Pi-Hui Liang – CEO, ImmunAdd

Taiwan offers a highly capable biomedical ecosystem, with strong talent, advanced manufacturing, and an efficient regulatory environment

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ImmunAdd's Dr Pi-Hui Liang discusses her transition from academic research to entrepreneurship, driven by the critical shortage of commercially available vaccine adjuvants. With a proprietary saponin-based platform addressing supply chain constraints and toxicity limitations of existing adjuvants, ImmunAdd aims to democratise access to advanced immunological tools whilst developing its own vaccine portfolio targeting herpes zoster and other challenging pathogens.

Your journey from academic scientist to biotechnology entrepreneur is remarkable. What convinced you that vaccine adjuvant technology represented a viable commercial opportunity?

The answer lies at the intersection of science and market reality. Nearly twenty years ago, during my postdoctoral research in Scripps, I focused on small molecules for immune activation – what we now broadly describe as vaccine adjuvants. I was fascinated by the fact that such small molecules could elicit remarkably immune responses. At that stage, however, my interest was entirely scientific.

The commercial opportunity only became clear after I became independent and established my own laboratory. Vaccine developers repeatedly approached us seeking support in adjuvant development. Over time, a consistent pattern emerged: companies had strong vaccine platforms but limited access to advanced adjuvant materials. This revealed a structural gap in the industry

rather than isolated demand.

I chose to focus on saponin adjuvants because of their complexity, challenge and inherent constraints. Derived from the Quillaja saponaria tree in Chile, these molecules present a fundamental supply challenge: the tree requires approximately twenty-five years to mature before its bark can be harvested. When one considers the scale of global vaccination, the limitations of this supply chain become immediately evident.

The turning point for the industry came in 2017, when a major pharmaceutical company successfully commercialised a saponin adjuvant, named QS-21, in its zoster vaccine. That success demonstrated not only commercial viability but also safety, addressing long-standing concerns about immune overactivation. The COVID-19 pandemic reinforced this lesson. It became clear that when vaccines alone cannot deliver sufficient durability or protection, adjuvants are indis-pensable in enhancing immune response and efficacy.

Our own work began as a purely scientific challenge. The total synthesis of QS-21 involves more than seventy chemical steps, making it one of the most complex molecules in this field. Building on our synthetic platform, we developed a next-generation saponin adjuvant – IA-05 –selected from over one hundred candidates for its favourable immune profile. Scientifically, it was a significant achievement.

Yet during the pandemic, despite discussions with both local and global vaccine manufacturers, no immediate commitments followed. The reality was simple: our technology was still at an early stage, while the crisis demanded solutions that could be deployed immediately. That moment crystallised a difficult truth. Without translation into a viable product, our invention would remain an academic discovery.

As a scientist witnessing the scale of global disruption and human suffering, I felt a responsibility to move beyond the laboratory. That was the point at which scientific curiosity gave way to purpose: to ensure that the IA-05 could ultimately reach patients and contribute meaningfully to public health.

How did ImmunAdd come into existence?

ImmunAdd emerged less from a single defining decision than from a convergence of circumstances. The catalyst was a conversation with VP Yen-Chen Huang at Diamond Bio Fund. After reviewing IA-05 and the underlying data, he asked a simple but disarming question: why had

it not been developed commercially? My answer was equally simple – I had primarily focused on the science and had never actively sought investment. He suggested forming a company to translate the discovery.

At the same time, we had secured a government grant from MOEA Value Creation Program, which required that funded technology be transferred into a commercial entity. Publication alone was not sufficient. We approached several local companies to explore licensing or technology transfer, but none are prepared to assume early-stage development risk. At that point, the options narrowed considerably. If the science was to progress beyond the laboratory, we would need to establish our own company, internalise the technology transfer, and raise capital to advance the IA-05 towards clinical applications.

In truth, the decision itself did not feel difficult. I tend to follow the logic of the situation. We are the first organisation globally to have developed a fully synthetic saponin adjuvant with potency comparable to the natural saponin adjuvant, without reliance on tree-derived sourcing, thereby providing a more sustainable and secure supply. When such a scientific and translational opportunity presents itself, establishing ImmunAdd allowed us to move the science into clinical development, ensuring that its impact could extend beyond the laboratory and ultimately contribute to improving human health.

How do you position ImmunAdd strategically? Are you a technology platform company or a vaccine developer?

ImmunAdd is positioned as a hybrid: we aim to become a pharmaceutical company with our own products. Firstly, we possess a vaccine adjuvant platform that facilitates strategic partner-ships with other organisations. We envision establishing our own manufacturing capacity to synthesise and formulate vaccine adjuvant products to other companies. Simultaneously, we will develop proprietary vaccine products.

We selected herpes zoster as our initial clinical candidate because it represents a validated market with proven precedent, effectively showcasing our adjuvant’s value proposition.

What is your current development status?

We are currently in the preclinical phase and recently completed a 15 million USD Series A financing round. These funds enable us to achieve the necessary preclinical milestones to Phase 1 clinical trials. It is important to note that adjuvants function only when combined with vaccine antigens; they do not elicit antigen-specific immunity on their own. Therefore, clinical trials must assess both toxicity and efficacy, which definitively requires a vaccine to demonstrate the adjuvant's safety and effectiveness. This strategy allows us to validate our platform technology under real-world translational conditions, while simultaneously generating proprietary clinical assets

Can you explain the molecular innovation behind IA-05 and its practical advantages regarding safety and stability?

IA-05 represents a rationally truncated structure of QS-21. We designed this molecule to preserve QS-21's potency whilst eliminating its toxicity elements. The parent molecule suffers from haemolytic activity – patients receiving vaccines containing QS-21 experience injection site le-sions and significant pain due to this side effect.

As a medicinal chemist, I specialise in molecular design. We systematically removed the structural elements causing haemolytic activity whilst maintaining immunological potency through subtle structural modifications.

Crucially, the toxicity-causing moiety also drives QS-21's instability. By removing this element, IA-05 became remarkably stable. Whereas QS-21 requires storage at minus 20 degrees Celsius, IA-05 remains stable at room temperature for up to 24 months. This eliminates cold chain requirements, enabling distribution to diverse geographical locations without specialised storage infrastructure.

Where do you see the greatest impact across the vaccine value chain – development, manufacturing, or distribution?

To clarify the current landscape, while efficiency is essential across the entire chain, we believe our greatest impact lies in "Development". Currently, most advanced adjuvants remain consol-dated within a few major pharmaceutical companies. Our R&D initiative addresses this market gap by creating a high-performance, accessible adjuvant platform. This aligns with the mandates of global organisations such as the World Health Organisation, CEPI, NIAID, and Gavi, which consistently advocate for adjuvant developers to contribute their technologies to accelerate global

immunisation efforts. To this end, we have proactively submitted proposals to participate in these international initiatives, reinforcing our commitment to promoting equitable access and accelerating global vaccine innovation.

The strategic value of adjuvant innovation often seems underestimated. Do you believe this is changing?

COVID-19 elevated awareness considerably. From a production perspective, adjuvants often represent the most resource-intensive components of a vaccine formulation, frequently exceeding the cost of antigens. While antigens are typically produced through cell-based systems enabling large-scale manufacture, adjuvants derived from botanical sources or complex synthetic adjuvants face greater challenges in achieving comparable cost efficiency. Recognition of these complexities is increasing appreciation for innovative adjuvants that combine potency, reproducibility, and scalable production.

How does the immune response you target in infectious disease vaccines differ from cancer or therapeutic vaccines?

Many pathogens and disease states have resisted effective vaccination because traditional approaches have focused almost exclusively on inducing high antibody titres. We now understand that, for a significant number of indications, antibodies alone are not sufficient. Robust and durable protection requires cellular immunity – specifically the activation of CD4 and CD8 T cells – to recognise and eliminate infected or aberrant cells.
Modern adjuvant development has shifted towards vaccines for particularly challenging indications such as herpes zoster, HIV, malaria, tuberculosis, and cancers. Our adjuvant system is designed to enhance cellular immune responses, which makes it especially relevant not only for difficult infectious diseases but also for cancer immunotherapy. In oncology, antibodies are inherently limited: they have relatively short half-lives, typically on the order of weeks, and cannot by themselves drive sustained tumour control. Adjuvant activated cellular immunity, by contrast, enables long-term immune surveillance and amplifies anti-tumour activity through repeated immune cell engagement.

From a development standpoint, we do not intend to create proprietary cancer vaccines. Instead, we collaborate with companies that are developing cancer and therapeutic vaccines, providing our

adjuvant technology to support and accelerate their programmes. Our role is to enable their success by supplying a highly potent immune-modulating component rather than competing downstream in vaccine development.

Regarding your recent fundraising, what types of investors have shown the greatest interest in adjuvant technology, and what milestones are critical for the next phase?

Our early funding was primarily non-dilutive, coming from government grants that enabled us to establish the scientific foundation. As we have progressed, our investor base has shifted towards venture capital, supported by some banking institutions. The majority of our investors are leading Taiwanese biotechnology-focused venture capital firms, complemented by one United States–based investor.

Looking ahead, the key milestone is the initiation of our first-in-human clinical trial, which we are targeting for the second quarter of 2027. Achieving this will position us to access later-stage capital, and we currently anticipate pursuing an initial public offering on the Taiwan market in late 2027 or early 2028.

The timeline is undoubtedly ambitious, but it reflects a clear strategic imperative. Ensuring the long-term sustainability of the company requires access to broader pools of capital, and an IPO provides the most effective mechanism for capital formation and long-term growth at that stage.

How do you envision monetising this technology? Will you remain a product company or pursue partnerships and licensing?

We envision a value-driven approach to monetisation that balances immediate licensing revenue with long-term product ownership. Following our Phase I clinical trial, stakeholders will possess safety and efficacy data for our adjuvant, creating partnership and licensing opportunities. These inflows will de-risk our transition into Phase II, allowing for the expanded patient populations required for definitive efficacy readouts. While we remain committed to our proprietary products, we maintain the flexibility to license specific assets post-Phase II to maximise stakeholder returns. Moreover, our R&D suggests our adjuvant technology possesses broad-spectrum potential beyond vaccines, specifically in the treatment of immune-related disorders, offering multiple future revenue streams.

Given that major pharmaceutical companies protect their proprietary adjuvants, are you not concerned about openly licensing yours?

IA-05 was designed from the outset as a scalable and accessible synthetic alternative designed for universal accessibility. This has meaningful implications for CMC consistency, global supply security, and regulatory clarity — all critical factors as vaccine technologies diversify into recombinant, mRNA, protein subunit, and novel delivery platforms.

Open partnering, in our case, is not about commoditising the molecule. It is about positioning IA-05 as a modular immunostimulatory component — a plug-in element that can be rationally integrated into multiple vaccine architectures.

Late-stage development and global deployment naturally benefit from a large pharmaceutical infrastructure. But the technological value resides in the molecular design, synthetic controllability, and platform flexibility of IA-05. Our objective is to enable broader innovation across the vaccine ecosystem, not to confine the technology within a single proprietary construct.

Who do you consider your primary competitors?

Some groups pursue biosynthetic production strategies, using cellular systems to express complex natural products. However, it remains technically demanding when dealing with structurally complex triterpenoid glycosides. Achieving consistent yield, structural homogeneity, and scalable purification can be challenging, particularly when regulatory-grade reproducibility is required. For example, the industrial-scale biosynthesis of complex natural products — such as Taxol — took decades of technological advancement before becoming commercially viable. While synthetic biology continues to evolve rapidly, the translation from laboratory expression systems to GMP-compliant, globally scalable manufacturing remains non-trivial.

We view these approaches as complementary, with the field benefiting from multiple pathways that improve safety, scalability, and immune precision.

How does operating from Taiwan support or challenge your development?

Taiwan offers a highly capable biomedical ecosystem, with strong talent, advanced manufacturing, and an efficient regulatory environment. At the same time, some international partners occasionally raise questions related to regional geopolitical dynamics and supply-chain continuity. In practice, Taiwan has demonstrated long-standing operational stability and resilience, supported by robust infrastructure, well-established legal and regulatory systems, and a globally integrated pharmaceutical sector. We proactively address partner concerns through diversified manufacturing strategies, international collaborations, and risk-mitigation planning to ensure continuity of development and supply. Overall, we view Taiwan's scientific strength and manufacturing agility as significant advantages, while remaining attentive to the importance of transparent risk management for global stakeholders.

What about capital access and talent recruitment?

Taiwan's successful semiconductor and technology industries have created substantial private capital and a strong deep-tech investment culture. Many individuals wish to support scientists in translating research into commercial reality. From our perspective, venture capital is quite supportive of early-stage development here; however, the broader funding environment may vary across companies.

Talent recruitment, however, presents greater challenges. The semiconductor and technology sectors' success mean that many graduates gravitate towards those industries. Combined with demographic headwinds and a low birth rate, this creates long-term competition for highly skilled personnel. For ImmunAdd, maintaining a lean and focused organisation has allowed us to operate effectively with a small team. However, as Taiwan's biotech sector continues to scale, expanding access to international scientific talent will become increasingly important. Some initiatives exist, such as the Employment Gold Card programme, but recruiting foreign talent remains substantially more complex than hiring domestically due to regulatory requirements.

Overall, capital availability is supportive, but sustainable growth of the biotech ecosystem will depend heavily on talent mobility and international integration.

Looking five years ahead, where do you envision ImmunAdd?

When you return in five years, ImmunAdd will have expanded significantly. We will turn a platform innovator into a clinically validated immunomodulation company. We anticipate multiple strategic

partnerships with several companies incorporating our adjuvant into their vaccine development programmes. Simultaneously, we will have established manufacturing capacity to ensure a reliable GMP supply of synthetic adjuvant materials and will develop a new immuno-modulating agent in our pipeline. Our first proprietary vaccine product will likely complete Phase II clinical trials, and at least one additional internally developed program will be advancing through early clinical development.

ImmunAdd aims to improve by addressing the challenges of ageing. We will help ageing populations maintain better health and live longer lives by improving immune resilience.

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