LENSai™ Technology – A Dive into the Artificial Intelligence Platform that is Turning Heads – is it the Key to Building Better Medicines?

On December 8th, the company ImmunoPrecise Antibodies, also known as "IpA", announced that its subsidiary, [BioStrand](#), had completed the encoding and indexing of 20 million unique biological structures into its artificial intelligence software, [LENSai™](#).
They referred to these structures as "HYFTs™". These HYFTs, which encode biological functions in proteins (including enzymes, antibodies, cell-surface receptors, disease targets, etc.) have significantly enhanced IPA's ability to perform rapid *in silico* (in a computer) antibody analysis and has catapulted their progress toward developing therapeutics entirely *in silico.*

The algorithm powering LENSai, which mines biological patterns from any genetic source, is continuously learning and improving as it analyzes. This technology currently connects *over 25 billion relations.*

These indexed HYFTs give IpA the unparalleled ability to solve one of sciences biggest challenges today: to connect functional biological data to structural patterns, or protein structures. The company believes the technology may serve as the missing link for multi-omic analysts and large pharma drug developers across the globe. This is because, currently, researchers are unable to connect predicted protein structures to text and, more importantly, to what matters most, the function of a protein. It isn't very useful to know the structure of, for example, 60,000 proteins, if you do not know what any of them do.

A key component to the Company's AI-powered algo-rithm is that it continuously learns and improves, analyzing datapoints that constantly inform the software about the structure-function relationships of HYFTs – something that no other software to date can do.

This structural HYFT breakthrough is now being used to revolutionize drug discovery and transform the field of antibody therapeutics.

Radically informed decisions with *in silico* insight

In silico, in parallel, in an instant

Quality and Experience Driving a Data-Feedback Loop

High quality mass data is difficult to find. In recent years, IpA has been dramatically streamlined, with phase 1 of management's efforts including major R&D investments into the well-respected 30-year-old antibody discovery company. A core focus was building the world's leading antibody discovery platforms, including their well-known function-first memory [B Cell Select™](#) platform, one of many capabilities focused on antibody discovery, sequence collection, and analysis. These platforms now provide the recently acquired LENSai software with immediate and potentially unlimited access to quality and proprietary sequence data. In fact, the IpA family of companies have grown both organically and through M&A in the past five years to include the discovery, development, manu-facturing, and analysis of antibodies at four independent laboratories spanning N. America and Europe, precisely the regions anticipated to capture the vast majority of the market's revenues over the next decade.

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The Company's ability to conduct this broad range anti-body research and services resulted in the recent selection of ImmunoPrecise Antibodies as best-in-class out more than 150 companies globally, collectively offering more than 200 technologies in antibody discovery, as confirmed by the reputable research group Roots Analysis[1]. Perhaps surprisingly, the Company topped the chart over larger, well-known service companies, such as Wuxi Biologics and Charles River Laboratories.

IpA's CEO believes the company has just gotten started. Phase 2 of the company strategy included the development of a pre-clinical therapeutics pipeline, including potential best-in-class and first-in-class products. These core strategic pillars then assembled with phase 3, the integration of LENS[ai], closing what she believes is a powerful, iterative, and cyclic feedback loop of data-driven algorithm enrichment, which she referred to as a 'deep-learning, data-driven powerhouse.'

"We are standing at the threshold of a new era for drug discovery targeting complex and deadly diseases," said Dr. Jennifer Bath. "In years past, data has been collected faster than it could be analyzed, which is a challenge that our algorithm solves. LENS[ai] is organizing and processing data in a meaningful and translatable way, which may ultimately enable the design of completely in silico-designed personalized drugs for patients."

Discovering and developing quality antibodies that exceed expectations is what we do, it's in our blood," Dr. Bath continued. "We are known for quality, and for rigorous science, and we'll always stand by that," she emphasizes, while referencing the >600 clients the company has developed custom antibodies for, recently growing to include 80% of the world's top twenty pharmaceutical companies.

"We aren't looking to just add additional in silico services to analyze and optimize antibodies, or just make predictions regarding lead candidates. We can already perform those functions in silico with great speed compared to a laboratory, and it's fantastic, but it is a drop in the bucket of what we believe our software will perform, as it continues to improve and evolve every day."

From Multi-Omics…

In April 2022, IpA announced the acquisition of control over BioStrand, a Belgian biotech company, known as a pioneer in the field of bioinformatics and biotechnology. Shortly thereafter, BioStrand was selected by StartUs Insights[2] analysts, out of 795 global bioinformatics startups and scaleups, as one of the world's top 5 bioinformatics companies.

…to the Google of Genomics

The indexing of the encoded HYFTs has reportedly enabled the almost instantaneous retrieval of relevant data using inputs from DNA, RNA, or protein sequences, or from text, or even using a structural search. The algorithm only needs to identify the HYFTs from the input, and as the HYFTs are indexed, similar to how you can rapidly search Google for text, images, and videos to retrieve information that is stored in the Google Index, one receives nearly instantaneous results. The process is similar to a Google search, in fact, leading one group to reference BioStrand as "The Google of Genomics.[3]

"That is our ultimate goal," stated Dr. Bath. "To be the go-to resource for rapid analysis of any type of biological data – to provide instant results which can be used to select the best drug for patients, to diagnose diseases more accurately and rapidly, to harmonize and organize massive amounts of disparate genetic information, to develop a new drug with exquisite precision and safety profiles and with unprecedented speed, to design and analyze clinical trials – you name it. Biological information is used all around us, every day, and we are already using it in transformative ways that many believed would never be possible."

Technology with transformative capabilities

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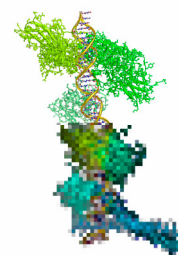
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3. DeTijd https://www.tijd.be/tech-media/technologie/google-van-de-genetica-krijgt-2-miljoen-euro/10230955.html