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Taiwan can function as a regulatory and evidence generation sandbox for Illumina

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Jerry Cheng is general manager for Illumina across Taiwan, Hong Kong, and Macau, steering the company's expansion in three strategically significant genomics markets. With over two decades of pharmaceutical industry experience, including pioneering biomarker-driven oncology therapeutics, Cheng now orchestrates Illumina's transition from research instrumentation to clinical implementation. His mandate encompasses policy architecture, ecosystem development, and translational research acceleration across markets representing critical inflection points in Asia-Pacific precision medicine adoption.

Illumina stands at the nexus of genomics' transition from research into routine clinical practice. What strategic priorities define your leadership mandate across Taiwan, Hong Kong, and Macau?

My responsibilities centre on three interconnected imperatives. First is policy architecture and market access optimisation. Whilst Illumina has operated for over two decades, we established our Taiwan legal entity four years ago, enabling direct connectivity between global resources and regional stakeholders. As we expand from genomics into multiomics platforms including proteomics, this institutional presence facilitates early access for local researchers.

Policy engagement has assumed paramount importance. Our Chief Executive Officer Jacob Thaysen highlighted at this year's J.P. Morgan Healthcare Conference that 60 percent of Illumina's business originates from clinical applications, yet clinical NGS adoption remains below 20 percent – representing a substantial addressable opportunity. Taiwan exemplifies this priority: after five years of stakeholder dialogue, authorities implemented partial NGS reimbursement in oncology in 2024, a milestone few jurisdictions in the APAC region have achieved. My role encompasses providing global comparative frameworks on cost structures and reimbursement criteria. Hong Kong operates as predominantly self-pay with approximately 60 percent private coverage, focusing on targeted panels. Beyond oncology, we are advancing frameworks across rare disease, infectious disease, and broader applications, following the UK's universal new-born whole genome sequencing model.

Second is global-local connectivity for innovation diffusion. Today, multiomics integration combining genomics with Illumina's spatial transcriptomics, 5-base sequencing and proteomics technologies enables exponentially deeper biological insights and accelerates the translation of global innovation into local application. As recently highlighted at AGBT, such integrated approaches powered by Illumina are already advancing discovery in areas like oncology.

At a global level, Illumina has supported numerous large-scale cohort initiatives through high-throughput sequencing and advanced bioinformatics analysis, including landmark programmes such as the UK Biobank. The UK Biobank initiated with 500,000 whole genome sequences, subsequently adding pharmaceutical-sponsored proteomics analysis. Our aspiration involves identifying medical centres implementing integrated multiomics platforms simultaneously rather than sequentially, accelerating Asia's convergence whilst generating region-specific insights. Our technological architecture enables unified execution on a single platform, ensuring data quality and ecosystem interoperability. Illumina's newly established BioInsight department further consolidates the company's bioinformatics and AI capabilities, enabling the delivery of end-to-end solutions at optimised cost structures.

Third is local partnership architecture. Taiwan and Hong Kong maintain world-class universities, including National Taiwan University, National Yang Ming Chiao Tung University, the University of Hong Kong, and The Chinese University of Hong Kong etc,. We collaborate with pioneers like Professor Dennis Lo, co-creating initiatives for measurable impact. Taiwan offers distinct advantages: exceptional healthcare infrastructure, robust medical centres with superior data, and advanced ICT capabilities. Globally, NVIDIA and AMD collaborate with us; locally, we partner with Taiwan's AI ecosystem and leverage UK Biobank's insights, which integrate genomics with patient

data enabling pharmaceutical companies to identify drug candidates efficiently – similar to Vanderbilt Hospital's 250,000-patient database. Strategic value derives from integrated data insights connecting genomic and clinical information.

Trust infrastructure and stakeholder relationships require sustained cultivation. What strategic challenges emerged in establishing Illumina's institutional presence beyond transactional commercial relationships?

Initial market perception positioned us as transactional instrument vendors. Leveraging pharmaceutical industry experience where sustained engagement proves essential, we implemented a differentiated value proposition emphasising resource mobilisation and capability development.

Our Medical Affairs team initiated pilot programmes structurally analogous to pharmaceutical medical affairs. Our TSO 500 comprehensive oncology panel encompasses 523 genes. Current practice employs targeted panels addressing 20 to 30 druggable genes, yet global practice is transitioning toward comprehensive genomic profiling. Despite proprietary technology, researchers initially hesitated regarding information complexity. Our Medical Affairs team launched pilot studies, engaging lung cancer and gynaecological oncology specialists. By participating in these studies, three to four key opinion leaders recognised substantive value: resource provision supporting enhanced genomics comprehension for optimised patient outcomes.

We established stakeholder forums engaging global thought leaders. Our global AI leadership, including Kyle Farh, visited Taiwan twice, presenting at key institutions regarding cutting-edge initiatives like UK Biobank, demonstrating how we leveraged technology support to elevate customers' research rankings. This catalysed collaboration appetite. Whilst channel partners manage operations, we provide strategic resources and comprehensive frameworks. We support reimbursement authorities with global value propositions and comprehensive dossiers. We facilitate oncology forums connecting medical societies and partners, demonstrating capability in demand identification and insight generation.

Within one year, three principal service providers in Taiwan each acquired two NovaSeq X Plus instruments – Taiwan now operates six systems, the region's largest concentration. We supported project pipeline development sustaining deployment. We currently support two medical centres executing large cohorts. National Taiwan University Hospital's initiative, commenced two years ago, begins sequencing 50,000 patient samples this quarter for the Taiwan Precision Medicine

Initiative. Additional centres are following, recognising genomics investment opportunities for global competitiveness.

How do you advocate internally for market prioritisation within Illumina's global organisation, particularly given the presence of significantly larger markets in the Asia-Pacific region?

Understanding cohort value propositions proves essential for internal advocacy. Examining UK Biobank pharmaceutical partnerships, we identified Taiwan's distinctive proposition: critical scarcity of Asian genomic data combined with execution velocity capabilities. Engaging our global leadership – facilitated by hosting executives like Kyle in Taiwan – enables rapid market intelligence connectivity. Taiwan possesses exceptional data infrastructure; the strategic requirement involves securing sponsors to replicate UK Biobank-scale initiatives.

Our team demonstrates proactive global engagement beyond local execution. Taiwan secured the first proteomics platform deployment across Asia-Pacific. We cultivated trust with a major partner, convincing global leadership regarding optimal timing. This medical centre represents potential participation in UK Biobank-scale cohort initiatives. We presented integrated whole genome sequencing (300,000 base pairs) combined with proteomics via the Infinity Plus Platform as a pilot. Headquarters recognises this centre's superior data quality and commitment, enabling us to secure resources for the region's inaugural proteomics instrumentation.

Taiwan maintains strategic orientation. We identify competitive strengths and engage proactively with Shanghai regional headquarters and global leadership, demonstrating support for product launches and major cohort initiatives.

Taiwan appears distinctive within Asia-Pacific, combining large hospital cohorts, genomic research programmes, and NGS reimbursement in oncology. Does Taiwan represent an emerging regional reference market for precision medicine?

Taiwan functions as a reimbursement market within Asia-Pacific's bifurcated structure – jurisdictions divide between comprehensive reimbursement and self-pay or partial models. Taiwan can demonstrate how genomics offerings provide evidence-based value propositions regarding treatment efficacy and diagnostic precision to reimbursement authorities, advancing precision medicine's healthcare integration.

Taiwan’s modest 23-million population enables efficient, rapid evidence generation through streamlined medical centre collaboration. Pharmaceutical partnerships prove critical. Current oncology diagnostics employ small panels addressing approximately 20 genes for FDA-approved druggable targets. However, pharmaceutical requirements expand given substantial phase I through three trial activity. Comprehensive genomic profiling addresses entire development pipelines. Oncology development increasingly targets rare molecular alterations – three per cent for specific mutations, four per cent for MET alterations. Efficient clinical trial enrolment presents significant challenges. Large panels addressing not merely current approved indications but anticipated pipeline requirements prove essential given trial cost structures.

Taiwan can function as a regulatory and evidence generation sandbox, supporting collaborative frameworks demonstrating genomics value propositions alongside pharmaceutical partners, with expansion to reimbursement markets. Southeast Asian jurisdictions and Hong Kong can leverage these demonstrations for decision-making. Regarding big data infrastructure, healthcare systems universally confront budget constraints. The strategic imperative involves paradigm transformation, enhancing precision medicine’s precision – understanding which patients, under what clinical circumstances, with which biomarker profiles, should receive which interventions, optimising resource efficiency whilst identifying cost savings for novel treatment reallocation.

Current efficiency remains suboptimal. When genomics achieves healthcare system integration, we realise enhanced precision whilst capturing savings from unnecessary interventions for new treatment funding. Illumina Taiwan can catalyse paradigm transformation – initiating with oncology comprehensive genomic profiling, expanding to whole genome sequencing, ultimately integrating proteomics. Connecting expanding data with medical centres’ AI infrastructure enables healthcare efficiency optimisation.

How are public healthcare stakeholders engaging with industry to enable systemic transformation, given the long timelines associated with reimbursement frameworks and the allocation of diagnostic budgets?

The strategic environment transformed substantially following the Healthy Taiwan initiative, aligning closely with Illumina’s vision of transitioning from sick-care to healthcare delivery. This represents a fundamental framework for population health optimisation within fiscal constraints. Traditional cancer treatment progression through multiple therapeutic lines proves effective yet financially unsustainable for patients and reimbursement systems.

We have established cross-stakeholder forums enabling sustained dialogue regarding implementation frameworks. Government agencies and industry associations, with Illumina and partners, maintain strategic conversations. Commencing with partial NGS oncology reimbursement in 2024, ministerial leadership has expressed willingness to transition from small panels towards comprehensive panels with differentiated co-payment structures, positioning all patients on comprehensive panels given superior insight generation, global trial participation facilitation, and database development support.

Liquid biopsy represents another strategic development. Current paradigms remain tissue-based, yet liquid biopsy demonstrates advanced clinical applications at conferences including ASCO. Liquid biopsy offers enhanced accessibility, particularly where tissue access proves challenging – lung cancer patients experiencing relapse cannot readily undergo repeat biopsies. Liquid biopsy provides diagnostic alternatives benefiting patients and clinicians. Currently entirely out-of-pocket with constrained access, ministerial leadership demonstrates willingness to advance comprehensive genomic profiling whilst simultaneously expanding liquid biopsy access.

Is comprehensive governmental reimbursement sustainable long-term, or should we anticipate hybrid models incorporating private insurance and hospital cost-sharing?

Hybrid architectures are emerging. Ministerial leadership has referenced private insurance collaboration for funding diversification, representing an important policy evolution. Diagnostics will continue relying predominantly on governmental reimbursement. However, private sector expansion accelerates from diagnostics toward disease monitoring and cancer early detection.

J.P. Morgan data demonstrates significant growth from minimal residual disease monitoring using liquid biopsy – approximately double-digit growth – alongside multi-cancer early detection platforms. Minimal residual disease monitoring transitions from diagnostics to longitudinal disease tracking, generating substantial growth through liquid biopsy-enabled early intervention and progression monitoring. Cancer early detection represents another emerging frontier, with researchers including Professor Dennis Lo demonstrating leadership.

Even within the United States, these applications receive only partial reimbursement, remaining largely private sector through health screening and out-of-pocket expenditure. Diagnostics will sustain governmental dependence, whilst monitoring and early detection will increasingly depend on private sector mechanisms and personal insurance products, with gradual healthcare system integration. Markets are already transitioning beyond diagnostics toward preventive health

paradigms.

You have established partnerships with Taiwanese AI companies to construct end-to-end gene-to-clinic platforms. What strategic challenges do these collaborations address?

Large cohort initiatives integrating genomics and multiomics generate enormous data volumes requiring AI computational capabilities. Strategic timing proves optimal because genomics testing costs decline through high-throughput instrumentation whilst data output expands exponentially. Customers require actionable insights. Small-scale research remains manageable, but integrating heterogeneous data creates complexity demanding AI-powered frameworks.

However, our AI leadership notes healthcare data differ fundamentally from general AI training paradigms. Healthcare data remains constrained – UK Biobank encompasses 500,000 samples, US initiatives several hundred thousand. Collaborative data integration would accelerate insight generation substantially. Currently, healthcare data remains siloed with platforms lacking interconnectivity. We advocate frameworks protecting individual privacy whilst avoiding excessive utilisation restrictions. Strategic imperatives require connecting genomic data with complementary datasets using AI for insight generation.

Additionally, regarding 20 percent clinical penetration, genomics testing demands substantial manual capability and bioinformatics expertise. Current centralised models – hospitals transmitting samples to central laboratories – create extended turnaround times. Acceleration requires transitioning toward decentralised models with compact, desktop-scale automation connecting hospital laboratories. When genomics testing automation is implemented, simplifying bioinformatics output proves critical. Sample-to-answer workflows currently lack clinically friendly automation and interpretable reporting. Taiwan medical technologists can execute genomic testing but require appropriate knowledge frameworks. We provide education through professional societies whilst enhancing end-to-end system clinical accessibility, enabling penetration expansion from 20 to 50 percent.

From a development perspective, Illumina’s global operations are advancing automation capabilities internally, but we are deliberately pursuing a diversified approach. The local market, in particular, offers strong development capabilities, and we actively seek strategic partners who can accelerate progress and adoption. While Europe and the United States already have solutions in place, significant opportunities remain to optimise workflows through greater simplification and

integration. As with many emerging technologies, meaningful capability gaps persist, and addressing them will require collaboration rather than purely in-house development.

What organisational culture are you cultivating across the three markets under your leadership?

Transitioning from well-established pharmaceutical environments to Illumina – a 28-year-old organisation maintaining entrepreneurial characteristics despite substantial scale – demands distinct cultural frameworks. We emphasise entrepreneurship, intellectual curiosity, and pioneering orientation.

Team members require multi-functional capabilities in coordinating business development, market access, and medical affairs. Our compact central teams, complemented by channel partners, must demonstrate versatility –being able to engage in reimbursement discussions and medical affairs discussions with support from respective function teams. Entrepreneurship and continuous learning prove essential, alongside collaborative mindset evolution. We provide instrumentation and core capabilities, but the full value and potential can only be unlocked through deep collaboration across the ecosystem. Ecosystem development supporting mutual stakeholder value demands sophisticated engagement and intellectual openness.

Taiwan demonstrates robust growth with compound annual growth exceeding double digits since 2020–2021, with substantial future potential from 2026 onwards. We emphasise long-term strategic horizons beyond short-term metrics. Genomics initiatives require sustained stakeholder connectivity and relationship cultivation. Recruitment emphasises technical competencies plus entrepreneurial mind-sets aligned with our cultural framework.

What sustains your personal motivation leading this organisation, particularly given inevitable challenges inherent in market transformation?

My motivation derives from pharmaceutical industry experience in oncology and rare diseases – approximately 20 percent genetic-related conditions. When I launched Gefitinib, the EGFR inhibitor, a decade ago as the inaugural biomarker-driven lung cancer therapeutic, I witnessed precision medicine’s transformative impact from single biomarker targeting.

Illumina represents the subsequent paradigm evolution – comprehensive panels like TSO 500 addressing 523 genes with substantial complexity. I envision genomics as a standard of care fundamentally transforming patient paradigms: early diagnosis, precise treatment eliminating empirical approaches, revolutionising patient experiences and healthcare outcome. We remain at 20 percent clinical NGS penetration – representing initial transformation stages.

Biological insight generation fascinates me profoundly. Whilst biological understanding presents inherent complexity, AI acceleration generates tremendous progress. Just as Gefitinib catalysed a focused paradigm transformation with now-substantial systemic impact, I remain passionate regarding meaningful healthcare transformation. I understand pharmaceutical industry evolution from sick-care towards healthcare delivery models – continuous evolution transitioning expenditure from end-stage expensive therapeutics toward prevention and early intervention paradigms.

This aligns precisely with Illumina’s vision: unlocking genomics and multiomics capabilities to advance human healthcare outcomes. This vision sustains daily motivation because whilst transformation remains incomplete, we observe tangible progress. After four years with Illumina, substantial opportunities remain, rendering the strategic journey profoundly engaging.

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