

From AI Models to Patient Impact: WhiteLab Genomics Maps the Future of Precision Therapeutics

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With TechBio emerging as one of the defining themes at BIO 2026, BioSpectrum Asia sat down with David Del Bourgo, Founder & CEO of WhiteLab Genomics, to discuss AI's role in the future of genomic medicine.

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**DESIGNING GENE THERAPIES.
TRANSFORMING LIVES.**

How WhiteLab Genomics is turning AI into clinically relevant genomic medicines

In an exclusive interaction with BioSpectrum Asia, David Del Bourgo, Founder & CEO of WhiteLab Genomics, discusses how AI is redefining bioprocess design, overcoming delivery challenges, and accelerating the path to better, safer and more effective therapies across a range of disease areas.

DAVID DEL BOURGO
Founder & CEO
WhiteLab Genomics

AI-POWERED BY DESIGN
Rational, interpretable AI models built on high-quality, fit-for-purpose data.

END-TO-END INNOVATION
From target identification to manufacturability – across modalities and diseases.

EXPERIMENTALLY VALIDATED
In-vivo validation in the lab closes the loop from prediction to proof.

GLOBAL BY DESIGN
French-American company with partners across Europe, North America and Asia.

“The tipping point will come when the industry can point to an approved medicine that simply could not have been developed without AI. AI is becoming as fundamental to making medicines as the lab bench itself.”

As artificial intelligence reshapes the future of genomic medicine, WhiteLab Genomics is positioning itself at the intersection of AI, gene delivery, and advanced therapeutics. **At BIO 2026 in San Diego, BioSpectrum Asia spoke with Founder and CEO David Del Bourgo** about how AI is accelerating bioprocess development, overcoming delivery challenges in gene therapy, and moving the industry closer to a future where medicines are designed rather than discovered.

The biotechnology industry has moved beyond viewing AI solely as a discovery tool. How do you see generative AI reshaping bioprocess design, development, and manufacturing workflows over the next decade?

AI has long served as a research tool in our sector. The real shift now is its evolution from a discrete tool into something far more fundamental, a deep integration of technologies, including generative AI deployed at scale to enhance every stage of development.

Over the next decade, AI will reach the workflows that have stayed stubbornly empirical. Upstream, this means cell line engineering for bioproduction: AI-guided design of producer cell lines optimized for yield, stability, and scalability, compressing what used to be years of iterative selection into targeted, rational engineering cycles. Our collaboration with Cytiva is a concrete example of this shift, bringing AI into the loop between vector design and bioprocess development. Downstream, AI is beginning to optimize the workflows, protocols, and purification processes that have traditionally relied on accumulated know-how and manual iteration, predicting optimal conditions, flagging deviations early, and continuously improving process efficiency at scale.

The result is a continuous, model-guided pipeline from target through to manufacturing, with far fewer dead ends along the way.

Despite significant investment in AI across life sciences, many organizations continue to struggle with translating promise into measurable outcomes. What separates successful AI deployment from experimentation?

We are actually seeing that AI is proving to be effective and efficient in multiple applications. We have already shown cost reduction, accelerated R&D and more efficient targeting and bioprocessing with multiple partners.

In our experience, success consistently follows when three conditions are in place.

First, high-quality, fit-for-purpose data, rather than whatever happens to be available, is crucial. In genomic medicine the data is often scarce, fragmented, and siloed, so curating reliable, well-structured datasets matters far more than sheer volume.

Second, models that are interpretable, so a scientist understands why a prediction was made and can act on it. A rationally guided approach helps here: when models are grounded in biological mechanism, rather than black-box correlations, their predictions are easier to interpret.

Third, and this is where most efforts fall short, closing the loop by validating those predictions experimentally. AI that never touches the wet lab is just a hypothesis generator.

We hold ourselves to *in-vivo* validation. At the ASGCT Annual Meeting in Boston this year, with Dr. Françoise Piguet's team from the Paris Brain Institute, we presented that our AI-designed vectors achieved roughly 50-fold higher DNA enrichment in the brain than AAV9, the standard in the field, with no detectable liver signal, after a standard intravenous injection.

That is the difference between a demo and a co-developed asset ready for clinical development.

WhiteLab Genomics operates at the convergence of AI and genomic medicine. Which therapeutic areas do you believe stand to benefit most from AI-driven optimization approaches?

Our AI platform is disease-agnostic because a key challenge in genomic medicine is the same across indications: delivering genetic material safely and precisely to the right cells.

That said, the therapeutic areas that benefit most are those where delivery is especially difficult:

- Central nervous system (CNS) disorders, where crossing the blood-brain barrier has been a major limitation. Our work with the Paris Brain Institute specifically addresses this bottleneck.
- Oncology, where precise targeting of tumor cells requires identifying cancer-specific receptors and designing tumor-targeted delivery.
- Rare diseases, which often depend on efficient delivery to very specific cell types. This is reflected in our work with Genethon, Institut Imagine, Nantes University, and Sanofi.
- Hard-to-reach cells like the eye, where localized and accurate delivery is critical. We're actively working on this through the GEAR consortium with Institut de la Vision (the Vision Institute). GEAR specifically targets photoreceptor cells in the outer retina, the cells essential for vision that are affected by retinal degenerative diseases, but are very difficult to reach with current viral vectors.

As advanced therapies continue to evolve, what are the biggest bottlenecks that AI can realistically help solve today, and where is the industry still overestimating AI's near-term capabilities?

What AI is genuinely transforming today is non-clinical R&D. The real bottleneck has never been ideas but the cost and time of generating the data needed to validate them. AI compresses that cycle meaningfully: we identify the receptors responsible for tissue access, design vectors optimized for stability, expression, and manufacturability, and work with smaller, smarter experimental libraries rather than brute-force screening. Critically, we close the loop in the wet lab. At WhiteLab, every AI prediction is subject to experimental validation, and that discipline is what separates a credible development candidate from a computational artefact. Our results at ASGCT this year, with a 50-fold improvement in brain enrichment over AAV9 and no detectable liver signal after standard intravenous injection, are a direct product of that approach.

Where the industry sometimes overestimates AI is in expecting it to short-circuit the time biology itself requires. Generating robust, reproducible experimental data takes time, and AI accelerates the path to the right experiment rather than removing the need for it.

On clinical trials specifically, the picture is more nuanced. Trials are regulated by design, and rightly so, as patient safety depends on it. But regulatory agencies, including the FDA and EMA, are actively developing frameworks to integrate AI-generated evidence and are openly working to embrace innovation that could accelerate development timelines. That is an encouraging signal, and one we follow closely. The honest position today is that AI dramatically de-risks and accelerates the path to a strong candidate; how much it reshapes the clinical stage will depend on how fast science and regulation co-evolve.

With global competition intensifying across the TechBio landscape, how is WhiteLab Genomics positioning itself for international growth and long-term differentiation?

Our differentiation is structural. Most companies in this space optimize one piece of the puzzle, such as a capsid, a payload, or a single modality. We are end-to-end and modality- and disease-agnostic, from target identification through to manufacturability, and we validate in vivo. We're not a software vendor you license; we work as a multi-year development partner, and that model is what brings partners like Sanofi, Cytiva, Debiopharm, Siren Biotechnology, Genethon, and UMass Chan to the table.

Geographically, WhiteLab is French-American by design. Founded in Paris, backed by Y Combinator, supported by the France 2030 program, with partners spanning Europe and North America, and an active focus on Asia, which has become one of the fastest-growing hubs for genomic medicine. That international footprint is not an accident; it reflects a deliberate choice to operate where the science and the capital are most dynamic.

Underlying all of this is a conviction I hold strongly: technological sovereignty in life sciences matters. The ability for Europe to develop its own life-saving treatments, on its own terms, is not just a competitive question, it is a strategic one. Our global partnerships are precisely what allow us to move faster while retaining control over what we build and how we build it.

Looking ahead, what do you believe will be the defining breakthrough that convinces the broader pharmaceutical industry that AI has moved from hype to indispensable infrastructure?

It will be an AI-designed therapy that reaches patients and succeeds where conventional approaches could not. The field has moved quickly, from predicting protein structure, to designing proteins, to predictive therapeutic engineering at scale. The next milestone is translating that into a candidate that moves through preclinical validation into the clinic on the strength of rational, AI-guided design alone.

We already see early signals of what that looks like in practice. When an AI-designed vector achieves roughly 50-fold higher DNA enrichment in the brain than AAV9, the current standard, with no detectable liver signal after a standard intravenous injection, that is not hype. That is two things at once: a dramatic gain in efficacy and a fundamental advance in safety, eliminating the off-target biodistribution that has historically been one of the field's most serious concerns. Both came from the same rational design process.

The tipping point will come when the industry can point to an approved medicine that simply could not have been developed without AI, one where the vector was designed, not discovered, and where the data trail leads unambiguously back to the platform. At that point AI becomes infrastructure, as fundamental to making medicines as the lab bench itself.

Our mission is to help bring that moment forward, because patients cannot afford to wait over a decade and pay millions for a cure.