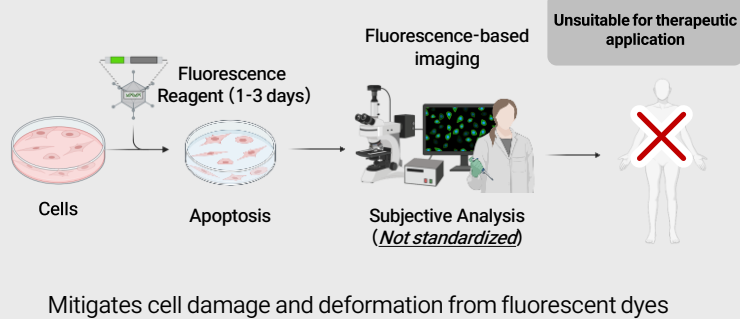
- Growth drivers in 3D Biology & Regenerative Medicine Market



Need for Holotomography

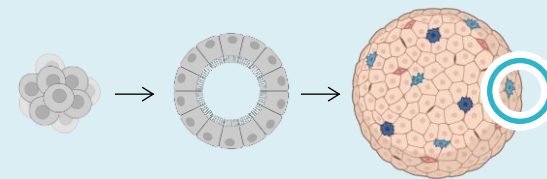
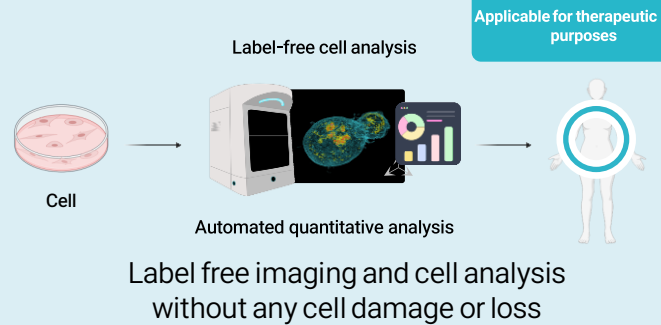
• Addressing Unmet Needs in Advanced Biomedical Industry

Conventional



VS

HT("Holotomography")



Applicable for therapeutic purposes

Holotomography Effects

Exclusive solution for
Cell biology &
Regenerative medicine

Sample preprocessing **Not Required**

Label-free
3D imaging
analysis **First in Class**

Unlimited,
prolonged
cell analysis **First in Class**

Penetration
depth **↑ 5x**

Typically, cells must be killed, sectioned, and stained for structural observation

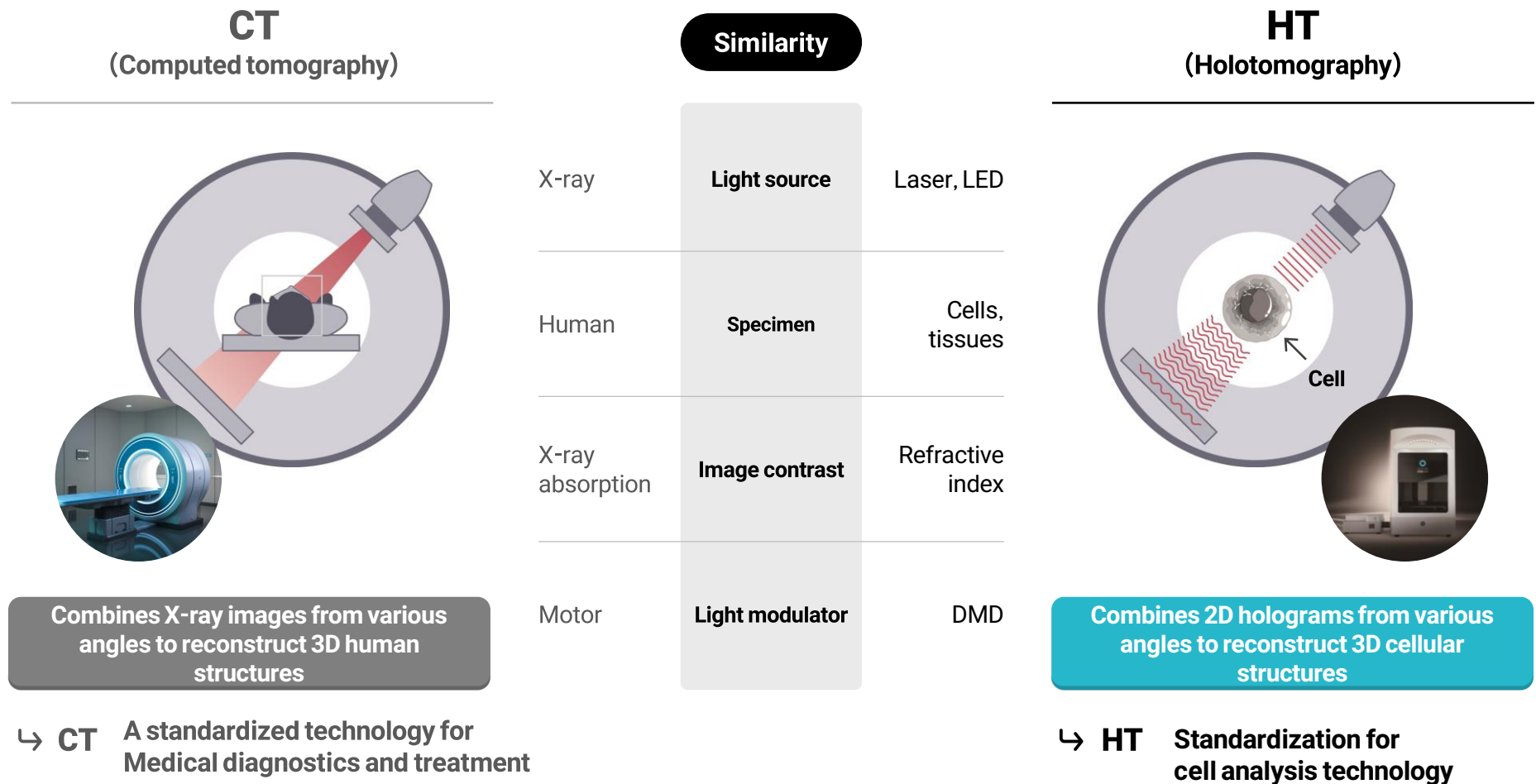
Unsuitable for therapeutic application

Impossible to conduct long term live cell analysis

Long-term 3D observation of live cells possible

Setting new standards in cell analysis via Holotomography

- Replacing conventional CT imaging as a global standard with safer, more economical and efficient technologies



Leading Advanced Bio/Medical Industry

- World-Class Holotomography Development & Commercialization

Paradigm Shift in Bioimaging

Evolution of cell imaging technologies during the bio-analysis paradigm shift

17th
century

Development of
light microscopy

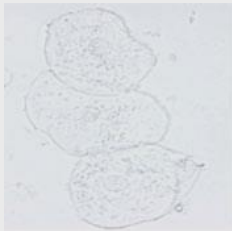
20th
century

Advances in
Cell biology

21st
century

Molecular cell
Biology and diagnostics

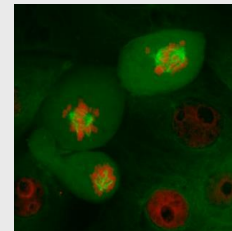
Brightfield
microscopy



Phasecontrast
microscopy



Fluorescence
microscopy



ZEISS



OLYMPUS

Nikon

Leica



ThermoFisher

Sartorius

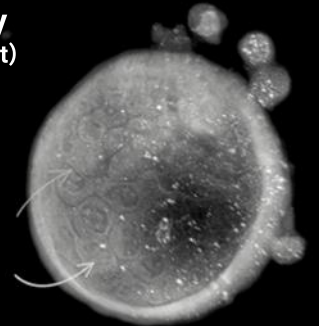
GE Healthcare



3D Biology & Regenerative Medicine

3D Cell Structure Measurement & Analysis

Holotomography
(Korea, 2015 - Present)



“ Major Developer of
Holotomography Technology ”

 Tomocube

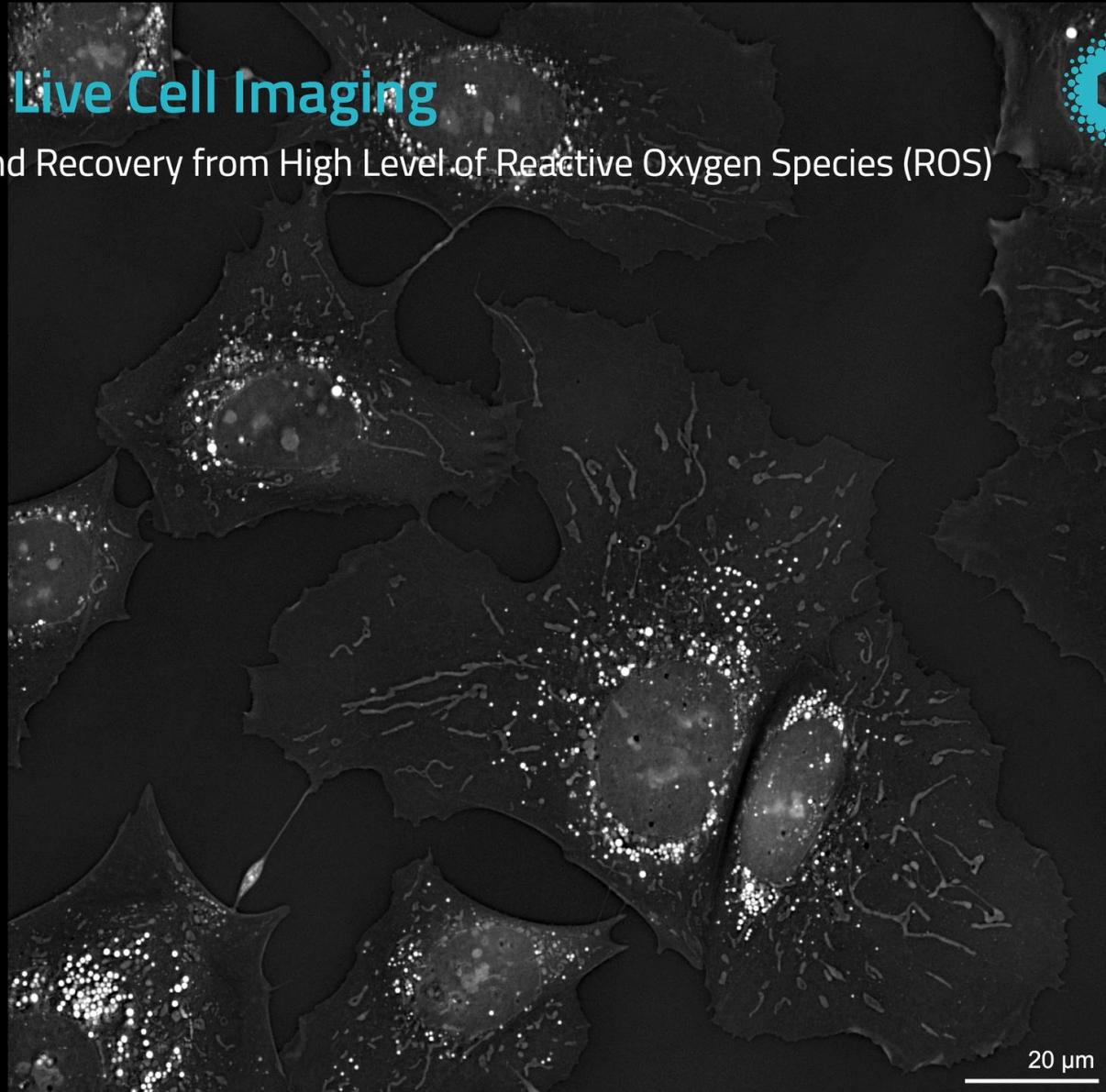


Label-free 3D Live Cell Imaging

Cellular Responses and Recovery from High Level of Reactive Oxygen Species (ROS)



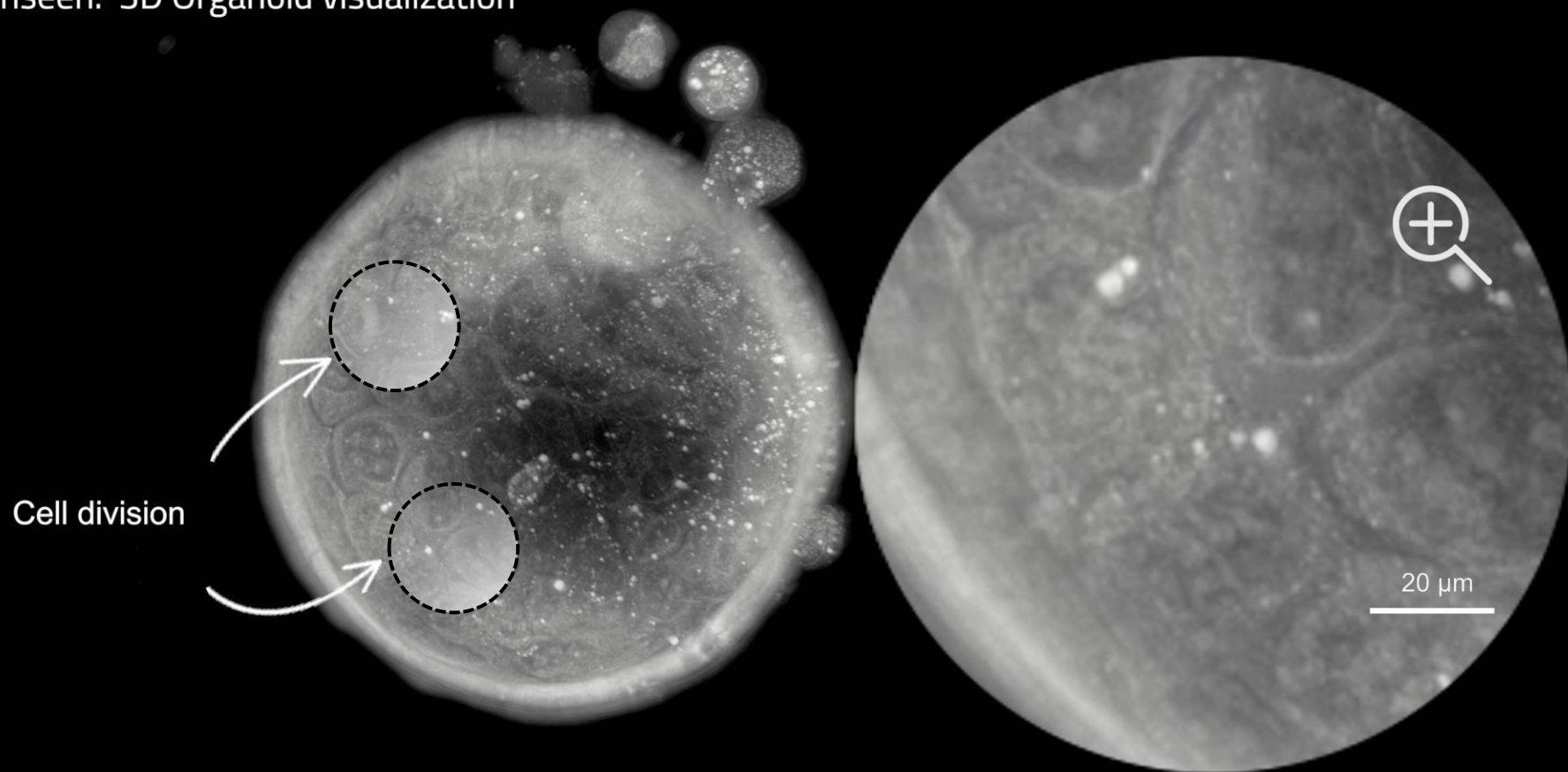
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- Cell line: Hep3B
- Microscope: HT-X1
- Observation duration: 4.5 hr
- Time interval: 20 sec
- Chip: ibidi μ -Slide 1 Luer
- Flow rate: 0.23 μ L/min

Label-free 3D live cell imaging

Unveiling the unseen: 3D Organoid visualization



Chapter 1.

Why Holotomography (HT)

01. Benefits from HT

02. HT Platform (1) Hardware

(2) Software

(3) AI

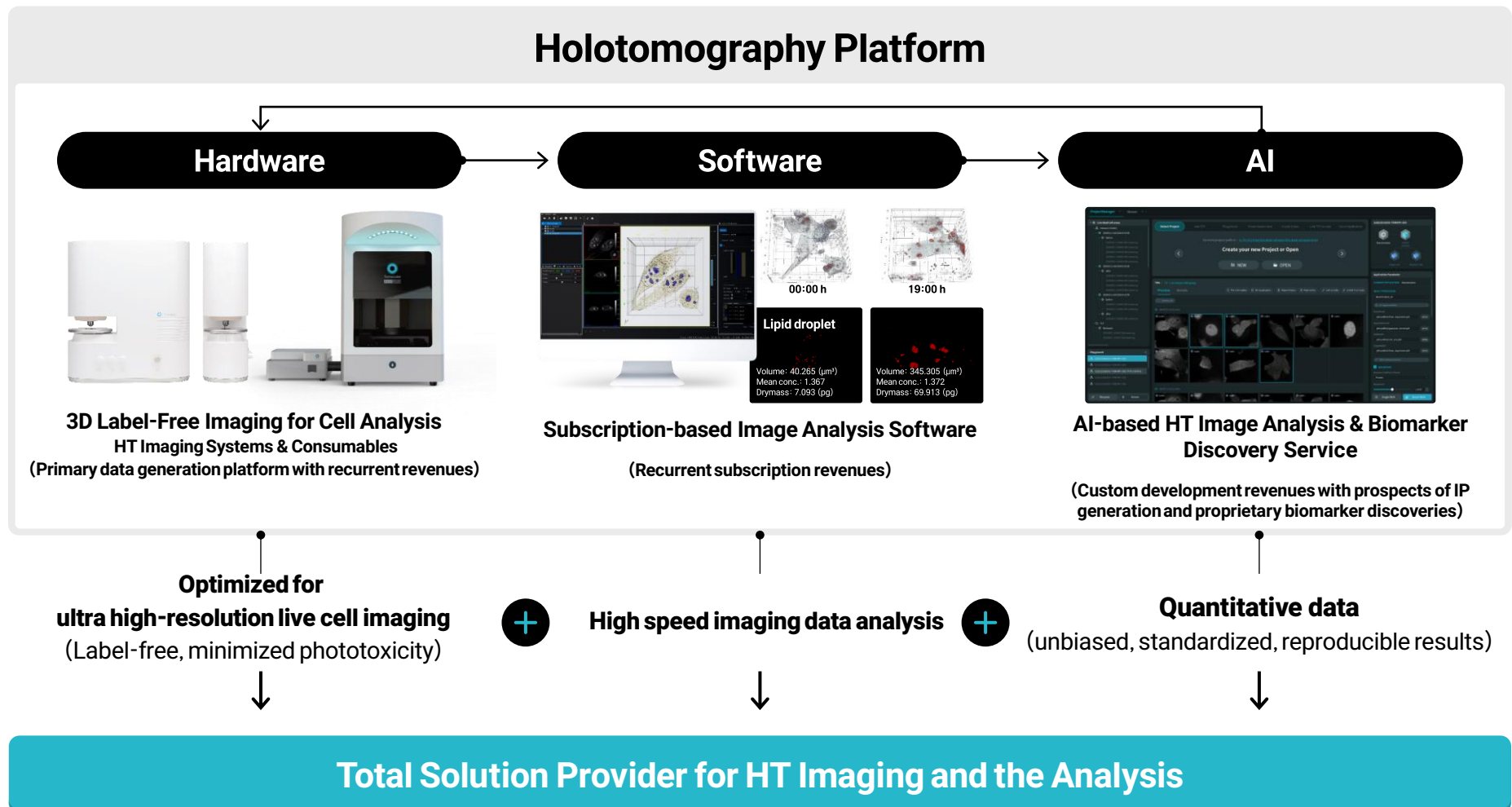
03. Distinct Competitive Advantages (1) Holotomography Comparison

(2) Cell Analysis Technology Comparison

04. Externally Validated Technological Capability

01. Benefits of HT

- Able to secure a competitive business model via proprietary hardware & software products

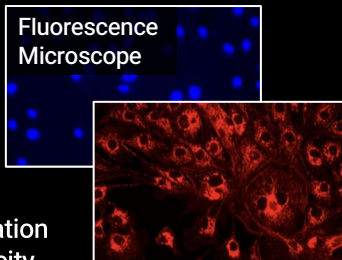


02. HT Platform (1) Hardware

•• 3D Label-Free Imaging Technology Standard Protocol

Unmet Needs

Limitations of Labeling



Fluorescent excitation
Causes phototoxicity,
leading to cell damage and deformation

Limitations of 2D cell analysis

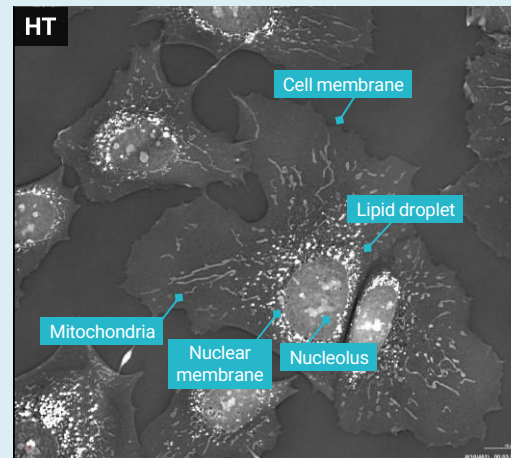


Difficult to analyze complex 3D cellular structures
and reduce accuracy & reliability



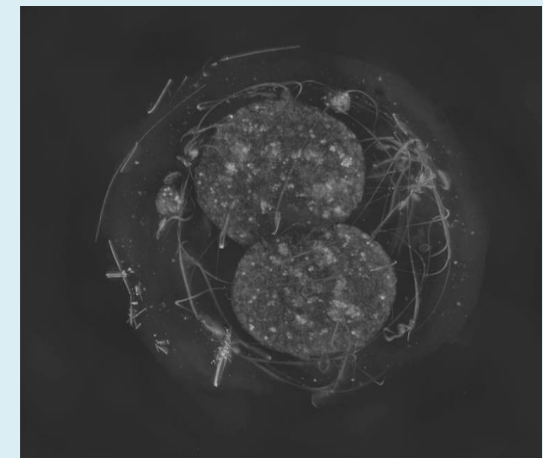
Hardware Competencies

Observes cells in their original state
without compromising cell viability and function



Observes intracellular organelles
Label-free, based on precise
refractive index measurement

Accurate 3D cell analysis for thick
tissues, organoids, etc.



No sectioning for thick tissues (< 150 μm)

Allows comprehensive
structural analysis of
entire cells

Maximizes cell survival
with minimal structural
impact

Enables extended cell
Imaging over time

02. HT Platform (2) Software

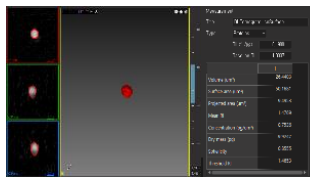
- Development of Custom Solutions for Specific Applications

Software Competencies

Demand-Based Solution Development

2017

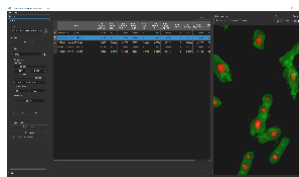
TomoStudio



Visualization of 3D HT data and single-cell analysis

2019

Lipid Analysis

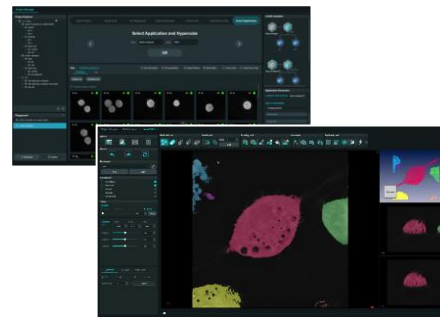


Targeted analysis optimized for specific conditions

“ Expanded application areas through AI model-based software ”

2022

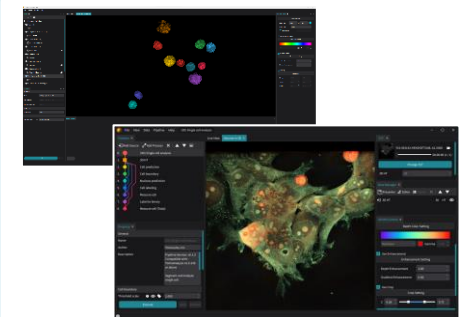
TomoAnalysis 1.0



- AI Model-Based Cell Organelle Analysis
- Rule-based multi cell analysis
- Applying uniform logics to big data

2024

TomoAnalysis 2.0

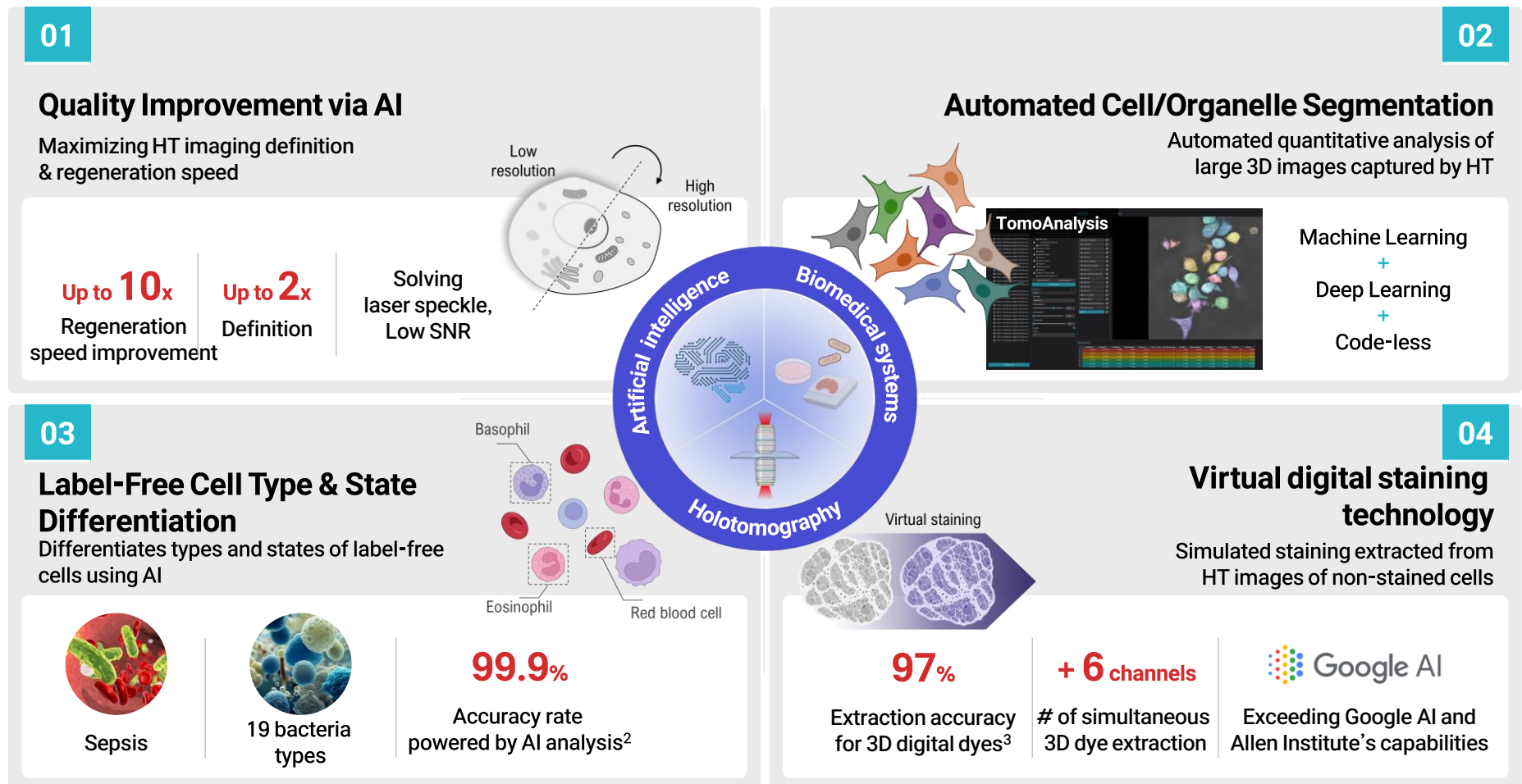


- Real-Time 3D Visualization
- System for Manageable Analysis Logic
 - Rule-based : 120 modules
 - AI-based : 7 modules
- 33 Application-Specific Logics

AI-based software for cell and organelle analysis

02. HT Platform (3) AI

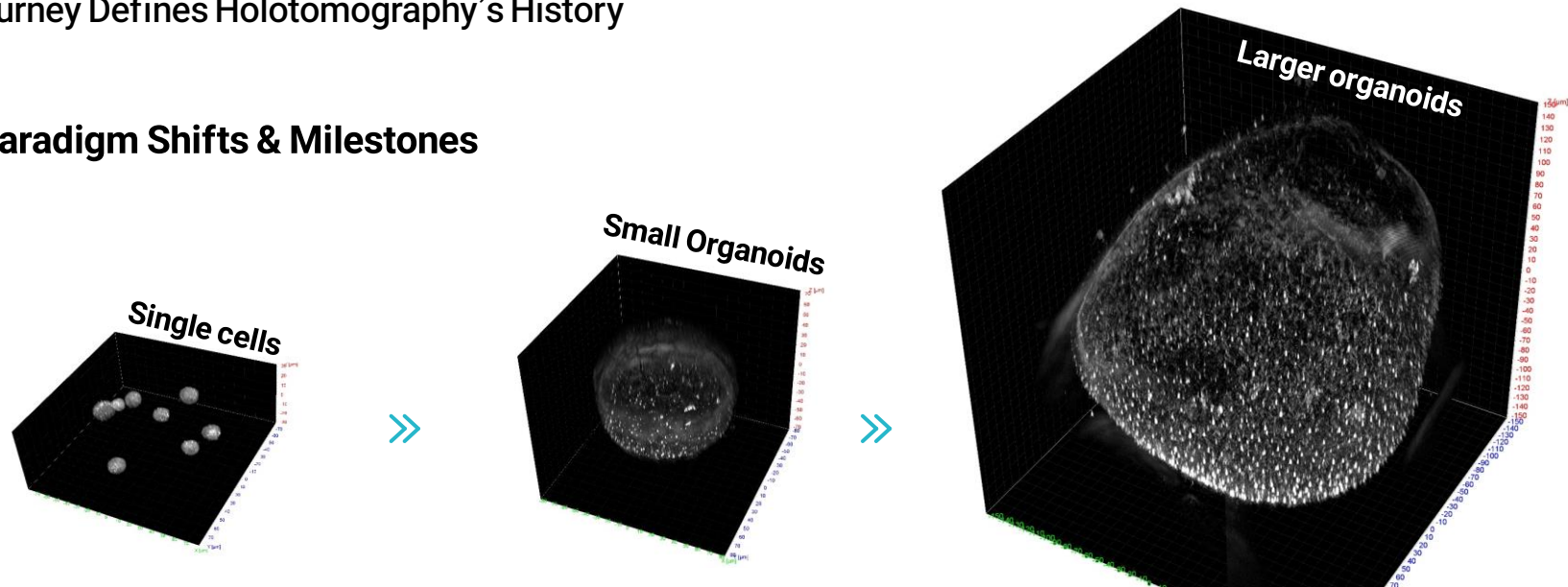
•• World-Leading AI-Based HT Imaging Analysis & Biomarker Discovery

Reference 1 : J. Park et al., *Nature Methods* 20, 1645 (2023)Reference 2 : G Kim et al. *Light: Science & Applications* 11, 190 (2022)Reference 3 : Y. Jo et al., *Nature Cell biology* 23, 1329 (2021)

03. Distinct Competitive Advantages: Holotomography Comparison

- Tomocube's Journey Defines Holotomography's History

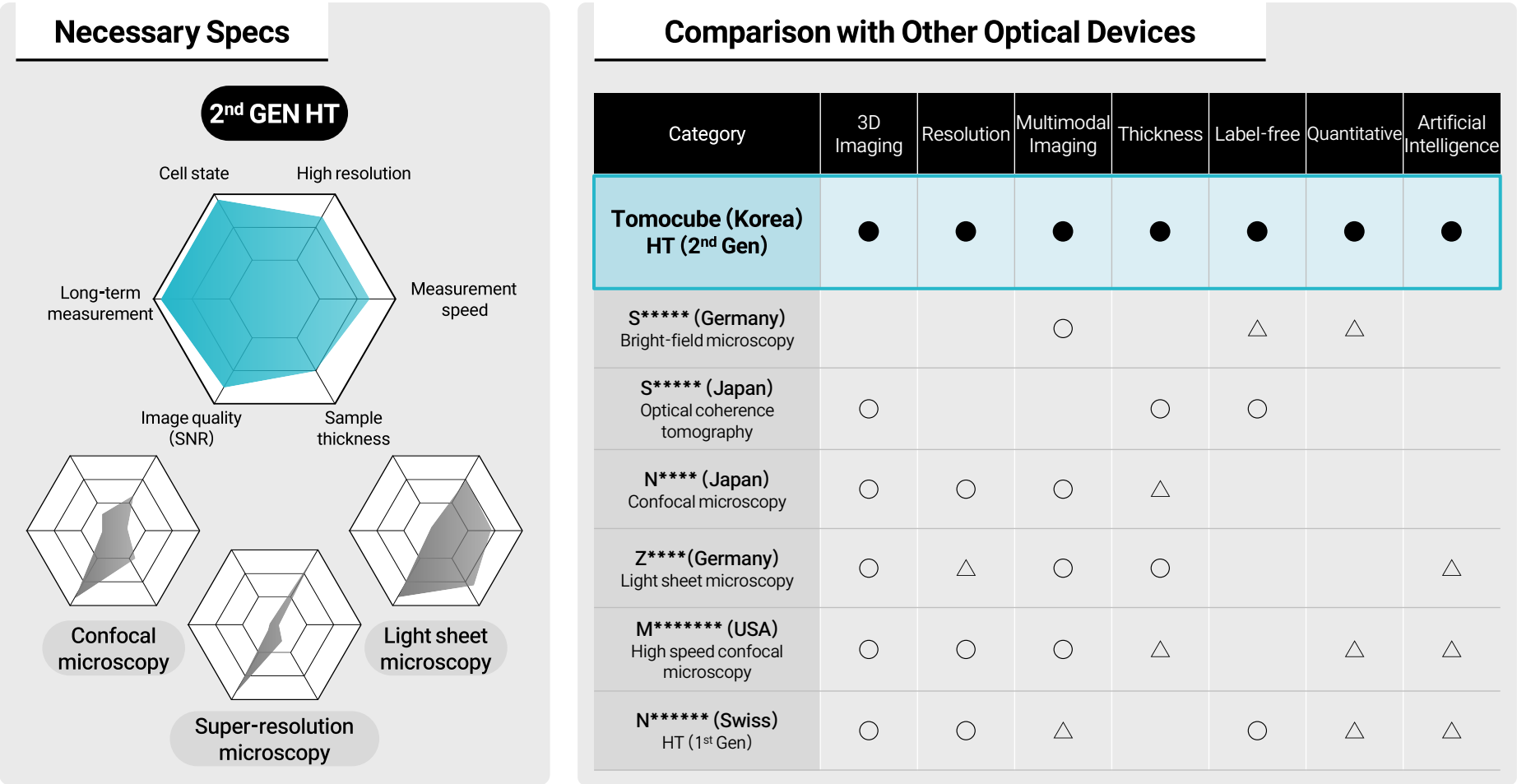
HT Technology Paradigm Shifts & Milestones



	1 st Generation		2 nd Generation	Future
Category	1 st Gen HT (Competitor)	1 st Gen HT (Tomocube)	2 nd Gen HT (Tomocube)	Future HT (Tomocube)
Model	3D Explorer	HT-2H	HT-X1	HT-X1 Max (under development)
Pros	High resolution	High resolution, 3D Fluorescence	High resolution & SNR (Signal to Noise Ratio) System stability with quantitative measurement	2x + a depth improvement from previous models Able to scan thicker organoids
Cons	Unstable, 3D measurement only for monolayered cell	3D measurement mostly for single cells	Increased capital expenditure	-
Maximum resolution	250 nm	110 nm	150 nm	124 nm
Depth	30 µm	40 µm	150 µm	Max 500 µm
Light source	Laser	Laser	LED (single wavelength)	LED (Multiple wavelengths)

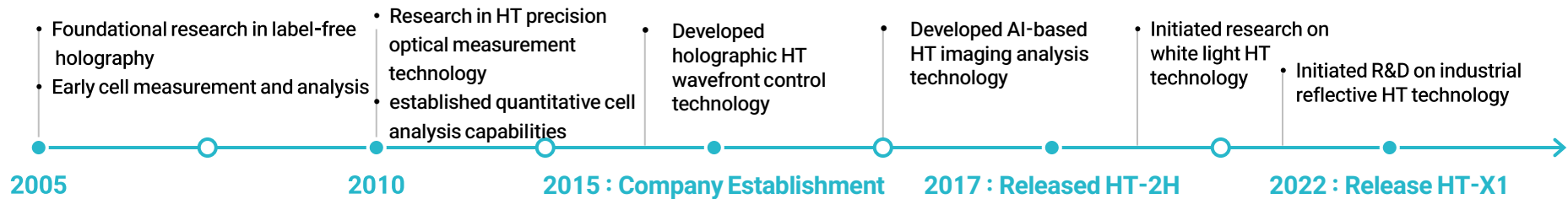
03. Distinct Competitive Advantages: Cell Analysis Technology Comparison

•• Tomocube Outperforms Competitors in All Aspects of Cell Analysis



04. Externally Validated Technology with strong IP protection

71 Granted and Pending Patents; Domestic & International Recognition



Patents related to core tech

R&D History	18 years
Publications	63
R&D Costs	KRW 19.8 bn.
domestic patents pending	10
domestic patents granted	23
international patents pending	17
international patents granted	21
Total patents	71

Awards and Recognitions



IR52 Jang Young-shil Award

Nov. '17 / Min. of Science and ICT



Microscopy Innovation Award

2019 / Microscopy Society of America



Best Life Science Product Finalist

2023 / SelectScience

- Top 10 Mechanical Technologies(2016)
- PRISM Awards Finalist (2018)
- Awarded by the Min. of Science and ICT, South Korea (2021)
- Awarded by the Min. of SMEs and Startups, South Korea (2021)
- Awarded by "Korea Innovative Startup" (2022)

Chapter 2.

Expanding the applications of HT

01. Tomocube's Target Market

02. Opportunity # 1 Organoids

Opportunity # 2 In Vitro Fertilization

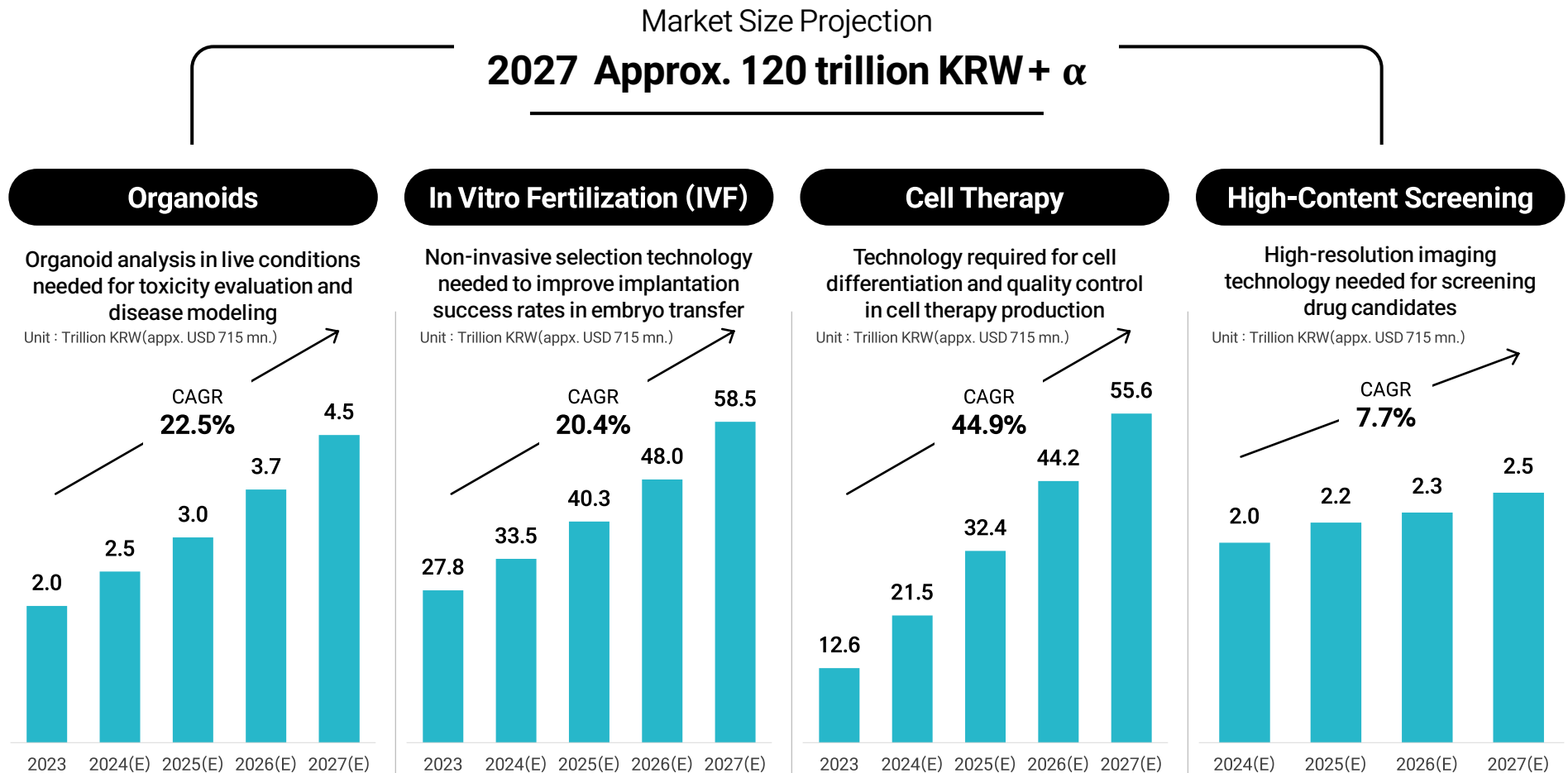
Opportunity # 3 Cell Therapies

Opportunity # 4 Drug Development

Opportunity # 5 Non-Bio Industrial Applications

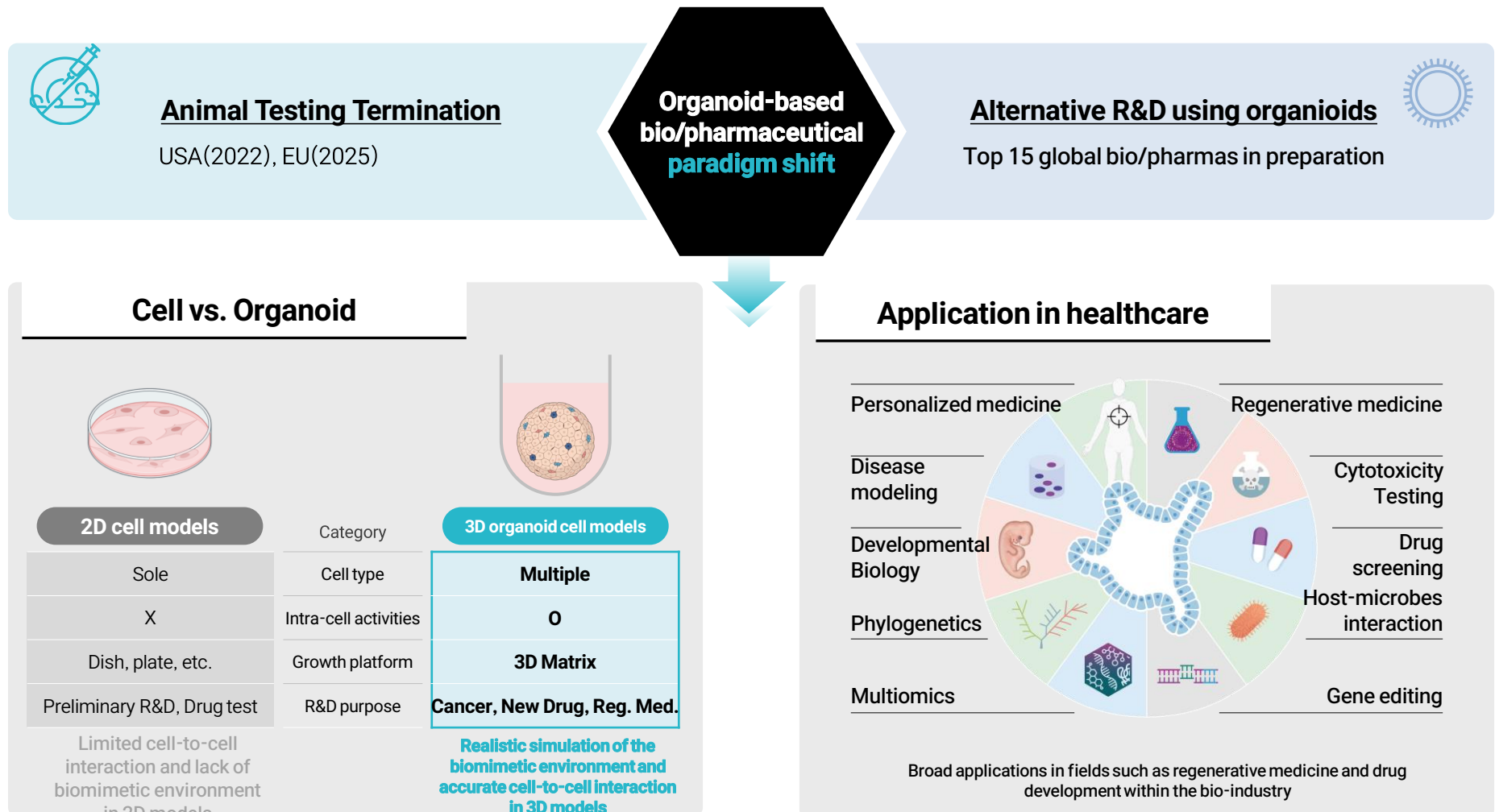
01. Tomocube's Target Market

• 3D Biology & Regenerative Medicine Market Growth



02. Expanding Applications of HT(1): Organoids*

• Organoids as a new model in Advanced Bioindustry



* Organoid: tiny, self-organized three-dimensional tissue cultures that are derived from stem cells

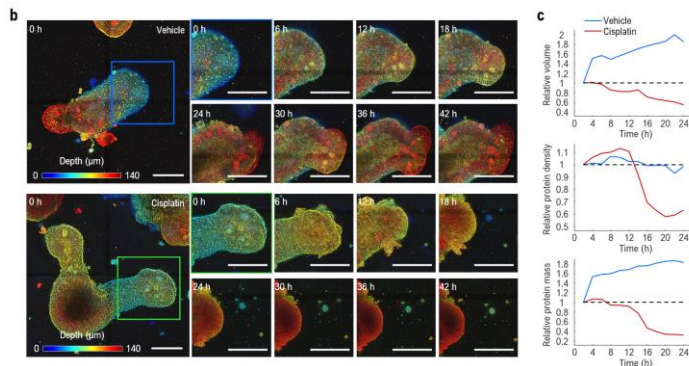
02. Expanding Applications of HT(1): Organoids

• Standardization of Organoid Analysis Using HT

Collaboration with Global Top Pharmas

In conversation to co-develop industry standards
→ **AI powered Holotomography organoid cell analysis**

3D label-free imaging and AI-based analysis protocols

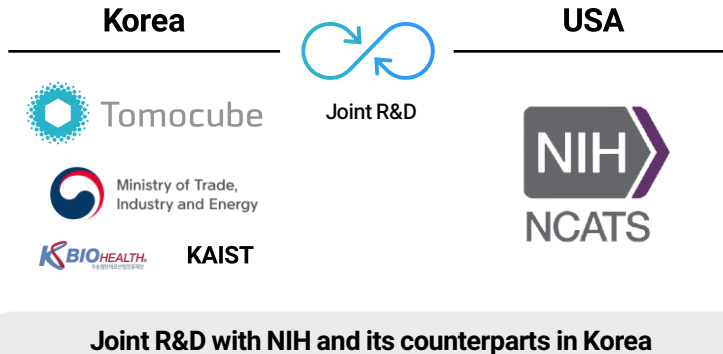


Reference: M. J. Lee et al., Experimental & Molecular Medicine (2024)

Collaborating w/ US-KOR Gov't Agencies

Selected for bio material developments
→ **3D organoids imaging device for new drug safety verification**

Leading organoids R&D and QA/QC standardization



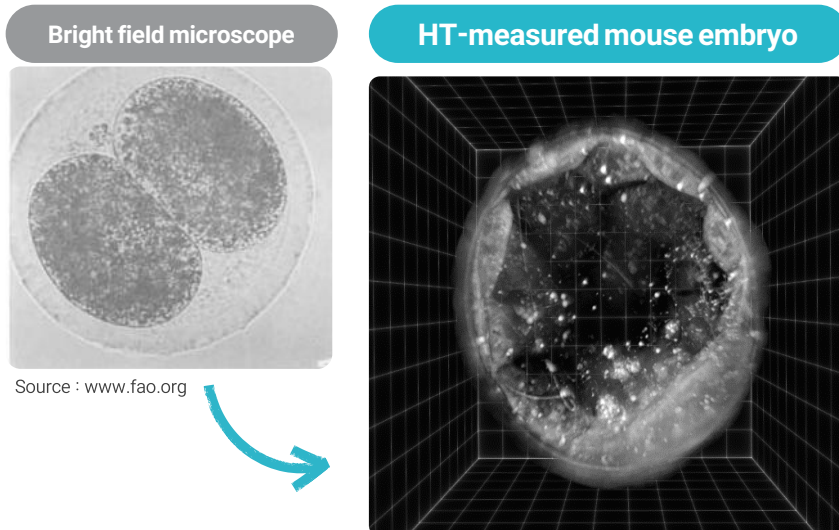
Leading Standardization Efforts with Global Enterprises and Government Agencies

02. Expanding Applications of HT(2): IVF

• 3D Label-Free HT Imaging & AI for High Implantation Rate Embryo Selection

Conventional Unmet Needs

- Label-less imaging is essential for embryo selection processes
- Prohibited to dye or edit genes during embryo selection process
- Current BF microscopy: intra- inter-clinician variability



Unique Technology for Label-Free Selection
→ 3D Label-free Holotomography

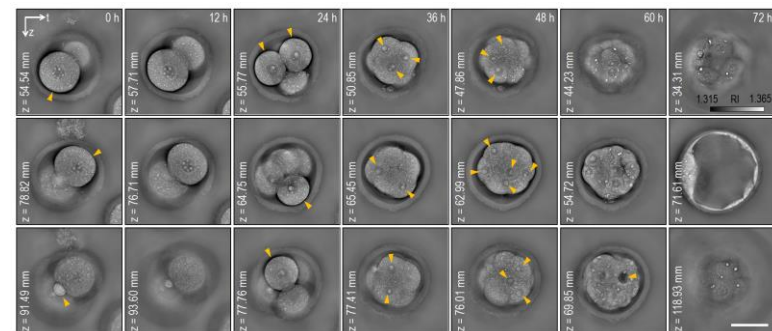
Synergies from strategic partnerships

Ovum selection using HT and Virtual Biomarkers

Big hospitals & institutions



Phototoxicity test for IRB approval using HT-X1 on human fetus studies

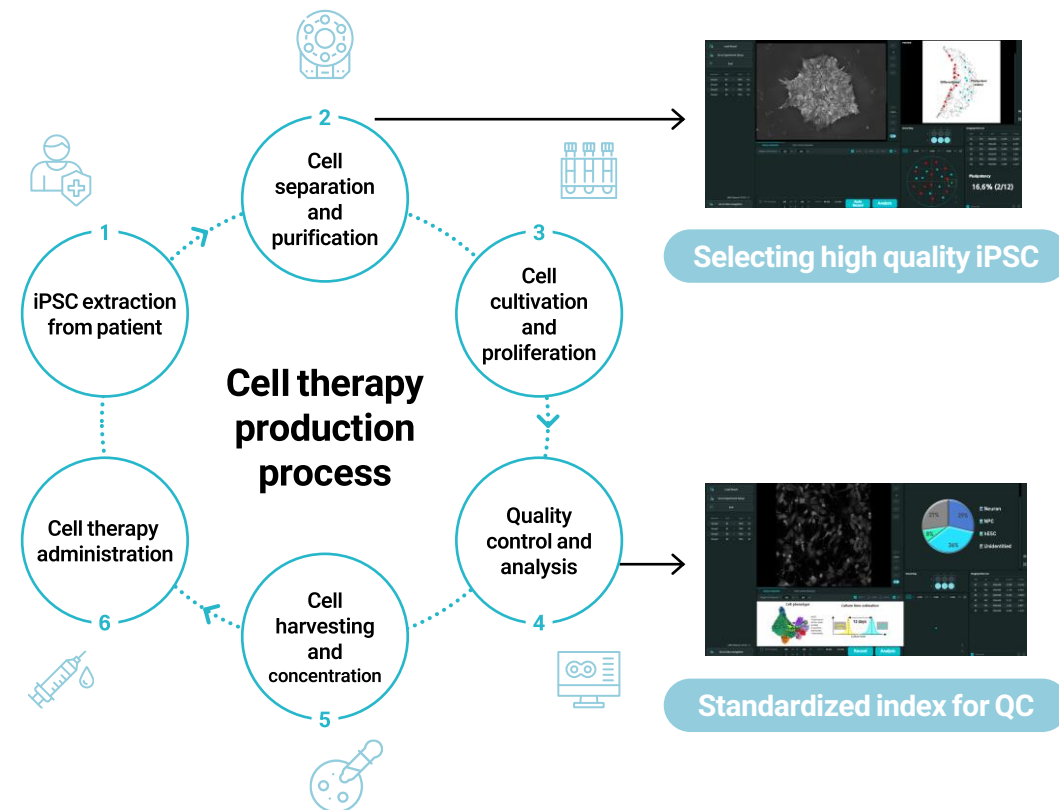


- 3D high-def imaging from G1 phase to blastocyte (72 hours) confirmed
- Achieved 95% accuracy on AI-based fetus selection algorithms (under review)

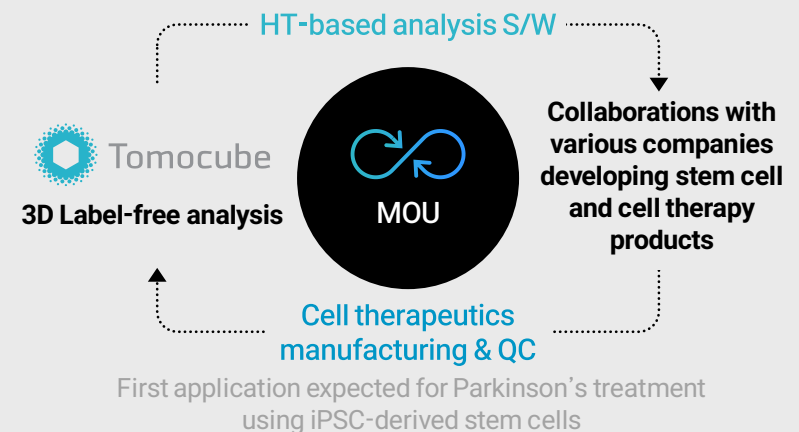
02. Expanding Applications of HT(3): Cell Therapy

- Revolutionary Solution for QC in Cell Therapy Production Processes

HT powered analysis S/W allowing
Improvements in cell therapeutics manufacturing



Non-invasive QC Process for Cell Therapy

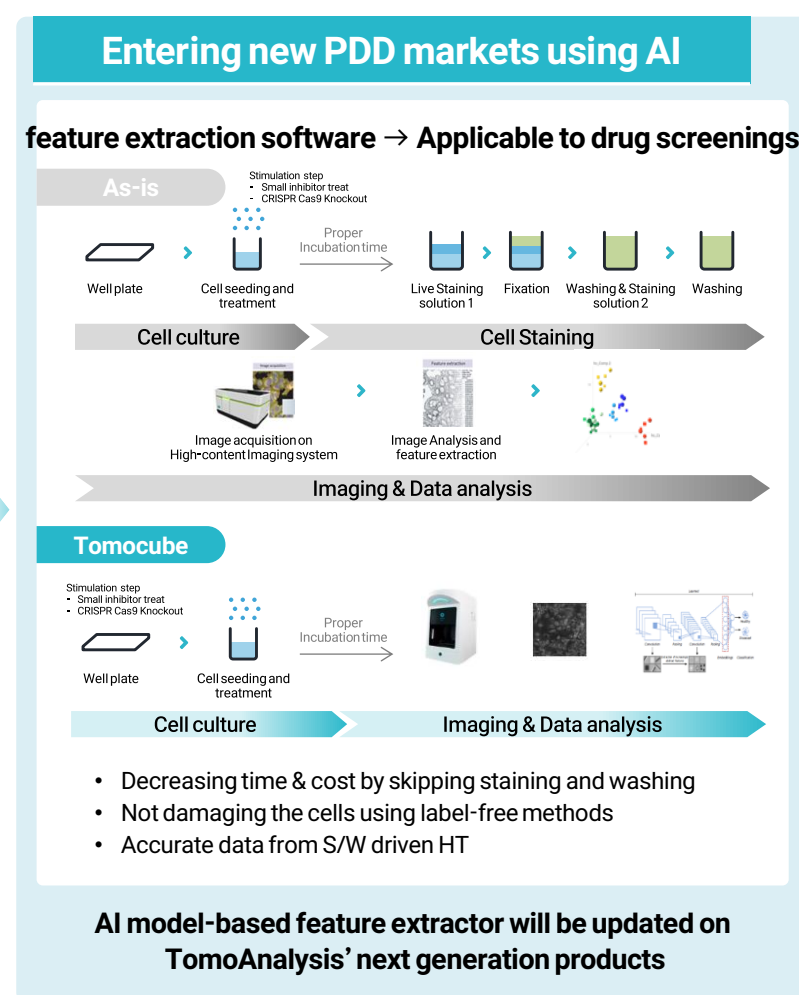
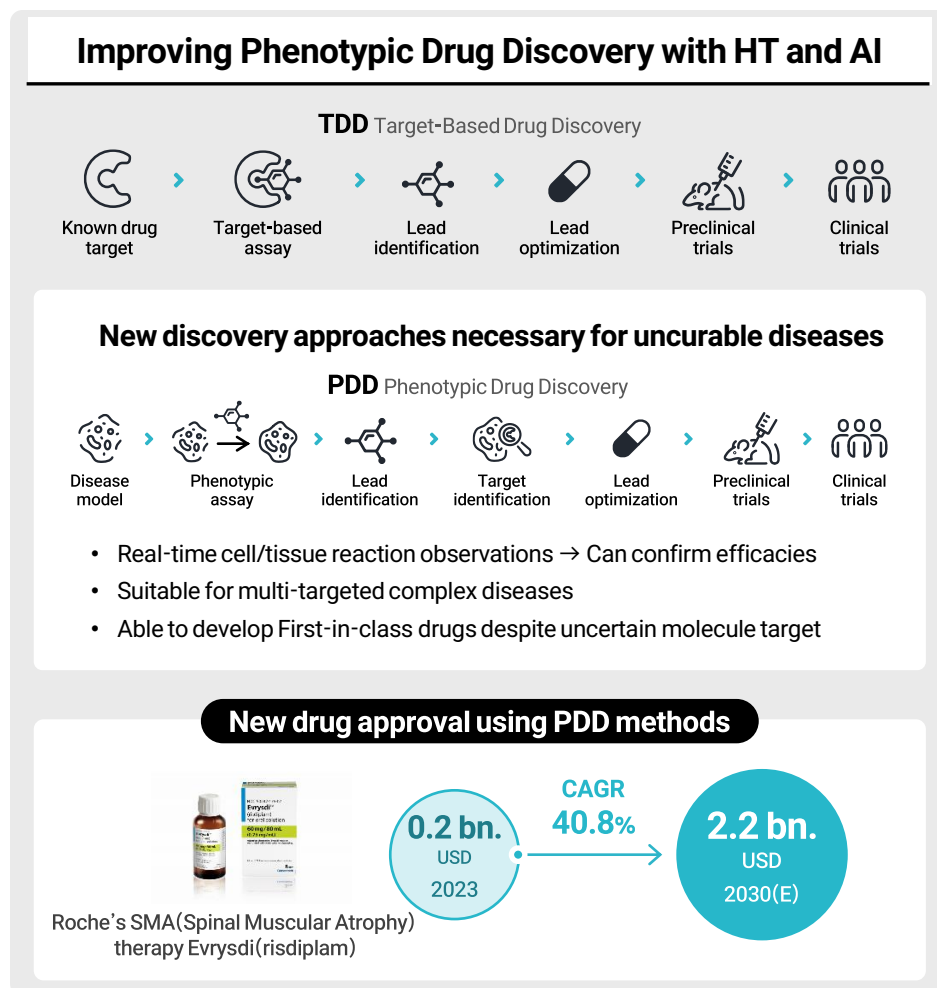


Potential for application across diverse cell therapies



02. Expanding Applications of HT(4): Drug Development

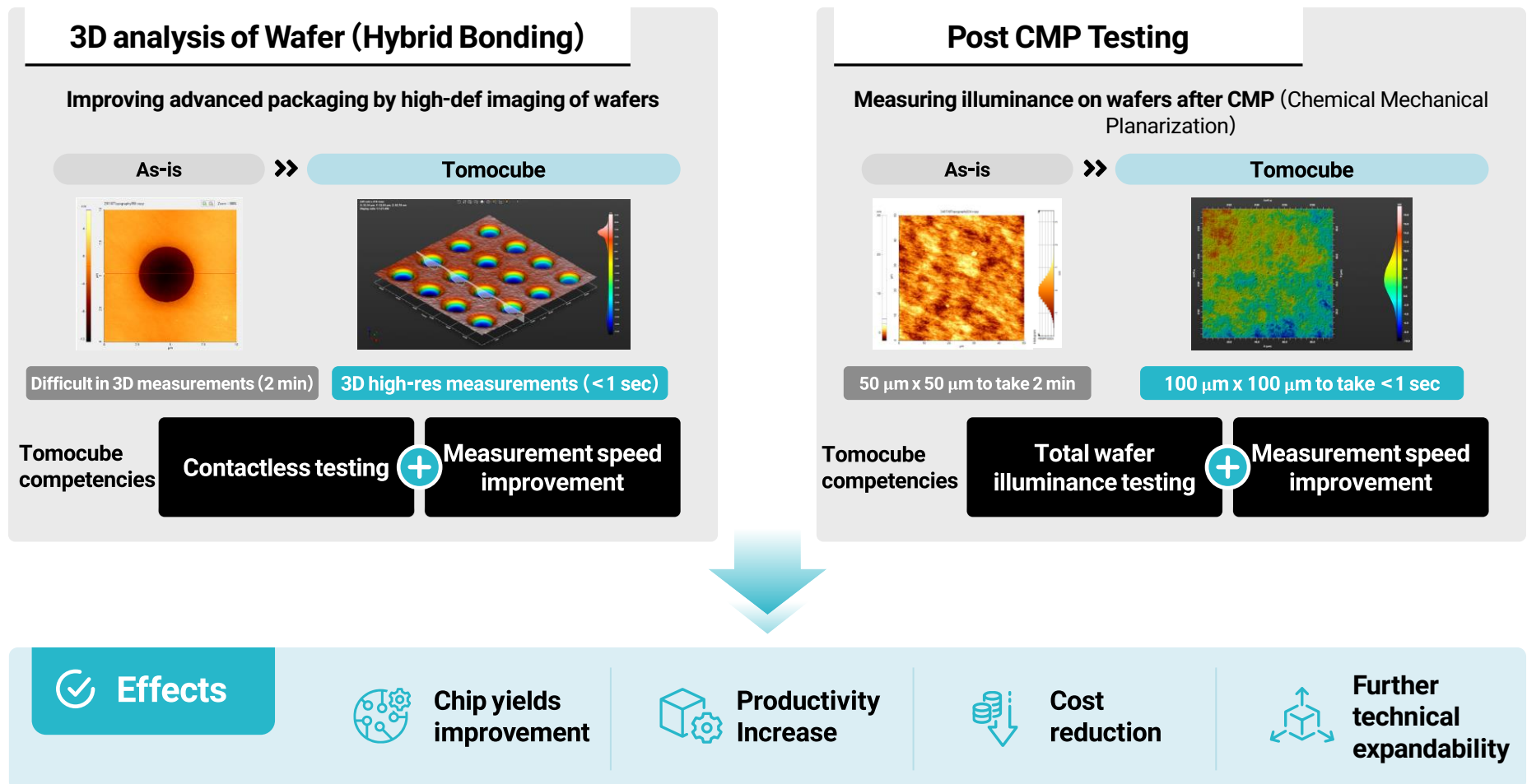
• Application of HT in Phenotypic Drug Discovery (PDD)



PDD(Phenotypic Drug Discovery): uses empirical, target-agnostic lead generation to identify pharmacologically active molecules and novel therapeutics which work through unprecedented drug mechanisms.
 TDD(Target-Based Drug Discovery): focused on a drug target, a gene product that provides a starting point for invention of a therapeutic which modulates its expression, function, or activity

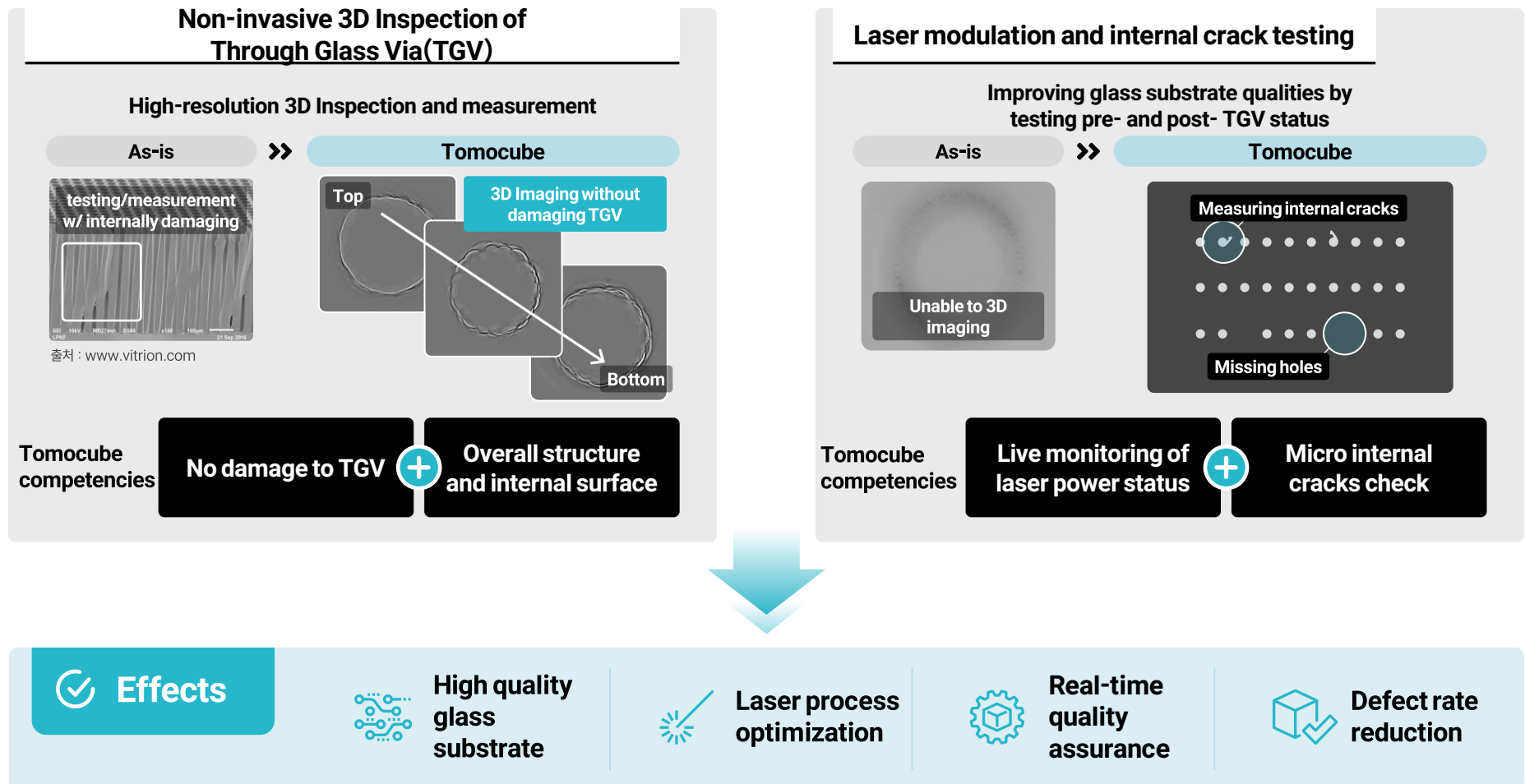
02. Expanding Applications of HT(5): Non-Bio Industrial Use

• HT-Based Inspection in Semiconductor Advanced Packaging



02. Expanding Applications of HT(5): Non-Bio Industrial Use

•• Glass Substrate testing market




 **Effects**



High quality glass substrate



Laser process optimization



Real-time quality assurance



Defect rate reduction

02. Expanding Applications of HT(5): Non-Bio Industrial Use

- Continuous R&D enabling the expansions beyond semicon and display sectors

New product launching



HT-R1 (Alpha) demo model

July '24 HT-R1 (Alpha) rev.3 dev. complete



Q3 '24 Aberration correction algorithm appl.



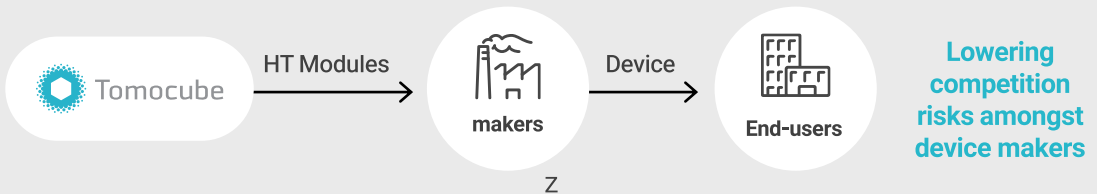
2025 Products for Hybrid Bonding testing



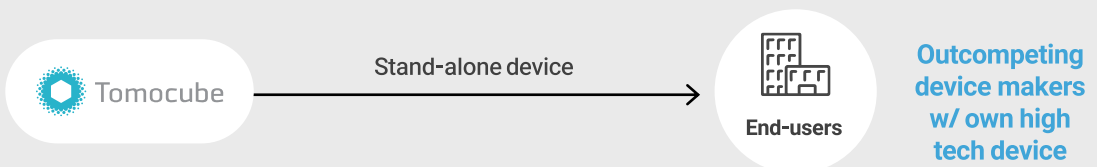
2026 HT-R1 launching

3D measurement modules & device

Early Providing modules to machinery/device makers



Late Providing device to End-Users



Industry	Partnering in progress(KOR)	Partnering in progress(Global)
OLED	Company S	2 Companies (including "S")
Glass Substrate	3 Companies(including "L")	2 Companies (including "K")
AR Glass	Company L	Company "M"
Hybrid Bonding	3 Companies(including "S")	3 Companies (including "I")

02. Expanding Applications of HT(5): Non-Bio Industrial Use

•• Peer Group Comparison in Non-Bio Inspection Market

Company Name	Market cap ¹	Sales(FY2023)	Specialties	High-def 3D Imaging	Internal testing w/o damaging	High-speed testing
 Tomocube	-	KRW 3.7 bn.	Hybrid Bonding & TGV Testing	✓	✓	✓
Company K(US)	USD 10 bn. (NASDAQ)	USD 9.8 bn.	Optical testing, damage analysis	✓		✓
Company O(US)	USD 9.3 bn. (NYSE)	USD 0.82 bn.	TSV depth & micro damage measurements	✓	✓	✓
Company C(Israel)	USD 3.8 bn. (NASDAQ)	USD 0.32 bn.	Automated optical testing	✓		✓
Company P(KOR)	KRW 1.22 tn.	KRW 145 bn.	Wafer defect and surface analysis	✓		
Company N(KOR)	KRW 0.45 tn.	KRW 87.9 bn.	Micro pattern defect testing		✓	✓
Company I(KOR)	KRW 0.18 tn.	KRW 74.8 bn.	Back-end packing testing	✓		✓
Company O(KOR)	KRW 0.16 tn.	KRW 45.5 bn.	TSV & wafer bumping testing			✓

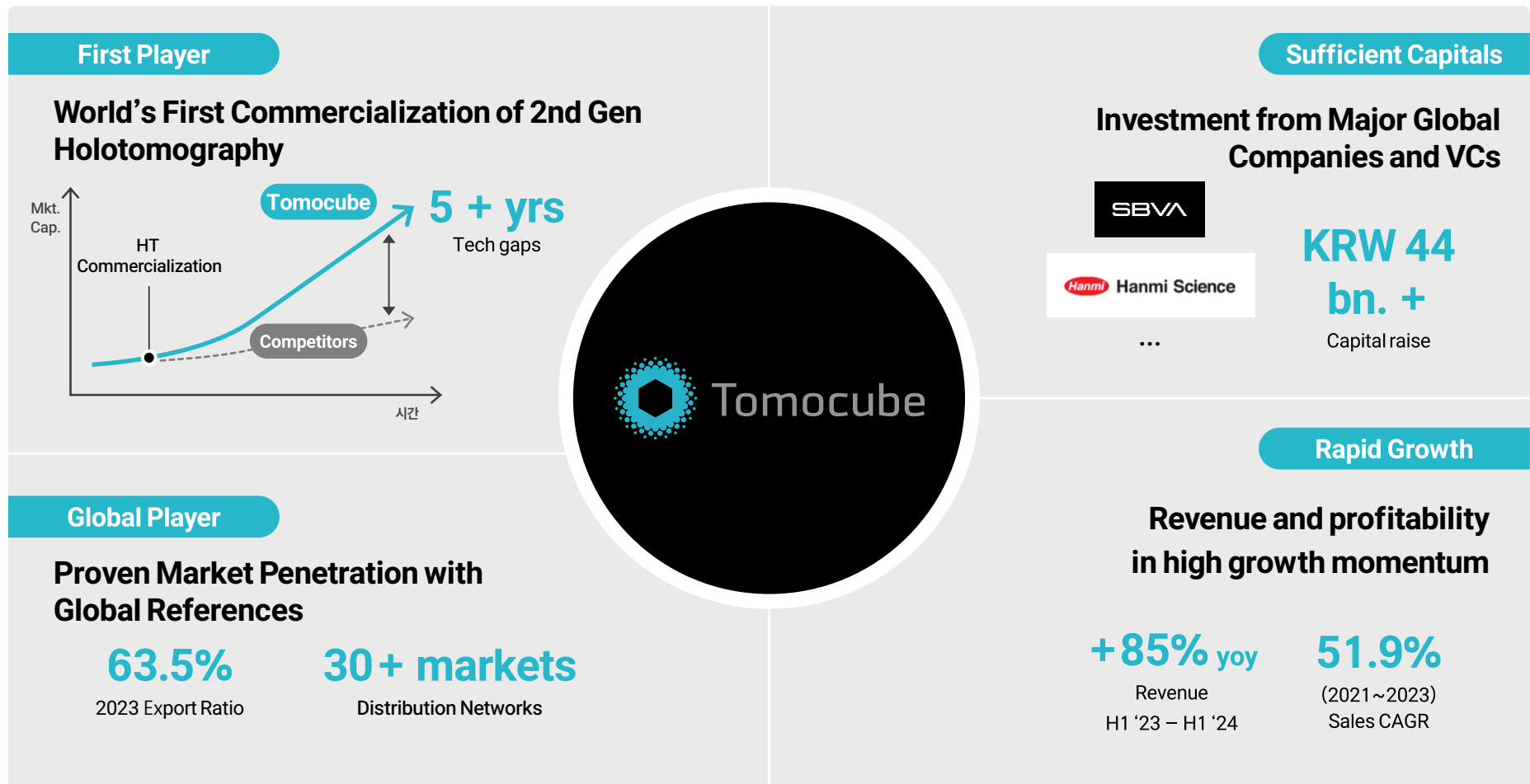
Chapter 3.

Investment Highlights

- 01. Tomocube's Key Success Factors
- 02. Proven Technology
- 03. Commercial Viability
- 04. Global Market Expansion
- 05. Downstream industry application & investments
- 06. Domestic/Global leader in bio materials/parts/equipment
- 07. Earnings guidance

01. Tomocube's Success Factors

- Advanced Deep Tech Innovator in Bio Industry

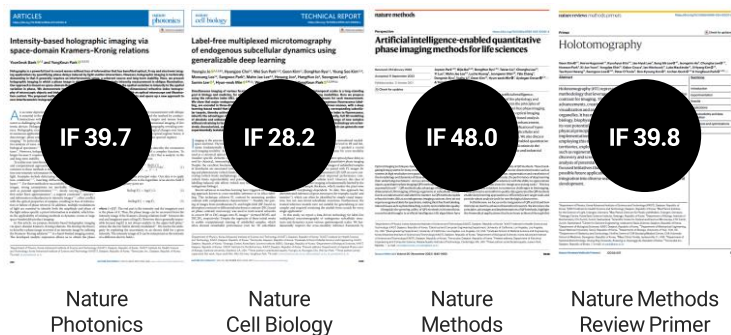


02. Proven Technological Excellence

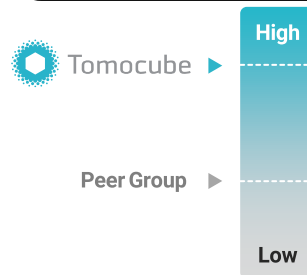
• Holotomography Recognition in Global Market

Tomocube is leading global technology developments

Holotomography featured in top publications by industry

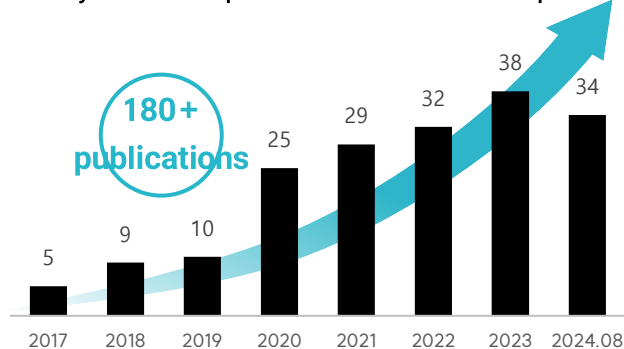


Competitive Impact Factor (IF)



Cumulated customer references to HT's market position

Steady increase in publications w/ Tomocube products



Main Research Areas



Driving new customer acquisition opportunities

Major International Collaborations and Conferences

Bioimaging, Organoids, Major Institutions (MIT, Harvard, Mayo Clinic, University of Tokyo, Tsinghua University)



Continuous exposure as the new bio/healthcare technology



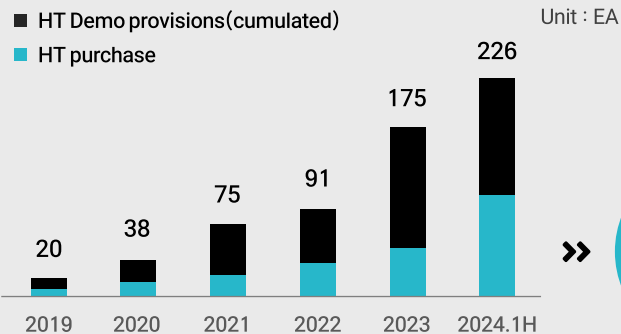
High Interest from Global Biopharma & Research Institutions

* : Impact Factor - a measure of the frequency with which the average article in a journal has been cited in a particular year. It is used to measure the importance or rank of a journal by calculating the times its articles are cited.

03. Proven Commercial Viability

- HT Expected to Show Explosive Growth as Best-in-Class Technology

High satisfaction from customer base



More global customer references

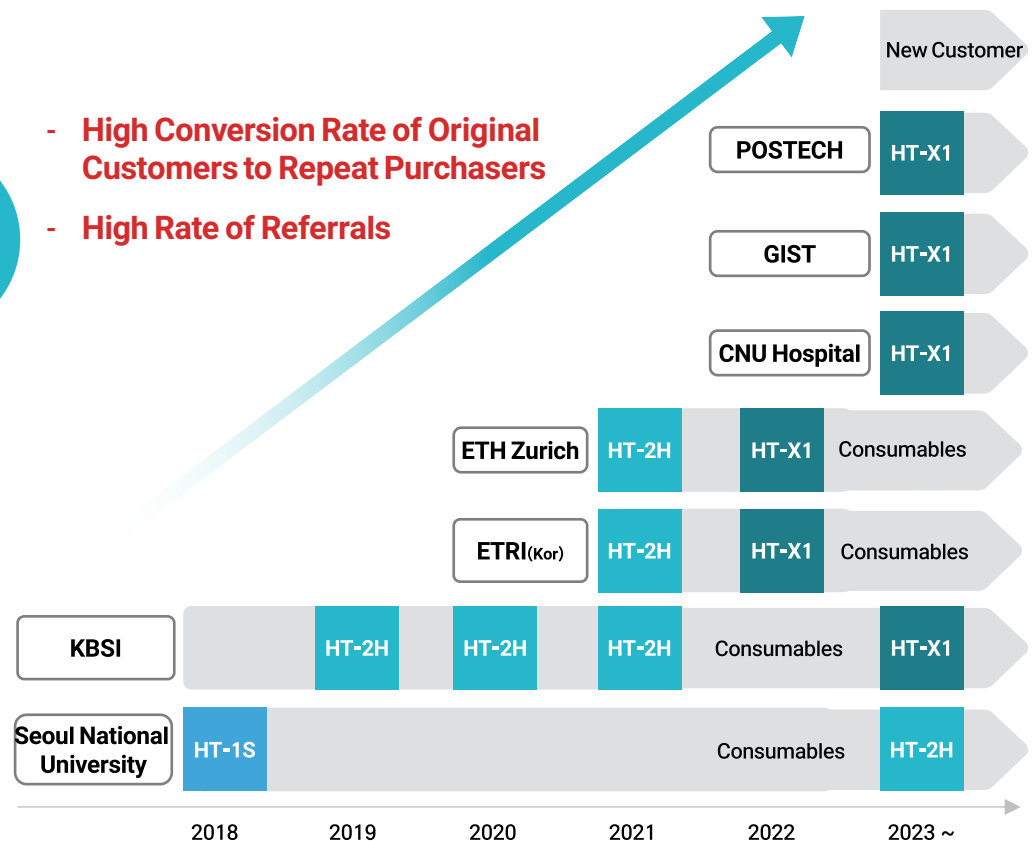
+ 85 Major Global Customers (Universities, Research Institutes, Corporations)

of Customers CAGR 27.3%(2019~2023)

Universities / Institutions			B2B	
JOHNS HOPKINS UNIVERSITY			CJ	
Seoul National University	ETH Zurich	MIT	LG Chem	
OIST	AFRL	Cha Med	BAYER	

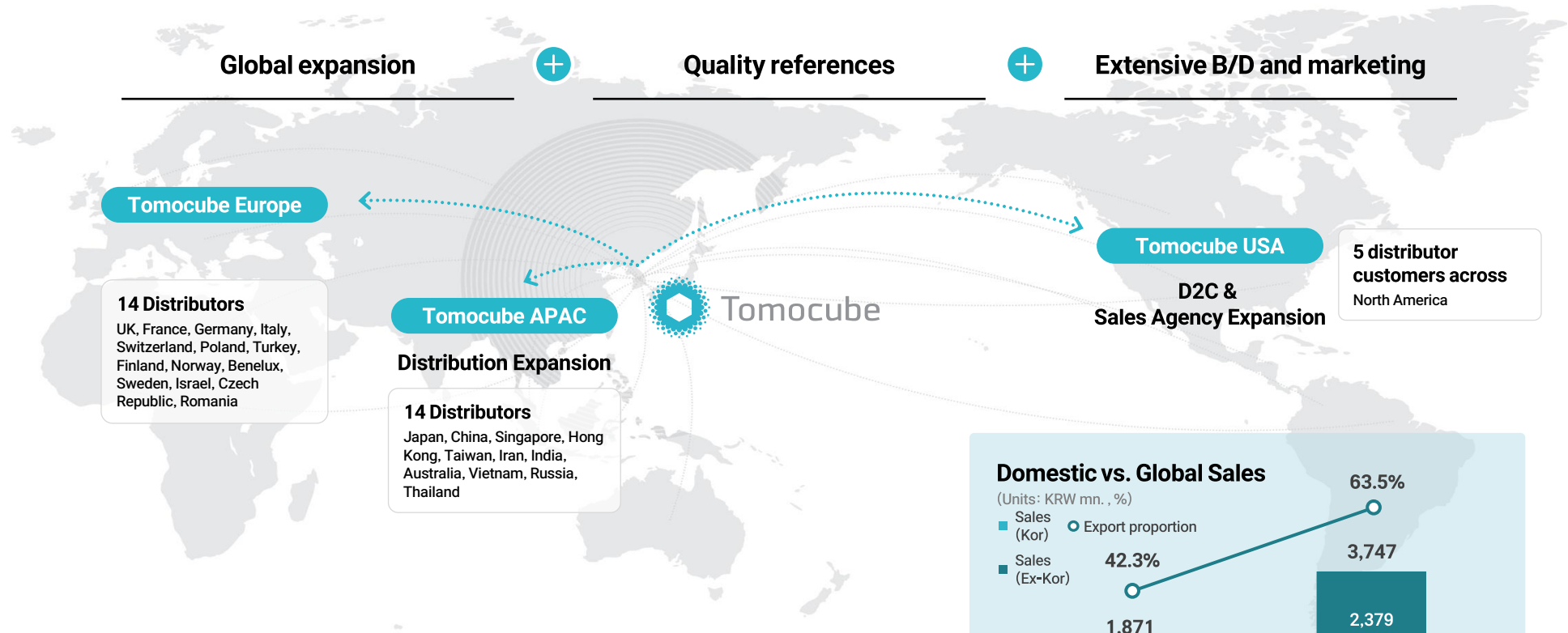
Continuous Revenue Pipeline Growth

- High Conversion Rate of Original Customers to Repeat Purchasers
- High Rate of Referrals



04. Global Expansion Strategy

- Expansion of Direct Sales & Distribution Networks Globally



B/D Marketing Actions

- Established Centers of Excellence
- Global professional conference coverage
- On-site demos
- Collaboration with distributors
- Social media / online PR

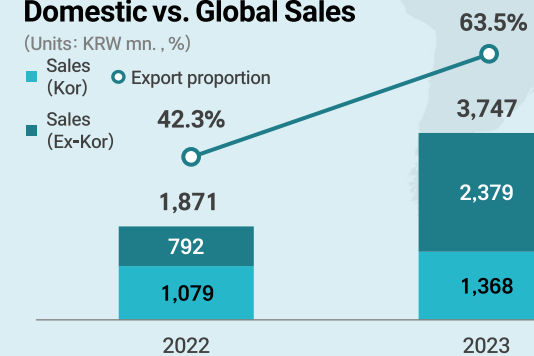


Domestic vs. Global Sales

(Units: KRW mn., %)

■ Sales (Kor) ● Export proportion

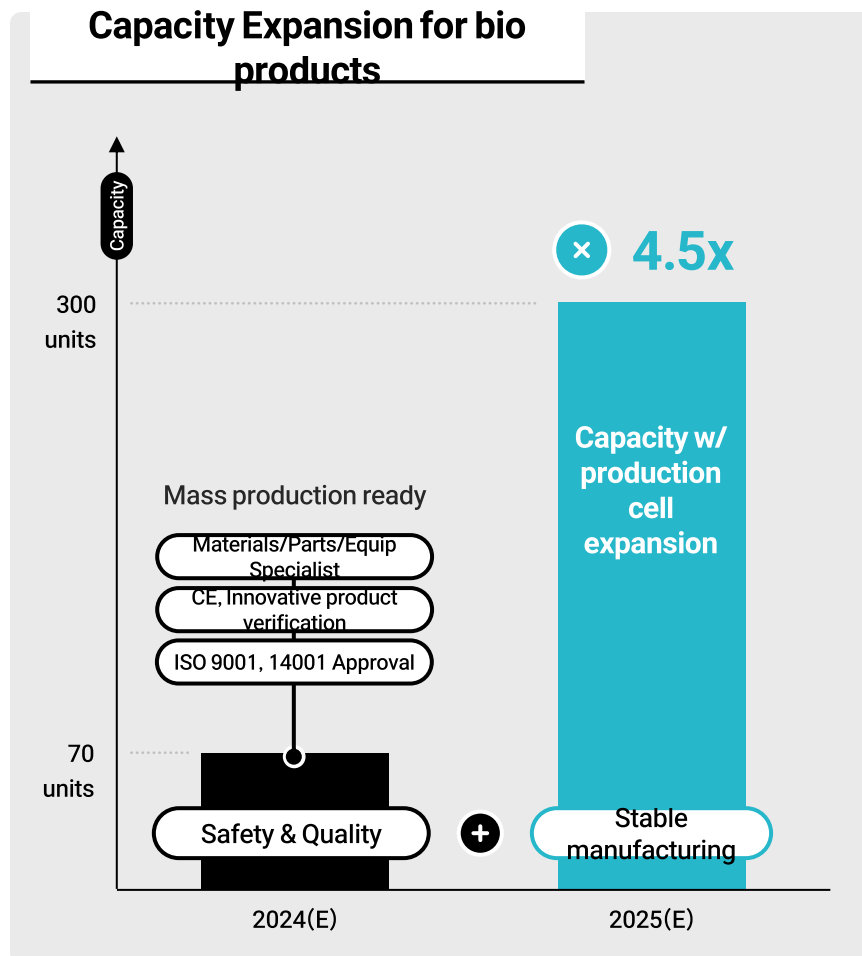
■ Sales (Ex-Kor)



Global expansion(USA, APAC, EMEA)

05. Strategic Investment to Meet Market Demand Expansion

- Increased Demand in Bio & Non-Bio Sectors, Market Positioning



CapEx for non-bio products



Holotomography to synergy

- 1 Enhanced Product Quality via Precision Measurement
- 2 Meeting each customer's technical demands
- 3 Efficiency in process management resulting in cost reduction

06. Leading Localization in Bio Equipment Manufacturing

- Direct Beneficiary of Government's Bio Equipment Localization Policy

KR Government's subsidy on domestic device R&D 5% or less for cell analysis equipment and other device dev.



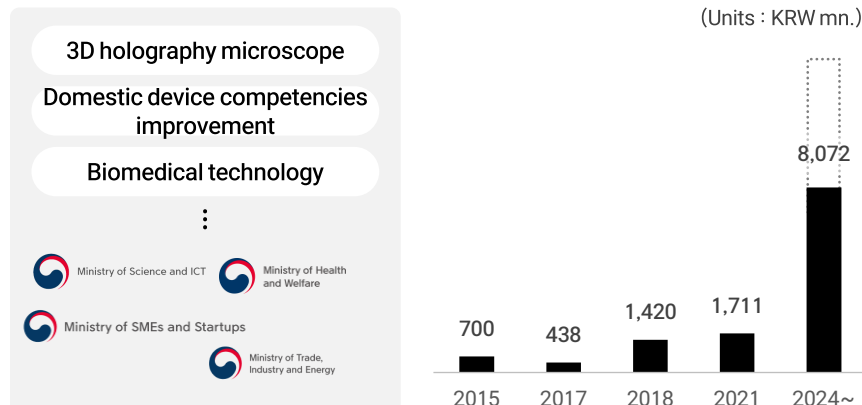
Ministry of Science and ICT

"20% or more to be domestically manufactured by 2027"

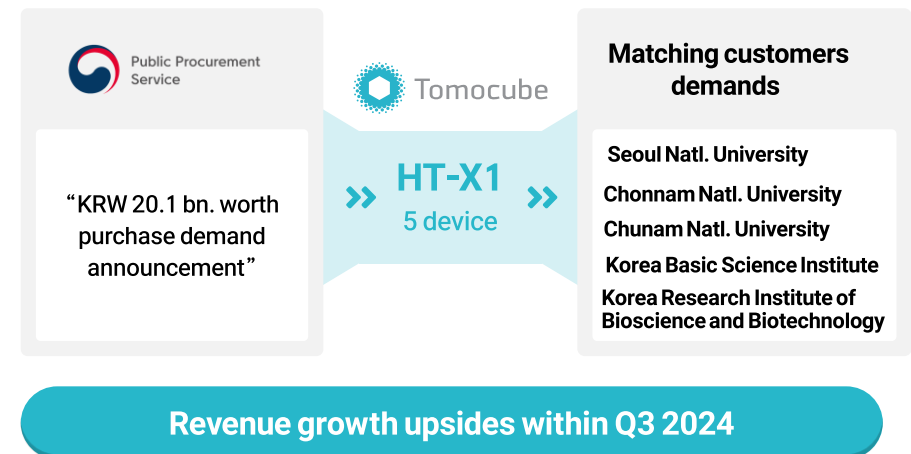
World-Class HT Technology

Tomocube's cumulative public funding history

Over KRW 12.5 bn. public R&D and subsidies since 2015

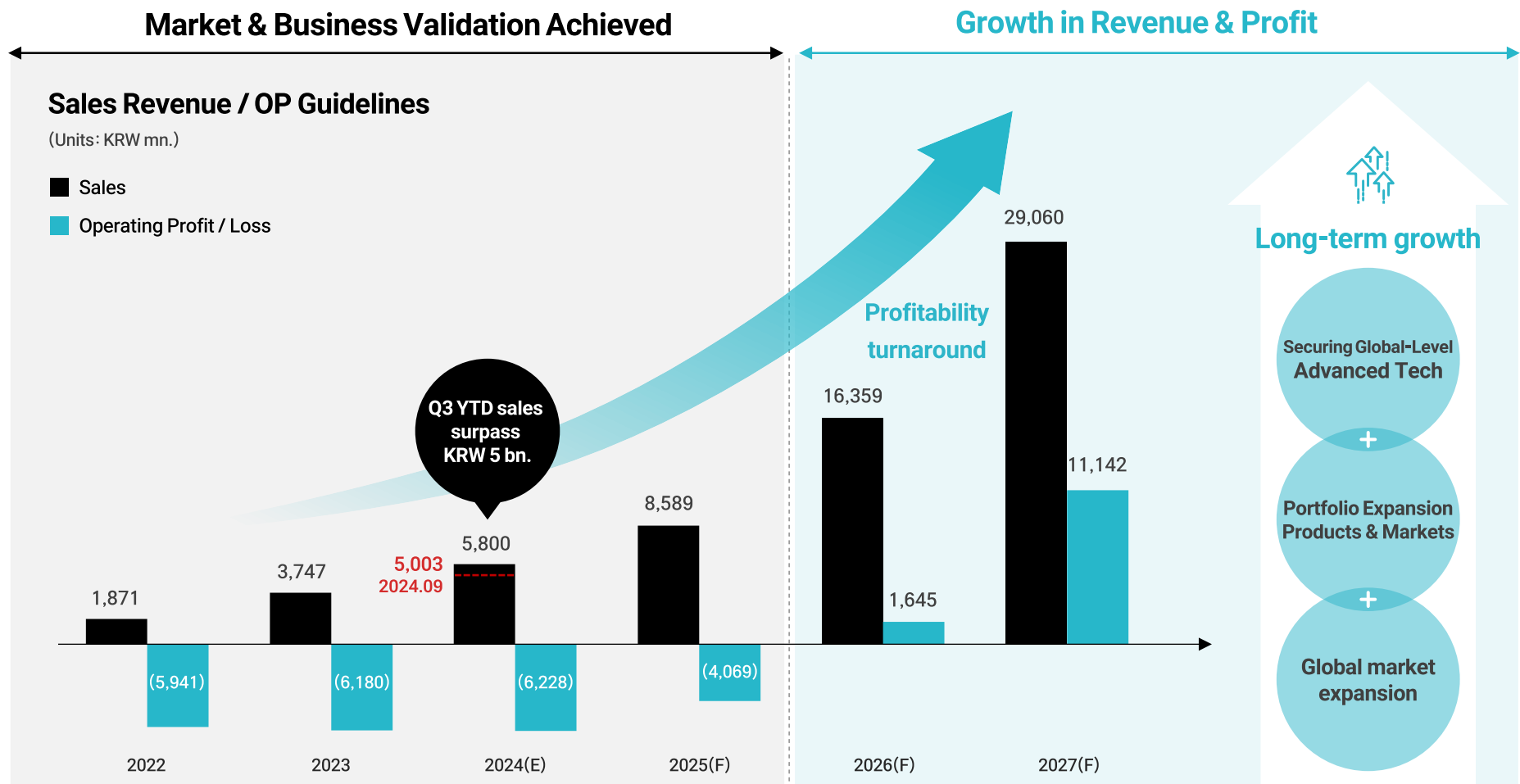


Selected for PPS's innovative device purchase



07. Financial Guidance

• Holotomography Sales Growth Projected to Drive Profitability from 2026



* Accounting standards: K-IFRS

Appendix

01. Financial Summary

02. Company Overview

03. Management (1) CEO

(2) Key Personnel

04. Board of Directors

01. Summary Financial Statements

Statement of Financial Position

Unit : million KRW

Category	2021	2022	2023	2024.1H
Current Assets	27,700	22,126	15,952	11,895
Non-Current Assets	2,263	2,930	3,823	4,004
Total Assets	29,963	25,055	19,775	15,899
Current Liabilities	87,794	52,198	1,776	1,707
Non-Current Liabilities	443	692	291	284
Total Liabilities	88,237	52,890	2,067	1,990
Capital Stock	1,100	1,100	2,612	5,336
Capital Surplus	-	-	66,720	65,025
Other Capital Items	3,611	4,713	5,610	4,997
Accumulated Other Comprehensive Income	19	21	-16	31
Retained Earnings (Deficit)	(63,004)	(33,668)	(57,218)	(61,479)
Total Equity	(58,275)	(27,834)	17,708	13,909

Notes : Based on audited K-IFRS financial statements.

Income Statement

Unit : million KRW

Category	2021	2022	2023	2024.1H
Sales	1,625	1,871	3,747	2,928
Cost of Goods Sold	959	928	1,565	1,258
Gross Profit	666	943	2,182	1,670
Selling & Admin Expenses	7,076	7,311	8,915	6,165
Operating Profit	(6,410)	(6,369)	(6,733)	(4,495)
Financial Gains (Losses)	(13,044)	35,579	(16,889)	126
Other Gains (Losses)	106	126	71	107
Profit (Loss) Before Tax	(19,349)	29,336	(23,550)	(4,261)
Income Tax Expense	-	-	-	-
Net Profit (Loss)	(19,349)	29,336	(23,550)	(4,261)

Notes : Based on audited K-IFRS financial statements.

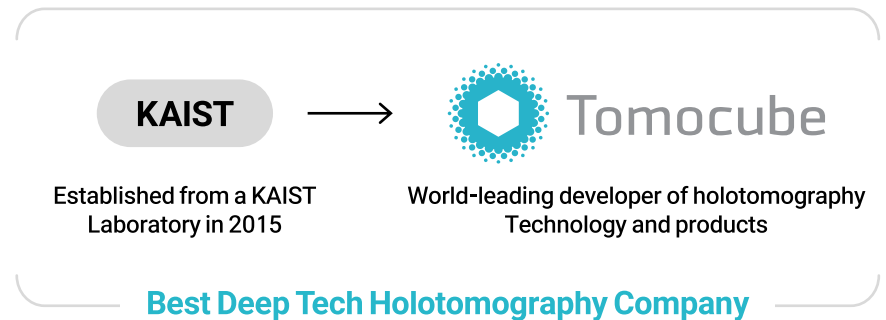
02. Company Overview

Company Overview

Company Name	Tomocube, Inc.
Co-CEOs	Paul Park, Hyung-Keun Hong (Co-CEOs)
Founded	August 24, 2015
Capital	5,336 Million KRW
Employees	67 (as of the date of the securities report)
Primary Business	Holotomography-based Cell Analysis Technologies & Equipment
Headquarters Address	4 th Floor, 155 Sinseong-ro, Yuseong-gu, Daejeon, South Korea
Website	www.tomocube.com

Note: Based on securities report

Establishments



Global leader in holotomography

Percentage of Research Staff with Ph.D./M.S. Degrees **58%**

World's First : Commercialization of 2nd generation HT **No.1**

Technology Rating : Single A grade

A-A

Domestic and Overseas Patents Owned : **71 patents**

03. Man Power (1) CEO

•• Collaboration Between Leading Experts in Bio Research and Startup Professionals



Young-Keun Park CEO

Holography, Bio imaging, AI specific industry leader

Education Ph.D., Harvard-MIT Health Science and Technology

- Activities**
- Fellow of the Optical Society of America (OSA) and the international Society for Optics and Photonics (SPIE)
 - Member, National Academy of Engineering of Korea
 - Member, Korean Academy of Science and Technology
 - Founder and Co-Chair, SPIE Photonics West Quantitative Phase Imaging Conference
 - Advisor, Ministry of Science and ICT Strategic Technology Planning Committee
 - +200 publications (*Nat. Photon.* 4, *Nat. Mater.* 1, *Nat. Cell Biol.* 1, *Nat. Meth.* 1, *Nat. Comms.* 4, and others)
 - 19,000+ citations (h-index 77)

Career

- Professor in Department of Physics at KAIST
- Director of Creative Research Initiative Center for Time Reversal Mirror
- Director of Virtual 3D Biology Center

Awards

2018
Fumio Okano Award
International Society for Optics and Photonics

2018
Honh Jin KI Creative Award
YooMin Cultural Foundation

2018
Order of Science and Technology Merit
The president of South Korea

2021
Minister of Science and ICT Award
표창



Ki-hyun Hong CEO

Serial entrepreneur in optical measurement device

Education BS, Industrial Management, KAIST

- Activities** Previous Roles :
- Partner, Bluepoint Partners
 - Branch Manager, Akron Photodynamic
 - Vice President, Rechem-Wise Planet
 - Committee Member and Advisor, Research Industry Promotion Plan
 - Steering Committee Member, Startup 300 Project

Career

- Former Founder and CEO, Akron
- Former Founder and CEO, Wise Planet

Awards

2009
Regional Economic Development Award
표창

2011
Daejeon Metropolitan city Exemplary Employer Award
표창

03. Man Power (2) Senior Executives

- More than 10 years of experienced management and development personnel in the relevant field



Jae-Pil Do **Technology Development Department**

Education Ph.D. in BioMEMS, University of Cincinnati

Career

- CTO & CSO, CytoDyx
- Team Lead, Diagnostic Device Development, i-SENS
- Research Planning, Samsung Seoul Hospital
- Samsung Jong Giwon, Bio Lab
- Researcher, Boston University



Sung-Ho Ko **COO**

Education M.S. in Industrial Engineering, KAIST

Career

- General Manager, Lutronic
- Country Manager, Samsung Medison
- Quality Control, Daewoo Electronics



Tae-Hong Kim **Product Development Department**

Education B.S. in Electrical and Electronic Engineering, KAIST

Career

- Software Team Lead, Wiseplanet
- Software Engineer, Photon Dynamics Korea
- Acron, S/W team



Kyung-Tae Oh **CFO**

Education B.S. in Economics, Sogang University

Career

- CFO, Engistech
- Team Lead, Financial Planning, Suprima
- Team Lead, Solbrain Eng
- Hansae Co., Ltd.



Su-Min Lee **Customer Development Department**

Education Ph.D. in Life Sciences, POSTECH

Career

- R&D Project Planning, National Forensic Service
- Postdoctoral Researcher, POSTECH



Wan-Sung Ku **CSO**

Education Ph.D. (ABD) in Pharmacy, Sungkyunkwan University

Career

- CFO, Geninus
- Analyst, NH Investment & Securities
- Research Planning, Dong-A Socio Holdings

04. Board of Directors

- Independent, professional board with a focus on accountability



Young-Keun Park **Chairman of the Board, CEO**

Education Ph.D. in Health Science and Technology, Harvard-MIT

- Career**
- Co-founder & CEO, Tomocube
 - Professor, KAIST



Sang-II Park **Outside Director**

Education Ph.D., Stanford University

- Career**
- CEO, Park Systems
 - Founder & CEO, Park Scientific Instrument



Byung-Kyun Ham **Outside Director**

Education J.D., Seton Hall University School of Law

- Career**
- Dentons Lee Senior Attorney
 - Law Firm Jipyeong Senior Foreign Lawyer
 - General Counsel, Seegene
 - attorney for the U.S. Department of Health and Human Services



Ki-hyun Hong **Inside Director, CEO**

Education Bachelor's in Industrial Management

- Career**
- Co-founder & CEO, Tomocube
 - Branch Manager, Acron Photon Dynamics
 - Vice-President, Leechem-Wise Planet



Sung-Ho Ko **Inside Director, COO**

Education M.S. in Industrial Engineering, KAIST

- Career**
- General Manager, Lutronic
 - Country Manager, Samsung Medison



Kyung-Tae Oh **Inside Director, CFO**

Education B.S. in Economics, Sogang University

- Career**
- CFO, Engistech
 - Team Lead, Financial Planning, Suprima
 - Team Lead, Solbrain Eng
 - Hansae Co., Ltd.

