



**NOVASCOPE**  
Diagnostics

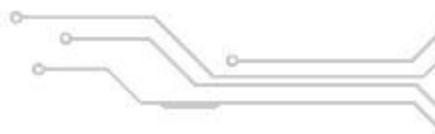
**Semiconductor Sensors, Clinically Proven Diagnostics  
From Alzheimer's to Sepsis, From Chips to Clinics**

Dr. Kuo, Chang-Fu  
CSO, Board Director

Proprietary and Confidential



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# Mission and Company Overview



## Company Positioning

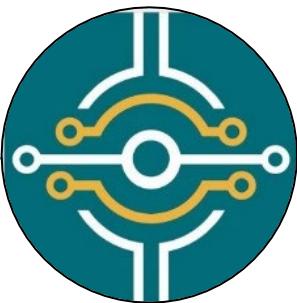
**Next-generation IVD:** fast, sensitive, scalable, powered by semiconductors.



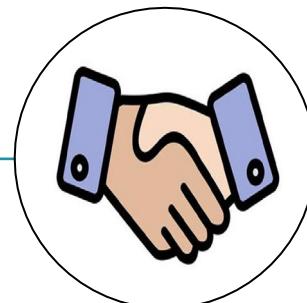
**Mission :** Revolutionize IVD with semiconductor biochips for ultra-fast, sensitive results.



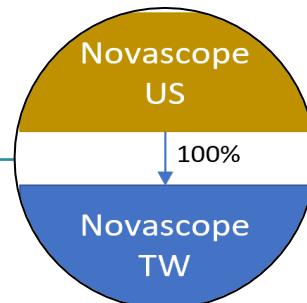
**Vision :** Create a scalable ecosystem to speed treatment and improve outcomes worldwide.



2022  
Incorporation (TW, US)



January 2023  
Series A financing completed



March 2023  
Corporate re-structuring



July 2023  
ISO13485 compliance laboratory  
(with clean room) constructed



April 2024  
>50 employees



1H 2025  
Sepsis and AD diagnostic pipelines  
achieved the clinical proof milestone

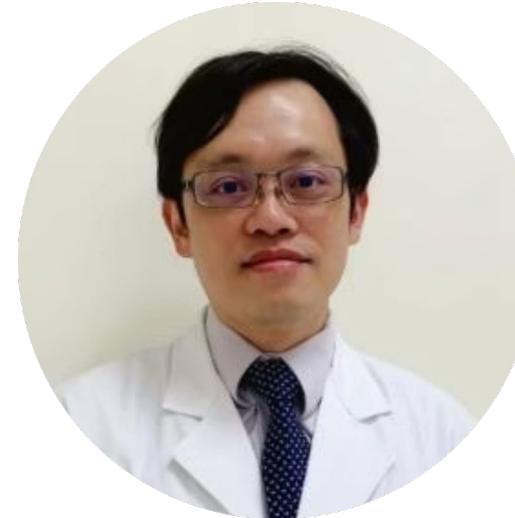
# World-Class Interdisciplinary Leadership Team



**Dorothy Yen, MD PhD**

**Chairwoman/GM**

- 40+ years in nuclear medicine with 500+ research publications
- Stanford-recognized "World Top 2% Scientist"
- Board member: Aprinoia, Jellow X Biotech, Research Foundation of Cardiovascular Medicine



**Chang-Fu Kuo, MD PhD**

**Chief Strategy Officer**

- Professor of Rheumatology and Clinical Immunology
- Former R&D Director of CGMH AI Center (2000+ annual publications)
- Stanford-recognized "World Top 2% Scientist"



**Joyce Huang, PhD**

**Laboratory Director**

- 25+ years in microbiology and diagnostics
- Director of Taiwan's largest clinical lab (\$100M+ annual revenue)
- Committee member: Laboratory Developed Test Certificate, National Quality Standards

# Top-Notch Research Expertise, Clinical Experience, and Operational Excellence



**James Wu, PhD**  
**Vice President**



Former ERSO/ITRI Deputy Director General, expertise in Micro Electronics , MEMS, Optoelectronics, Renewable Energy, Medical Devices, and IoT, etc.



**Keith Chan, PhD**  
**VP, Board Director**



Former FDA Division Director at the Office of Generic Drugs; Co-Founder of GloboMax, a drug development organization; and IP Professor at National Chengchi University



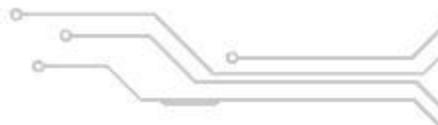
**Ming-Tang Chiou, Professor**  
**Taiwan Advisory Board Member**

NPUST | Veterinary Medicine  
Director, Research and Technical  
Center for Sustainable and  
Intelligent Swine Production



**Wen-Yao Chung, Professor**  
**Taiwan Advisory Board Member**

CYCU | Electronic Engineering  
Expertise in microelectronics and  
biomedical engineering



# US-Based Advisors: Biotech/Healthcare Expertise and Entrepreneurship

## Wenn Sun, PhD

### Founder and President, PREMIA

Founded PREMIA in 2018 in collaboration with LCSCRUM leadership, bringing entrepreneurial vision and scientific expertise

## Haluk Tezcan, MD

### Medical Oncologist and Hematologist

Over three decades of specialized experience in cancer management and clinical research, providing critical medical insights

## Ayse Tezcan, PhD

### Clinical Research Expert

Head of Data Quality at N-Power medicine who built innovative teams of field coordinators and data specialists

## Stan Lapidus

### Serial Entrepreneur

Board member at multiple biotech companies including Droplet, Lucid Diagnostics, Binx Health, and Mercy BioAnalytics

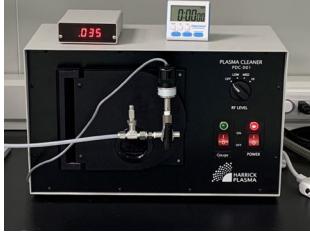
## Michael McCurdy, MD

### Critical Care Physician

Clinical Professor of Pulmonary/Critical Care Medicine and Emergency Medicine at University of Maryland

# Production and Technology Development

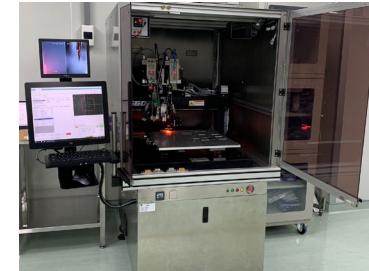
- PCB level process
- Wafer (shot) level process
- Low temperature process
- High uniformity process
- AI & Automation



**Nov 2022**  
O2 plasma



**Mar 2023**  
OM system



**Jun 2023**  
Pilot line set up

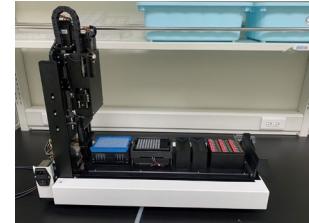


**Aug 2023**

Molding machine

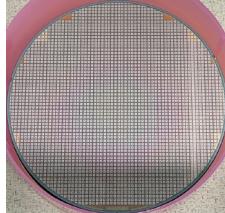


**Nov 2023**  
PE CVD

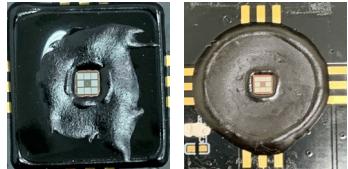


**May 2024**  
Coating machine

**Oct 2022**  
NS01A  
Wafer out



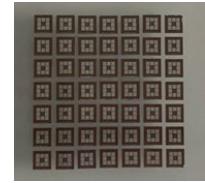
**Nov 2022**  
Outsourcing package



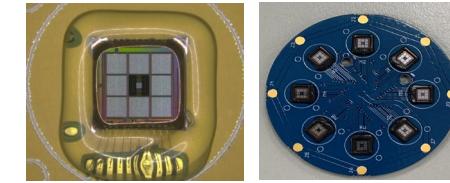
**Feb 2023**  
Self development



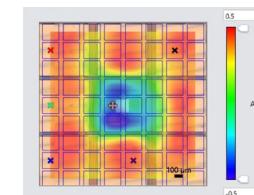
**May 2023**  
Wafer level molding



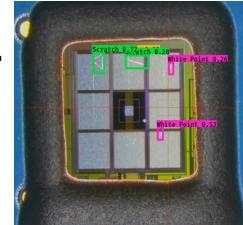
**Oct 2023**  
Different process & chip



**Nov 2023**  
Function group check

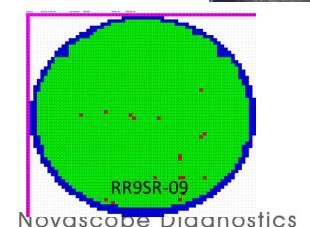
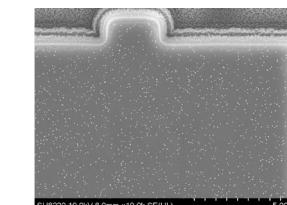


**Apr 2024**  
AOI



**Apr 2023**

Electrical inspection





**NOVASCOPE**  
Diagnostics

## Heterogenous Integration of Biochemistry and Semiconductors

Proprietary and Confidential





# NOVASCOPE Lab-on-a-Chip: Electric-Signal Speed and Accuracy to Create a New Market

## NOVASCOPE

- Molecule agnostic detection
- Semiconductor FET sensor with femtogram/mL sensitivity
- Fast and simplified process enabled by heterogeneous integration

TAM: New Market Opportunity

## PCR Systems

- Optical fluorescence detection, nucleic acids only
- Standard PCR is qualitative (positive/negative)
- Desktop systems with complex workflow

TAM: \$25B (2.4% CAGR)

## ELISA/Rapid Tests

- Optical detection, primarily protein-based
- ELISA is slow, equipment-dependent and less field-friendly
- Rapid tests are fast but prone to sensitivity/specificity trade-offs

TAM: \$2B (5.6% CAGR)

**Inherent challenges of optical detection – penetration of sample layers and attenuation of signals:** Other inherent disadvantages include sensitivity to Interference and instrumentation complexity

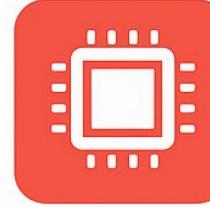
**Our advantage based on electric signals – higher precision and sensitivity:** No need for bulky instruments. Potential to detect down to single-molecule levels in optimized conditions. Sample color or turbidity doesn't affect signals.

# NOVASCOPE End-To-End Solutions: Where Biochemistry Meets Semiconductors

Enabling Engine

## NovaCHIP

- Molecule-agnostic
- Cost-effective ASIC



## NovaKIT

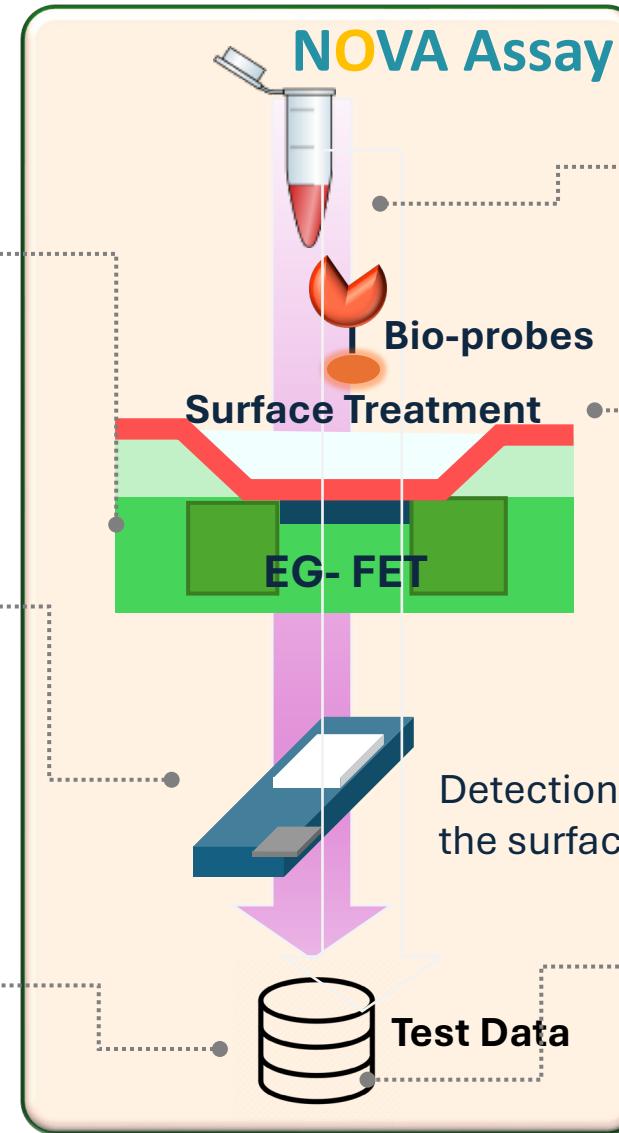
- Cartridge for disposable ASIC
- Analyzer for data reading



Value-added services

## NovaAI

- Smart process Automation



## NovaBIO

- Microfluids-based fast-tracked sample
- Buffer system



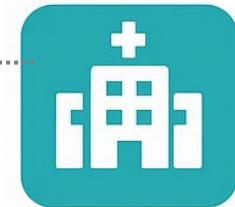
## NovaLINK

- Patented chemistry
- Proprietary reagents
- Probe embedded in surface coating

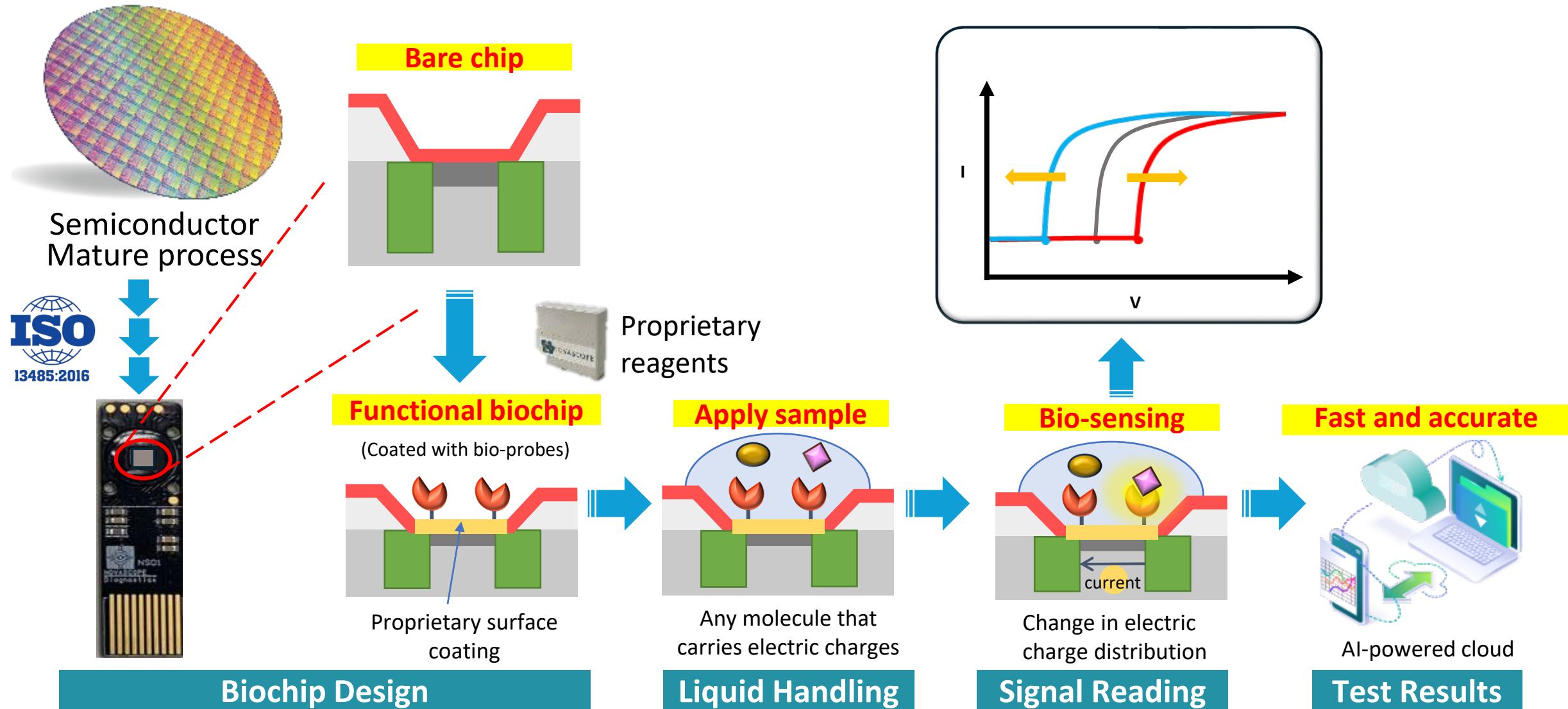


## NovaCRO

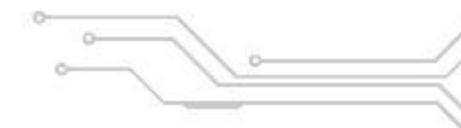
- Specimen repository
- Certified lab



# NOVASCOPE Biochip: Extended-Gate FET (Field Effect Transistor)



# Prototype Products Ready for Clinical Validations



1

## Sample Preparation

Any molecule that carries electric charges in any sample types

- Microfluids for sample fast-tracking
- Built-in buffer system



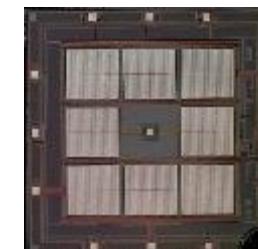
2

## Detection

Ultra-high sensitivity

- Disposal chip cartridge in the reader
- Cost competitive thanks to in-house capabilities and the Taiwan semiconductor and PCB ecosystem

NS01 chip



3

## Reading and Report

Fast and accurate results  
Connected to AI-empowered cloud

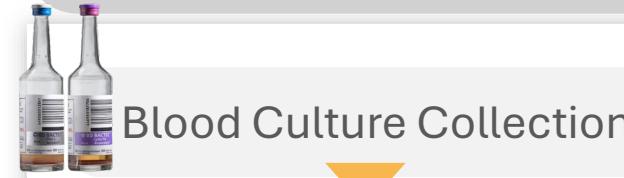
- Portable Reader
- Desktop Analyzer



Cassia  
Production automation (lab use)

# NOVASCOPE's End-to-End Lab-on-a-Chip: Workflow for Rapid Sepsis Diagnosis

## Blood Culture Testing Process



Blood Culture Collection

Automated System Monitoring

Gram Staining  
(Preliminary Classification)



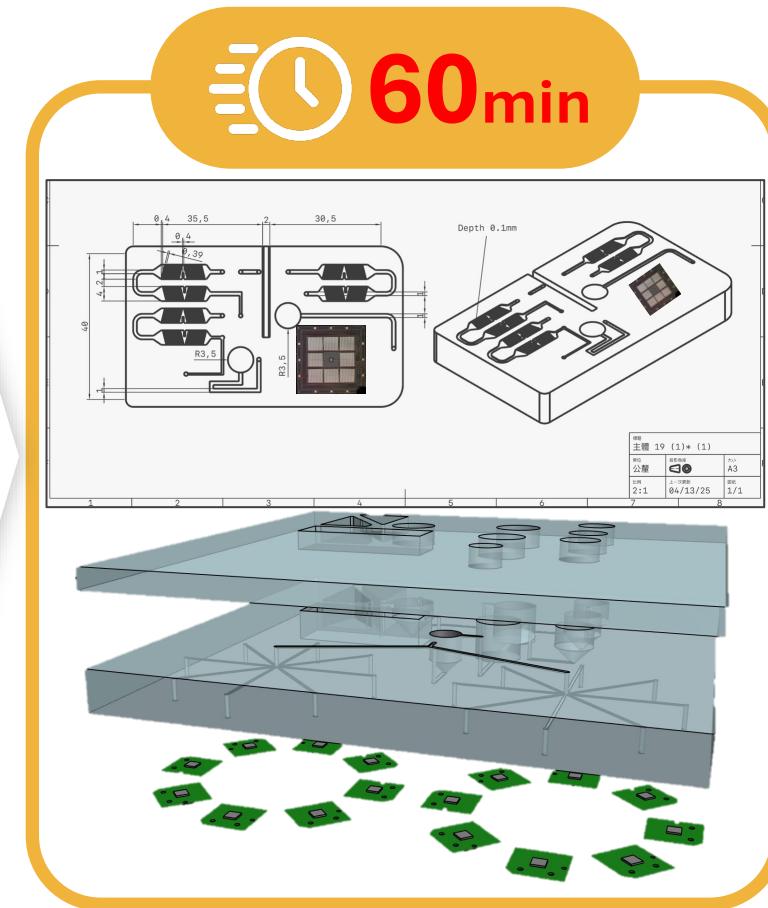
Subculture → Pure Colony

Organism Identification  
(Maldi-Tof/ PCR)

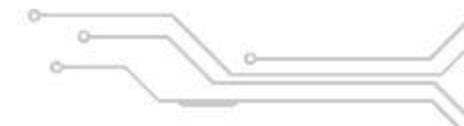
Report → Notify Clinician

2~5 Days

## Microfluidic system integration



Design Concept:  
Sample-in / Result-out



# Global Footprint accelerates a cost-efficient path to commercialization

1

## R&D and Validation Network

- US: Lab in San Diego lab to connect with University California San Diego (UCSD), academia and the industry
- Taiwan: Clinical trials with Chang Guang Memorial Hospital (CGMH), National Taiwan University Hospital (NTUH) and Veterans General Hospital (VGH)
- China: Validation partnerships with premier hospitals such as Shanghai Chang Hai Hospital

2

## Business Development

- Early OEM discussions with Delta, ILMN, TauRx and Blot
- RUO and LDT revenue → validation → regulatory submissions
- Leverage TFDA approval for FDA/CE submissions
- Distribution partnerships in the US and Asia Pacific
- Initial system deployments in hospital central labs

3

## Product Portfolio Roadmap

- Cross-border development platform
- Expansion of indications (e.g., Sepsis and Alzheimer)
- Increase of automation for end-to-end lab-on-a-chip solutions
- Development of multiplexing chips and microfluid cartridges
- Extension of value chain activities (e.g., AI analytics)

## Razor and Razorblade Business Model

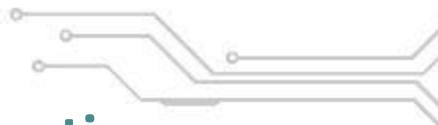
High-margin recurring revenue from single-use of biochip cartridges



## Flexible business models to maximize revenues (initially from Sepsis and AD)

Business model	Market	Product	Indication
Licensing and royalty	Initially US and China with exclusivity for specific indications	Biochips (cartridges), devices	Upon request
Contracted design and manufacturing (OEM/ODM)	Any market	Bare chips, biochips (cartridges), devices	Upon request
B2B channel sales	Initially in Taiwan	biochips (cartridges), devices	Depending on TFDA's approval

- These three business models are *not* mutually exclusive for any markets because our technology platform can detect different biomolecules for different indications.
- Taiwan: We believe TFDA approval will accelerate regulatory pathways in other markets given Taiwan's global leadership in the semis value chain and Novascope's time-to-market of revolutionary offerings.
- Financial forecasts are based on sale of biochips (cartridges) given our proprietary knowhow in surface treatment, linking and bio-design. That said, we are open to sale of bare chips.
- Sale of devices is not factored in the forecasts as we anticipate low or zero gross profit in the razor and blades business model for ourselves and our strategic partners.



# Our Unfair Advantage: Semiconductor strengths and multi-disciplinary integration



## Semiconductor Scale

- We are the only platform using standard CMOS process for cost effectiveness. Our chips are manufactured by UMC.
- **Exponential cost/performance curve** far ahead of optical/chemical competitors.



## IP Fortress

- **24 patents** filed across chip design, chemistry, systems
- **10+ additional patents** in preparation
- **Trade secrets and knowhow** in IC design, mechanical design, and recipe design for surface treatments



## Technical Expertise

- Analogue IC design
- FET reader design



## Chemistry Platform

- Surface chemistry
- in-house biomaterials



## Production Ready

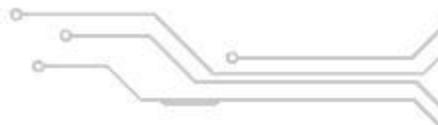
- Pilot line with clean rooms
- ISO13485 quality systems



## Competitive landscape by technology and cost structure

Company	NanoDx	Paragraf	NOVASCOPE
Inception / Country	2010 / United States	2017 / United Kingdom	2022 / Taiwan
Device	Silicon nanowire FET	Monolayer graphene FET	Extended-gate FET
Technical Challenges	<ul style="list-style-type: none"><li>• Sensor reproducibility</li><li>• Manufacturing</li></ul>	<ul style="list-style-type: none"><li>• Scalability</li><li>• Electrical uniformity of large-area graphene</li></ul>	N/A because chips are fabricated with standard CMOS process
Integrated circuit	Unknown	Unknown	Standard IC
Production readiness	In development	Pilot production	Pilot production
Analyzer	Handheld / Desktop	Desktop	Handheld / Desktop
Cost / Price	Product not yet available	\$143 per test	COGS: \$10 per test
Capital Raised	\$30m (including \$18m in Series C in 2020)	\$85m (including \$60m in Series C in 2025)	\$13.5m in Series A in 2023 \$9m for Series B in 2025

Source: Company data



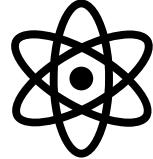
# Biomarker Portfolio Under Development

Field	Infection	Dementia	Liquid Biopsy	Animals & Food Safety
Probe sorts	NA	Ab & NA	NA	Ab & NA
Biomarker Probes (Ab/NA)	<ul style="list-style-type: none"><li><i>E. faecium</i></li><li><i>A. baumannii</i></li><li><i>K. pneumoniae</i></li><li><i>E. coli</i></li><li><i>E. faecalis</i></li><li><i>P. aeruginosa</i></li><li><i>S. aureus</i></li></ul>	<ul style="list-style-type: none"><li>pTau 181/217/231</li><li>NfL</li><li>GFAP</li><li>S100B</li><li>TDP-43</li><li><math>\alpha</math>-synuclein</li><li>Amyloid beta 40/42</li><li>APOE4 (NA)</li></ul>	<ul style="list-style-type: none"><li>EGFR</li><li>ALK</li><li>ROS1</li><li>BRAF</li><li>NTRK</li><li>RET</li><li>K-RAS</li><li>METex14</li></ul>	<ul style="list-style-type: none"><li>PRRSV</li><li>PEDV</li><li>PCV1/2/3/4</li><li>CSFV</li><li>PRV</li><li>SB</li></ul>

# NOVASCOPE's Biochip NS01E redefines bloodstream infection detection



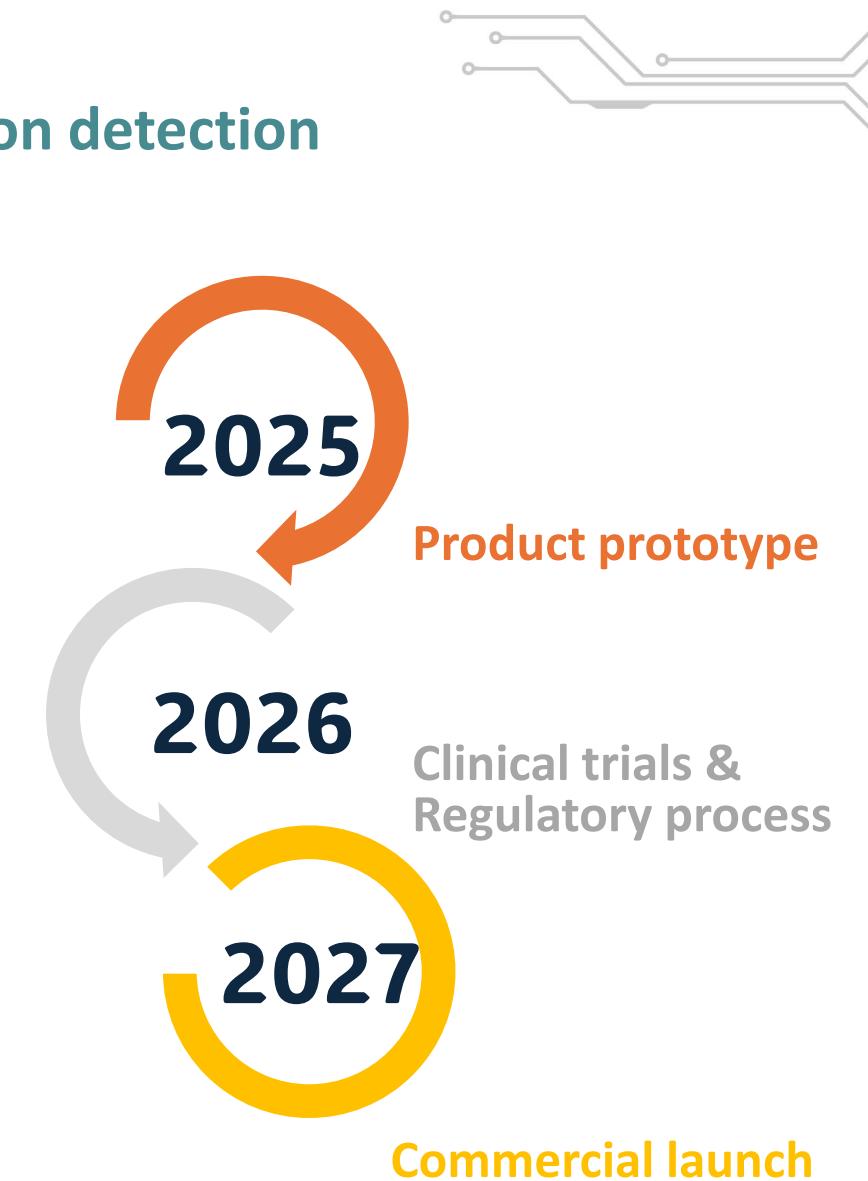
Integration of both direct-from-blood and post-culture detection approaches achieves **high sensitivity and results within one hour.**

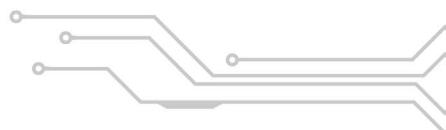


Preliminary CBC-based testing indicates strong potential for direct detection, with **good performance even in low-concentration samples.**



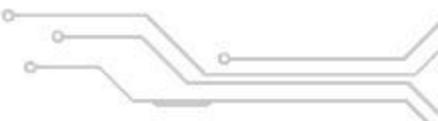
Ongoing efforts focus on enhancing **specificity and signal stability** to improve clinical feasibility.





# Accelerating Pathogen ( Sepsis ) Detection & Antimicrobial Stewardship

Current pathogen-sepsis detection workflows are too slow for optimal patient outcomes. **NovaScope aims to dramatically reduce detection time from days to under an hour**, transforming antimicrobial stewardship and patient care.



# Unmet Needs for SEPSIS Diagnostics

Technology	Sensitivity	Turnaround time	Accessibility	Price
Conventional culture	N/A	2-7 days	Central lab	US\$20
MALDI-TOF MS	$10^7$ cfu/mL	1 day	Central lab	US\$50
BioFire FilmArray	$1-10^5$ TCID <sub>50</sub> /mL	1 day	Central lab	US\$150-180
<b>NOVASCOPE</b>	$10^3$ cfu/mL	60 mins	POCT or central lab	Competitive

## IT CAUSES A LOT OF DEATHS

3rd Leading Cause of Death

- 1. Heart disease
- 2. Cancer
- 3. Sepsis**

Sources: Elixhauser et al.; CDC.

Contributes to **1** in every  
**2 to 3** hospital deaths

Source: Liu et al.



## IT CAN PROGRESS QUICKLY



### Septic shock:

7.6% drop in chance  
of survival each hour  
until antimicrobials  
are begun

Source: Kumar et al.

## IT COSTS A LOT

Most Expensive Condition  
Treated in U.S. Hospitals

- 1. Sepsis**
  2. Osteoarthritis
  3. Liveborn infants
  4. Complication  
of device,  
implant, or graft
  5. Heart attack
- Accounts for  
**6.2%** of hospital  
costs, or  
**\$24 billion**



Source: Torio and Moore.

## IT IS UNDERRECOGNIZED

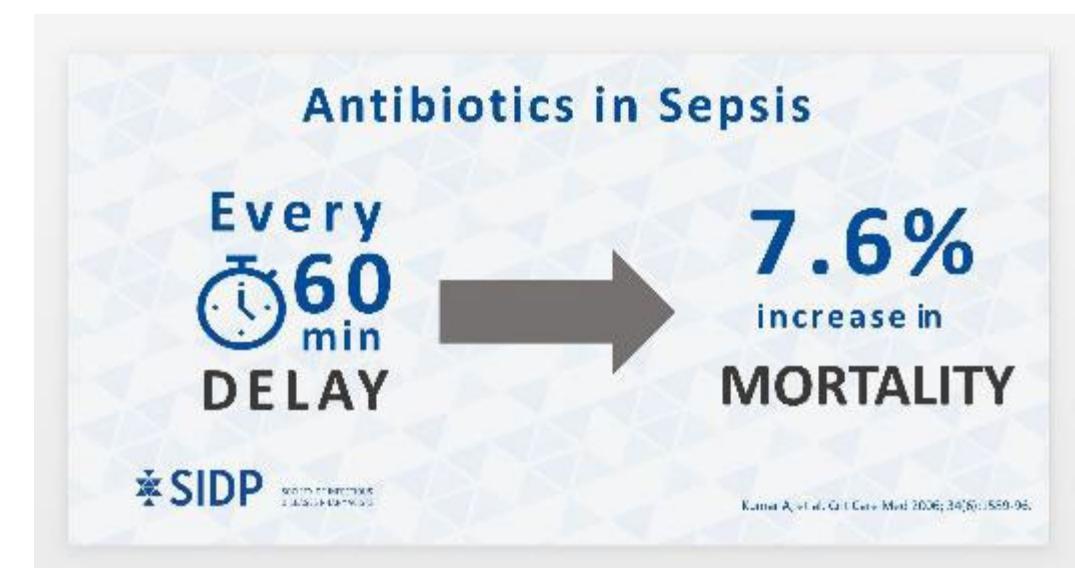


**44%**

U.S. adults who have  
heard of sepsis

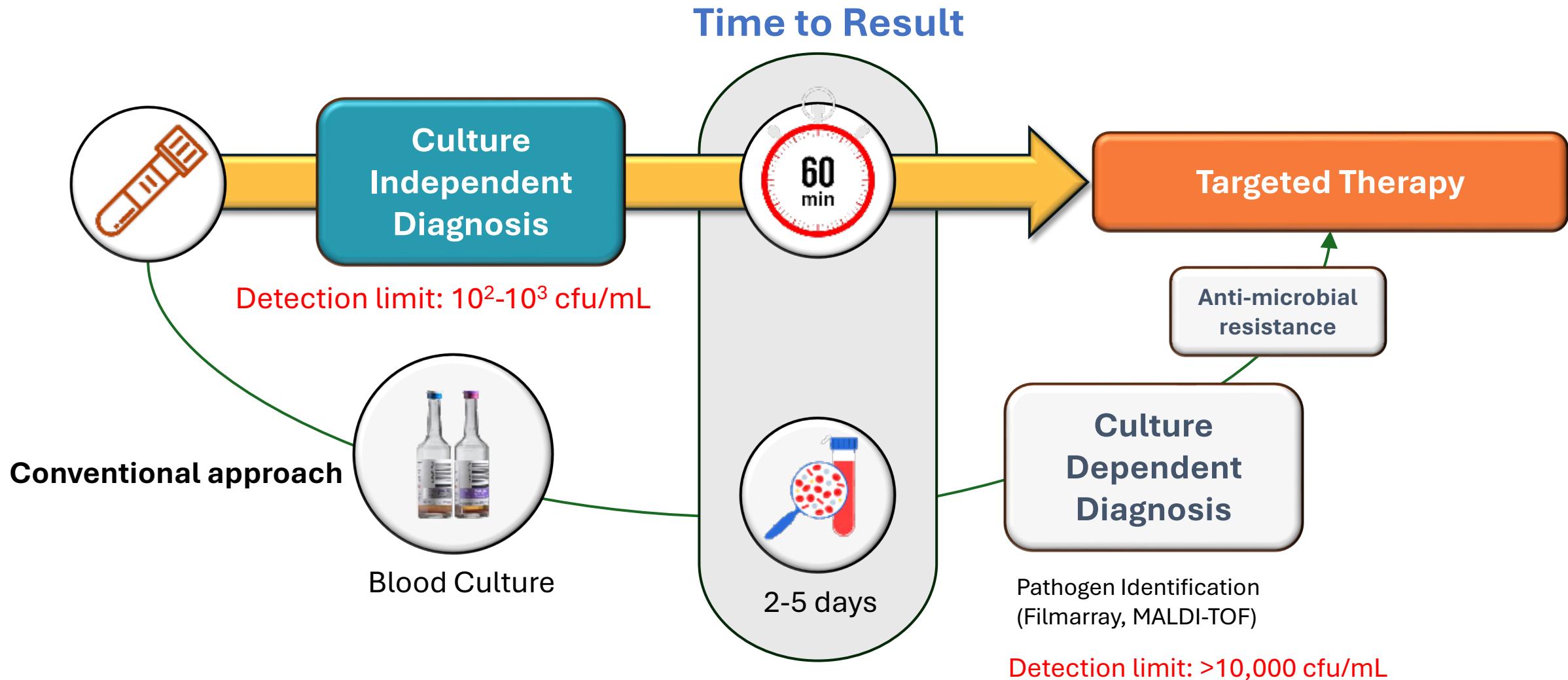
Source: Harris Interactive.

Death usually attributed  
to underlying infection  
Often not on  
death certificates





# NOVASCOPE's Fast and Accurate Test Result Enables Timely Treatment of Sepsis





# Clinical Validation Breakthrough: 98% Accuracy in Sepsis Detection

Our platform demonstrates a Limit of Detection ( $10^2$  cfu/mL) that is **orders of magnitude more sensitive** than competing technologies.

## Direct-from-Whole-Blood Detection Results

**98%**

**Overall Accuracy**

Detecting pathogens from non-cultured clinical samples

**97%**

**Sensitivity**

True positive rate in clinical testing

**100%**

**Specificity**

Zero false positives in validation study

**<1hr**

**Time to Result**

Enabling rapid clinical decision-making



*Source: Chang Gung Memorial Hospital*

# Competitive IVD Landscape (Nucleic Acid)

Specification	BioFire BCID2	T2 Bacteria Panel	Roche Eplex BCID	Vivalytic (BOSCH)	NOVASCOPE
Technology	Multiplex PCR	(T2MR)	AC Voltammetry	Multiplex PCR	FET / GFET
Specimen	Positive blood culture	Whole blood	Blood culture	Nasal or throat swab	Whole blood
Types of pathogen to be detected	43 pathogens (incl. resistance genes)	6 common bacteria	56 pathogens (incl. resistance & fungi)	Single pathogen ( <i>S. aureus</i> )	7 common sepsis pathogens (e.g., <i>E. coli</i> , <i>S. aureus</i> )
Reaction time	~1 hr	~3–5 hrs	~90 min	~1 hr	<1 hr
Incubation time	Yes (12–24 hrs)	No	Yes (~12 hrs)	No	Current: <6 hrs; Goal: No incubation
Total testing	>1 day	<5 hrs	<15 hrs	<1 hr	Current: <8 hrs; Goal: <1 hr
Detection limit	E.f=1*10^5 cfu/ml E.c=5*10^5 cfu/ml K.p=5*10^4 cfu/ml P.a= 1*10^4 cfu/ml S.a=1*10^4 cfu/ml	E.f=5 cfu/ml; E.c=11 cfu/ml; K.p=2 cfu/ml; P.a= 5 cfu/ml; S.a= 2 cfu/ml A.b=3 cfu/ml	NA	NA	1*10^3 cfu/ml
Resistance Gene	CTX-M, IMP, KPC, <i>mcr-1a</i> , <i>mecA/C</i> <i>mecA/C</i> and MREJ(MRSA), NDM, OXA-48-like, <i>vanA/B</i> , VIM	NA	CTX-M ( <i>blaCTX-M</i> ), NDM ( <i>blaNDM</i> ), IMP ( <i>blaIMP</i> ), OXA ( <i>blaOXA</i> ), KPC , ( <i>blaKPC</i> ), VIM ( <i>blaVIM</i> )	NA	CTX-M, IMP, KPC, <i>mcr-1a</i> , <i>mecA/C</i> <i>mecA/C</i> and MREJ ( MRSA ) , NDM, OXA-48-like, <i>vanA/B</i> , VIM
Specimen Pre-processing	Manual	Integrated (✓)	Integrated (✓)	Integrated (✓)	Integrated (✓)
Sensitivity	>90%	~91–96%	>90%	NA (in development)	>90% (target)
Specificity	97–100%	99%	97–100%	NA (in development)	>90% (target)
Global price (US\$)	\$150–180 / test	\$300–450 / test	\$180–220 / test	\$100–150 / test	Target: <\$100 / test



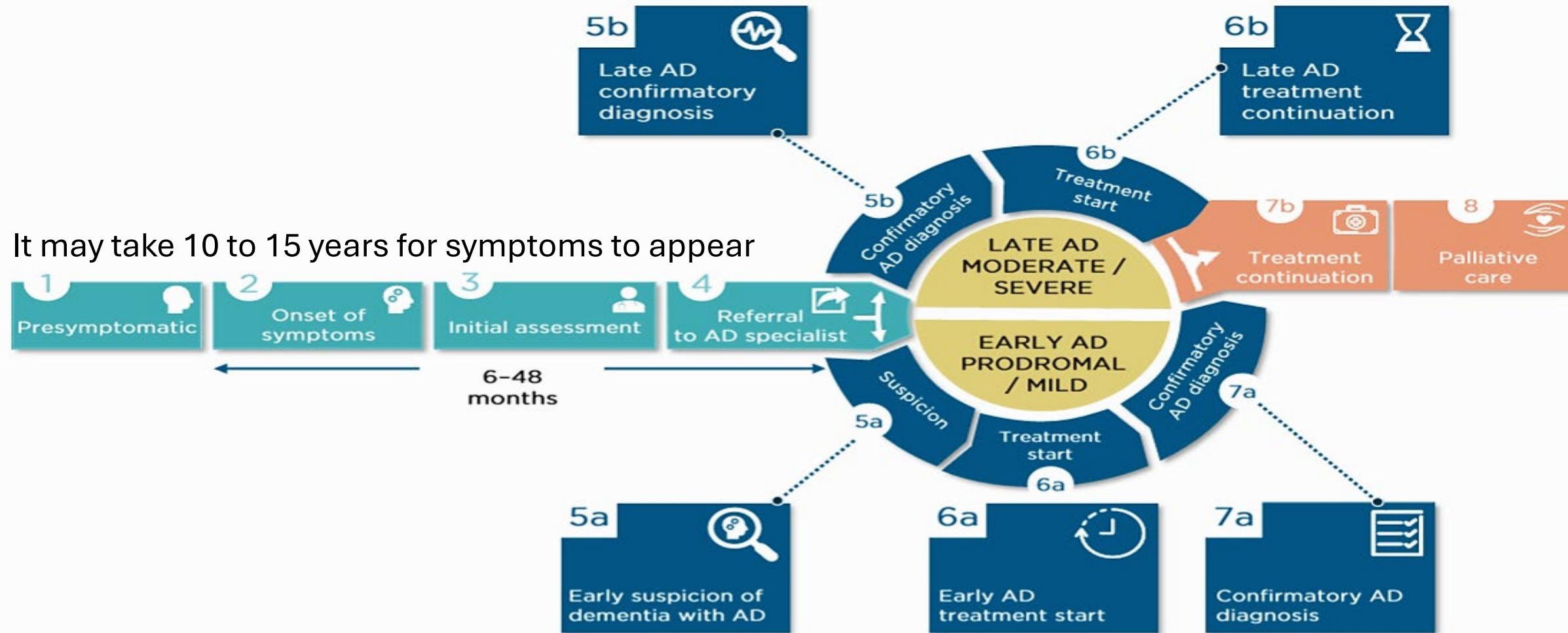
**NOVASCOPE**  
Diagnostics

## Early Alzheimer's Detection Using Biochip-NfL Platform

Proprietary and Confidential

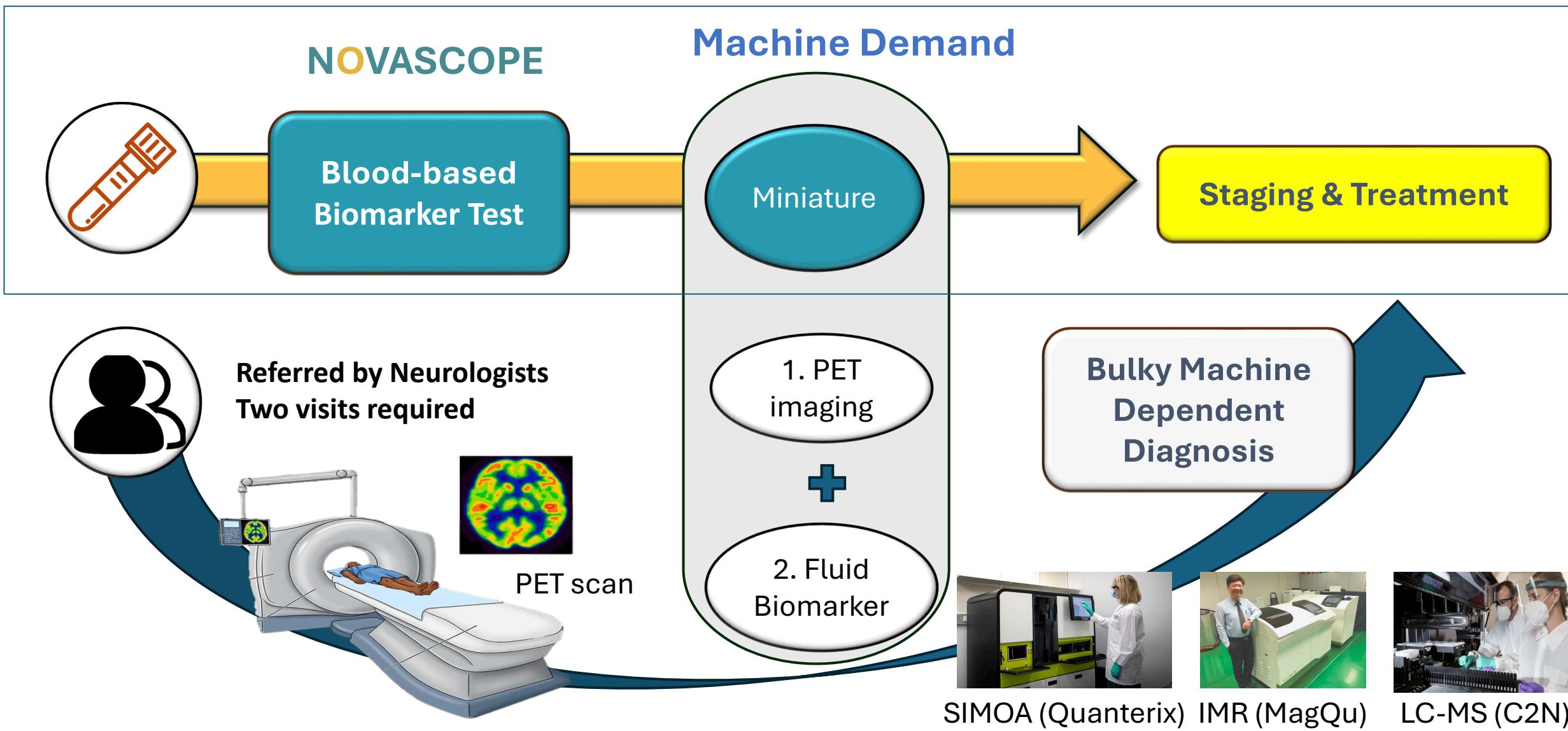


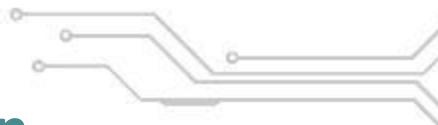
# Early Detection of Alzheimer's Disease is Critical



Source: Satellite Symposium, "Empowering Physicians to Advance the Future of Alzheimer's Disease Management and Care," AAIC 2020, July 28 (Online)

# Detection of Alzheimer's Disease: Mainstream Method vs. Novascope's Solution





# Clinical Validation: Breakthrough in Alzheimer's Disease Biomarker Detection

## Head-to-Head Performance vs. Industry Gold Standard

Our biochip platform has demonstrated **exceptional performance** in detecting neurofilament light chain (NfL) protein—a critical biomarker for neurodegeneration in Alzheimer's Disease.

0.97-0.99

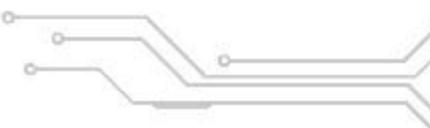
Correlation Coefficient ( $R^2$ )

Near-perfect correlation with Quanterix SIMOA, the current gold standard platform



**Our biochip platform vs. traditional SIMOA assay results for NfL protein detection**

# IVD Competitive Landscape (Protein)



	<b>Fujirebio</b>	<b>Roche</b>	<b>C2N</b>	<b>Quanterix</b>	<b>MSD</b>	<b>NOVASCOPE</b>
Status	FDA approval in 2022 (CSF) and 2025 (blood)	FDA 510(k) clearance in 2022 (CSF)	LDT service in 2021	LDT service in 2022	RUO, GLP/GCLP-compliant testing	<b>Under development</b>
Core tech	CLEIA	CLEIA	LC-MS	Digital ELISA	Enhanced ECL (Electrochemiluminescence)	<b>FET / GFET</b>
System	Lumipulse G®	Elecsys®	PrecivityAD®	SIMOA™	MSD S-Plex ECL	<b>Novascope kits</b>
Price per test	\$600 (Labcorp)	\$600 (Labcorp)	\$400 (Quest)	\$500 (LucentAD)	Unclear	<b>Very competitive</b>
Machine cost	\$200K	\$200K	\$300-400K	\$300-400K	Unclear	<b>Very competitive</b>
Turnaround time	Days / batch	Days / batch	Days / batch	Days / batch	Days / batch	<b>Minutes</b>
Proprietary and Confidential						

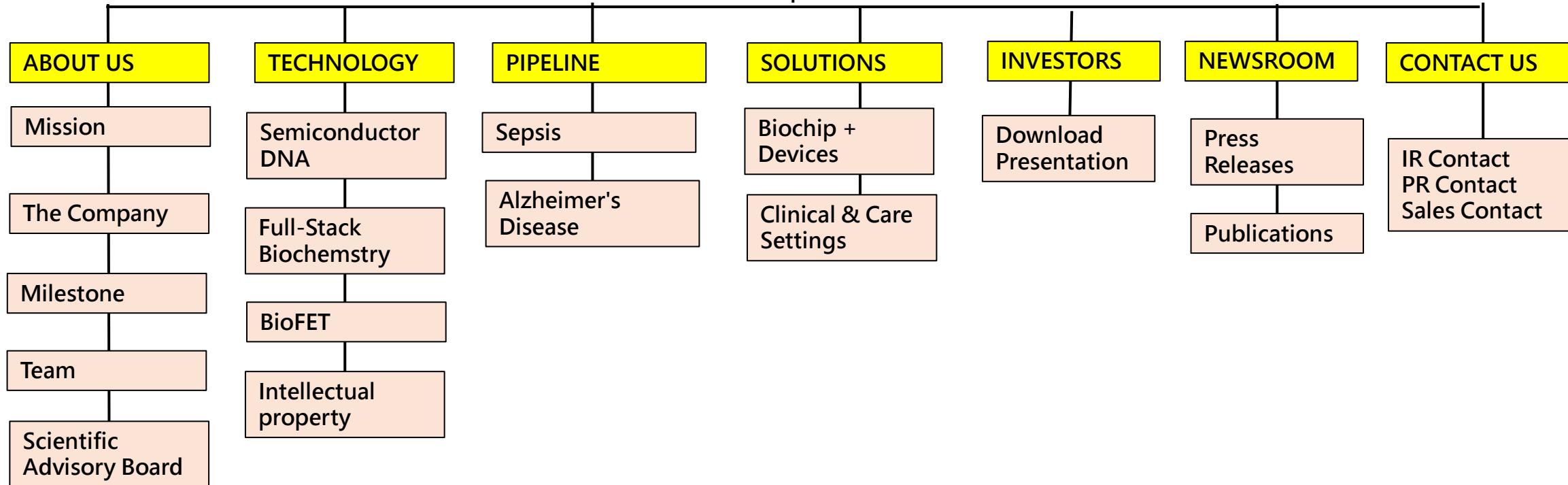


THANK YOU

Emily Liu, CFA, CAIA  
Head of Capital Markets  
[emily.liu@Novascopedx.com](mailto:emily.liu@Novascopedx.com)

## NOVASCOPE SITEMAP

### Index

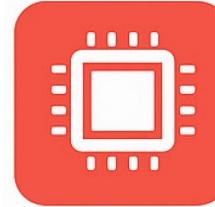


# NOVASCOPE End-To-End Solutions: Where Biochemistry Meets Semiconductors

Enabling Engine

## NovaCHIP

- Molecule-agnostic
- Cost-effective ASIC



## NovaKIT

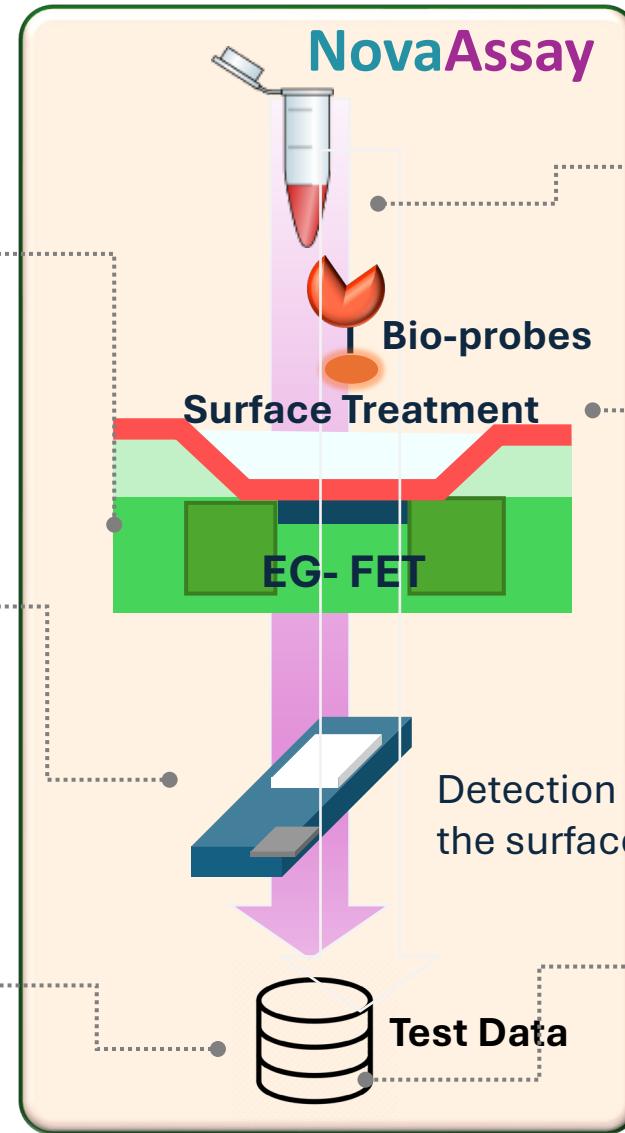
- Cartridge for disposable ASIC
- Analyzer for data reading



Value-added services

## NovaAI

- Smart process Automation



## NovaBIO

- Microfluids-based fast-tracked sample
- Buffer system



## NovaLINK

- Patented chemistry
- Proprietary reagents
- Probe embedded in surface coating



## NovaCRO

- Specimen repository
- Certified lab

### A New Paradigm for Clinical Diagnostics

Novascope is redefining in-vitro diagnostics (IVD) by uniting two historically separate disciplines: semiconductor engineering and biochemistry. As a BioIC company, we apply the rigor, scalability, and design discipline of CMOS-based integrated circuits to the complexity of biomolecular detection by creating a fully integrated, end-to-end IVD platform.

### Bringing Semiconductor Economics into Clinical Diagnostics

The integration of semiconductor technology and biochemical expertise allows Novascope's technology platform to achieve high-density multiplexing, intrinsic on-chip controls, and exceptional signal fidelity

## Semiconductor IC Design Model Applied to In-Vitro Diagnostics

### First-in-class BioFabless Design House

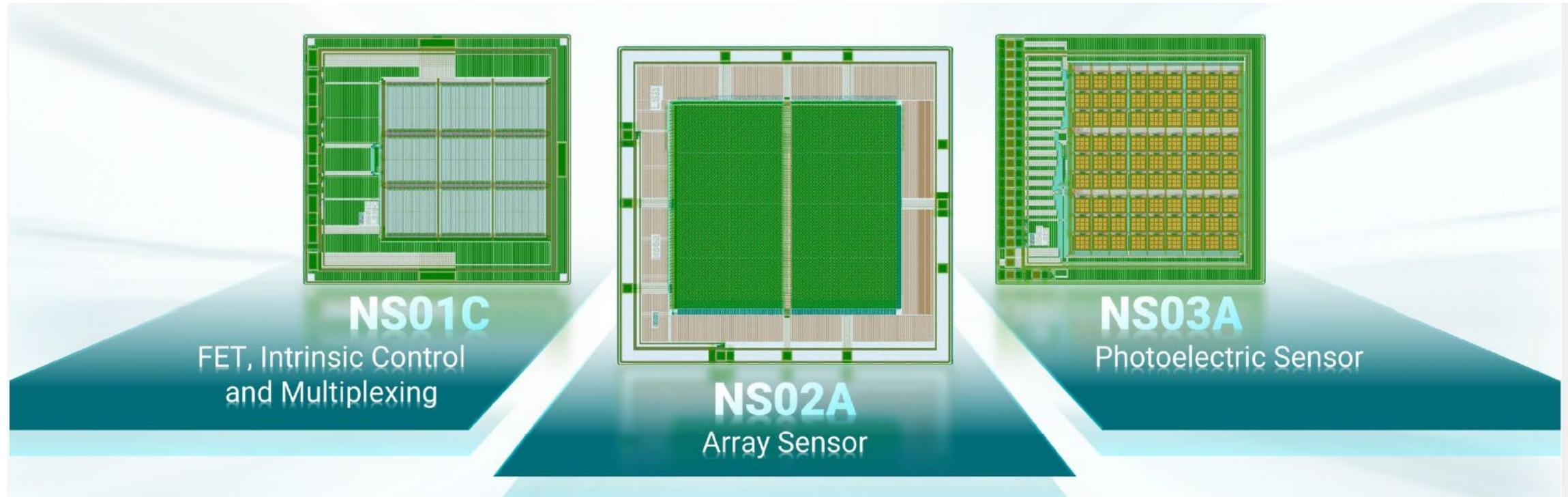
Inspired by the fabless semiconductor paradigm, we develop and own 100% of our silicon IP and focus on chip design excellence. As a direct customer of UMC, a leading semiconductor foundry in Taiwan, we maintain the flexibility to rapidly iterate chip designs while leveraging the cost advantages of mature-node manufacturing on 8-inch wafers.

Our analogue ASIC is built on extended-gate FET (EG-FET) architecture and purpose-designed for ultra-sensitive biomarker detection at low concentrations and high-performance molecular diagnostics in real-world clinical settings.

### 100% Silicon IP Built from Ground Up

Different from many IC design houses that rely heavily on standard IP blocks and automated EDA (Electric Design Automation) tool flows, we have developed our own silicon IP. This allows us to preserve both performance differentiation and capture full economic value.

## Semiconductor DNA



## Semiconductor DNA

**Novascope's BioIC Platform: Robustness, Scalability and Cost Efficiency****NS01C: FET-Based Biosensing with Intrinsic Control & Multiplexing**

NS01C is our field-effect transistor (FET) biosensing architecture designed specifically for surface-charge detection of an assay with up to eight target molecules. When a target analyte binds to a probe embedded on the chip surface, it alters the local electric field and converts molecular binding events into measurable electronic signals in real time.

All our products currently in the pipeline are built on NS01C.

**NS02A: Array Sensor Architecture for High-Throughput Detection**

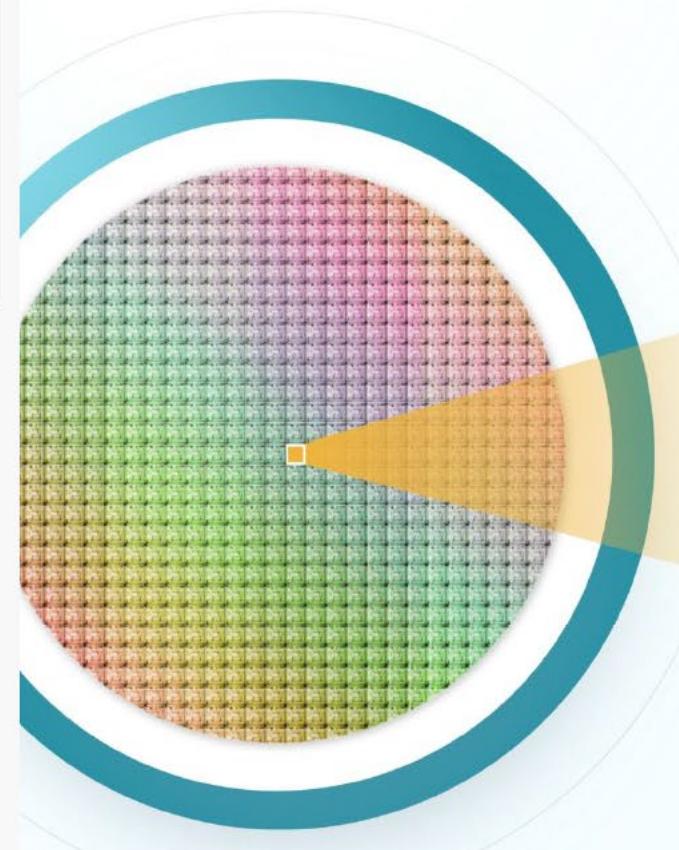
NS02A expands the NovaChip platform into a high-density array configuration, enabling scalable multiplexing and quantitative analysis across large biomarker panels. The NS02A architecture is particularly suited for pathogen panels and antimicrobial resistance (AMR) profiling, where simultaneous interrogation of multiple genetic markers is essential for timely clinical decision-making.

**NS03A: Photoelectric Sensor for Hybrid Detection Modalities**

NS03A introduces a complementary photoelectric sensing module to support hybrid detection strategies. While Novascope's core platform leverages electronic charge redistribution, NS03A takes a step further to enable optical-electronic integration where fluorescence or photonic signals can enhance assay flexibility.

## Semiconductor DNA

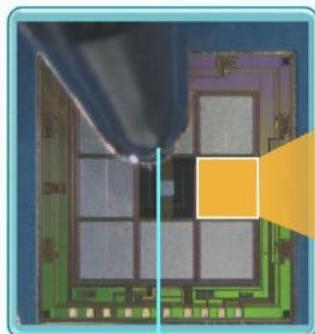
# Billions of Probe Sensors Packed into One Biochip



## Miniaturization for IVD Use Cases

**2.4B**

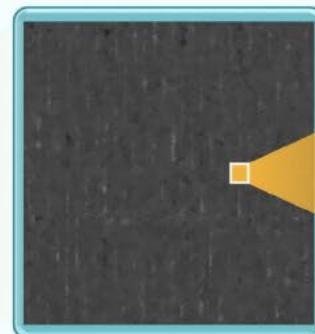
sensors /Biochip



penpoint: 0.5mm

**300M**

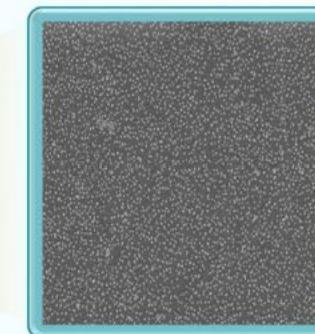
sensors /Sensing Block  
0.5 mm<sup>2</sup>



size of grain of sand

**4M**

sensors /Sensing Unit  
6 μm<sup>2</sup>



size of red blood cell

## Semiconductor Density Advantages

Unprecedented detection density captures and transmits electric signals at a short distance on a single chip and enables multiplexing and ultra-high sensitivity.

**Full-Stack Biochemistry****Programmable, Scalable and Vertically Integrated Biochemistry****Biochemistry Built into Silicon****NovaBIO™**

NovaBIO is our microfluidics-based, fast-tracked sample and buffer system designed to streamline sample preparation and stabilize complex biological inputs. By optimizing fluid dynamics at the microscale, NovaBIO ensures controlled analyte transport, efficient reaction kinetics, and minimized sample loss.

This engineered buffer ecosystem improves reproducibility and reduces turnaround time—critical for time-sensitive conditions such as sepsis. It forms the biochemical foundation that allows our biochips to operate with precision under real-world clinical conditions.

**NovaLINK™****Patented Surface Chemistry & Proprietary Reagents**

NovaLINK represents our proprietary chemistry platform, where probes are embedded directly within the engineered surface coating of the NovaChip. Unlike conventional assays that rely on secondary labeling or optical amplification, NovaLINK integrates specificity at the material level.

Our patented surface treatment technologies and embedded bioprobes enable stable high-affinity binding while preserving electrical sensitivity before and after binding. Our chemistry is not added on—but built within.

## High-Purity Antibodies: A Strategic Asset Engineered for Precision

### High-Purity Antibodies: a Strategic Asset Essential for Novascope BioICs

At Novascope, our high-purity antibodies were born out of necessity. Off-the-shelf antibodies often lack the exact chain composition or the purity required for our ultra-sensitive biochips to deliver reliable, reproducible results. To meet the demanding specifications of molecular-level detection, we designed and manufactured our own proprietary antibodies as bioprobes—tailored to perform with exceptional specificity and stability.

#### VHH antibodies — also known as nanobodies — expressed in *E. coli*.

VHH antibodies are single-domain antibody fragments derived from camelid heavy-chain IgG (immunoglobulins). Their compact structure (~15 kDa, compared to ~150 kDa for conventional IgG) confers exceptional advantages for surface-based biosensing: superior thermal and chemical stability, deeper epitope access, and more uniform surface orientation when immobilized on a chip coating.

#### IgG monoclonal antibodies (mAbs)

Our IgG monoclonal antibodies (mAbs) are produced using Chinese hamster ovary (CHO) cell expression systems — the gold standard for therapeutic-grade biologics manufacturing. This production platform ensures high yield, batch-to-batch consistency, and compatibility with stringent clinical validation standards.

## High-Purity Antibodies: Ready for Monetization

### For sale

p-Tau 181
P-Tau 181
P-Tau 217
P-Tau 217
P-Tau 231
P-Tau 231
Neurofilament light polypeptide (NfL)
Neurofilament light polypeptide (NfL)
Glial Fibrillary Acidic Protein (GFAP)
Glial Fibrillary Acidic Protein (GFAP)
Glial Fibrillary Acidic Protein (GFAP)
Amyloid beta 42

### Ready to commercialized products

pTau181	SNCA	UCH-L1
pTau181	SNCA	VHH-pTau217
pTau217	SNCA	
pTau217	S100B	
pTau217	S100B	
pTau231	S100B	
pTau231	TDP43	
pTau231	TDP43	
Amyloid beta 42	TDP43	
Amyloid beta 42	pTau184	
Amyloid beta 42	pTau235	
Amyloid beta 40	pTau2-14 (M)	
Amyloid beta 40	pTau3-15	

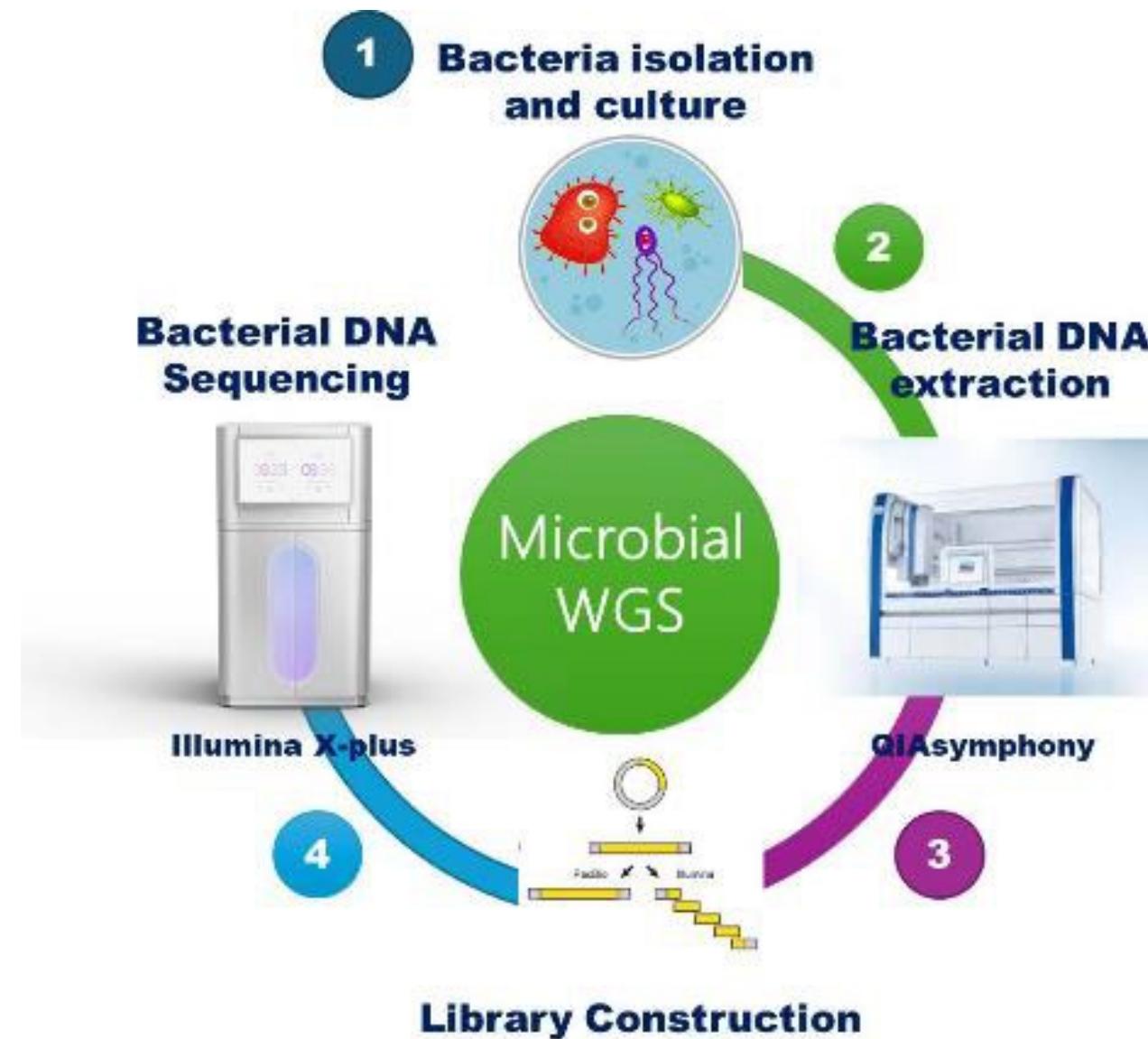
As both a core enabler of our BioIC platform and a standalone revenue-generating asset, our antibodies exemplify the intersection of biotech innovation, precision engineering, and strategic intellectual property.

**Nosocomial Pathogen Strain Bank & WGS (Whole-Genome Sequencing) Library**

To power rapid assay development of our bio-portfolio of infectious diseases, we are building a pathogen strain bank in collaboration with Chang Gung Memorial Hospital. This resource includes 700+ bacterial isolates accumulated over nearly 30 years. Out of these, 206 isolates are ready for whole-genome sequencing (WGS) and 494 isolates have been prepared for DNA extraction.

This curated strain repository enables rapid bioprobe design, antimicrobial resistance (AMR) panel development and optimization, and real-world validation. Our WGS library currently under construction promises to transform clinical isolates into actionable genomic intelligence on the NovaChip platform.

## WGS (Whole-Genome Sequencing) Library Construction



# Data-Driven Probe Design

**Sourced from Chang Gung Memorial Hospital**

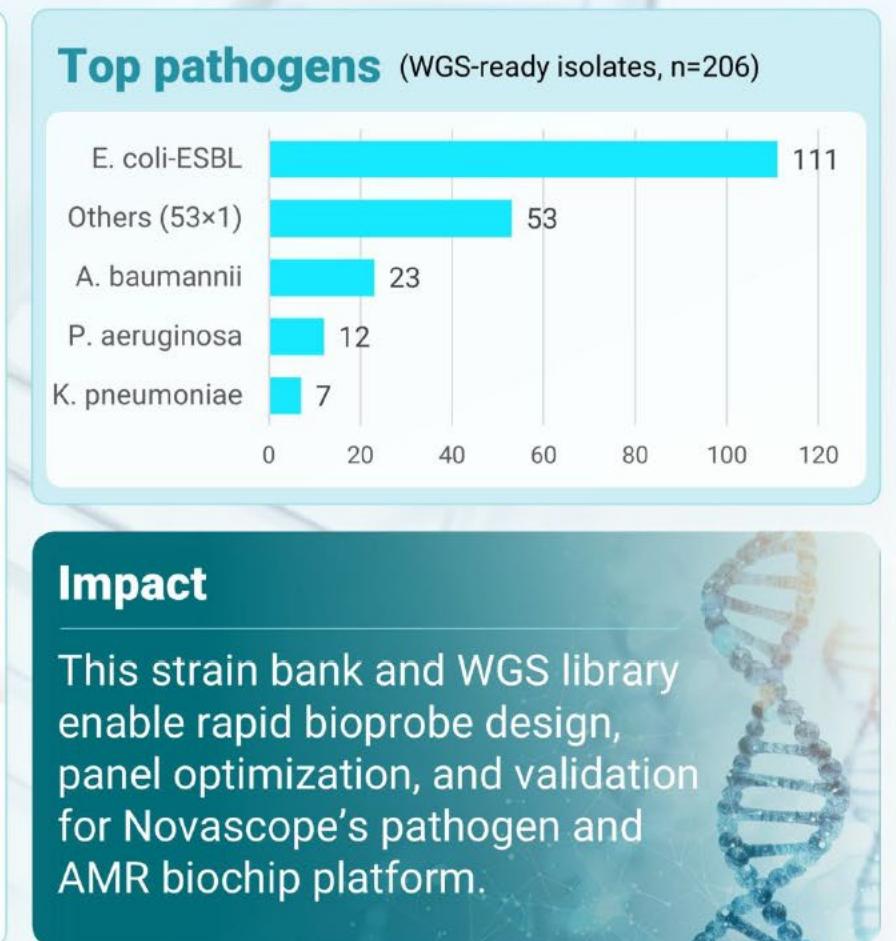
**700+** Bacterial isolates  
≈30 years real-world collection

**206** WGS-ready isolates  
Ready for extraction & sequencing

**494** Extraction-prep isolates  
Prepared for DNA extraction

**Microbial WGS**

- 01 Bacteria isolation and culture 
- 02 Bacterial DNA extraction 
- 03 Library Construction 
- 04 Bacterial DNA Sequencing 



## The BioFET Advantage

## From Probes to Processors

### From Silicon to Signals: A Simple and Seamless Diagnostic Workflow

Novascope's BioIC platform is engineered for simplicity. Each step—from semiconductor fabrication to real-time results—is designed to minimize complexity while maximizing performance. The workflow is intuitive, scalable, and built on semiconductor-grade precision.

#### 1. Bare Chip: Precision Fabricated. Fully Validated.

Every NovaChip begins at UMC in Taiwan, a world-class CMOS foundry to which we are a direct customer. Once fabricated, each wafer undergoes rigorous electrical testing and quality verification by Novascope.

#### 2. Functional Biochip: Proprietary Bioprobe Design and Surface Coating.

Through our proprietary surface chemistry platform, bioprobes are embedded directly into the engineered chip surface coating. This transforms a precision silicon die into a functional biochip.

#### 3. Apply Sample: Sample in, Simple and Direct.

Using our optimized microfluidic and buffer system, the sample is applied directly onto the chip. Any molecule that carries an electric charge—DNA, RNA, proteins, or other analytes—can be detected at a low concentration, provided a specific binding event induced by the bioprobe occurs.

## The BioFET Advantage **From Probes to Processors**

### **4. Bio-Sensing: Direct Electronic Detection of Molecules at the Silicon Interface.**

When a target molecule binds to its bioprobe, it alters the electric charge distribution at the chip surface. This change is immediately detected by the underlying FET sensor architecture.

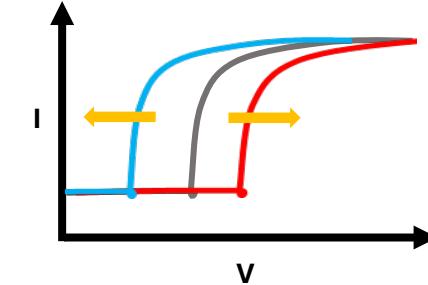
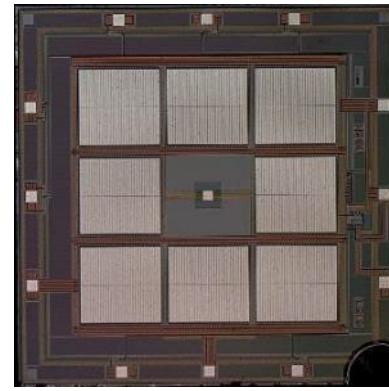
### **5. Signal Reading: Real-Time Results, Digitally Native**

The electrical signal is digitized directly on-chip and transmitted for clinical interpretation. Ignoring the sample preparation process, test results are generated in real time, enabling rapid clinical decision-making.

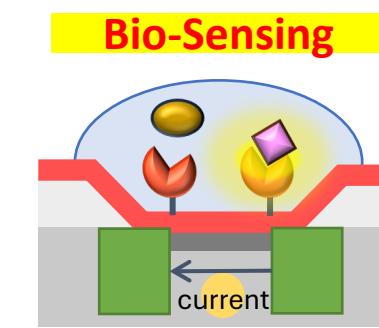
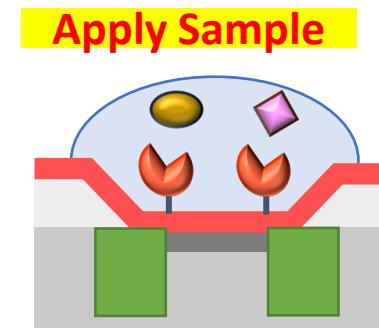
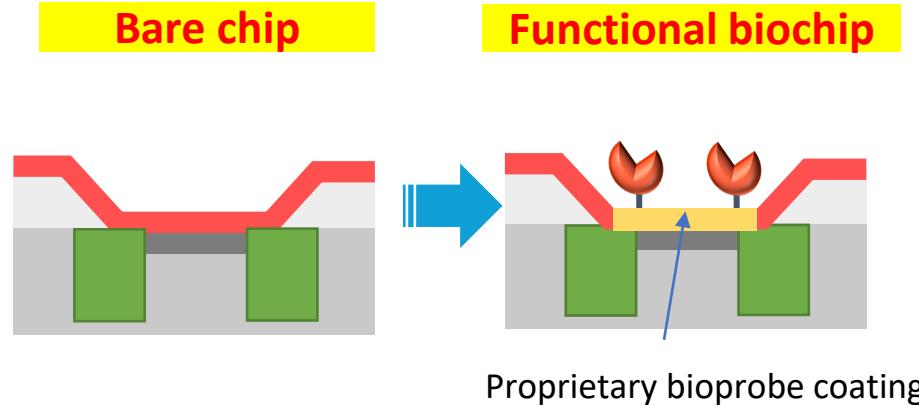
### **6. AI-Powered Analytics: From Detection to Decision Support (Future Expansion)**

Looking ahead, Novascope plans to introduce AI-powered analytics as a value-added layer. By leveraging aggregated signal data, pathogen strain intelligence, and clinical context, advanced algorithms will support:

# NOVASCOPE Extended-Gate FET (Field Effect Transistor): From Probes to Processors



AI-powered analytics  
as value added service



Real-time test results

## Biochip Design and Production

## Automated Process

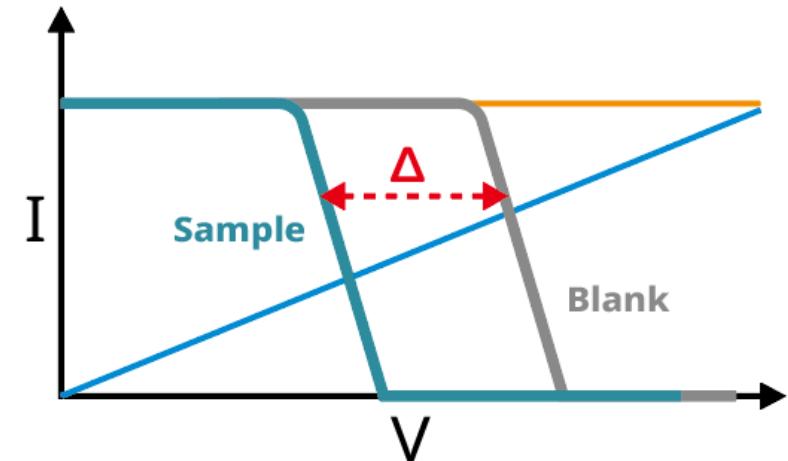
## The BioFET Advantage

# From Probes to Processors

## From Silicon to Signals

The Novascope platform detects target molecules by reading the information on the change of direct electrical signals on silicon caused by the binding of the target molecule and the bioprobe.

The molecular interaction provides the signal required for both qualitative (shift of the electric curve) and quantitative results (magnitude of the shift).



## Intellectual Property

## From Silicon Layout to Surface Chemistry

### Full-stack Intellectual Property Ownership

Novascope maintains full ownership of its intellectual property, with 40+ patents filed and pending covering chip architecture, detection circuitry, chemistry integration, and system design.

### 100% Silicon IP Designed from First Principles

We are the first-in-class bio-fabless company that applies the semiconductor chip design paradigm to the domain of biochemistry and diagnostics. However, we are different from many IC design houses that rely heavily on standard IP blocks and automated EDA (Electric Design Automation) tool flows. Our core sensing architecture, layout strategy, and signal chain design are proprietary. By maintaining direct control over device physics modeling, analog front-end optimization, and layout engineering, we preserve both performance differentiation and economic value capture.

## Intellectual Property

## From Chip to Chemistry: Fully Protected

### **Intellectual Property Strategy: Layered Protection. Long-Term Advantage.**

Innovation at Novascope is protected with the same rigor used to design it. We have filed more than 40 patents, spanning chip architecture, sensing circuitry, surface chemistry, reagent systems, and integrated diagnostic platforms.

We have developed a layered IP protection strategy as follows:

- Patent Protection: Securing core inventions and platform-level claims
- Trade Secrets: Protecting implementation details, process know-how, and optimization methods
- Operational Safeguards: Controlled knowledge access and disciplined documentation management

## Intellectual Property

## An End-to-End Platform

### A Walled Garden Built on Intellectual Property.

We are building a vertically integrated BioIC ecosystem, from bioprobes, biochips, test result readers to diagnostic devices. From chip architecture and surface chemistry to assay development, firmware, analytics, and clinical validation, every layer of the stack is designed to work seamlessly together and safeguarded with a layered IP protection strategy.

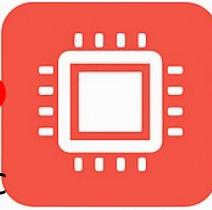
This end-to-end integration allows us to control performance, quality, and user experience in the same way category-defining companies have done in other technology industries.

# NOVASCOPE End-To-End Solutions: Where Biochemistry Meets Semiconductors

Enabling  
Engine

## NovaCHIP

- Molecule-agnostic
- Cost-effective ASIC

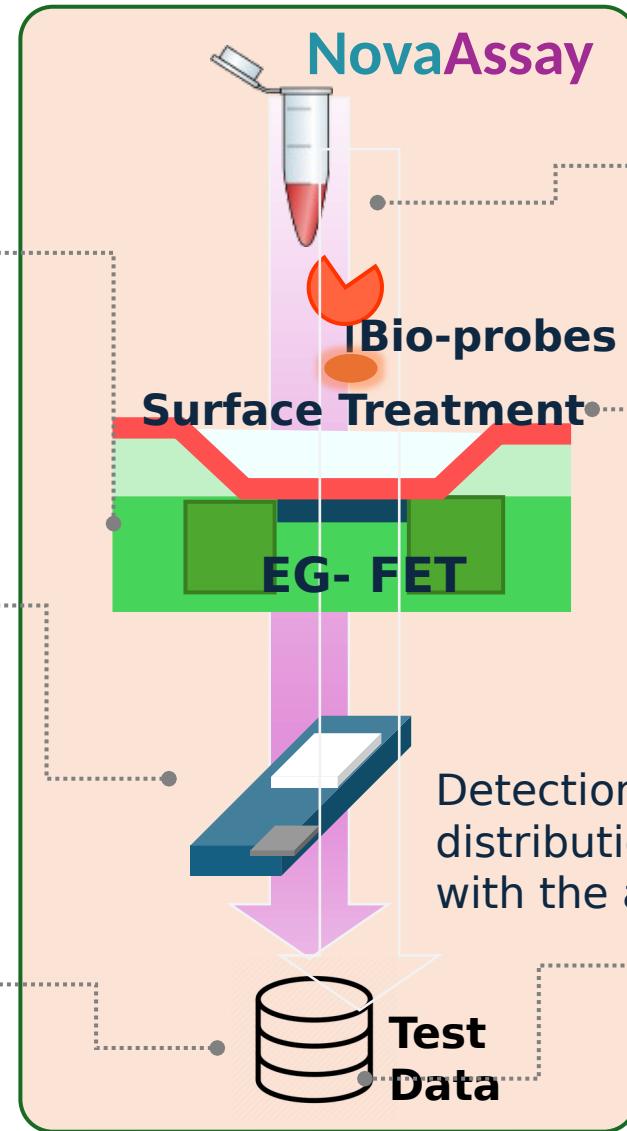


## NovaKIT

- Cartridge for disposable ASIC
- Analyzer for data reading

## NovaAI

- Smart process Automation



## NovaBIO

- Microfluids-based fast-tracked sample
- Buffer system



## NovaLINK

- Patented chemistry
- Proprietary reagents
- Probe embedded in surface coating



## NovaCRO

- Specimen repository
- Certified lab

# Prototype Products Ready for Clinical Validations

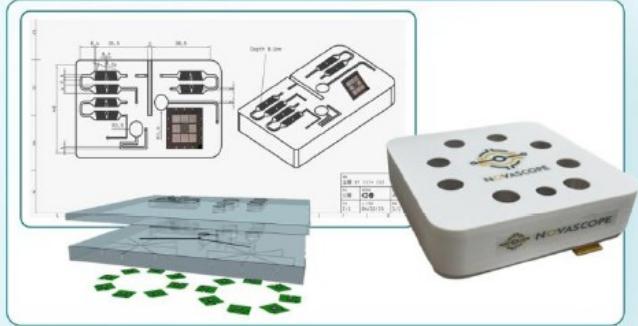


## Sample Preparation

01

Any molecule that carries electric charges in any sample types

- Microfluids for sample fast-tracking
- Built-in buffer system



## Detection

02

### Ultra-high sensitivity

- Disposal chip cartridge in the reader
- Cost competitive thanks to in-house capabilities and the Taiwan semiconductor and PCB ecosystem



## Reading and Report

03

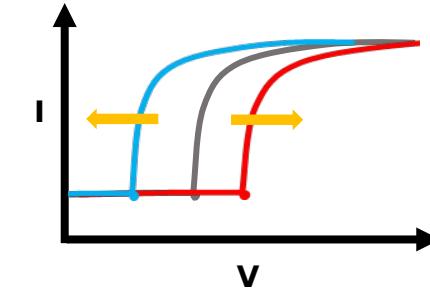
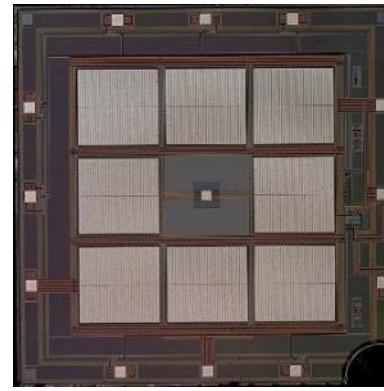
Fast and accurate results  
Connected to AI-empowered cloud

- Portable Reader
- Desktop Analyzer

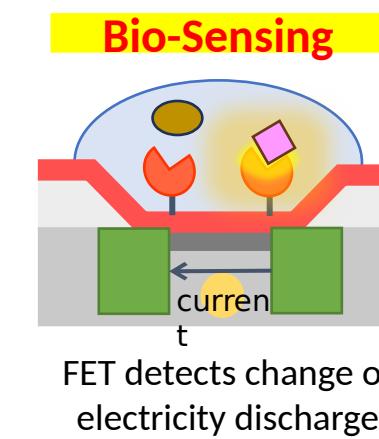
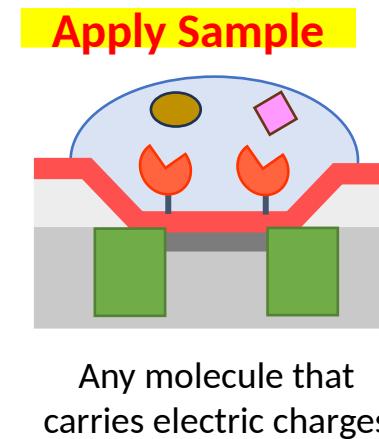
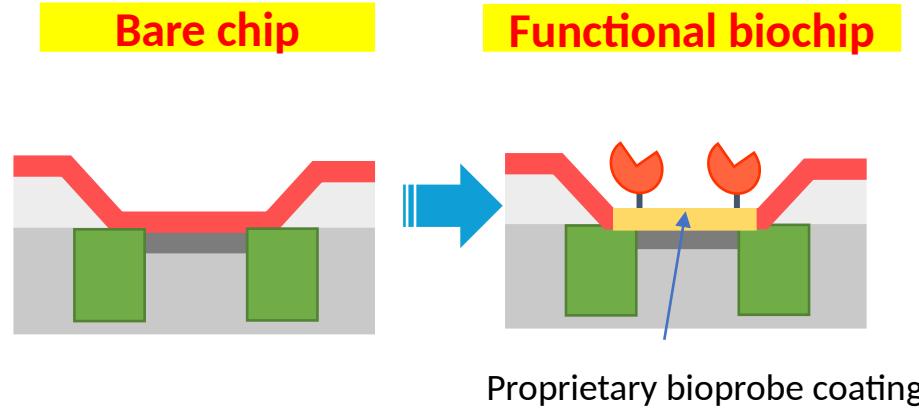


Cassia  
Production automation (lab use)

# NOVASCOPE Extended-Gate FET (Field Effect Transistor): From Probes to Processors

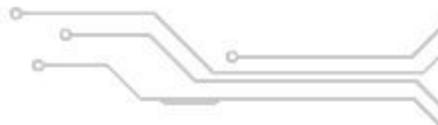


AI-powered analytics  
as value added service



## Biochip Design and Production

## Automated Process



# Biomarker Portfolio Under Development

Field	Infection	Dementia	Liquid Biopsy	Animals & Food Safety
Probe sorts	NA	Ab & NA	NA	Ab & NA
Biomarker Probes (Ab/NA)	<ul style="list-style-type: none"><li><i>E. faecium</i></li><li><i>A. baumannii</i></li><li><i>K. pneumoniae</i></li><li><i>E. coli</i></li><li><i>E. faecalis</i></li><li><i>P. aeruginosa</i></li><li><i>S. aureus</i></li></ul>	<ul style="list-style-type: none"><li>pTau 181/217/231</li><li>NfL</li><li>GFAP</li><li>S100B</li><li>TDP-43</li><li><math>\alpha</math>-synuclein</li><li>Amyloid beta 40/42</li><li>APOE4 (NA)</li></ul>	<ul style="list-style-type: none"><li>EGFR</li><li>ALK</li><li>ROS1</li><li>BRAF</li><li>NTRK</li><li>RET</li><li>K-RAS</li><li>METex14</li></ul>	<ul style="list-style-type: none"><li>PRRSV</li><li>PEDV</li><li>PCV1/2/3/4</li><li>CSFV</li><li>PRV</li><li>SB</li></ul>

# Novascope NVDFlow™ Automated BioChip Platform System

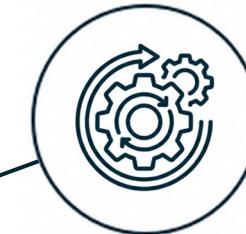
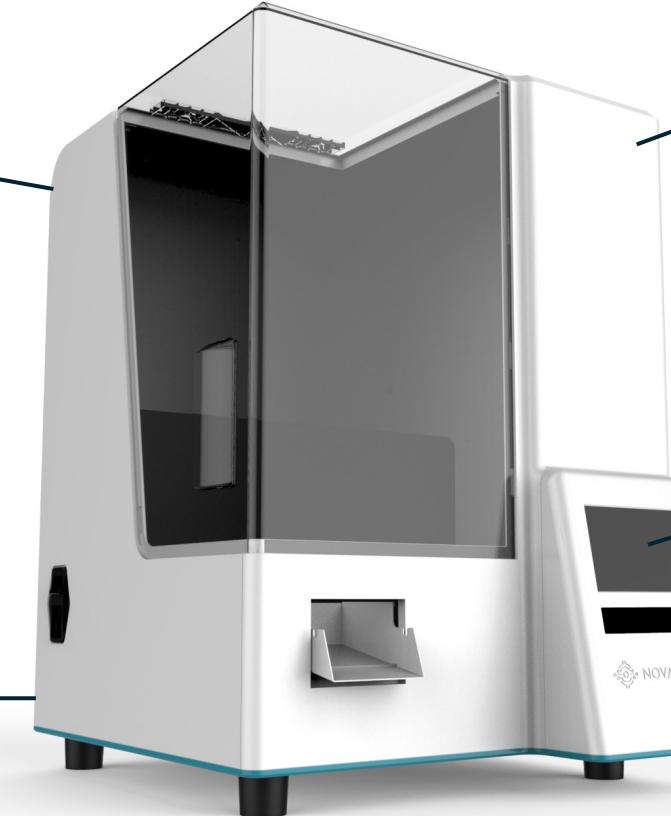
→ A **flexible**, validated BioChip workflow ready for real-world clinical integration.



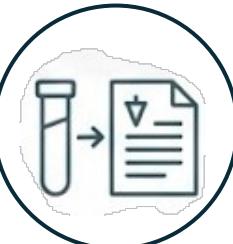
**Cross-platform  
verified**  
(Benchmarking vs  
SIMOA)



**Bench-  
top**  
(~20KG)



**Operatio  
nal  
flexibility**



**Sample-to-  
Answer**  
(same-day result)



**Resource-  
efficient**

Please insert my pic and change my job title to “Finance & IR Director”

