Samsung Bioepis Proteina AI Antibody Deal Explained (2026)

Published July 15, 2026 50 min read


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Executive Summary

On **July 9, 2026**, **Samsung Bioepis Co., Ltd.** and the Seoul-based AI antibody discovery firm **Proteina Co., Ltd.** signed a license and option agreement to jointly develop AI-designed antibody therapeutics, formalizing a collaboration that began as a government-funded research project in October 2025 (Source: m.samsungbioepis.com) (Source: www.thepharmaletter.com). The agreement sits inside a national research and development (R&D) initiative called "Development and Demonstration of Antibody Biopharmaceuticals Using AI Models," backed by South Korea's Ministry of Health and Welfare with a total project budget of roughly **46.9 to 47 billion won** (approximately **$32 million to $34 million**) (Source: www.asiae.co.kr (Source: www.koreabiomed.com). Structurally, the deal is not a traditional buy-the-molecule license: Samsung Bioepis has purchased an **option**, not the antibodies themselves, which it can exercise later to acquire clinical development and commercialization rights, paying milestone payments and royalties to Proteina only if it does (Source: m.samsungbioepis.com). The upfront and milestone figures were not publicly disclosed; a related regulatory filing separately estimated deal value at a minimum of **41.8 billion won**, equal to at least 2.5% of Proteina's most recent full-year sales (Source: biz.chosun.com.

The technical core of the deal is Proteina's proprietary **SPID (Single-molecule Protein Interaction Detection)** platform, which the company says can screen more than **10,000 antibody sequences per week** and compress candidate validation from several months to roughly **two weeks** (Source: m.samsungbioepis.com). SPID measures seven developability metrics in parallel, including binding affinity, productivity, thermal stability, and aggregation, from minute unpurified samples (Source: www.koreabiomed.com). On the design side, Proteina works with Professor **Minkyung Baek** of Seoul National University, the first author of **RoseTTAFold**, the deep-learning protein structure prediction tool she developed with 2024 Nobel Chemistry laureate David Baker at the University of Washington (Source: www.nobelprize.org (Source: www.ipd.uw.edu). Their jointly developed antibody-design model, called **AbGPT-3D**, has reportedly identified structural rules in the complementarity-determining regions (CDRs) of antibodies that generalize with a stated internal suitability rate exceeding 90% (Source: www.asiae.co.kr).

Analysts frame this deal as significant because it is among the first serious industrial tests of AI-driven de novo antibody design, a modality far more structurally complex than the small-molecule compounds behind earlier AI drug milestones such as **Exscientia's DSP-1181** (2020) and **Insilico Medicine's rentosertib** (Phase IIa results published in Nature Medicine in June 2025) (Source: www.asiae.co.kr (Source: insilico.com). The Samsung Bioepis-Proteina agreement follows a broader industry shift toward option/license structures, which grew from roughly 5% of biopharma licensing deals in 2023 to about 35% by the first quarter of 2026 (Source: calculator.ambrosiaventures.co). It sits alongside comparable Western and domestic transactions, including Jazz Pharmaceuticals' June 2026 option-license deal with AbCellera worth up to $792 million in fees and milestones on top of $56 million upfront (Source: investor.jazzpharma.com), and Celltrion's parallel partnership with Korean rival Galux, which uses a different, fully generative "GaluxDesign" approach (Source: www.koreabiomed.com).

Investors reacted immediately: Proteina shares jumped as much as 19.14% in extended trading following the announcement (Source: www.koreabiomed.com). Whether this enthusiasm is justified depends on unresolved questions the rest of this report examines in depth: what the option structure actually commits each party to, how SPID and AbGPT-3D compare to rival AI antibody platforms, what Samsung Bioepis's 14-year biosimilar track record (11 approved products, no IND rejections) contributes to de-risking the effort (Source: www.koreabiomed.com), and what a peer-reviewed 2026 review in the journal Pharmaceuticals means when it finds that roughly 90% of drug candidates entering clinical development still fail to reach approval despite over $100 billion in cumulative AI drug-discovery investment (Source: www.mdpi.com).

Introduction and Background

The **Samsung Bioepis Proteina AI antibody deal** refers to the license and option agreement announced on July 9, 2026, between Samsung Bioepis, the Incheon-based biosimilar and biologics arm of the newly formed **Samsung Epis Holdings**, and Proteina, a KOSDAQ-listed AI antibody discovery company founded in 2015 by a Korea Advanced Institute of Science and Technology (KAIST) faculty member (Source: www.koreabiomed.com). The agreement is not a standalone commercial arrangement conjured from nothing; it is the commercialization layer placed atop a pre-existing, government-funded research collaboration.That collaboration, titled "**Development and Demonstration of Antibody Biopharmaceuticals Using AI Models**," was launched in October 2025 under South Korea's Ministry of Health and Welfare and is led by a three-way consortium of Samsung Bioepis, Proteina, and a research team headed by Professor **Minkyung Baek** at Seoul National University's School of Biological Sciences (Source: m.samsungbioepis.com).

Understanding why this deal matters requires understanding where it sits in the broader trajectory of AI-driven drug discovery. Since Exscientia's DSP-1181 became the first AI-designed drug candidate to enter human clinical trials in Japan in January 2020 (Source: www.cas.org), nearly every headline AI drug discovery milestone, from Exscientia's EXS21546 and DSP-0038 to Insilico Medicine's rentosertib, has involved small-molecule chemistry: compact, synthesizable compounds with well-understood rules of medicinal chemistry. Antibodies are a different order of problem, and the underlying economics of drug development make the stakes of getting that problem right unusually high: traditional discovery-to-approval work still typically requires more than a decade, and "the cost of bringing a new drug to market now averages US$2.6 billion," a burden AI is being enlisted to reduce across every modality, antibodies included (Source: www.towardshealthcare.com). A typical immunoglobulin G (IgG) antibody is a roughly 150-kilodalton protein built from two heavy and two light polypeptide chains, folded into a complex three-dimensional structure whose binding specificity is governed by six flexible loop regions called **complementarity-determining regions (CDRs)**. Designing an antibody from scratch, known as **de novo design**, means specifying an amino acid sequence that will fold correctly, express well in a production cell line, remain thermally stable, avoid aggregation, and bind a chosen target with high affinity, all without first observing any naturally occurring antibody against that target. As of mid-2026, no company anywhere had publicly demonstrated a fully validated first-in-class, de novo-designed antibody progressing through clinical development, according to on-the-record comments from Proteina's own chief executive (Source: www.asiae.co.kr).

Samsung Bioepis brings a specific, non-trivial credential to this challenge: 14 years of biosimilar development experience since its founding in 2012, during which it secured approval for 11 biosimilar products from major regulators including the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA), and has reportedly never had an Investigational New Drug (IND) application rejected (Source: www.koreabiomed.com). A more granular disclosure places that record at 39 IND approvals across 11 products in 39 countries (Source: www.koreabiomed.com). That expertise, in cell-line development, chemistry, manufacturing and controls (CMC), and regulatory submission for complex biologics, is precisely what a small AI-native discovery company like Proteina lacks, and precisely what the option structure is designed to import into the collaboration at the point where AI-designed candidates need to become real, manufacturable, submittable drugs. Samsung Bioepis President and CEO **Kyung-Ah Kim** described the rationale directly: "Leveraging the biosimilar development expertise we have built over the past 14 years, we are now applying our process optimization capabilities to the development of novel antibody therapeutics" (Source: m.samsungbioepis.com).

This report examines the deal's structure, the underlying AI antibody design technology, the regulatory and commercial context, and how the arrangement compares with peer transactions in Korea and the West. It also addresses, directly, the technical vocabulary a reader is likely to encounter while researching this topic: what "SPID scoring" measures, how RosettaFold-family models relate to antibody generation, why AI drug design is only now extending from small molecules into antibodies, and what claims of screening "10,000 antibody candidates per week" actually mean in practice. Because much of the primary reporting on this deal originates from Korean-language business and biotech press, this report draws on official corporate disclosures, an English-language Samsung Bioepis press release, a Nobel Prize-winning research lineage documented by Western academic institutions, and comparable transactions disclosed under US securities rules, in order to triangulate a picture that is both internally consistent and independently verifiable.

Key Changes: How the Samsung Bioepis-Proteina Deal Is Structured

The Option Contract Model: Buying the Right, Not the Product

The single most important structural fact about this transaction is that Samsung Bioepis did not acquire antibody candidates outright. It acquired an **option** to license them later. Industry coverage of the deal was explicit on this point: rather than immediately acquiring candidate substances, "the company is adopting an option contract that allows it to select only those antibodies designed and verified by domestic AI that demonstrate strong performance" (Source: www.asiae.co.kr.

Mechanically, Samsung Bioepis "has the right to exercise the license option to proceed with clinical development and commercialization and will be paying certain milestone payments and royalty fees in return" (Source: m.samsungbioepis.com). Should Samsung Bioepis exercise the option, "the company will receive exclusive rights to global clinical development and commercialization, while Proteina will be eligible for milestone payments tied to development progress and royalties on future sales" (Source: pulse.mk.co.kr). Crucially, Samsung Bioepis is not obligated to exercise the option on every, or any, candidate the collaboration produces. "The number and timing of option exercises by Samsung Bioepis will be determined through internal evaluation before the project concludes at the end of 2027" (Source: www.asiae.co.kr).

This structure is not idiosyncratic to Samsung Bioepis; it reflects a broader, measurable shift across the biopharmaceutical licensing market. According to deal-benchmarking data covering more than 1,500 transactions, option/license structures represented approximately 5% of biopharma deals in 2023 but had grown to roughly 35% of new licensing transactions by the first quarter of 2026, "a 7x increase in three years" (Source: calculator.ambrosiaventures.co. The same analysis attributes the shift to "post-2022 capital discipline at large pharma, combined with early-stage pipeline uncertainty," which has made option structures attractive because "licensees pay a smaller initial commitment, preserve capital, and gain data-driven decision points before committing full economics" (Source: calculator.ambrosiaventures.co. Typical option terms across the industry involve

"option fees of $10M-$75M (5-10% of total deal value), exercise windows of 12-24 months, and exercise payments that are 2-4x the option fee," with overall deal economics scaling by clinical stage: "preclinical deals typically command upfronts of $5M-$30M, Phase 1 deals $15M-$75M, Phase 2 deals $50M-$250M, and Phase 3/approved products $100M-$1B+" (Source: calculator.ambrosiaventures.co (Source: calculator.ambrosiaventures.co), figures against which the Samsung Bioepis-Proteina program, still in a research and early-preclinical phase, would be expected to sit at the lower end.

For an AI antibody platform still in an unproven, industry-wide validation phase, the option structure allocates risk sensibly: Proteina gets a committed, well-resourced clinical development and commercialization partner contingent on demonstrable results, while Samsung Bioepis avoids paying full licensing economics for antibodies that might fail SPID's own developability screens before ever reaching a clinic. This asymmetric risk allocation is also why option agreements have become the default vehicle for platform-stage biologics deals generally, not just AI-native ones: the licensee effectively rents a call option on future value rather than purchasing that value outright at a moment when the underlying science is least de-risked.

Financial Architecture: Disclosed Budgets, Undisclosed Deal Terms

The parties elected not to disclose the specific commercial terms of the option agreement itself. Samsung Bioepis's own press release states plainly that "the financial details of the R&D project remain confidential" (Source: m.samsungbioepis.com), and Korean business press reported that "for reasons related to its patent strategy, Proteina has decided not to disclose the specific contract amount until 2047" (Source: www.asiae.co.kr, an unusually long confidentiality window that itself signals how competitively sensitive the underlying antibody targets and pricing benchmarks are considered within Korea's biotech sector.

What is disclosed is the underlying national project budget, though even here sources show minor variance consistent with rounding and translation from Korean won figures. Samsung Bioepis and Proteina's own joint LinkedIn announcement cites a "total budget: KRW 47 billion (approx. USD 34M)" and describes the division of responsibilities as "PROTEINA leads discovery and optimization of candidates" while "Samsung Bioepis leads preclinical development through IND" (Source: www.linkedin.com (Source: www.linkedin.com), while The Asia Business Daily's investigative coverage puts it at "a total budget of about 46.9 billion won" (Source: www.asiae.co.kr, and Korea Biomedical Review's more granular reporting states the figure precisely as "46.96 billion won ($32.4 million) national project," broken down as "government funding totals 30.3 billion won, with Proteina contributing 13.635 billion won" (Source: www.koreabiomed.com (Source: www.koreabiomed.com. These figures describe the underlying research grant, not the commercial option agreement's upfront, milestone, or royalty terms, which remain unquantified in any source reviewed for this report.

The one publicly estimated figure tied to the July 2026 commercial agreement itself comes from a Korean regulatory filing: the deal was estimated "at a minimum of 41.8 billion won, or at least 2.5% of the most recent fiscal year's sales" (Source: biz.chosun.com. This is a disclosure-rule-triggered floor estimate, not a negotiated headline deal value, and should be read as such: Korean securities regulations typically require listed companies to disclose material contracts once they cross a percentage-of-revenue threshold, which produces a minimum estimate rather than the actual contract ceiling.

Division of Labor: SPID Meets Samsung's Manufacturing Discipline

The agreement cleanly divides responsibility along each party's core competency. Proteina "will be responsible for lead discovery of novel therapeutics," using its SPID platform for **antibody optimization and performance measurement**, while "Samsung Bioepis will take responsibility for advancing selected candidates through preclinical development and toward investigational new drug application submission" (Source: www.pharmajournalist.com (Source: www.pharmajournalist.com. That same trade outlet frames the deal as part of a wider strategic pivot, noting "the collaboration marks a broader move by Samsung Bioepis beyond its established biosimilar business," which "has built its reputation through the development and commercialization of biosimilar medicines across immunology, oncology and ophthalmology, and is now seeking to apply its biologics development and process optimization capabilities to novel antibody therapeutics" (Source: www.pharmajournalist.com.

A more granular account from Korea Biomedical Review specifies that Samsung Bioepis's contribution includes "building automated cell lines, optimizing upstream and downstream processes, establishing large-scale chemistry, manufacturing and controls (CMC) for clinical supply and managing GLP toxicology through filing" (Source: [www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=29532#:~:text=Samsung%20Bioepis%20will%20take%20selected%20leads%20to%20clinic-ready%20manufacturing%2C%20building%20automated%20cell%20lines%2C%20optimizing%20upstream%20and%20downstream%20processes%2C%20establishing%20large-scale%20chemistry%2C%20manufacturing%20and%20controls%20%28CMC%29%20for%20clinical%20supply%20and%20managing%20GLP%20toxicology%20through%20filing). Notably, Samsung Bioepis is not confining itself to a single antibody modality. A company representative stated the collaboration is "broadly exploring the full range of antibody drugs, including monoclonal antibodies, bispecific antibodies, and antibody-drug conjugates (ADCs), to identify the best candidates" (Source: www.asiae.co.kr.

The Government-Backed National R&D Framework and Timeline to 2027

The commercial agreement cannot be understood apart from its origin as a state-sponsored research consortium. South Korea's Ministry of Health and Welfare structured the project to run from October 2025 through December 2027, with the explicit near-term goal of identifying **10 antibody candidates** and filing **at least one IND application** by the project's close (Source: www.koreabiomed.com. By year-end 2027, the consortium aims to "secure 10 antibody candidates, including biobetters and bispecifics, complete preclinical packages for three programs and either submit a phase 1 IND or sign a licensing deal for one asset" (Source: www.koreabiomed.com.

The July 2026 option agreement, arriving just nine months after the research consortium's launch, was read within the industry as an unusually early signal of commercial conviction. As one industry source put it, "the fact that commercial terms such as upfront payments, milestones, and royalties have already been set at this stage can be seen as a positive assessment of the early research results" (Source: www.asiae.co.kr. This detail matters for a reader assessing how seriously to weigh the deal: most option/license agreements in biopharma are struck after a defined data readout, not nine months into an exploratory government grant, which suggests either unusually promising interim data or a strategic decision by Samsung Bioepis to lock in preferential access to a scarce domestic AI antibody capability before competitors could.

The Technology Behind the Deal: RosettaFold, AbGPT-3D, and De Novo Antibody Design

From Small Molecules to Antibodies: Why AI Drug Design Is Moving Up in Complexity

To situate why this deal is described as a frontier test rather than routine business development, it helps to trace the arc of AI drug design achievements that preceded it. The **first AI-designed drug candidate** to enter human clinical trials was Exscientia's **DSP-1181**, a serotonin 5-HT1a receptor agonist for obsessive-compulsive disorder developed with Sumitomo Dainippon Pharma, which began Phase 1 testing in Japan in January 2020 (Source: www.cas.org. By 2022, industry analysis identified roughly 160 discovery programs among AI-focused drug companies, "of which 15 products are reportedly in clinical development," using a methodology CAS separately built to measure "the structural novelty of new molecular entities (NMEs) to better assess the innovativeness of new AI drugs" (Source: www.cas.org (Source: www.cas.org). All of these first-wave candidates, including EXS21546 and DSP-0038, were small molecules, chemical entities of a few hundred atoms whose structural space, while vast, is far more tractable computationally than that of a folded, multi-domain protein.

The next major proof point, **Insilico Medicine's rentosertib** (originally ISM001-055), pushed the field further by using generative AI not only to design the molecule but to identify its novel biological target, a TNIK inhibitor mechanism for idiopathic pulmonary fibrosis (IPF), developed by a company that describes itself as "a global clinical stage biotechnology company powered by generative AI, connecting biology, chemistry, medicine and science research using next-generation AI systems" (Source: insilico.com. Its Phase IIa results, published in Nature Medicine in June 2025, were described by the company as "the industry's first proof-of-concept clinical validation of AI-driven drug discovery" (Source: insilico.com. Patients receiving the highest studied dose, 60 milligrams once daily, showed a mean forced vital capacity (FVC) improvement of **+98.4 mL**, compared to a mean decline of **-20.3 mL** in the placebo group over 12 weeks (Source: insilico.com. Insilico also reported that its AI platform compressed candidate nomination timelines to "12-18 months on average" from a typical 2.5 to 4 years, requiring "synthesis and testing of only about 60-200 molecules" per program (Source: insilico.com. Rentosertib remains a small molecule; it is still not an antibody.

Antibodies present a categorically different design problem, and Korean coverage of the Samsung Bioepis-Proteina deal frames it explicitly this way: "this research is considered highly significant as it represents the first test of expanding AI drug development from small molecules to antibodies," noting that "the design and optimization of antibodies, which are larger and more complex, present greater challenges" and that "AI-driven drug development in this area is still considered uncharted territory where notable breakthroughs have yet to be achieved" (Source: www.asiae.co.kr (Source: www.asiae.co.kr. Roots Analysis frames the same shift at the industry level, observing that "the market is progressing from AI-assisted screening toward AI-native drug design, where AI systems play a central role in creating novel molecules, antibodies, proteins, and therapeutic candidates from the earliest stages of discovery" (Source: www.rootsanalysis.com.

Outside Korea, the appetite for de novo antibody design AI companies is also visible in venture funding: Chai Discovery, a US-based AI-native biology startup, "raised $130 million in a Series B funding round" in December 2025 "for its Chai-2, a generative platform to replace the slow, iterative experimentation that dominates drug discovery with a computational design process," with the platform generating "novel antibody sequences based on a target without extensive screening" (Source: www.towardshealthcare.com. Another prominent entrant, Xaira Therapeutics, launched in April 2024 "with over $1 billion in funding," backed by ARCH Venture Partners and Foresite Labs "jointly incubating the biotechnology startup" around AI-native medicine design (Source: www.towardshealthcare.com). Towards Healthcare's broader market analysis also finds that AI's benefit varies by design task: for "a

completely new molecule for a difficult or poorly understood target," comparable to de novo antibody design, "AI reduces the time by 41% and cuts the cost by 30%," a smaller gain than AI delivers when optimizing an already-known chemical series, and the same report projects that the "de novo drug design and drug optimization segment is expected to grow with the highest CAGR" of any application category through the forecast period (Source: www.towardshealthcare.com (Source: www.towardshealthcare.com).

RosettaFold's Lineage and Its Role in Antibody Generation

The scientific pedigree behind Proteina's design partner is directly traceable to the 2024 Nobel Prize in Chemistry. That prize was awarded "with one half to David Baker...'for computational protein design' and the other half jointly to Demis Hassabis [and] John Jumper...'for protein structure prediction'" (Source: www.nobelprize.org) (Source: www.nobelprize.org. The Nobel committee's own account of Baker's foundational contribution dates to 2003, when "David Baker succeeded in using these blocks," the twenty amino acids that make up all proteins, "to design a new protein that was unlike any other protein," opening the door to the antibody-design work Proteina and Seoul National University now pursue two decades later (Source: www.nobelprize.org. The Hassabis/Jumper half of that same prize recognized AlphaFold2, whose structure predictions "have been used by more than two million people from 190 countries" since its 2020 debut, illustrating how quickly protein-AI tools of this kind can be adopted once validated (Source: www.nobelprize.org). RoseTTAFold, the tool developed in Baker's laboratory, was described by its creators as software that "uses deep learning to quickly and accurately predict protein structures based on limited information," such that "a protein structure can be computed in as little as ten minutes on a single gaming computer," where the same task might otherwise take years of laboratory work (Source: www.ipd.uw.edu. Adoption was immediate on release: "in just the last month, over 4,500 proteins have been submitted to our new web server," the Institute for Protein Design reported shortly after RoseTTAFold's 2021 launch, while making the underlying code freely available (Source: www.ipd.uw.edu. The University of Washington's Institute for Protein Design is explicit that "this work was led by Baker lab postdoctoral scholar Minkyung Baek, Ph.D." (Source: www.ipd.uw.edu, the same researcher who now leads the Seoul National University antibody-design team inside the Samsung Bioepis-Proteina consortium. Korean press coverage of the deal identifies her explicitly as "the first author of the paper that developed the protein structure prediction and design AI 'RoseTTAFold' together with Professor David Baker of the University of Washington, who won the Nobel Prize in Chemistry in 2024" (Source: www.asiae.co.kr.

Within the consortium, "Professor Baek's team will use computers to design antibodies from scratch (de novo) with desired functions" (Source: www.asiae.co.kr. The specific model her group has built with Proteina is named **AbGPT-3D**, described in one interview as having uncovered the elusive "rules" governing CDR design, "these six loop structures, which directly bind to antigens" and "have highly variable and 'flexible' configurations, making them difficult for even AI to design" (Source: www.asiae.co.kr. Proteina CEO Yoon Tae-young explained the discovery came from analysis at unusual scale, stating that because these conditions were identified from nearly hundreds of thousands of data points, he was "internally convinced that these rules apply broadly across antibodies" (Source: www.asiae.co.kr. Applied to internal data, the company reported "a suitability rate exceeding 90%" (Source: www.asiae.co.kr. It is worth stressing that these figures are company-reported, internal, and not yet published in peer-reviewed literature; readers should treat them as vendor claims pending independent replication. By comparison, Galux, the rival Korean AI antibody design firm, positions its own generative platform as "modality-agnostic," noting that "our proprietary AI platform is trained to design proteins from first principles, resulting in its modality-agnostic nature" rather than relying on the large empirical training sets Proteina's SPID platform generates (Source: galux.co.kr.

SPID Scoring: What Proteina's Platform Actually Measures

SPID stands for Single-molecule Protein Interaction Detection, and it is the wet-lab validation engine that gives Proteina's AI designs empirical grounding. The company's technology page describes the underlying detection method in granular terms: SPID "acquires fluorescence signals at the single molecule level using the TIRF (Total Internal Reflection Fluorescence) optical system" and then "selectively detects target PPI complexes formed by substrate proteins on the surface of the Pi-Chip" (Source: www.proteina.co.kr (Source: www.proteina.co.kr). On its solutions page, Proteina similarly describes SPID as a platform that "utilizes single-molecule imaging technology to rapidly and accurately analyze protein and protein-protein interaction (PPI) information" (Source: www.proteina.co.kr. The company was founded in 2015 around this underlying single-molecule detection technology, initially applied to clinical diagnostics before being extended to antibody optimization (Source: www.koreabiomed.com.

The specific term "SPID scoring" that researchers encounter refers to the platform's function as a multi-parameter developability screen. In the context of the Samsung Bioepis deal, "SPID reads out seven developability metrics in parallel, including binding affinity, productivity, thermal stability, and aggregation," using "minute, unpurified samples" (Source: www.koreabiomed.com. A separate account of the technology describes the same function as evaluating "seven indicators such as binding affinity, productivity, and thermal stability" to select the strongest AI-designed candidates (Source: www.asiae.co.kr. Upstream of that scoring step, Proteina's own materials describe how candidate diversity is generated in the first place: by "generating new sequences by altering some protein sequences within the CDR regions where antibodies bind to antigens" and then "creating a large-scale sequence variant antibody library" for SPID to screen (Source: www.proteina.co.kr (Source: www.proteina.co.kr). These converge on the same picture: SPID is not itself a generative design tool. It is the empirical scoring function that filters and ranks candidates produced by generative models like AbGPT-3D, closing the loop between computational proposal and physical validation.

Throughput has scaled sharply since the national project began. Proteina's own solutions page, describing its "PPI Landscape" antibody discovery product, states the platform has an "ability to generate 5,000 High-quality PPI Data per week" using "our next generation 384 High Throughput Pi-chip" (Source: www.proteina.co.kr. By the time of the Samsung Bioepis agreement, that figure had roughly doubled to tripled: "last fall, Proteina's antibody sequence processing capacity was about 5,000 per week; now, it has increased to 15,000-30,000 per week," a scale-up CEO Yoon attributed partly to "equipment automation" undertaken specifically "in response to the demand for large-scale data production during collaboration with Samsung Bioepis" (Source: www.asiae.co.kr. Both Samsung Bioepis's own newsroom and multiple press accounts settle on the round figure of "screening over 10,000 antibody sequences per week" as the headline capacity claim for the deal, a figure Pulse by Maeil Business Newspaper independently corroborated in its own reporting on the announcement (Source: m.samsungbioepis.com (Source: pulse.mk.co.kr. Proteina's stated next milestone is more ambitious still: "Proteina's next goal is to handle 100,000 candidates per week," which the company says "will require not just scale-up, but innovation in the platform itself," targeted for completion "next year" as of the March 2026 interview (Source: www.asiae.co.kr.

As a proof point of the platform's capability, Proteina has cited preclinical, non-peer-reviewed internal animal data on an AI-redesigned biobetter of **Humira (adalimumab)**, AbbVie's anti-tumor necrosis factor (TNF) therapy, "showing 20 to 100 times the reference antibody's activity and comparable or better effects at up to 100-fold lower doses" (Source: www.koreabiomed.com. Korea Biomedical Review's reporting is explicit that "the results are preclinical and not peer-reviewed" (Source: www.koreabiomed.com, a caveat this report retains: such figures should be read as a vendor-disclosed internal benchmark, not an independently validated clinical result. Proteina's business strategy in the near term leans on this same closed-loop logic applied to already-validated antibodies rather than wholly novel ones: the company describes its current focus as "compressed development of biobetters," starting from antibodies with existing clinical proof of efficacy and using AI plus automated experimentation to generate redesigned, patent-free sequences "in just 3-4 months," reserving fully de novo, first-in-class design as the next frontier goal (Source: www.asiae.co.kr.

Implementation Considerations and Process Changes

Regulatory Pathway: IND Filing and Samsung Bioepis's Track Record

For any AI-designed antibody to become a marketable therapeutic, it must pass through the same regulatory gauntlet as any other biologic: preclinical toxicology, Good Laboratory Practice (GLP) studies, chemistry, manufacturing and controls (CMC) documentation, and an Investigational New Drug (IND) application before a Phase 1 clinical trial can begin. This is the stage where the Samsung Bioepis-Proteina division of labor is most consequential, because it is where Samsung Bioepis's institutional experience is meant to substitute for capabilities that a young AI discovery company like Proteina does not yet possess in-house.

The reported IND track record underpinning that confidence is unusually clean for a biologics developer of Samsung Bioepis's scale: "the company said it has not experienced an IND rejection during the clinical development of its biosimilar portfolio, reflecting its experience in antibody drug research, process development and regulatory submissions" (Source: www.koreabiomed.com, and a separate disclosure quantifies this as "39 IND approvals across 11 products in 39 countries from regulators including the FDA and EMA" with "no IND rejections" (Source: [www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=29532#:~:text=The%20company%20says%20it%20has%20secured%2039%20IND%20approvals%20across%2011%20products%20in%2039%20countries.%20%E2%80%A6%20and%20reports%20no%20IND%20reje
Since its 2012 founding, Samsung Bioepis has "launched 11 biosimilars, achieving 1.54 trillion won ($1.07B) in 2024 sales and an operating profit of 435.4B won," and now operates under the newly created holding structure Samsung Epis Holdings, formed after Samsung Biologics completed a corporate spin-off in November 2025 to focus purely on contract development and manufacturing (Source: bigmoleculewatch.com. That sibling CDMO is itself scaling capacity that could eventually support any AI-designed antibody Samsung Bioepis advances: Samsung Biologics "plans to strengthen its position as the world's largest biomanufacturer by completing Bio Campus II by 2032, bringing total capacity to 1.32 million liters" (Source: bigmoleculewatch.com.

This regulatory experience is directly relevant to how quickly the Samsung Bioepis-Proteina AI antibody candidates could move if the SPID/AbGPT-3D pipeline performs as claimed. Manufacturing know-how for complex biologics, particularly cell-line development and large-scale CMC, is often the binding constraint on timeline in novel biologics programs, more so than discovery-stage candidate generation. By routing AI-generated leads through an organization with a documented zero-rejection IND history, the consortium is explicitly trying to de-risk the regulatory step that has historically slowed novel biologic programs, even when discovery moved quickly.

Competitive Positioning: Korea's Two AI Antibody Camps and the Global Landscape

South Korea's biotech press has framed the Samsung Bioepis-Proteina alliance as one half of a domestic rivalry in AI antibody design philosophy. As one dedicated feature on the sector put it, "the axis of competition in Korea's AI-driven drug development is split between 'data observation' and 'protein design.' The Samsung-Proteina alliance has adopted a strategy centered on 'analytical AI,' leveraging the accumulation of large-scale experimental data to uncover antibody rules. In contrast, Galux, collaborating with Celltrion, takes a 'generative AI' approach, designing protein structures that do not exist in nature" (Source: www.asiae.co.kr.

The comparison is instructive because both Korean pairs, Samsung Bioepis/Proteina and Celltrion/Galux, use a structurally similar option or joint-development model, but diverge on the underlying science. Galux describes its own approach as one that "develops a pioneering protein therapeutics design platform, GaluxDesign, that uniquely integrates artificial intelligence and physical principles," demonstrated "through the de novo design of antibodies, one of the most challenging protein classes to design" (Source: galux.co.kr (Source: galux.co.kr. In its own December 2025 collaboration with Celltrion, "Galux will lead AI-driven antibody engineering and early-stage candidate validation, while Celltrion will oversee non-clinical and clinical development through commercialization," a division of labor that closely mirrors the Samsung Bioepis-Proteina structure (Source: www.koreabiomed.com. Galux has separately reported "a de novo antibody design success rate of more than 30 percent across multiple targets," which it describes as "industry-leading precision in computational biologics design" (Source: [www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=29825#:~:text=The%20company%20recently%20reported%20a%20de%20novo%20antibody%20design%20success%20rate%20of%20more%20than%2030%20percent%20across%20multiple%20targets%2C%20a%20leading%20precision%20in%20computational%20biologics%20design.

Outside Korea, the closest structural analogue to the Samsung Bioepis-Proteina deal is Jazz Pharmaceuticals' June 2026 collaboration with AbCellera, "a clinical-stage biotechnology company focused on discovering and developing first-in-class antibody-based medicines in the areas of endocrinology, women's health, immunology, oncology, and more," part of a Jazz Pharmaceuticals business "dedicated to developing life-changing medicines for people with rare disease" (investor.jazzpharma.com (Source: investor.jazzpharma.com. Under that agreement, "AbCellera will receive $56 million in total upfront payments for the first two research programs plus an additional $28 million due upon initiation of the third program," and "should Jazz exercise its option for development, AbCellera is eligible to receive up to $792 million per program in option fees and development, regulatory, and commercial sales milestone payments along with tiered royalties on net sales ranging from mid-single digits to low double-digits" (Source: investor.jazzpharma.com (Source: investor.jazzpharma.com. That deal targets multispecific, T-cell-engaging antibodies for gastrointestinal cancers, a different indication area from the Samsung Bioepis-Proteina program, but the option/license architecture, disclosed upfront figures, and contingent milestone-and-royalty economics offer a useful, transparent benchmark against which to weigh the undisclosed Samsung Bioepis-Proteina terms.

For life-sciences organizations evaluating whether and how to engage with this new generation of AI-native discovery partners, the operational question extends beyond the science itself into commercial and compliance readiness: once an AI-designed biologic clears IND and begins accumulating clinical, regulatory, and eventually commercial data, that information has to flow into the same validated, FDA 21 CFR Part 11-compliant systems, customer relationship management (CRM), regulatory tracking, and business intelligence platforms, that govern any other biologic launch. Advisory firms focused on pharmaceutical AI and Veeva CRM implementation, such as IntuitionLabs, note that AI-enhanced drug discovery and development can accelerate timelines by up to 60%, citing analysis from Deloitte, and that McKinsey has estimated AI could generate over $100 billion in annual value for the pharmaceutical industry (Source: intuitionlabs.ai (Source: intuitionlabs.ai. The same advisory analysis observes that "organizations implementing AI in commercial operations report 25-45% efficiency improvements in field force activities," a reminder that the operational payoff of an AI antibody pipeline like Samsung Bioepis's ultimately depends on downstream commercial systems, not only upstream discovery science (Source: intuitionlabs.ai. Those figures describe the industry-wide opportunity, not this specific deal, but they underscore why commercial infrastructure readiness, not just discovery-stage AI capability, increasingly determines how quickly a promising antibody program can translate into deployed, compliant, revenue-generating operations once it clears the clinic.

Data Analysis and Evidence

Quantifying the Samsung Bioepis-Proteina deal against the broader AI drug discovery and antibody therapeutics markets requires reconciling figures from multiple independent research firms, which is itself informative: forecasts for the same underlying AI-in-drug-discovery market diverge substantially depending on methodology and scope definition.

Grand View Research, a commercial market research firm, sized the global artificial intelligence in drug discovery market "at USD 2.3 billion in 2025" with growth "from USD 2.9 billion in 2026 to USD 13.8 billion by 2033, at a CAGR of 24.8% from 2026 to 2033" (Source: [www.grandviewresearch.com](https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-drug-discovery-market#:~:text=The%20global%20artificial%20intelligence%20in%20drug%20discovery%20market%20size%20was%20valued%20at%20USD%202.3%20billion%20in%202025%20and%20is%20projected%20to%20grow%20 That same report finds the "pharmaceutical & biotechnology companies segment led the market with the largest revenue share" of the AI drug discovery industry, "59.19% in 2025," confirming that established drug developers, not standalone AI vendors, still capture most of the category's revenue (www.grandviewresearch.com. Other research firms, using broader market definitions that likely include adjacent AI infrastructure and services spend, report figures many multiples higher for the same nominal category: Towards Healthcare states that "the global AI in drug discovery market size was evaluated at USD 19.89 billion in 2025, is projected to grow to USD 24.51 billion in 2026 and is expected to attain around USD 160.49 billion by 2035, growing at a CAGR of 23.22% from 2026 to 2035" (Source: www.towardshealthcare.com, while Roots Analysis places the "global AI in drug discovery market, valued at USD 6.0 billion in 2025," projected "to reach USD 8.6 billion in 2026 and USD 25.0 billion by 2035, representing a CAGR of 12.6%" (Source: www.rootsanalysis.com. This scale of disagreement is common in nascent technology markets where "AI in drug discovery" is not a standardized reporting category, and readers should treat any single figure as one methodology's estimate rather than a settled consensus. Grand View Research's own qualitative assessment of the industry helps explain why: the market "is highly fragmented," it notes, "and several emerging players are entering the market, thereby contributing to increased fragmentation within the market" (Source: www.grandviewresearch.com.

Table 2 below summarizes these divergent AI drug discovery market-size estimates side by side, alongside the more consistently sized addressable monoclonal antibody therapeutics market, to make the scale of disagreement concrete.

SOURCE	BASE YEAR ESTIMATE	NEAR-TERM (2026) ESTIMATE	LONG-RANGE FORECAST	CAGR
Grand View Research (AI in drug discovery)	$2.3B (2025) (Source: www.grandviewresearch.com)	$2.9B	$13.8B by 2033	24.8%
Towards Healthcare (AI in drug discovery)	$19.89B (2025) (Source: www.towardshealthcare.com)	$24.51B	$160.49B by 2035	23.22%
Roots Analysis (AI in drug discovery)	$6.0B (2025) (Source: www.rootsanalysis.com)	$8.6B	$25.0B by 2035	12.6%
Grand View Research (monoclonal antibodies, addressable market)	$267.6B (2025) (Source: www.grandviewresearch.com)	$294.1B	$547.3B by 2033	9.3%

The nearly eightfold spread between the lowest and highest 2026 AI-in-drug-discovery estimates ($2.9B versus $24.51B) reflects differing decisions about what counts as "AI drug discovery" revenue, whether that includes software licensing alone or also cloud compute, contract research services, and adjacent bioinformatics tooling, rather than any factual disagreement about the underlying deals and product launches each firm cites as evidence. By contrast, the monoclonal antibody market figures in the bottom row cluster far more tightly across sources because that category, FDA-approved and clinical-stage antibody drugs, is defined against public regulatory filings rather than a self-defined technology-market boundary. This is the practical reason this report treats the antibody therapeutics market, not the AI-tooling market, as the more reliable backdrop for assessing the Samsung Bioepis-Proteina deal's commercial upside.

By contrast, the addressable therapeutic market that AI-designed antibodies would ultimately compete in is more consistently sized. Grand View Research separately valued the global monoclonal antibodies market "at USD 267.6 billion in 2025" with growth "from USD 294.1 billion in 2026 to USD 547.3 billion by 2033, at a CAGR of 9.3%" (Source: [www.grandviewresearch.com](https://www.grandviewresearch.com/industry-analysis/monoclonal-antibodies-market#:~:text=The%20global%20monoclonal%20antibodies%20market%20size%20was%20valued%20at%20USD%20267.6%20billion%20in%202025%20and%20is%20projected%20to%20grow%20from%20USD%20294.1 As of August 2025, the same report counts "144 FDA-approved antibody drugs and 1,516 candidates across the globe in clinical development" (www.grandviewresearch.com, a pipeline that any successful Samsung Bioepis-Proteina candidate would eventually join and compete within.

The AI drug discovery investment landscape extends well beyond this single transaction, and situating it against recent comparable deals helps explain why antibody-specific AI partnerships remain relatively rare. Insilico Medicine entered a research and licensing collaboration with Eli Lilly in November 2025 "to co-discover and advance novel therapies" using its Pharma.AI platform, with Insilico "anticipated to generate, design, and optimize compounds for Lilly-defined targets" (Source: www.grandviewresearch.com. That relationship deepened further by March 2026, when, according to Roots Analysis, "Eli Lilly expanded its collaboration with Insilico Medicine in a deal worth up to USD 2.75 billion to leverage Insilico's AI engine for preclinical oral therapies," following a similarly large February 2026 agreement in which "Takeda entered into a multi-year partnership worth over USD 1.7 billion with Iambic to use AI for designing small-molecule drugs targeting cancer and gastrointestinal diseases" (Source: www.rootsanalysis.com (Source: www.rootsanalysis.com. Lilly has also opened its AI infrastructure more broadly: in September 2025 "Eli Lilly launched TuneLab, an AI/ML platform, sharing drug-discovery models trained on over USD 1 billion of Lilly data with select biotechs, including Circle Pharma and insitro" (Source: www.grandviewresearch.com, while a separate September 2025 deal saw "Capgemini partnered with Insilico Medicine to accelerate AI-powered drug discovery for life sciences firms," developing "Pharmaceutical Superintelligence (PSI), an agentic AI system for end-to-end workflows, from target identification to clinical design" (Source: www.grandviewresearch.com. None of these headline transactions target antibody design

specifically; nearly all concentrate on small-molecule discovery, target identification, or drug repurposing, which underscores how comparatively rare and early-stage the antibody-focused segment of AI drug discovery, where Samsung Bioepis and Proteina are now competing alongside Celltrion, Galux, Jazz, AbCellera, Chai Discovery, and Xaira Therapeutics, remains relative to the far more mature small-molecule AI discovery market these bigger-name deals represent.

Table 1 below places the disclosed terms of the Samsung Bioepis-Proteina agreement alongside two comparable option/license deals in AI-driven antibody discovery, one Western (Jazz Pharmaceuticals-AbCellera) and one Korean domestic peer (Celltrion-Galux), to illustrate how much of the Samsung Bioepis-Proteina deal's economics remain undisclosed relative to its closest comparators.

DEAL	STRUCTURE	DISCLOSED FINANCIAL TERMS	AI APPROACH	TARGET TIMELINE
Samsung Bioepis and Proteina (July 2026)	License and option agreement inside a government-backed national R&D consortium	National project budget approx. 46.9 to 47 billion won ($32M to $34M); commercial deal value estimated at a minimum of 41.8 billion won under disclosure rules; upfront, milestone, and royalty figures undisclosed (Source: biz.chosun.com	Analytical AI: SPID single-molecule PPI detection plus AbGPT-3D generative design (RoseTTAFold lineage) (Source: www.asiae.co.kr	10 candidates and at least one IND filing by end of 2027 (Source: www.koreabiomed.com
Jazz Pharmaceuticals and AbCellera (June 2026)	Preclinical research, option and license agreement	$56M upfront for first two programs plus $28M on third program initiation; up to $792M per program in option fees, milestones, and tiered royalties (mid-single to low-double digit percent) (Source: investor.jazzpharma.com	AbCellera's proprietary antibody discovery engine and T-cell engager (TCE) platform (Source: investor.jazzpharma.com	Two initial programs plus a third discovery program within 12 months of signing (Source: investor.jazzpharma.com
Celltrion and Galux (December 2025)	Strategic joint development agreement	Not disclosed in reviewed sources	Generative AI: GaluxDesign integrates AI with physical principles for de novo multi-specific antibody design (Source: galux.co.kr	Multi-specific autoimmune disease antibody candidates, no fixed public date disclosed (Source: www.koreabiomed.com

As the table illustrates, the Samsung Bioepis-Proteina agreement is the least financially transparent of the three comparable deals, likely a function of both the Korean regulatory disclosure framework (which surfaces only a revenue-percentage floor rather than negotiated deal terms) and Proteina's stated patent-strategy rationale for confidentiality through 2047 (Source: www.asiae.co.kr. By contrast, the Jazz-AbCellera deal, governed by US Securities and Exchange Commission (SEC) and Nasdaq disclosure norms, provides granular upfront and milestone figures that give outside observers a clearer read on how the market currently prices option-stage antibody discovery collaborations.

A second data point worth isolating is the market's own real-time verdict on the announcement. Following the July 9, 2026 disclosure, "Proteina shares surged more than 19 percent in after-hours trading Thursday," reaching "27,700 won ($18.33), up 19.14 percent from the previous session" on Nextrade (NXT), Korea's alternative after-hours trading system (Source: www.koreabiomed.com (Source: www.koreabiomed.com. A parallel account of the same trading day, reported by Chosun Biz and reflecting regular Korea Exchange session activity rather than the NXT extended-hours venue, recorded Proteina shares rising 13.59% to close at 25,500 won, while Samsung Epis Holdings shares rose 6.11% to 408,000 won on the same day (Source: biz.chosun.com. Notably, Korea Biomedical Review's account of the same NXT session found the opposite direction for Samsung's holding company, reporting that "Samsung Epis Holdings, the parent company of Samsung Bioepis, was down 2.89 percent at 369,500 won" in that after-hours window (Source: www.koreabiomed.com. This discrepancy between regular-session and after-hours reactions for the same corporate parent is not necessarily contradictory once the different trading venues and timeframes are accounted for, but it does illustrate how volatile and venue-dependent the market's real-time interpretation of the deal was on its first trading day, and it should caution against reading any single-day price move as a stable verdict on long-term deal value.

Case Studies and Real-World Examples

Samsung Bioepis and Proteina: The National AI Antibody Project

The primary case at the center of this report began quietly, as an academic-industrial government grant rather than a headline transaction. From October 2025, the consortium of Samsung Bioepis, Proteina, and Professor Minkyung Baek's Seoul National University team worked under Ministry of Health and Welfare funding without any separate commercial contract between the corporate partners (Source: www.asiae.co.kr. Proteina completed its Kosdaq initial public offering (IPO) during this same window, targeting "up to ₩21 bil." with "an offering price band of 11,000 won to 14,000 won ($7.8 to $10)" and an expected market capitalization between roughly 151 billion and 190 billion won (Source: www.koreabiomed.com (Source: www.koreabiomed.com. At listing, CEO Yoon Tae-young framed the IPO explicitly around the antibody design ambitions later formalized with Samsung: "this listing on Kosdaq signals our entry into the global antibody design and drug discovery market with our SPID platform, which multinational pharmaceutical companies have validated" (Source: [www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=27616#:~:text=This%20listing%20on%20Kosdaq%20signals%20our%20entry%20into%20the%20global%20antibody%20design%20and%20drug%20discovery%20market%20with%20our%20SPID%20platform%2C%2

The July 2026 option agreement then converted that research relationship into a formal, commercially structured collaboration. It also closed a circle in Samsung's own innovation-funding history: Proteina CEO Yoon Tae-young "received support from the Samsung Science & Technology Foundation for five years from 2014 to 2018," meaning the deal represents "a case of Samsung's future technology nurturing program leading to actual commercialization" (biz.chosun.com (Source: [biz.chosun.com](https://biz.chosun.com/en/en-science/2026/07/09/7D5ZYSO5PNFZPDC7CB5JOJGA5U/#:~:text=The%20collaboration%20is%20also%20a%20case%20of%20Samsung%27s%20future%20technology%20nurturing%20program%20leading%20to%20actua
In its own public framing of the milestone, Proteina described the core commercial insight driving the partnership: "AI antibody design has never really been bottlenecked at the design step. It's bottlenecked at proving the designs work. Closing that loop is the whole point" ([www.linkedin.com](https://www.linkedin.com/posts/proteina-co_aidrugdiscovery-antibodyengineering-biotech-activity-7481153693980073984-1EPF#:~:text=AI%20antibody%20design%20has%20never%20really%20been%20bottlenecked%20at%20the%20design%20step.%20It%27s%20bottlenecked%20at%20proving%20the%20designs%20work.%20Closing%20t
Proteina CEO Yoon summarized the strategic significance similarly in his own remarks: "combining AI with an experimental validation platform to resolve bottlenecks in drug development has now entered an important proof-of-concept stage that could lead beyond research to the development of actual medicines" ([www.koreabiomed.com](https://www.koreabiomed.com/news/articleViewAmp.html?idxno=32379#:~:text=Combining%20AI%20with%20an%20experimental%20validation%20platform%20to%20resolve%20bottlenecks%20in%20drug%20development%20has%20now%20entered%20an%20important%20proof-of-concept%20stage%20that%20could%20lead%20beyond%20research%20to%20the%20development%20of%20actual%20medicines.

Jazz Pharmaceuticals and AbCellera: A Western Option-License Comparator

As a comparative case, Jazz Pharmaceuticals' June 2026 collaboration with AbCellera illustrates how a similarly structured option-license antibody discovery deal looks when negotiated under US public-market disclosure norms. Jazz's chief scientific officer for oncology, Josh Allen, framed the deal strategically: "this research collaboration with AbCellera directly aligns with Jazz's rare disease strategy, expanding our focus on GI cancers and building on our existing expertise in oncology" ([investor.jazzpharma.com](https://investor.jazzpharma.com/news-releases/news-release-details/jazz-pharmaceuticals-and-abcellera-announce-collaboration#:~:text=This%20research%20collaboration%20with%20AbCellera%20directly%20aligns%20with%20Jazz%E2%80%99s%20rare%20disease%20strategy%2C%20expanding%20our%20focus%20on%20GI%20c
AbCellera founder and CEO Carl Hansen described the underlying platform: "AbCellera's T-cell engager platform is a fully integrated capability, from discovery to clinical manufacturing, for developing multispecific TCEs for difficult-to-treat cancers" ([investor.jazzpharma.com](https://investor.jazzpharma.com/news-releases/news-release-details/jazz-pharmaceuticals-and-abcellera-announce-collaboration#:~:text=AbCellera%27s%20T-cell%20engager%20platform%20is%20a%20fully%20integrated%20capability%2C%20from%20discovery%20to%20clinical%20manufacturing%2C%20for%20developing%20multispecific%20TCEs%20for%20difficult-to-treat%20cancers. This case demonstrates that the option/license model applied to AI-enabled antibody discovery is not a Korea-specific innovation; it reflects a general industry accommodation to the uncertainty inherent in early-stage AI-designed biologics, regardless of geography.

Celltrion and Galux: Korea's Rival AI Antibody Camp

The Celltrion-Galux partnership offers the most direct domestic counterpoint to Samsung Bioepis-Proteina, both structurally and scientifically. Galux CEO Seok Cha-ok described the underlying technical rationale: "AI-driven protein design is transforming drug development by enabling us to engineer candidates with defined structures and functions from the outset" ([www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=29825#:~:text=AI-driven%20protein%20design%20is%20transforming%20drug%20development%20by%20enabling%20us%20to%20engineer%20candidates%20with%20defined%20structures%20and%20functions%20from%20the%20outset.
Celltrion's vice president and head of new drug research, Lee Soo-young, added: "high-complexity biologics require new approaches that overcome longstanding technical limitations and through our collaboration with Galux,

Celltrion intends to lead the evolving paradigm in drug development" ([www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=29825#:~:text=High-complexity%20biologics%20require%20new%20approaches%20that%20overcome%20longstanding%20technical%20limitations%20and%20through%20our%20collaboration%20with%20Galux%2C%20Celltrion%20intends%) Because Galux uses a fully generative, first-principles physics-integrated design approach rather than Proteina's data-driven analytical method, this case study functions as a useful scientific control: if both camps eventually produce clinically validated antibodies on similar timelines, it would suggest the underlying AI design philosophy matters less than execution discipline and manufacturing partnership quality, a hypothesis the industry will only be able to test once both consortia's 2027-era candidates reach the clinic.

Insilico Medicine's Rentosertib: Proof of Concept for AI-Designed Small Molecules

Although rentosertib is a small molecule and therefore not directly comparable in modality, it remains the field's most relevant precedent case for what a genuine, peer-reviewed clinical proof-of-concept for AI-driven drug design looks like, and thus the benchmark against which any future Samsung Bioepis-Proteina antibody readout will likely be measured. Insilico Medicine founder and CEO Alex Zhavoronkov summarized the study's significance: the results "suggest that Rentosertib has a manageable safety and tolerability profile, but also warrants further investigation in larger-scale clinical trials of longer duration, demonstrating the transformative potential of AI in drug discovery and development" ([insilico.com](https://insilico.com/news/tnrecuxsc1-insilico-announces-nature-medicine-publi#:~:text=These%20results%20not%20only%20suggest%20that%20Rentosertib%20has%20a%20manageable%20safety%20and%20tolerability%20profile%2C%20but%20also%20warrants%20further%20investigation%2scale%20clinical%20trials%20of%20longer%20duration%2C%20demonstrating%20the%20transformative%20potential%20of%20AI%20in%20drug%20discovery%20and%20development. The trial's lead investigator, Dr. Zuojun Xu of Peking Union Medical College, added an important caveat that applies equally to early antibody-design claims: "the sample size in each patient group was relatively limited, and these findings will need to be validated in larger cohort studies" ([insilico.com](https://insilico.com/news/tnrecuxsc1-insilico-announces-nature-medicine-publi#:~:text=However%2C%20the%20sample%20size%20in%20each%20patient%20group%20was%20relatively%20limited%2C%20and%20these%20findings%20will%20need%20to%20be%20validated%20in%20larger%2 The GENESIS-IPF trial enrolled 71 patients across 22 sites in China, testing placebo against three dosing arms of Rentosertib over 12 weeks ([insilico.com](https://insilico.com/news/tnrecuxsc1-insilico-announces-nature-medicine-publi#:~:text=The%20Phase%20IIa%20GENESIS-IPF%20trial%20%28Generative%20AI%20Enabled%20Novel%20Experimental%20Study%20of%20ISM001-055%20in%20Subjects%20with%20Idiopathic%20Pulmonary%20Fibrosis%29%20reported%20in%20this%20paper%20is%20a%20double-blind%2C%20placebo-controlled%20trial%20that%20enrolled%2071%20patients%20with%20IPF%20across%2022%20sites%20in%20China. This case is instructive precisely because of its modesty: even a landmark, peer-reviewed AI drug discovery result carried explicit statistical limitations acknowledged by its own investigators, a standard of transparency that any future Samsung Bioepis-Proteina clinical data will need to meet for the market to treat it as more than a preliminary signal.

Implications and Future Directions

The Samsung Bioepis-Proteina deal arrives at a moment when the broader AI drug discovery field is being subjected to more rigorous, and more skeptical, independent scrutiny than it faced in its earlier hype cycle. A structured narrative review published in the peer-reviewed journal Pharmaceuticals in June 2026 found that despite "global investment exceeding USD 100 billion" in AI life-sciences applications between 2022 and 2026, "clinical attrition rates remain high, with approximately 90% of drug candidates entering clinical development failing to achieve regulatory approval" (www.mdpi.com (Source: [www.mdpi.com](https://www.mdpi.com/1424-8247/19/6/916#:~:text=Current%20evidence%20indicates%20that%20clinical%20attrition%20rates%20remain%20high%2C%20with%20approximately%2090%25%20of%20drug%20candidates%20entering%20clinical%20dev The same review concludes, more broadly, that "AI in drug discovery is currently in a transitional phase characterised by high investment but limited validated clinical impact" ([www.mdpi.com](https://www.mdpi.com/1424-8247/19/6/916#:~:text=These%20findings%20suggest%20that%20AI%20in%20drug%20discovery%20is%20currently%20in%20a%20transitional%20phase%20characterised%20by%20high%20investment%20but%20limited% Even in protein structure prediction, the sub-field with AI's clearest track record and the one underpinning RoseTTAFold and AbGPT-3D alike, the same review cautions that while AlphaFold-family systems have "achieved high structural prediction accuracy, with predicted local distance difference test (pLDDT) scores exceeding 90 for well-structured proteins and root mean square deviation (RMSD) values comparable to experimental methods, limitations persist in modelling protein dynamics, post-translational modifications, and protein-ligand interactions" (Source: www.mdpi.com, precisely the categories of biochemical behavior that determine whether a computationally designed antibody will actually bind, fold, and manufacture as intended.

This is the honest backdrop against which the Samsung Bioepis-Proteina claims should be weighed. The consortium's headline metrics, screening capacity climbing toward 30,000 or even a targeted 100,000 antibody sequences per week (Source: www.asiae.co.kr, a greater than 90% internal suitability rate for AbGPT-3D-designed CDR sequences (Source: www.asiae.co.kr, and preclinical Humira-biobetter potency gains of 20 to 100 times baseline (Source: www.koreabiomed.com, are all discovery-stage or preclinical figures. None has yet been tested against the attrition curve that historically eliminates the vast majority of clinical candidates, AI-designed or otherwise. The project's own governance reflects this caution: rather than an outright license, Samsung Bioepis retained optionality specifically so it could evaluate real clinical and preclinical data before committing full economics, and the option exercise decisions themselves will not be finalized until "before the project concludes at the end of 2027" (Source: [www.asiae.co.kr](https://www.asiae.co.kr/en/article/2026071008121129982#:~:text=The%20number%20and%20timing%20of%20option%20exercises%20by%20Samsung%20Bioepis%20will%20be%20determined%20through%20internal%20

A useful historical lens comes from the field's own first wave of hype, when structural analysis of the earliest AI-designed drug candidates found their chemical shapes were often not radically novel, sharing structural features with older, already-approved compounds. Reflecting on that finding, one analysis concluded that "the structural innovativeness of these candidates in AI drug discovery might not set the world on fire, but this does not diminish the potential impact AI will have on drug discovery," and invoked futurist Roy Amara's observation that "we tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run" (www.cas.org (Source: www.cas.org. That pattern, initial disappointment in the specifics followed by durable structural change in the field, is a plausible frame for how the Samsung Bioepis-Proteina antibody program should be judged over a multi-year horizon rather than against any single quarterly data readout.

Practitioners closer to the applied, commercial side of AI drug design echo this same tempered optimism rather than either boosterism or dismissal. James Halle, Chief Commercial Officer of the AI drug-design firm Optibrium, observed that "nearly every biotech and biopharma company is exploring or deploying AI in some capacity," but cautioned that "very few can quantify the value they are generating from these initiatives," citing his own firm's projects, which "demonstrated a 70-80% reduction in synthetic and experimental effort" once that value was properly measured (Source: www.rootsanalysis.com (Source: www.rootsanalysis.com. For a platform like SPID, whose central selling point is exactly this kind of quantified experimental efficiency, that same measurement discipline is likely to determine how the broader market judges the Samsung Bioepis-Proteina program once its first preclinical packages are complete.

Several concrete developments will determine whether this deal is remembered as the moment AI antibody design proved itself industrially viable, or as one more data point in the pattern the Pharmaceuticals review describes. First, whether the consortium hits its stated 2027 target of 10 candidates and at least one IND filing on schedule (Source: [www.koreabiomed.com](https://www.koreabiomed.com/news/articleView.html?idxno=29532#:~:text=aiming%20to%20produce%2010%20candidates%20in%2027%20and%20file%20at%20least%20one%20investigational%20new%20drug%20%28IND%29%20application%20by%20the%20end%20of%2 Second, whether Proteina's targeted scale-up to 100,000 sequences screened per week materializes as promised, a benchmark that would represent an order-of-magnitude leap over its current disclosed capacity. Third, whether Samsung Bioepis actually exercises its option on any candidate, and on what terms, since option agreements by design carry no guarantee of exercise. Fourth, how the Samsung-Proteina "analytical AI" approach performs relative to Celltrion-Galux's "generative AI" approach once both consortia have comparable clinical or late-preclinical data, a natural experiment the Korean biotech sector is effectively running in parallel (www.asiae.co.kr. Finally, given that monoclonal antibody markets are forecast to grow from roughly $294 billion in 2026 to $547 billion by 2033 (Source: www.grandviewresearch.com, even modest success in de novo AI antibody design would carry outsized commercial upside relative to the deal's currently disclosed cost, which is one plausible explanation for why Samsung Bioepis was willing to move to a commercial option only nine months into an exploratory government-funded project.

Frequently Asked Questions (FAQs)

What is the Samsung Bioepis Proteina AI antibody deal? It is a license and option agreement signed on July 9, 2026, under which Samsung Bioepis can exercise the right to license AI-designed antibody drug candidates discovered by Proteina, paying milestones and royalties only if it exercises that option, within a government-backed national R&D project running through the end of 2027 (Source: m.samsungbioepis.com.

What is Proteina's AI antibody design platform? Proteina's core technology is SPID (Single-molecule Protein Interaction Detection), a wet-lab validation platform that scores AI-generated antibody sequences on developability metrics like binding affinity, thermal stability, productivity, and aggregation, screening more than 10,000 sequences per week as of the Samsung Bioepis agreement (Source: m.samsungbioepis.com.

How does RosettaFold relate to antibody generation in this deal? RosettaFold is the deep-learning protein structure prediction architecture developed by Minkyung Baek and David Baker, whose broader body of computational protein design work earned Baker a share of the 2024 Nobel Prize in Chemistry (Source: www.nobelprize.org. Baek now leads the Seoul National University team inside the Samsung Bioepis-Proteina consortium, applying that lineage of protein modeling to a new generative antibody design tool called AbGPT-3D (Source: www.asiae.co.kr.

What does "SPID scoring" mean in antibody design? SPID scoring refers to the platform's single-molecule imaging-based measurement of seven parallel developability indicators for a candidate antibody, including binding affinity, productivity, thermal stability, and aggregation, used to rank AI-generated candidates for further development (Source: www.koreabiomed.com.

How does an option contract differ from a standard biotech licensing deal? In a standard license, the licensee acquires rights to develop and commercialize an asset immediately in exchange for upfront, milestone, and royalty payments. In an option/license structure, the licensee first pays a smaller option fee for the right, but not the obligation, to license the asset later, typically after a defined data readout, deferring the larger commitment until more information is available (Source: [calculator.ambrosiaventures.co](https://calculator.ambrosiaventures.co/guides/biotech-licensing-deal-structure#:~:text=These%20deals%20give%20the%20licensee%20a%20time-limited%20option%20%28typically%20exercisable%20at%20a%20key%20data%20readout%29%20to%20acquire%20full%20licensing%20rights%2C%20rather%20than%20committing%20to%20a%20traditional%20upfront%

Which companies are pursuing de novo antibody design with AI? In Korea, Proteina (with Samsung Bioepis) and Galux (with Celltrion) represent two distinct approaches, analytical and generative AI respectively. Internationally, AbCellera partners with Jazz Pharmaceuticals on AI-driven multispecific antibody discovery (Source: investor.jazzpharma.com, while US-based Chai Discovery and Xaira Therapeutics have raised $130 million and over $1 billion respectively to pursue generative, AI-native antibody and drug design (Source: www.towardshealthcare.com.

How is AI drug design moving from small molecules to antibodies? Early AI drug discovery milestones, Exscientia's DSP-1181 (2020) and Insilico Medicine's rentosertib (Phase IIa data published 2025), involved small molecules (Source: www.cas.org (Source: insilico.com. The Samsung Bioepis-Proteina deal is described in Korean industry coverage as "the first test of expanding AI drug development from small molecules to antibodies," a structurally harder computational design problem.

What does "10,000 antibody candidates per week" actually mean? It refers to Proteina's SPID platform throughput for screening and scoring AI-generated antibody sequences on developability criteria, not to fully validated, clinic-ready drug candidates. The company has stated this capacity reduces validation time from several months to about two weeks per batch (Source: m.samsungbioepis.com.

How big is the market for antibody therapeutics that AI-designed candidates would compete in? Grand View Research values the global monoclonal antibodies market at approximately $294.1 billion in 2026, growing to a projected $547.3 billion by 2033, with 144 FDA-approved antibody drugs and 1,516 candidates in clinical development globally as of August 2025 (Source: www.grandviewresearch.com (Source: www.grandviewresearch.com.

What happened to Proteina's stock price after the deal was announced? Proteina shares rose as much as 19.14% to 27,700 won in Nextrade after-hours trading on the announcement day, while regular Korea Exchange session trading recorded a 13.59% gain to 25,500 won, a discrepancy attributable to the two different trading venues and timeframes rather than conflicting reporting (Source: biz.chosun.com.

Conclusion

The Samsung Bioepis Proteina AI antibody deal is best understood as a carefully hedged bet rather than a declaration of technological triumph. Samsung Bioepis paid for an option, not a product, deferring its largest financial commitments until Proteina's SPID platform and the Baek laboratory's AbGPT-3D design system produce candidates that survive the developability and preclinical screens both parties have built into the collaboration. The underlying national R&D project, budgeted at roughly $32 million to $34 million and running through the end of 2027, gives the consortium a defined and relatively short window to prove that de novo antibody design, a modality no company anywhere had yet fully validated in the clinic as of mid-2026, can be industrialized the way AI-driven small-molecule discovery has been over the preceding six years.

What distinguishes this deal from earlier AI drug discovery milestones is not the AI itself so much as the pairing: a research-stage discovery platform with genuinely novel throughput claims, backed by a scientific lineage traceable to a Nobel Prize-winning body of protein design work, matched against a manufacturing and regulatory partner with a documented, zero-rejection IND track record across 39 approvals in 39 countries. That pairing addresses the specific bottleneck both Proteina and independent industry analysis identify as the field's real constraint: not generating candidate designs, but proving experimentally, and eventually clinically, that they work. Whether Samsung Bioepis ultimately exercises its option, and on how many of the consortium's targeted 10 candidates, will not be known until closer to the project's 2027 conclusion. Until then, the deal stands as one of the clearest industrial signals to date that AI-driven antibody design has moved from academic demonstration toward a genuine, if still unproven, commercial development pathway.

Tags: samsung bioepis, proteina, ai antibody design, spid platform, rosettafold, de novo antibody design, biotech licensing deals, ai drug discovery, antibody therapeutics, abgpt-3d

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