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Biotech firm poised to transform mRNA medicine with game-defining drug delivery technology

Its proprietary and differentiated lipid nanoparticle (LNP) platform is a cornerstone in advancing next-generation messenger ribonucleic acid (mRNA) therapies and vaccines.

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Since their emergency-use rollout in late 2020, billions of doses of COVID 19 vaccines built on disruptive mRNA technology have been administered worldwide, saving hundreds of millions of lives. Now, the global pharmaceutical industry is pushing far beyond next generation vaccines. Companies worldwide are rapidly expanding into mRNA based therapeutics aimed at chronic and autoimmune diseases, rare genetic disorders, and cancer.

According to Innorna, a biotechnology company headquartered in Hong Kong with operations across Mainland China, U.S. and Europe, this global momentum reflects a broader vision of mRNA as a highly adaptable platform for treating a wide range of conditions.

Innorna is at the forefront of this shift, pioneering pivotal advances in RNA medicine through its proprietary LNP delivery system – a technology increasingly recognised as essential for creating safer, more effective mRNA vaccines and therapies. As Dr Li Linxian, Founder and CEO of Innorna, explains: “For RNA medicines, LNP is half of the drug. If RNA is the message, LNP is the envelope that ensures the message reaches the cells and becomes a therapy.”

Scientist performs mRNA purification at Innorna's advanced bioprocess development lab.

At its core, mRNA is a molecule carrying the instructions cells need to make proteins. mRNA based medicines harness this natural process by delivering synthetic RNA into the body, prompting cells to produce specific proteins that can spark immune responses, or deliver targeted therapeutic effects against disease.

“At the heart of the mRNA innovation are ionizable lipids, which is designed to stay neutral in the bloodstream and dramatically reduce toxicity compared with earlier lipid systems — a breakthrough that made safer and more effective mRNA medicines possible.”

Innorna’s proprietary LNP platform is built on a library of more than 6,000 structurally diverse ionizable lipids engineered to meet different medical needs. Li, who spent over 16 years advancing LNP research across Germany, the United States, Hong Kong, and Mainland China, continues to leverage his expertise to broaden the clinical reach of mRNA into a wide range of therapeutic areas. “We want to continually raise the bar for safer technology, unlocking mRNA’s full potential to address unmet medical needs worldwide,” he says.

Innorna makes its mRNA medicines on fully automated isolator line within its current good manufacturing practices (cGMP) facility.

Novel mRNA therapeutics

Innorna's core pipeline extends well beyond infectious diseases like COVID 19, moving into mRNA based therapeutics for chronic and autoimmune conditions. One programme, IN026, is being developed as an mRNA drug candidate for chronic disease treatment.

"We are advancing liver focused programmes while expanding delivery capabilities to other tissues — such as muscle, the central nervous system, and immune cells — through targeted optimisation," Li adds. One programme uses Innorna's cutting edge antibody conjugated LNP technology to achieve targeted delivery outside the liver to target immune cells, opening the door to next generation in vivo therapies for autoimmune disorders.

Meanwhile, the US Food and Drug Administration (FDA) has also granted Rare Pediatric Disease and Orphan Drug Designations to four protein replacement therapies developed using Innorna's LNP technology.

Dr Li Linxian, Founder and CEO of Innorna, spent over 16 years advancing LNP research across Germany, the US, Hong Kong, and Mainland China

Pioneering mRNA vaccines

In response to the global burden of the flu-like respiratory syncytial virus (RSV), Innorna has developed a world-first innovation: IN006, the first bivalent RSV mRNA vaccine that targets both RSV subtype A and subtype B simultaneously. It is the first RSV vaccine in China to obtain clinical trial approval and also the first non-COVID-19 mRNA vaccine approved in China for clinical trials.

With global intellectual property rights to its novel LNP platform, Innorna is among the first Chinese biotech to out-license this technology internationally. Its progress has accelerated through a landmark partnership with BeOne Medicines (formerly BeiGene), one of the world's leading biopharmaceutical companies. This collaboration is expected to fast-track the translation of mRNA science into real world therapies.

"This strategic long-term partnership has strengthened our team's expertise," Li notes. "It also allows us to help our partner in areas where our platform excels, beyond our own pipeline focus."

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Despite his decades-long global advanced research career, Li chose to establish Innorna in Hong Kong.

"Hong Kong's innovation ecosystem, anchored by the Hong Kong Science & Technology Parks Corporation (HKSTP), has propelled our growth with infrastructure, funding, and ecosystem support," he says. "Early-stage grants, matched R&D funding, and access to global talent foster biotech advancement. Meanwhile, Hong Kong's role as a financial hub attracts international investors, ensuring sustained clinical and commercial success."

"In Hong Kong, we enjoy a global presence and can easily connect with potential investors and collaborators worldwide," he adds.

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