

# THE VALUE OF INNOVATION POTENTIAL (VIP)

Foundations and an Integrative  
Research Perspective in Biotechnology

OBIS STRATEGIC INVESTMENT SERIES – INSTITUTIONAL RESEARCH MONOGRAPH  
SUPPLEMENT FOR STRATEGIC REVIEW

OBIS Innovation & Solutions, Inc.

SCIENTIFIC · STRATEGIC · ECONOMIC FRAMEWORK

# Introduction

## The value of innovation potential in its scholarly context



Every breakthrough begins before the market can measure it. At that moment, its scientific promise may be visible in an experiment, a platform architecture, or a body of knowledge, while its commercial effects remain years away. The difficulty for valuation is not the absence of financial mathematics. It is deciding what, precisely, that mathematics is being asked to describe.

How should an early biotechnology enterprise be assessed when its capabilities may support several applications? This question has a substantial history. Bogdan and Villiger (2010, pp. 233–234, 284–292) explicitly address project-generating technologies, company valuation and acquisition synergies. Rothman (2020, section 12.6) also values a technological platform through its capacity to generate future projects. These are foundations of the present discussion, not discoveries attributed to OBIS.

Value of Innovation Potential (VIP) is used here as OBIS's organising label for an integrative research perspective. Its purpose is to connect established valuation methods, explicit assumptions and institutional dialogue. The supplement does not establish a new valuation theory, demonstrate superiority over existing approaches or validate a numerical premium for innovation.

This revised October 2026 edition recognises the historical contributions of valuation researchers and distinguishes established foundations, OBIS interpretations and questions requiring investigation. Human-led exchanges with AI systems supported drafting; OBIS retains editorial responsibility. AI working materials are not independent scholarly evidence.

# I. The Problem of Early Innovation

## The scope of an assessment matters



Biopharmaceutical development is costly, lengthy and uncertain. A risk-adjusted net present value (rNPV) model can incorporate several assets, indications and contingent cash flows when its scope and assumptions are specified appropriately. An assessment restricted to one candidate may omit other opportunities; that restriction is a modelling choice, not a universal limitation of the method (Bogdan and Villiger, 2010, pp. 103–145, 218–234).

Consider a delivery technology that may ultimately support several candidates. The first clinical program may create knowledge relevant to manufacturing, formulation, regulatory strategy and subsequent programs. Whether this reduces risk across the entire platform is an empirical question; the impact is neither certain nor necessarily uniform. A useful valuation must allow both learning benefits and correlated failures.

A purchaser's manufacturing capacity, development experience and complementary portfolio may affect the value it can realise. Bogdan and Villiger (2010, pp. 290–292) explicitly discuss acquisition synergies and why an asset may be worth more within a pharmaceutical acquirer. VIP applies this established distinction between standalone and buyer-specific value.

The task is to define what is being valued and recognise incremental effects without counting revenues, synergies or opportunities more than once. Neither scientific ambition nor the word platform establishes a premium.

## II. Foundations rNPV and Real Options

### Established methods and their limits



A consistent baseline discounts expected net cash flows:  $V = \sum E[CF_t] / (1 + r)^t$ , under a stated risk and discounting convention. If expected cash flows already incorporate success probabilities, those probabilities must not be applied again. Development costs must reflect the states in which they are incurred, including costs paid before failure. The rate and probability treatment must avoid duplicating the same risk (Bogdan and Villiger, 2010, pp. 96–145).

Dixit and Pindyck (1994) and Trigeorgis (1996) established major foundations for investment under uncertainty and managerial flexibility. In life sciences, Bogdan and Villiger (2010, pp. 36–59, 121–134) explain decisions to defer, expand, abandon, license and stage investment. These concepts precede VIP and belong to the literature on real options.

Real-options estimates depend on the available actions, information, competition and parameter choices. Roche (2005, chapter 7) provides a critical discussion of the approach. Combining methods therefore requires examining their assumptions, rather than treating real options as an automatic source of additional value.

Specify the valuation date, currency, financing basis and cash-flow perimeter. Meza Orozco (2013, chapters 3–4) provides a practical foundation for project cash flows and investment evaluation. A future VIP implementation must reconcile with these financial fundamentals.

### III. Principles of the VIP Framework

#### Established foundations, OBIS interpretation and research hypotheses

Established foundations include discounted cash flows, success probabilities, conditional decisions, technology valuation, synergies and simulation. They are developed in the cited literature. The working principles below organise these ideas for institutional use; their inclusion in VIP is not a claim that OBIS originated them.

OBIS’s interpretation is to examine the valuation perimeter, reusable capabilities, staged decisions, dependencies, buyer-specific benefits and source traceability together. Each opportunity must identify a plausible mechanism, costs and evidence. An option or synergy already captured in the baseline receives no separate addition.

The research hypothesis is that this organisation may improve completeness, consistency or communication. That hypothesis has not been empirically validated. Kemsal (2019, sections 5.4 and 6.2) illustrates how a complementary capabilities framework can be proposed while expressly acknowledging the need for validation; its marketing indicators cannot simply be transferred to biotechnology.

A conceptual framework, a reproducible numerical implementation and an empirically validated method are different stages of development. VIP, as presented here, remains a conceptual research perspective.

| Status              | Meaning                                                |
|---------------------|--------------------------------------------------------|
| Established         | Methods and concepts attributed to prior literature    |
| OBIS interpretation | Organisation for institutional analysis and discussion |
| Research hypothesis | Incremental usefulness remains to be tested            |

## IV. The Three Pillars

### An OBIS grouping of established valuation dimensions

The three headings organise existing concepts: platform capabilities; managerial options; and buyer-specific strategic effects. Platform analysis can examine a technology’s project-generation rate, costs and useful life (Bogdan and Villiger, 2010, pp. 233–234; Rothman, 2020, section 12.6). Real options concern conditional choices; acquisition analysis concerns benefits and costs specific to the purchaser.

The three pillars frequently interact, but cannot be treated as independent multipliers. If a platform allows faster introduction of a second indication, the associated cash flows cannot be booked as platform value and then counted again as a strategic time-to-market premium. A valuation bridge must identify such overlaps explicitly.

Platform development can also create concentration risk. A failure of a core technology may impair several products at once. The benefits of scientific reuse must therefore be considered alongside common-mode failure and resource constraints.

| Dimension              | Established antecedent                                                |
|------------------------|-----------------------------------------------------------------------|
| Platform capabilities  | Bogdan and Villiger (2010), pp. 233–234; Rothman (2020), section 12.6 |
| Managerial flexibility | Dixit and Pindyck (1994); Trigeorgis (1996)                           |
| Buyer-specific effects | Bogdan and Villiger (2010), pp. 290–292                               |

## V. A Working Valuation Architecture

### A valuation bridge with explicit adjustments

The following expression is a conceptual reconciliation, not an accounting identity or a validated pricing formula: assessed value = baseline asset value + incremental platform effects + incremental decision flexibility + buyer-specific effects – overlaps and interaction costs. The categories organise questions; they do not prescribe independently measurable additions.

Every proposed increment requires a counterfactual: what cash flows or decisions are missing from the baseline? Platform effects may arise through additional projects or cost savings; flexibility through conditional actions; buyer effects through integration. These effects should be modelled jointly where they interact. A fully specified baseline may already capture them.

Shared scientific failure, capacity constraints, cannibalisation and integration costs must enter the relevant scenarios. Risks already modelled through probabilities or discounting must not be subtracted again as an unspecified adjustment. Report standalone value separately from buyer-specific value and reconcile enterprise value with equity value.

The distinction between a whole business and allocations to its components also matters in other valuation contexts (Chu and Lonergan, 2020, Introduction). Their tax-specific framework is not adopted here as a biotechnology pricing standard. A negotiated price cannot by itself identify the components of this reconciliation.

Implementation rule: define the baseline first; quantify only effects absent from it. Interacting components may require a joint model.

## VI. Evidence and the Five Cases

### How to use transactions without overclaiming

Transactions provide grounded evidence of what parties agreed to pay and how purchasers publicly explained their strategies. They rarely reveal complete probability models, private synergy assumptions or internal option values. Accordingly, case analysis must distinguish observable terms from our interpretation of their relevance to VIP.

These deliberately selected transactions illustrate different price scales, program maturity and contingent terms. They are not a representative sample and cannot establish how frequently innovation attracts a premium. Their selection creates potential survivorship and hindsight biases; Rothman (2020, chapters 5–7) discusses behavioural influences relevant to valuation.

Each case separates announced facts, OBIS interpretation and a limitation. Public announcements support terms and stated rationale, not a causal decomposition of price. The cases therefore illustrate questions for analysis rather than validate VIP or a premium assigned to any early-stage enterprise.

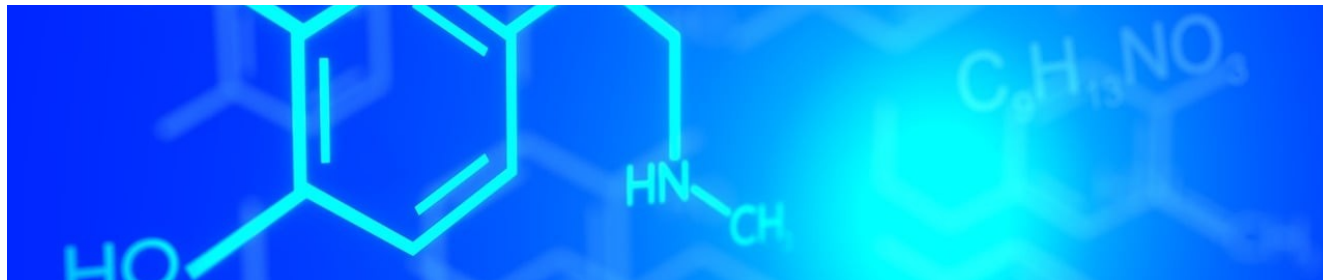
The analytical interpretations below draw on established technology, option and acquisition concepts (Bogdan and Villiger, 2010). Milestones are evidence of contingent consideration, not evidence that a buyer used VIP.

| Case               | Announced consideration                                     |
|--------------------|-------------------------------------------------------------|
| Vertex / Alpine    | Approximately US\$4.9 billion cash                          |
| Roche / Carmot     | US\$2.7 billion upfront + up to US\$0.4 billion milestones  |
| Lilly / Morphic    | Approximately US\$3.2 billion                               |
| AbbVie / Landos    | US\$137.5 million upfront + up to US\$75 million contingent |
| Merck / Prometheus | Approximately US\$10.8 billion                              |

Sources: [D1–D6]. Headline amounts have different structures and are not normalised comparable valuations. No platform score or premium is inferred.

## VII. Case Study Vertex and Alpine Immune Sciences

### Platform capability and pipeline-in-a-product thinking



In April 2024, Vertex announced an agreement to acquire Alpine Immune Sciences for approximately US\$4.9 billion in cash. Vertex described Alpine's lead program, povetacicept, and its protein-based immunotherapy expertise as strategically relevant. The announcement also referred to the potential of povetacicept across additional serious diseases.

From a VIP perspective, the transaction highlights the intersection of lead-asset value and scientific platform potential. A candidate that may have multiple indications can support future optionality; the buyer also acquires expertise that may strengthen discovery and development capability beyond a single product.

However, the headline transaction price cannot be allocated conclusively between program cash flows, scientific skills and strategic value using public statements alone. The practical lesson is that "pipeline-in-a-product" value must be mapped carefully to indications, development probabilities and nonduplicated future cash flows.

Documentary source: Vertex Pharmaceuticals, 10 April 2024 [D1].

## VIII. Case Study Roche and Carmot Therapeutics

### Upfront consideration and milestone-linked potential



Roche announced in December 2023 that it would acquire Carmot Therapeutics for US\$2.7 billion upfront, with up to US\$400 million in additional milestone payments. Carmot's clinical-stage incretin portfolio addressed obesity and diabetes, with opportunities for combination with Roche's existing assets.

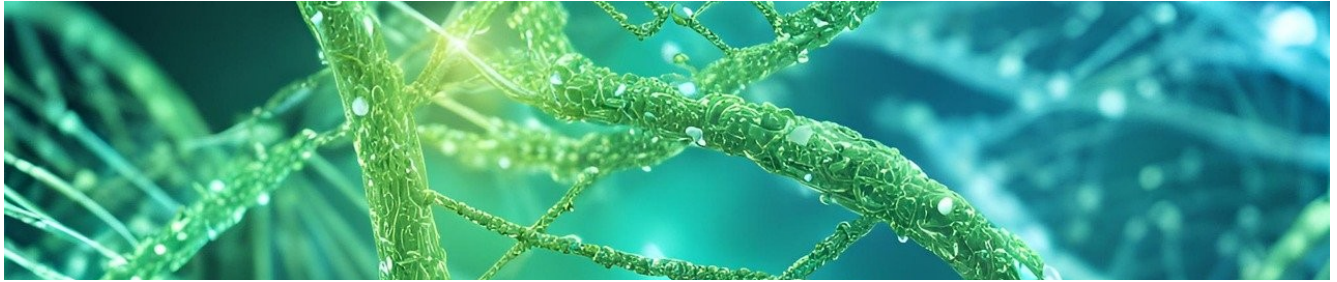
This case vividly illustrates the separation between value recognised at closing and additional amounts made conditional on future outcomes. In a VIP analysis, the upfront component is a negotiated acquisition payment while the milestone rights can distribute clinical and commercial risk over time.

Platform and portfolio interaction are also relevant: multiple candidate compounds and potential combinations may matter more than a single stand-alone forecast. Still, one must not treat the contingent maximum as if it were cash already paid, nor automatically add it to a risk-adjusted valuation at face value.

Documentary source: Roche, 4 December 2023 [D2].

## IX. Case Study Eli Lilly and Morphic

### Buyer fit and oral therapeutic capabilities



Eli Lilly announced and completed the acquisition of Morphic in 2024, with the transaction valued at approximately US\$3.2 billion. Morphic's portfolio included investigational oral integrin therapies, with MORF-057 as a lead program for inflammatory bowel disease.

The VIP reading is grounded in strategic complementarity. Morphic's technology could fit a purchaser already active in gastrointestinal and immunological therapies. The value to Lilly may therefore include capability integration, formulation expertise, program acceleration and future indications, alongside the core asset's own cash-flow prospects.

These possibilities are not equivalent to publicly confirmed price components. Analysts would need a buyer-specific business case to estimate synergies, integration expenses and potential overlap with the acquirer's existing portfolio. The case demonstrates why the identity of the purchaser matters, but it does not independently validate a numerical strategic premium.

Documentary source: Eli Lilly and Company, 16 August 2024 [D3].

## X. Case Study AbbVie and Landos Biopharma

### A measured illustration of contingent value



AbbVie agreed to acquire Landos Biopharma in March 2024 for approximately US\$137.5 million in upfront consideration, plus a potential US\$75 million contingent payment. The central investigational asset was NX-13, an oral NLRX1 agonist being developed for inflammatory bowel disease.

Landos is analytically useful because the price scale is far below that of several other selected transactions. Its contingent component nevertheless highlights the importance of assigning part of the consideration to a verifiable future event rather than treating all potential outcomes as present value.

The case warns against assuming that all early biotechnology companies necessarily warrant very large platform premiums. Where a company has a comparatively concentrated pipeline, an asset-level model may already capture most of the value, with only limited incremental optionality or strategic value.

Documentary sources: AbbVie, 25 March and 23 May 2024 [D4–D5].

## XI. Case Study Merck and Prometheus Biosciences

### Precision immunology and portfolio expansion



Merck completed its acquisition of Prometheus Biosciences in June 2023 in a transaction valued at approximately US\$10.8 billion. Merck described the transaction as an expansion of its immunology pipeline and research capabilities, including a leading candidate aimed at inflammatory conditions.

For VIP, Prometheus illustrates the value that a purchaser may see in a clinical asset together with enabling research and precision-medicine capabilities. Additional value may arise if clinical or biological insights can be applied across indications or accelerate future program selection.

As with all cases in this selection, the acquisition price is observable, but allocation to platform value, clinical probabilities and buyer-specific synergies is not. This distinction matters particularly for high-value transactions, where impressive consideration can otherwise be mistaken for proof of an abstract valuation theory.

Documentary source: Merck, 16 June 2023 [D6].

## XII. Complementary Market Observations

### Pfizer–Metsera and Pfizer–Seagen



Pfizer completed its acquisition of Metsera in November 2025. Its announced rationale concerned clinical-stage obesity and cardiometabolic opportunities. This case illustrates how an acquirer can combine an immediate payment with contingent consideration; the announcement does not disclose a complete internal valuation model [D7].

Pfizer also completed its acquisition of Seagen in December 2023 at approximately US\$43 billion enterprise value. Unlike an earlier-stage startup, Seagen had commercial oncology products and a broader antibody–drug conjugate technology base. The case therefore illustrates how platform value can coexist with established revenue streams.

These supplementary observations should not be conflated. A mature revenue-generating platform and an early development portfolio present different uncertainties. Together they reinforce the view that VIP is a structured valuation lens rather than a formula predicting transaction prices solely from scientific promise.

Documentary sources: Pfizer, 13 November 2025 and 14 December 2023 [D7–D8].

## XIII. Pembrolizumab and the Oncology Franchise

### Indication expansion and cumulative development



Pembrolizumab (Keytruda®, Merck) illustrates the evolution of an individual therapeutic asset. FDA records date its original approval to 4 September 2014. Subsequent development expanded its clinical uses. This history provides a retrospective illustration of investment and learning, rather than proof that its eventual commercial scale was foreseeable at inception [D9].

The economic contribution of an additional indication depends on its development cost, probability, timing, market and overlap with existing uses. Multiple-indication valuation is an established topic (Bogdan and Villiger, 2010, pp. 218–232). VIP uses this history to organise questions about incremental opportunities.

Merck's February 2026 results report combined worldwide Keytruda and Keytruda Qlex sales of approximately US\$31.7 billion for 2025. Revenue is an observed commercial measure, not present value or the product's initial valuation [D10].

On 19 September 2025, the FDA approved subcutaneous pembrolizumab with berahyaluronidase alfa-pmph (Keytruda Qlex). This illustrates continued product development, while its incremental economic contribution requires assessment of costs, adoption and substitution for the intravenous formulation [D11].

The original asset, subsequent indication investments and broader franchise capabilities must be distinguished without duplicating their cash flows. A successful product history also requires comparison with failed or less successful programs before drawing general conclusions.

This is a longitudinal illustration of realised innovation, subject to hindsight and selection bias. It does not validate a VIP premium or imply comparable outcomes for OBIS.

Analytical foundation: Bogdan and Villiger (2010); behavioural caution: Rothman (2020). Documentary sources: FDA and Merck [D9–D11].

## XIV. OmniRNA Biologics

### An expressly fictional teaching case



The working documents developed through the interaction between OBIS Innovation & Solutions and Google AI present OmniRNA Biologics as a fictional university venture developing ORN-101, an mRNA-based oncology candidate supported by a hypothetical nanoparticle-delivery platform named EncapsuDrive.

The teaching question is how different model specifications change an assessment: a narrowly defined candidate baseline versus a model that explicitly includes additional projects and conditional decisions. Those extensions can be implemented within established valuation methods; they are not exclusive to VIP.

Any future numerical exercise must disclose assumptions, probability conventions, costs and timing. Hypothetical upfront payments and milestones are teaching inputs, not market observations. No reproduced negotiation outcome is presented here as a validated estimate.

A reproducible implementation could compare fixed decisions with contingent decisions under the same information set. It should expose interactions and any added value already embedded in the baseline (Bogdan and Villiger, 2010, pp. 113–145).

OmniRNA Biologics is therefore a teaching scenario for exploring the foundations of Value of Innovation Potential (VIP); it is neither a verified commercial transaction nor a direct reference for determining the pre-money valuation of OBIS Innovation & Solutions.

Its contribution is a setting for conceptual exploration and model testing. Independent evidence would still be required to assess predictive performance or transfer conclusions to a real enterprise.

## XV. Probabilistic Valuation

### Monte Carlo, correlations and distribution interpretation

Simulation and sensitivity analysis are established valuation tools (Bogdan and Villiger, 2010, pp. 134–145, 275–278). Monte Carlo sampling can represent uncertain inputs such as sales, costs and timing. Outputs remain conditional on the selected distributions, dependencies and decision rules.

The method is only as reliable as its assumptions. Especially important are correlation between programs, consistency of clinical success probabilities, choice of discounting convention and separation of upside scenarios from expected value. Simply running 10,000 iterations does not establish validity or remove model risk.

When reporting results, P5 refers to the fifth percentile, P50 to the median and P95 to the ninety-fifth percentile. These are alternative points of a distribution, not automatically a floor, a fair market price and an attainable acquisition ceiling. The expected value, median and negotiated value may differ materially.

A future implementation should disclose parameter provenance, distributions, correlations, sensitivity tests and reproducible code or a workbook. This supplement reports no validated VIP simulation or empirically estimated output distribution.

| Output            | Interpretation                                        |
|-------------------|-------------------------------------------------------|
| P5 / P50 / P95    | Percentiles of a specified model distribution         |
| Expected value    | Probability-weighted mean; may differ from the median |
| Transaction price | Negotiated outcome; not a percentile by definition    |

No simulated monetary distribution is shown because a reproducible VIP dataset and model are not supplied.

## XVI. Contract Architecture and Implementation

### From analytical value to risk-sharing terms



Licensing and acquisition terms can distribute consideration across upfront payments, clinical or regulatory milestones, commercial milestones, royalties and contingent rights. These are established mechanisms, discussed extensively by Bogdan and Villiger (2010, pp. 146–218). Their present values depend on timing, conditions and the applicable valuation assumptions.

Illustrative contractual provisions include objective milestone definitions, measurement dates, reporting requirements, dispute-resolution mechanisms, commercially reasonable efforts and audit rights. Contract language must be adapted by qualified counsel to the governing law and transaction facts. A fictional clause should never be presented as an automatically enforceable industry standard.

VIP brings these established contractual mechanisms into its institutional discussion. Contingent payments may help parties address differing expectations, but they do not create an independently measurable innovation premium or remove the need to value the underlying rights.

For OBIS, this discussion is useful as conceptual background and should remain separate from specific negotiation proposals until parties and legal counsel define terms.

## **XVII. Application to OBIS and Institutional Dialogue**

### **A research resource, not a revised Pre-Money number**

For OBIS, VIP provides a structure for discussing biotechnology capabilities, research assumptions and future decisions with institutional readers. It does not establish the technical feasibility, market demand or commercial success of any OBIS program. Scientific maturity and evidence must be stated separately for each application.

The monograph provides a conceptual framework for examining the assumptions, scientific capabilities and development opportunities involved in valuing a biotechnology platform. Its purpose is to enrich methodological analysis and facilitate informed dialogue with researchers, investors and potential institutional partners.

This is an institutional conceptual research supplement. Giuffrida et al. (eds., 2024) offer wider reflection on valuation judgements, evidence and values, primarily in territorial and environmental contexts. That perspective encourages explicit reasoning; it supplies neither biotechnology success probabilities nor a financial premium.

A future application should also state geographic exposure and financing assumptions. Köseoğlu and Patterson (eds., 2025) address emerging-market valuation challenges; their insights require adaptation to actual operating exposure. Corporate domicile alone is insufficient to determine those risks. Confidential scientific and intellectual-property information must remain protected.

Institutional boundary: this supplement neither recalculates nor independently validates OBIS's existing financing valuation.

## XVIII. Research Agenda and Closing Synthesis

### Questions for evaluation and independent scrutiny



Research should first test whether the VIP presentation helps analysts identify omitted cash flows, inconsistent assumptions or duplicated value. A fair comparison requires a well-specified conventional model that can include platforms and conditional decisions, rather than an artificially restricted single-asset baseline.

Tests should predefine outcomes, use independent reviewers and include unsuccessful as well as successful programs. A numerical implementation would require traceable inputs, correlated risks, explicit decision rules and sensitivity analysis. Better documentation or communication must be distinguished from better valuation accuracy or predictive performance.

Established foundations belong to the cited researchers. OBIS contributes the proposed organisation and institutional application. Whether that organisation offers incremental analytical benefit is an open research question. Neither novelty of terminology nor persuasive case histories resolve it.

The purpose remains to examine innovation potential with intellectual honesty. Preserve the question, recognise the intellectual heritage and expose the assumptions to scrutiny. OBIS retains responsibility for the interpretation and any future implementation.

## XIX. Academic References

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## Documentary Sources

### Transaction announcements

D1 Vertex Pharmaceuticals (10 April 2024). Vertex Enters Into Agreement to Acquire Alpine Immune Sciences.

[Open official source](#)

D2 Roche (4 December 2023). Definitive merger agreement to acquire Carmot Therapeutics.

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D3 Eli Lilly and Company (16 August 2024). Lilly Completes Acquisition of Morphic. Corporate release filed with the SEC.

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D4 AbbVie (25 March 2024). AbbVie to Acquire Landos Biopharma, Further Strengthening its Portfolio in Inflammatory and Autoimmune Diseases.

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D5 AbbVie (23 May 2024). AbbVie Completes Acquisition of Landos Biopharma.

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D6 Merck (16 June 2023). Merck Completes Acquisition of Prometheus Biosciences, Inc.

[Open official source](#)

D7 Pfizer (13 November 2025). Pfizer Completes Acquisition of Metsera.

[Open official source](#)

D8 Pfizer (14 December 2023). Pfizer Completes Acquisition of Seagen.

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## Product Sources and Editorial Scope

D9 FDA. Purple Book record for Keytruda (BLA 125514); original approval 4 September 2014.

Open official source

D10 Merck (3 February 2026). Fourth-Quarter and Full-Year 2025 Financial Results.

Open official source

D11 FDA (19 September 2025). FDA approves pembrolizumab and berahyaluronidase alfa-pmph for subcutaneous injection.

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### Source boundaries

Academic citations identify established methods and contextual arguments. The presence of a reference does not imply that its authors endorse VIP or OBIS. Corporate announcements document terms and stated rationale; they do not disclose complete internal valuation models. The case interpretations are OBIS's analytical readings.

The internal OBIS/Google AI working conversations, fictional OmniRNA exercise and exploratory modelling memoranda are drafting background. They are not independent evidence, peer-reviewed validation or substitutes for the cited scholarship. No numerical result from those materials is used here as proof of VIP.

### Revised edition

Revised edition — 19 October 2026. This edition places the value of innovation potential within the valuation literature and acknowledges the historical contributions of its researchers. It presents an integrative perspective that distinguishes established foundations, proposed interpretations and hypotheses open to research, preserving its purpose of contributing to the scientific, strategic and economic analysis of innovation.

This supplement is a selective synthesis for institutional discussion, not a comprehensive history of valuation. It does not establish priority for the VIP label or validate a valuation method. Future research and independent review remain necessary.