INSTANOSIS

Bring High-Performance Diagnostics to Patient’s Side
Background:

In 2020 Instanosis Inc was founded by Dr. Ping Wang, UPENN Professor & Director of the HUP Clinical Chemistry Labs. The company was founded to address underlying issues with clinical testing:

Technology for diagnosing disease is insufficient.
Existing technologies have trade-offs.
No existing technology is highly sensitive, accurate, portable, and cost-effective.
First application is a Rapid High-Performing COVID Antigen Test

Instanosis will bring to the market a testing technology which does not compromise.

Mission:
Improving patients lives by bringing to them affordable, highly sensitive and accurate diagnostic tests.
FRIST CLASS TEAM
.. with Full Resource Access

Founder & President
Dr. Ping Wang
Chief of Clinical Chemistry & Director of Core Laboratory
Hospital of University of Pennsylvania
Professor of Pathology and Laboratory Medicine
University of Pennsylvania, Perelman School of Medicine
Postdoctoral Fellow University of California, San Francisco
B. Sc. Tsinghua University

Clinical Advisor
Dr. Ronald Collman
Forty years experience in Clinical Medicine and Infectious Diseases
Professor of Medicine
Director of Penn for AIDS Research
Core Director, Critical Illness

Business Advisor
Dr. Cynthia Cai
Over 30 years experience in Life science tool and diagnostic field
Senior Advisor, Northern Light Venture Capital
President, Tharton Consulting

Scientific Advisor
Dr. Xiaofeng Xia
Over 20 years experience in stem cell translational research and commercialization
CEO ATGC Inc.
MARKET OPPORTUNITY
Addressing an unmet need
MARKET OPPORTUNITY

Rapid High-Performing CoVID Antigen Test:

Broad Unmet Diagnostic Need

Lack of **RAPID, LOW COST, HIGHLY SENSITIVE** and suitable **for POCT** biomarker tools for both research and diagnostics market

Clear Need  Ready for Trial  Clear Regulation  Huge Demand  Ready Customers
MARKET OPPORTUNITY

Platform: Addressing Significant Unmeet Needs

CoVID Antigen Test
Rapid ultra-sensitive, low cost, easy of use POCT for community surveillance

Infectious Diseases
Rapid ultra-sensitive, low cost, easy of use POCT for community surveillance

Cardiac Markers
Rapid ultra-sensitive, low cost, easy of use POCT for early cardiac disease detection and triage

Neurology Markers
Rapid ultra-sensitive, low cost, easy of use diagnostics for early neurodegenerative disease detection
## Market Opportunity

### Platform: Addressing Significant Unmet Needs

3 Markets for ultrasensitive biomarker detection

<table>
<thead>
<tr>
<th>Market Type</th>
<th>Estimated Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applications</strong></td>
<td></td>
</tr>
<tr>
<td>• Research</td>
<td>• $15B</td>
</tr>
<tr>
<td>• Core Lab Diagnostics</td>
<td>• $54B</td>
</tr>
<tr>
<td>• POC Diagnostics</td>
<td>• $20B</td>
</tr>
<tr>
<td><strong>Analytes</strong></td>
<td></td>
</tr>
<tr>
<td>• PSA</td>
<td>• $4.2B</td>
</tr>
<tr>
<td>• hCG</td>
<td>• $1.0B</td>
</tr>
<tr>
<td>• Protein Biomarkers</td>
<td>• $10.4B</td>
</tr>
<tr>
<td><strong>Channels</strong></td>
<td></td>
</tr>
<tr>
<td>• Core Labs</td>
<td>• $54B</td>
</tr>
<tr>
<td>• Physician Offices/ER</td>
<td>• $18-20B</td>
</tr>
<tr>
<td>• Consumers</td>
<td>• $1-5B</td>
</tr>
</tbody>
</table>
MARKET OPPORTUNITY

Lead Product: SARS-CoV-2 Antigen Detection Device

Competition Analysis for the microbubbling SARA-CoV-2 antigen assay
03
Innovative Solution
INNOVATIVE TECHNOLOGY

Bring High-Performance Diagnostics to Patient’s Side

Ultra-Sensitive
Fast
Portable
Low Cost
Temp & Light Tolerant
Easy-to-use
**A: Microbubble Development**
Magnetic beads to capture platinum nanoparticle-labeled target molecules; and loaded onto microchip with H2O2 solution.

**B: Microbubble Signaling**
Oxygen microbubbles entrapped in the square micro-well array serve as the visible digital signal.

**C: Microbubble Readout**
Mobile microscope with smart phone is used as read out device.
INNOVATIVE TECHNOLOGY – ULTRA-SENSITIVE

Use Case: Rapid High-Performing COVID Antigen Test

Detect as few as 8-9 viral copies/reaction
Sensitivity comparable to molecular methods

<table>
<thead>
<tr>
<th>Rt-PCR</th>
<th>LOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roche</td>
<td>0.003-0.009 TCID50/mL</td>
</tr>
<tr>
<td>Thermo Fisher</td>
<td>10 GE/reaction</td>
</tr>
<tr>
<td>Hologic</td>
<td>0.01 TCID50/mL</td>
</tr>
<tr>
<td>Cepheid</td>
<td>250 copies/mL</td>
</tr>
<tr>
<td>Genmark</td>
<td>$10^5$ copies/mL</td>
</tr>
<tr>
<td>CDC</td>
<td>$10^3$-$10^{3.5}$ copies/mL</td>
</tr>
<tr>
<td>Abbott</td>
<td>100 copies/mL</td>
</tr>
<tr>
<td>Instanosis</td>
<td>85 copies/mL</td>
</tr>
</tbody>
</table>
INNOVATIVE TECHNOLOGY – ULTRA-SENSITIVE

Use Case: PSA as Biomarker

Linearity at ultra-low concentrations

\[ R^2 = 0.994 \]

Blank+3δ LOD=0.060 pg/mL (2.0 fM)

Instanosis Limit of Detection

- Instanosis: 0.06 pg/mL
- Clinical method: 10 pg/mL

\~ 200 fold higher sensitivity
INNOVATIVE TECHNOLOGY – ROBUSTNESS

Fast microbubble generation

Microbubble growth rate is temperature independent
03 PRACTICAL GAME PLAN
GAME PLAN

Microbubbling Digital Assay

Intellectual Property:

- PCT International application filed for microbubbling digital assay (September 2019)
- Provisional patent application filed for SARS-CoV-2 application (June 2020)
Lab-based assay for FDA EUA
Clinical validation of lab-based assay for FDA EUA. Commercialization opportunity for assay, professional market

Automation Integration
Commercialization opportunity for both assay and platform, professional & non-professional markets

Assay Portfolio
Continuous development of other applications to enable consistent growth, in other Infectious diseases, as well as for Cardiac markers and Neurology markers
<table>
<thead>
<tr>
<th></th>
<th>Instanosis</th>
<th>rRT-PCR</th>
<th>Lateral flow antigen tests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target</strong></td>
<td>Antigen</td>
<td>RNA</td>
<td>Antigen</td>
</tr>
<tr>
<td><strong>Assay complexity</strong></td>
<td>+</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Time to results</strong></td>
<td>~20 min</td>
<td>Hours-days</td>
<td>~15 min</td>
</tr>
<tr>
<td><strong>Operator training needed</strong></td>
<td>+</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Widely deployable</strong></td>
<td>√</td>
<td>×</td>
<td>√</td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td>+++</td>
<td>+++</td>
<td>+*</td>
</tr>
<tr>
<td><strong>Specificity</strong></td>
<td>+++</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Frequent repeated testing</strong></td>
<td>√</td>
<td>×</td>
<td>√</td>
</tr>
<tr>
<td><strong>Data transmission and integration at POC</strong></td>
<td>√</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td><strong>Setting</strong></td>
<td>Community, homes, clinics, field</td>
<td>High complexity labs, BSL2+</td>
<td>Community</td>
</tr>
</tbody>
</table>
03

GAME PLAN

Product Development Strategy

POCT Consumer Market

Instrument Readout

Mobile Readout

Integrated Sample Preparation w. Microbubbling Digital Assay

Research Diagnostics
**GAME PLAN**

**Competitive Advantages: as Platform**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Limit of Detection (pg/mL)</th>
<th>Readout device</th>
<th>Readout Device Price</th>
<th>Cartridge Price</th>
<th>Power Need</th>
<th>Connectivity to Patient Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microbubbling PSA</td>
<td>0.060</td>
<td>Smartphone</td>
<td>$90-$1000</td>
<td>&lt;$3</td>
<td>None</td>
<td>Smartphone-integrated</td>
</tr>
<tr>
<td>Quanterix Simoa PSA</td>
<td>0.015</td>
<td>Floor-type fluorescence imaging instrument</td>
<td>$150,000</td>
<td>~$10/sample 96 samples minimum</td>
<td>Grid power</td>
<td>None, research use only</td>
</tr>
</tbody>
</table>
GAME PLAN
Timeline and Milestones

**CoVID Antigen Test-Lab**
Product: Ultra-sensitive lab test for professional user market
Timeline: <6 months
Funding needed: $100K (received from Penn)

**CoVID Antigen Test-POC**
Product: Ultra-sensitive POC device for non-professional use
Timeline: 1 yr
Funding needed: $2-3M

**Microbubbling Diagnostic Device**
Product: Tabletop device for diagnostic use
Timeline: 1-2 yrs
Funding needed: $2-3M

**Microbubbling Research Device**
Product: Tabletop device for research, CRO, and Pharma use
Timeline: 1-2 yrs
Funding needed: $2M
Thank You

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