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ASIA EDITION

Ã¢â?¬Å?Asia-Pacific represents a vast and relatively untapped market for Digital PathologyÃ¢â?¬Â•

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JelloX Biotech, a Taiwanese startup, is at the forefront of revolutionising cancer pathology by utilising 3D digital imaging and Artificial Intelligence (AI) technology. Its 3D imaging technology demonstrates potential beyond the field of oncology. In a groundbreaking paper published in February 2023, Dr Lin-Shien Fu and colleagues from Taiwan's Taichung Veterans General Hospital showcased the innovative application of their 3D pathology in analysing kidney inflammation caused by lupus nephritis. Dr Yen-Yin Lin, CEO of JelloX Biotech, highlights this new era in digital pathology, unveils the company's growth plans, strategic partnerships, and significant developments.



How does your innovative technology differ from traditional pathology methods?

JelloX Biotech is revolutionising cancer pathology with its 3D digital imaging and AI technology. Our patented technologies include tissue clearing technologies developed for 3D neuron circuit research and licensed from National Tsing Hua University. One of our notable innovations is MetaLite, a cost-effective software platform that employs AI to analyse 3D-rendered thick tissue images quickly, which saves pathologists valuable time while improving diagnostic precision.

Traditionally, 2D biopsy samples often lack comprehensive spatial information, which can limit diagnostic accuracy. However, the JelloX team addresses this issue by utilising 3D imaging, which captures much greater information compared with a traditional 4-micron-thin slide. Compared with traditional 2D biopsy samples, our 3D imaging technology provides much more detailed spatial information, particularly in capturing key elements of chronic inflammation. This has significant implications for improving the prognosis of conditions.

Furthermore, JelloX has been making strides in AI-powered pathology. In a recent study, we demonstrated how AI deep learning techniques can effectively analyse a combination of image types and distinguish between them. By using a cross-staining inference AI model on biopsy samples stained with two different types of dyes, we achieved high precision in identifying tumour features. This is a groundbreaking achievement that paves the way for AI to have a more substantial impact on tumour recognition and pathology in the future.

Our technology also shows potential beyond oncology. A recent study led by Dr Lin-Shien Fu, Director of the Pediatric Nephrology and Immunology Department at Taiwan's Taichung Veterans General Hospital, utilised our 3D pathology technology to explore how chronic kidney damage progresses, like lupus nephritis, in different kidney diseases.

The next generation pathology, an emerging field that we are pioneering at JelloX, is a subfield of pathology that focuses on comprehensive 3D/2D tissue data and data management based on information generated from real tissue scanning. Through the use of computer-based technology, digital pathology utilises virtual microscopy. This field is on the verge of becoming a mainstream option for routine diagnostics, as it enables pathologists like us to engage, evaluate, and collaborate rapidly and remotely, improving efficiency and productivity.

Are there any specific markets or regions where you plan to expand your presence?

While the adoption of digital pathology is currently most prominent in the USA, this market must be the key market to promote 3D pathology in daily pathological diagnosis. We believe Asia-Pacific represents a vast and relatively untapped market for this technology. Given our origin as an Asian startup, we feel a responsibility and are excited about the opportunity to bring advanced medical technology to this region.

In the global landscape, we are not alone in this journey. Other companies such as Alpenglow Biosciences, Visikol, and ClearLight Biotechnologies, are also making significant strides in this field. However, each of us brings unique strengths and focus areas to the table. At JelloX, our combination of 3D digital pathology image and tissue feature-based diagnosis sets us apart and gives us a unique competitive advantage in precision diagnosis and AI medicine.

We look forward to bringing our technology to markets around the world and believe that our focus on 3D pathology and AI analysis will make a significant difference in the global medical landscape.

As a university startup, has JelloX Biotech collaborated with medical centres, biotech companies and research institutes? How significant are they to the company's growth and development?

Our collaborations with medical centres and research institutes play a crucial role in accelerating our R&D efforts. The integration of our cutting-edge technology with their medical expertise facilitates more rapid and innovative medical discoveries. These partnerships not only help in pushing the boundaries of our research but also play a pivotal role in transforming traditional 2D pathological diagnosis to a more advanced and comprehensive 3D analysis.

When it comes to our interactions with biotech industries, we focus on synergistic collaborations. We explore how our proprietary technologies can add value to our biotech partners and vice versa. It is indeed a long journey from initial conversations to the establishment of official collaborations, but each step brings us closer to more innovative solutions in the field of 3D digital pathology. The adoption of 3D pathology is currently at a nascent stage, and our partnerships are vital in promoting this new technology. Every early adopter contributes to the expansion of its impact, accelerating the growth and development of our company as well as the field as a whole.

What are some of the key trends and developments in the field of digital pathology and AI-assisted diagnostics? How does JelloX position itself within this industry landscape?

In the digital pathology landscape, the costs associated with innovation can be quite high, which has led to the United States being a primary early adopter. However, our focus extends beyond digital pathology to include 3D pathology. This unique concentration allows us to offer digital pathology instruments and systems at a more reasonable price point. This affordability, we believe, can help catalyse and accelerate the maturity of the next wave of innovation in the industry — 3D pathology. By promoting this emerging technology, we are positioning JelloX Biotech as a catalyst for change and growth in the APAC region. We aim to incubate this technology and lead the way towards the future of pathology.

What will it take for hospitals and laboratories to adopt these solutions?

The major medical centres and top medical laboratories will adopt these kinds of solutions as they have an innate mission to discover innovative technology to help humans and patients.

What lies ahead for JelloX Biotech's product development and expansion?

Our team has made a breakthrough in cross-staining solutions for precision medicine. We demonstrated that AI deep learning techniques, which power our technology, can effectively analyse a combination of image types and distinguish between them, even overcoming challenges of colour variation in staining technologies. This achievement paves the way for AI to have an even greater impact on tumour recognition and pathology in the future.

As we progress, our roadmap includes providing a comprehensive solution to the market, enabling hospitals to independently perform 3D pathology services while we continue to provide robust analysis data for comparison. We believe that this will not only enhance healthcare delivery but also drive the next wave of innovation in the field.

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