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Beansprout

Biotechnology

An Industry Primer

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Introduction to Biotechnology

Biotechnology is now a major driver of medical innovation, supported by advances in genomics, molecular biology, cell engineering and data-led research.

Today, biotech is helping to drive breakthroughs across areas such as cancer, immune-related diseases, metabolic disorders, neurological conditions and rare genetic illnesses.

The sector also covers a wide range of business models – from drug developers and research tools providers to contract research organisations (CROs), contract development and manufacturing organization (CDMOs) and AI-enabled platforms – each with its own earnings profile and valuation drivers.

A rapidly growing market to reach US$5.7 trillion by 2034

The global biotechnology industry continues to enjoy strong long term growth tailwinds.

Precedence Research estimates that the global biotech market could grow from about US$1.77 trillion in 2025 to US$5.71 trillion by 2034, implying annual growth of around 11.8 percent.

At the same time, IQVIA expects global medicine spending to reach about US$2.4 trillion by 2029, supported by rising demand for biologics and specialty therapies.

The biggest spending increases are likely to come from areas such as oncology, diabetes and obesity, immunology, and neurology. While the US remains the centre of innovation, demand growth is increasingly coming from Asia Pacific and Latin America.

As treatments become more complex and costly, healthcare data and analytics platforms are also becoming more important in supporting adoption, reimbursement, and real-world evidence.

In the near term, biotech performance can still be affected by interest rates, funding conditions, and the broader macro environment, especially for earlier stage companies.

But over the longer term, the outlook remains supported by rising demand for biologics and specialty medicines, an ageing population, ongoing scientific advances, and the shift towards more value-based healthcare.

In our view, the companies best placed to benefit are those with strong science, disciplined execution, and resilient supply chains.

Asia-Pacific and Singapore: An emerging biotech innovation hub

Asia-Pacific is emerging as an important biotechnology growth region, supported by ageing populations, rising chronic disease burdens, and increasing healthcare investment.

Within this landscape, Singapore stands out for its long-term commitment to research and development, strong intellectual property protection, trusted biomanufacturing capabilities, and well-developed translational research ecosystem.

The rise of companies such as Mirxes, Hummingbird Bioscience, Nuevocor, Respiree, UltraGreen.ai, Tessa Therapeutics, Tychan and Engine Biosciences also shows how Singapore is evolving beyond a manufacturing base into a more innovation-led biotech hub with global ambitions.

Biotech valuation framework

Biotech valuations can vary widely depending on where a company is in its growth journey.

For early-stage companies, investors often focus on the future potential of the pipeline, the strength of the platform, and comparisons with similar deals or companies.

For clinical stage biotechs, valuations tend to move based on trial results, regulatory progress, competition, and how quickly a product could reach the market.

Once a biotech company has commercialised its products, it is usually valued more like a specialty pharmaceutical business, using metrics such as earnings, sales, cash flow, and operating profit.

For adjacent sectors such as life science tools, CROs, CDMOs, and medtech, investors often pay closer attention to recurring revenue, utilisation levels, and the strength of the installed customer base.

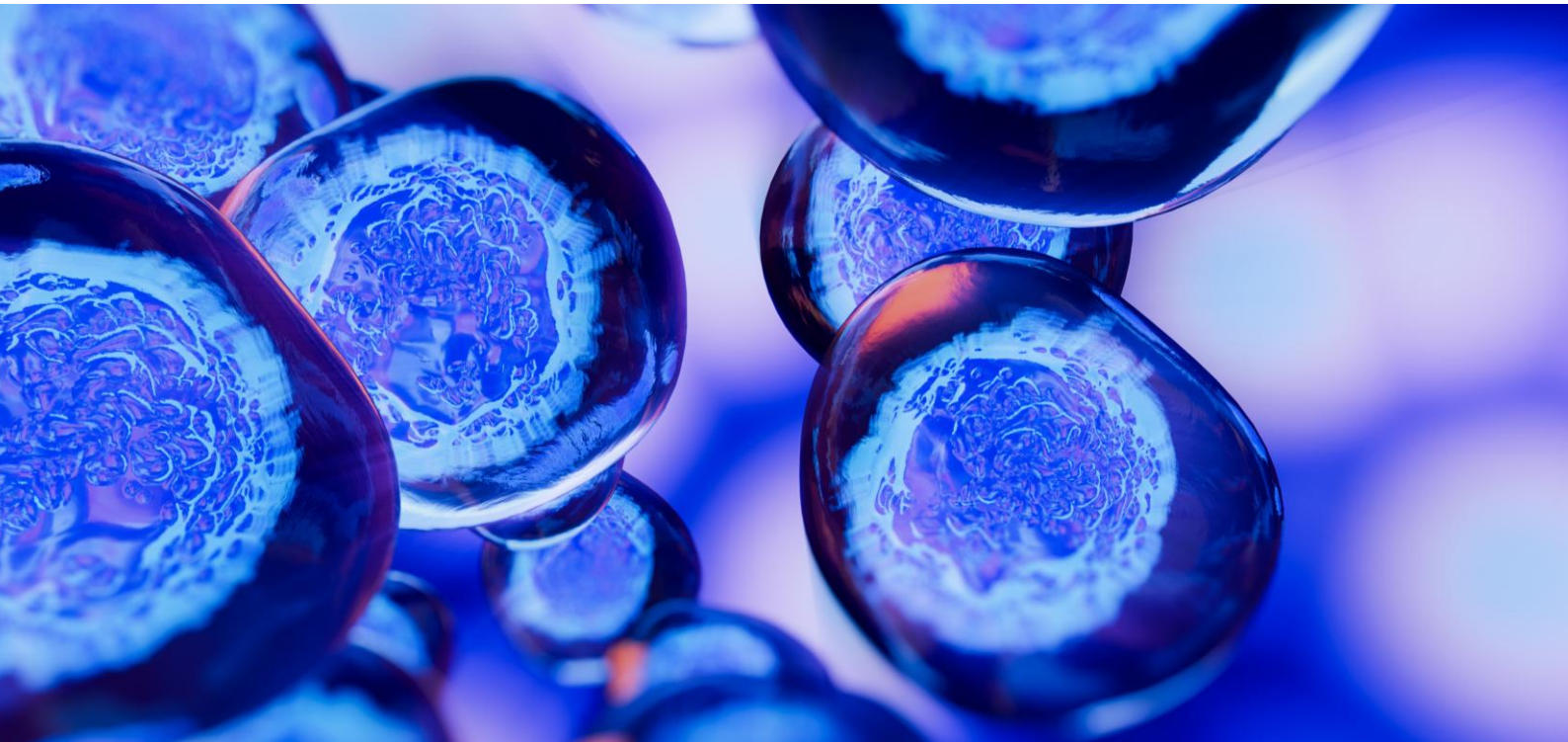
This is why using the right valuation framework for each business model is important when assessing share price moves and long-term investment potential.

Key risks and challenges

Biotechnology comes with real risks, including failed clinical trials, regulatory delays, manufacturing challenges, and intense competition.

For more established products, revenue can also come under pressure from biosimilars and generics. At the same time, funding conditions can affect how quickly new innovation moves forward, especially for earlier stage companies.

This is why investors need to be selective. In our view, it is important to diversify, track key milestones closely, and understand where each company sits in its development and commercialisation journey.



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The global biotech market is expected to grow from USD 1.8 trillion in 2025 to USD 5.7 trillion by 2034, driven by an 11.8% annualised growth rate.

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Introduction to Biotechnology

Biotechnology as a catalyst for modern medical innovation

What is Biotech?

Biotechnology is the use of biological science to develop products that can improve human health.

In healthcare, this often means using living systems such as proteins, antibodies, cells, or genetic material to create treatments that go beyond what traditional chemical-based medicines can do.

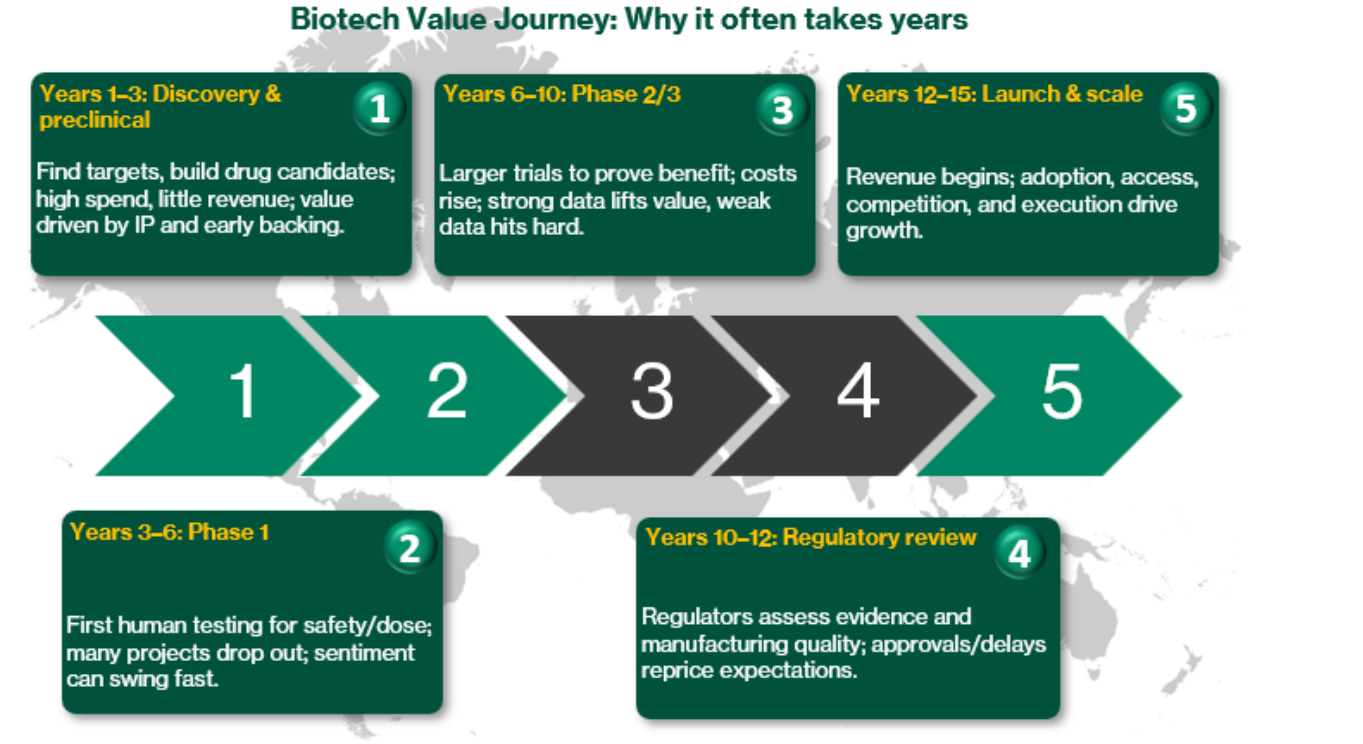
Over the past two decades, advances in molecular biology, genomics, cell engineering, and bioinformatics have made biotechnology one of the most important drivers of medical innovation today.

Biotech therapies are now playing a central role in treating diseases where traditional medicines often have limited effect. These include autoimmune conditions, many types of cancer, inherited genetic disorders, neurological diseases, and complex metabolic illnesses.

As these therapies continue to improve, they are expanding the range of conditions that can be treated and raising expectations for better patient outcomes.

For investors, biotechnology is not a single, uniform sector. It includes drug discovery companies, commercial-stage biopharma

Figure 1: Valuation journey



Source: Finro Financial Consulting

firms, life science tools providers, CROs, CDMOs, diagnostics players, medtech companies, and increasingly, healthcare data and AI platforms.

These businesses can look very different from one another in terms of risk, revenue model, and valuation. A small clinical-stage biotech, for example, behaves very differently from a life science tools company, even if both sit under the broader biotech label.

What also makes biotech unique is its long development cycle and the importance of key milestones. Products typically move from early research to clinical trials, regulatory review, and eventually commercialisation.

At each stage, new information can significantly change investor expectations. Trial results or regulatory decisions can move share prices sharply in a very short period of time.

That is why understanding where a company sits in this journey is so important when assessing biotech performance and investment potential.

How biotech creates value: from discovery to market adoption

Biotech value creation usually starts with scientific discovery.

Researchers first identify a biological target linked to a disease, then test whether a potential treatment can meaningfully affect that pathway in preclinical studies. At this stage, investors tend to focus on the strength of the science, the quality of the platform, and how convincing the early data looks.

As a therapy moves into human trials, confidence can build, but expectations also rise. Phase 1 trials focus on safety and dosing, Phase 2 looks at whether the treatment works in a specific patient group, and Phase 3 aims to show clear benefit compared with existing standards of care. Regulators then assess not just the clinical results, but also manufacturing quality, consistency, and safety.

Even after approval, value creation depends on commercial execution. A successful launch requires reliable manufacturing, doctor adoption, reimbursement support, treatment guideline inclusion, and clear differentiation from competing therapies. Some products lose momentum if better treatments emerge, while others can scale quickly if they address a major unmet need.

This is also why biotech valuations evolve over time. Earlier stage companies are often valued based on future potential and the probability of success. As products mature and begin generating revenue, investors increasingly look at more traditional measures such as earnings, cash flow, and operating profit.

Because biotech value is often tied to milestone events, share prices can move sharply around clinical data, regulatory decisions, and commercial launch updates.

Global industry growth trends

Structural drivers of global biotech and pharmaceutical expansion

Biotechnology as a multi-layered ecosystem

Biotechnology today goes well beyond traditional drug development. It now includes areas such as genomic sequencing, biologics and cell therapy manufacturing, molecular diagnostics, AI-led discovery platforms, digital clinical trial tools, and industrial biotech applications.

This broadening of the industry is also reflected in its growth outlook. Precedence Research estimates that the global biotech market could expand from about US$1.77 trillion in 2025 to US$5.71 trillion by 2034, implying annual growth of around 11.8 percent.

This growth is being driven by rising demand for biological therapies, increasing global R&D investment, and the wider use of data-driven tools across the life sciences value chain.

Biotech within the global medicines market

Within pharmaceuticals, demand for medicines continues to rise.

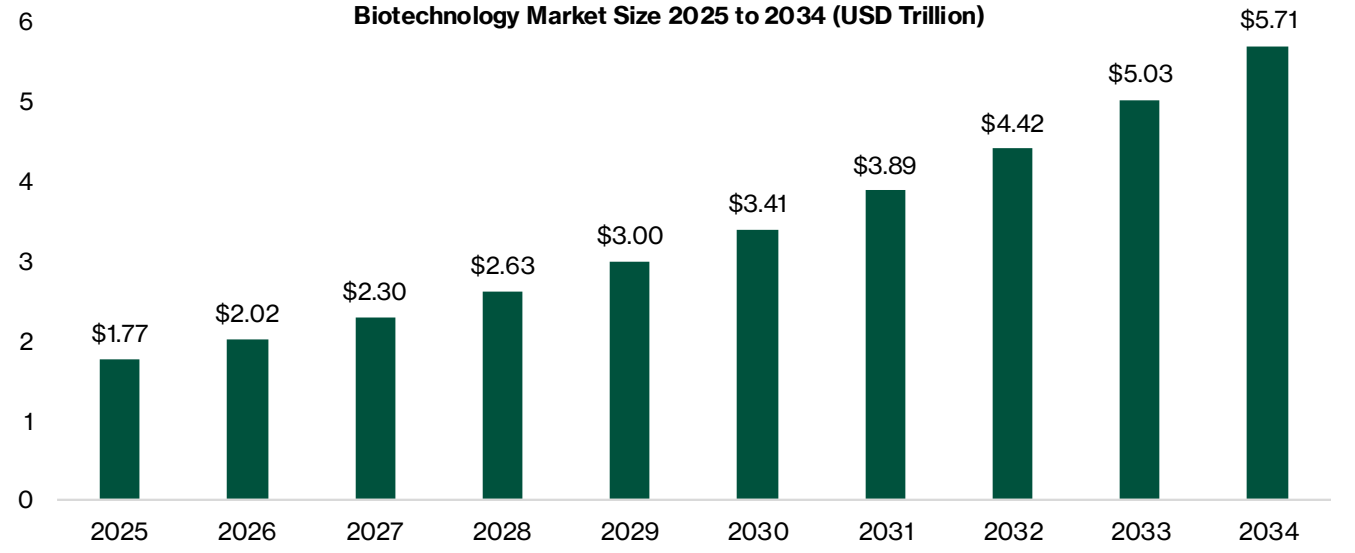
IQVIA's 2025 Medicines Outlook noted that global medicine use increased by about 14 percent over the past five years, and is expected to grow by a further 12 percent through 2028, reaching around 3.8 trillion doses annually.

Spending is also rising. Global medicine expenditure at list prices has increased 35 percent over the past five years and is projected to grow by another 38 percent through 2028, reaching about US$2.3 trillion.

Importantly, this growth is now being driven more by higher usage than by price increases.

Three therapy areas are contributing a large share of this expansion.

Figure 2: Global biotechnology market size



Source: Precedence Research

In immunology, biosimilars are helping to widen access to biologic treatments. In metabolic disease, GLP-1 and related therapies are reshaping the treatment of diabetes and obesity. In oncology, continued innovation and earlier treatment across multiple tumour types are lifting both usage and spending.

Specialty medicines, especially biologics, are also taking up a larger share of global drug spending. By 2029, biotech-derived medicines are expected to account for roughly one third of total medicine expenditure.

Three therapeutic areas account for a significant share of the increase: immunology, where biosimilars are broadening access to biologic therapies; metabolic disorders, where GLP-1 and GIP/GLP-1 agonists are reshaping diabetes and obesity care; and oncology, where continued innovation and earlier intervention across multiple tumour types are pushing up both usage and spending.

Specialty medicines – particularly biologics – now make up a growing share of global pharmaceutical expenditure, and IQVIA projects that by 2029, biotech-derived medicines will represent roughly one-third of total medicine spending.

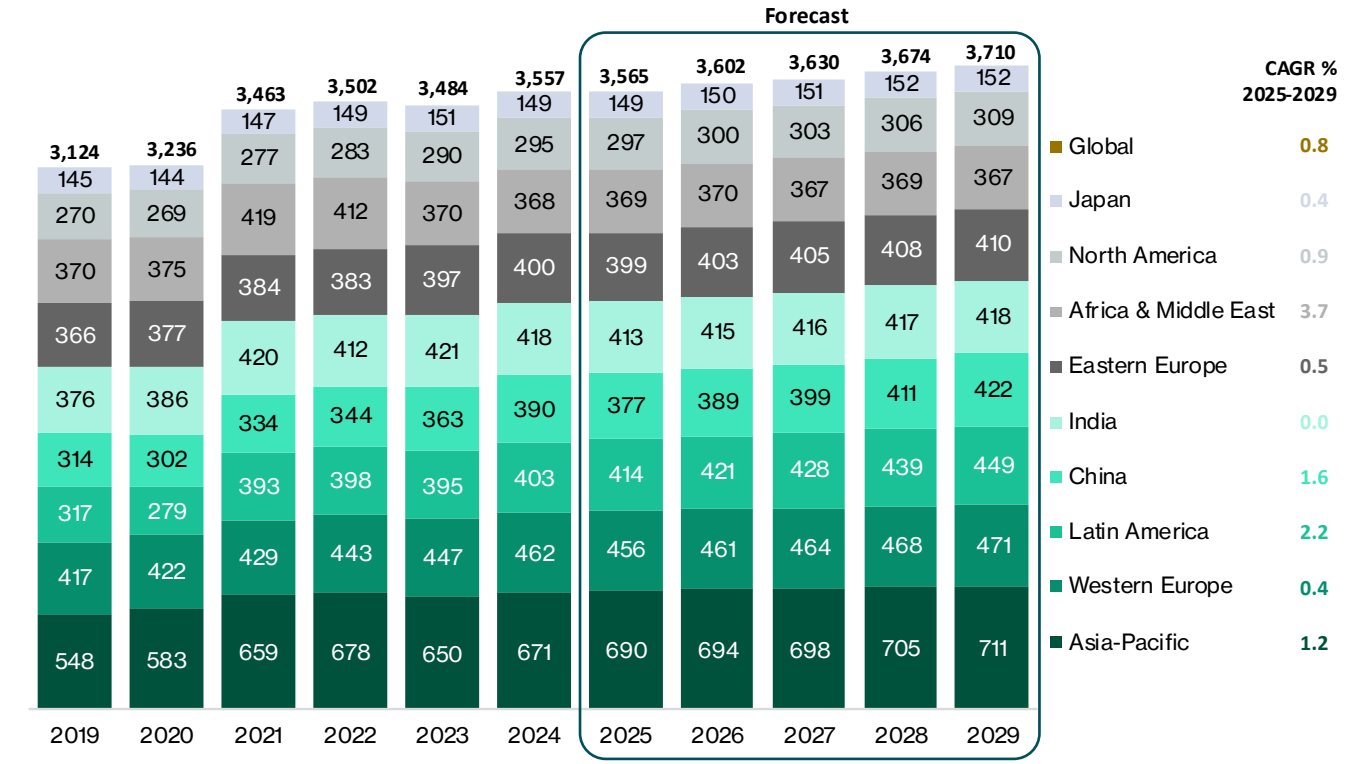
Asia and Latin America lead in volume growth

While global medicine spending is expected to grow at 5–8% annually through 2029, the outlook differs significantly across regions.

In the US, medicine spending is still expected to rise at a healthy pace, supported by continued demand for high value therapies in areas such as oncology, obesity and diabetes, and immunology. Although policy changes may put some pressure on drug pricing over time, growth in usage and innovation is still expected to support the market.

In Europe, spending is also likely to grow, but at a slower pace after accounting for ongoing pressure from healthcare payers and cost containment measures.

Figure 3: Global medicine consumption by region, defined daily doses (DDD) in billions



Source: IQVIA Institute

By contrast, faster growth is expected in China, India, Southeast Asia, and Latin America, driven by expanding middle class populations, broader insurance coverage, and better access to specialty treatments. China's growth is expected to normalise after pandemic related volatility, while Latin America is projected to remain one of the faster growing regions. Japan, on the other hand, is likely to see a more subdued outlook due to recurring price revisions.

This regional divergence matters because it shows that while innovation and pricing power remain concentrated in the US and Europe, future demand growth is increasingly being driven by emerging markets, especially in Asia Pacific and Latin America.

Therapy areas shaping global spending

Over the next five years, the biggest increase in medicine spending is expected to come from oncology, diabetes and obesity, immunology, cardiovascular disease, and neurology.

Oncology remains the largest driver. Global spending in this area is projected to rise sharply by 2029, supported by continued launches of new therapies and broader use of treatment across more cancer types.

Diabetes and obesity are another major growth area, with GLP-1 and related therapies reshaping the market. These drugs have already become a significant part of diabetes spending, and their use in obesity is growing rapidly. If ongoing trials continue to show benefits in related conditions, this could further expand their market opportunity.

Immunology is still expected to grow, though at a more moderate pace, as higher usage is partly offset by pricing pressure from biosimilars.

Neurology could also see stronger growth than in the past, driven by wider adoption of new treatments for conditions such as Alzheimer's disease, migraine, and neuromuscular disorders.

Taken together, these therapy areas are likely to remain key drivers of global medicine spending, and they also highlight where biotech innovation is expected to stay most active in the years ahead.

The major categories of participants in the biotech ecosystem

The biotech sector covers a wide range of businesses, and each comes with a different risk and earnings profile.

Figure 4: Forecast of global medicine spending by region/country in 2029 (US$)

	Forecast spending in 2029	2025-2029 CAGR
Global	$2,365 - 2,395 billion	5 - 8%
North America	$1,200 - 1,230 billion	6 - 9%
Western Europe	$390 - 420 billion	4.5 - 7.5%
Asia Pacific	$120 - 125 billion	5 - 8%
Japan	$72 - 74 billion	-0.5 - 2.5%
Africa & Middle East	$68 - 72 billion	5 - 8%
Latin America	$126 - 130 billion	6 - 9%
Eastern Europe	$133 - 137 billion	7 - 10%
India	$40 - 44 billion	6.5 - 9.5%
China	$175 - 205 billion	1 - 4%

Source: IQVIA Institute

#1: Commercial biotech and biopharma innovators. At one end are commercial biotech and biopharma companies such as Eli Lilly, Amgen, Gilead, Vertex and Regeneron. These firms already have approved products and generate revenue from drug sales. Their performance depends on factors such as doctor adoption, reimbursement support, pricing power and competition.

#2: Diversified large pharma and healthcare leaders. A second group is large diversified pharma and healthcare companies such as Johnson & Johnson, Merck, AbbVie, Pfizer and Bristol Myers Squibb. These businesses tend to have broader portfolios across multiple therapy areas and markets, which can make earnings more stable. Investors often focus on how well they manage patent expiries, launch new products and sustain cash flow.

#3: The "picks-and-shovels" life-science enablers. A third bucket includes the "picks and shovels" providers such as Thermo Fisher Scientific and Danaher. These companies sell the tools, instruments, consumables and lab systems that support research, diagnostics and manufacturing. Rather than relying on the success of one specific drug, they benefit from broader growth in biotech and pharmaceutical R&D.

#4: The CROs and CDMOs. The fourth group is made up of CROs and CDMOs, which form an important part of the industry's operating backbone. CROs help drug companies run clinical trials, manage data and navigate the regulatory process. CDMOs support the development and manufacturing of drugs, especially as therapies become more complex.

Looking at biotech through these different buckets can help investors better understand how each business makes money, where the risks lie, and which valuation approach makes the most sense.

Medtech and device companies sit just outside these four buckets, at the intersection of biotech, surgery, and diagnostics.

Companies such as Intuitive Surgical, Boston Scientific, Stryker, Medtronic, and Abbott generate revenue as hospitals adopt their products and procedure volumes grow.

Many of these businesses also benefit from installed-base economics. Once a hospital adopts a platform, such as a robotic surgery system or a specialised implant range, it can lead to recurring revenue from disposables, consumables, servicing, and upgrades.

The biotech ecosystem in motion: From laboratory discovery to long-term cash flow

Biotech value creation does not end with a scientific breakthrough.

After a therapy is approved, companies still need to scale up manufacturing, secure reimbursement, educate doctors, and protect market share.

Figure 5: Main categories of participants in biotech ecosystem

Four core biotech buckets, with medtech adjacent				
Commercial biotech and biopharma innovators	**Diversified large pharma and healthcare leaders**	**Life-science tools and equipment providers**	**CRO and CDMO**	**Medtech and device companies**
Revenue from marketed products, supported by pipeline depth; growth driven by physician adoption, reimbursement durability and product exclusivity	Diversified portfolios across therapies and geographies; returns driven by cash-flow durability, lifecycle management and capital returns.	Sell instruments, consumables and services for R&D, diagnostics and manufacturing; benefit from broad research and capacity investment rather than single-drug outcomes.	Manage global clinical trials for sponsors; benefit from rising trial complexity and scale rather than individual drug outcomes. Provide complex biologics and cell-therapy manufacturing; benefit from capacity constraints and demand surges, but exposed to quality and regulatory risk.	Revenue driven by hospital adoption and procedure volumes; installed-base platforms support recurring disposables and upgrade sales.

Source: IQVIA, Beansprout analysis.

This is especially important in fast moving areas such as oncology, where new treatments can quickly replace older standards of care.

For investors, this means it is not enough to track scientific progress alone. Commercial execution, competition, and supply chain strength also matter.

In our view, the most durable biotech winners are usually those that combine strong science with manufacturing discipline, regulatory know-how, and diversified pipelines that reduce reliance on any single product.

Funding cycles and the role of sentiment

Biotech funding tends to be cyclical and closely tied to market sentiment and interest rates.

After peaking in 2021, venture funding and public market issuance fell sharply in 2022 and 2023 as rates rose and investors became more cautious. More recently, funding conditions have started to improve, but the recovery remains selective rather than broad based.

This matters because access to capital affects almost every part of the biotech sector, from trial activity and pipeline expansion to IPOs and follow on fundraising.

Earlier stage and pre revenue companies are usually the most vulnerable when funding tightens, while life science tools firms, CROs, and CDMOs tend to be more resilient because their revenues are linked more to overall R&D activity than to the success of any single drug.

IPO activity: selective reopening, higher quality bar

Recent biotech IPOs suggest public markets are reopening, but investors are being far more selective than they were in 2020 and 2021.

The companies that have listed successfully tend to share a few common traits: clearer clinical differentiation, stronger mid to late-stage data, large addressable markets, backing from specialist healthcare investors, and enough cash runway to reduce near term dilution risk.

The US remains the main market for innovative biotech listings, while Hong Kong continues to be Asia's key venue for pre revenue and clinical stage biotech companies under its specialist listing framework.

Although few Singapore-founded biotech firms have listed on SGX so far, a growing pipeline of companies and ecosystem support could help support future listings, whether on SGX or through dual listing routes.

Private funding and alternative capital pathways

Private markets are also becoming more disciplined and milestone-driven.

Venture investors are placing greater emphasis on capital efficiency, staged funding, and platform potential, rather than backing broad pipelines upfront.

As a result, more biotech companies are turning to alternative funding routes when IPO markets are less supportive. These include strategic partnerships and licensing deals with large pharmaceutical firms, programme specific financing, and convertible or structured funding that offers downside protection while preserving upside.

This has generally favoured companies with strong platforms, credible IP, and clear translational capabilities, while single asset companies with weaker differentiation have found fundraising more difficult.

Recent biotech IPOs

Over the past year, biotech IPO activity has started to recover, but the market remains highly selective.

Larger deals such as Jiangsu Hengrui Pharmaceuticals (May 2025) in Hong Kong raising about US$1.27bn (HK$9.89bn), LB Pharmaceuticals on Nasdaq (Sept 2025)

raising US$285m, and Insilico Medicine in Hong Kong (Dec 2025) raising HK$2.277bn (~US$290m) suggest that public markets are open again, but mainly for companies with stronger pipelines, clearer differentiation, and better funding visibility.

Looking ahead, the IPO pipeline is increasingly centred on more de-risked, mid- to late-stage biotech stories.

Recent names such as Aktis Oncology and Eikon Therapeutics suggest investor appetite is returning for companies with more mature pipelines, stronger clinical data, and clearer funding needs.

More broadly, this points to a 2026 issuance environment that is likely to favour higher-quality biotech names, especially in areas such as cancer, obesity, precision medicine, and respiratory diseases.

Expected trends going forward

Looking ahead, biotech capital markets are likely to remain selective rather than returning to the broad enthusiasm seen in earlier cycles.

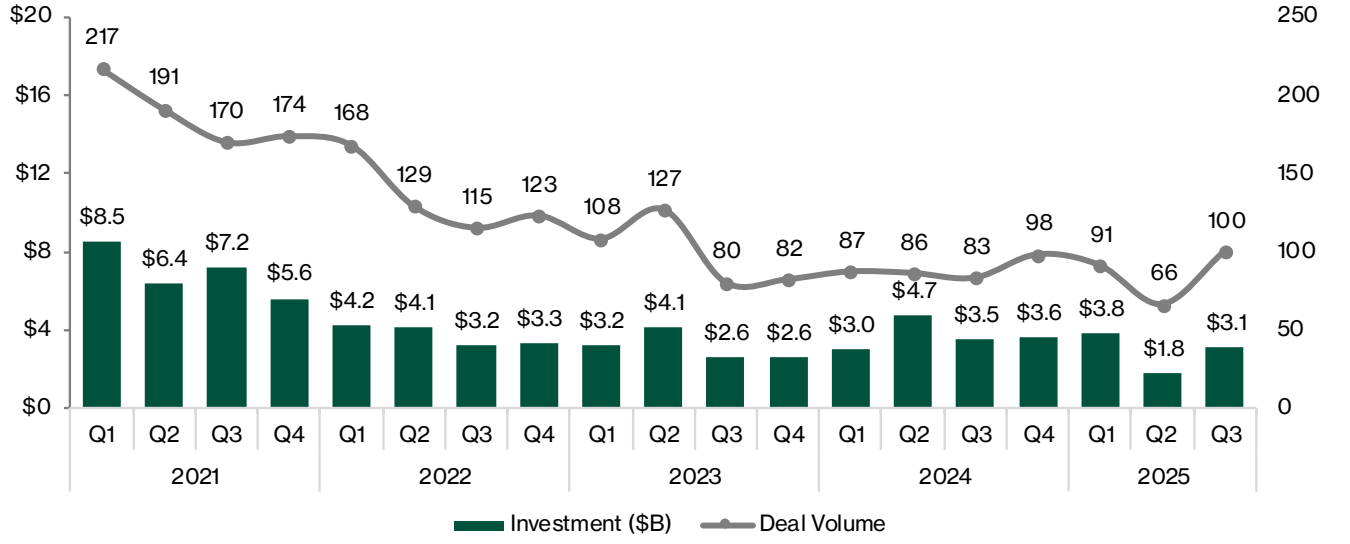
Investors are still favouring later stage and more de-risked companies, with greater focus on scientific quality, clinical execution, and capital discipline rather than pipeline size alone.

At the same time, M&A and partnership activity could increase as large pharmaceutical companies look externally for innovation to offset patent expiries and replenish their pipelines.

IPO markets may continue to reopen gradually, but likely for companies with differentiated platforms and clearer regulatory pathways, rather than early-stage concept driven stories.

Over the longer term, the sector's growth outlook remains supported by ageing populations, rising healthcare spending, and ongoing scientific advances. But because the path to value creation can still be uneven, funding conditions, investor sentiment, and business model quality will remain important factors for investors to watch.

Figure 6: Total global biotech venture financing deal volume and deal value (1Q2021 to 3Q2025)



Source: GlobalData, Pharma Intelligence Centre, Deals Database (as of 9 October 2025)

Note: Data includes announced and completed venture financing deals that involve companies headquartered globally with at least one biologic drug tagged to the deal, were announced between January 1, 2021 and September 30, 2025, and have a dear value that has been publicly disclosed.

Short-term cyclical drivers: rates, risk appetite and capital access

In the short term, biotech performance is still heavily influenced by the broader market environment.

Factors such as interest rates, investor risk appetite, and access to funding can all drive sharp swings in sentiment, especially for earlier stage companies whose earnings are still far in the future.

Funding conditions also matter because they affect when companies can go public, raise follow on capital, or expand their pipelines and clinical trials.

Medium- to long-term demand trends remain strong

Despite these shorter-term swings, the medium to long term outlook for biotechnology remains strong.

IQVIA expects global medicine spending to reach about US$2.4 trillion by 2029, with biotech and specialty medicines making up an even larger share of total spending.

At the same time, medicine use per person globally is expected to stay broadly flat. This suggests future growth will be driven less by volume and more by innovation, as higher value therapies reach the right patients.

Structural cost pressures and evolving reimbursement models

Cost pressures are becoming a more lasting challenge for biotech.

Biosimilar competition is putting ongoing pressure on pricing in several mature biologic categories, while payers are becoming stricter on value assessment and increasingly asking for stronger real-world evidence before approving reimbursement.

At the same time, governments and health agencies are placing more emphasis on antimicrobial stewardship and vaccination coverage, which could also shape long term demand patterns in infectious diseases.

Innovation trends shaping the next decade

Biotechnology is entering a new phase of innovation, driven by several powerful trends at the same time.

Oncology remains the biggest focus area, with new treatments such as immunotherapies, antibody-drug conjugates, and precision medicines expanding across more cancer types and moving into earlier lines of treatment.

Rare diseases are also attracting strong interest, as many have clear genetic causes and high unmet need, making them suitable for gene and cell therapies.

At the same time, platforms such as gene therapy, cell therapy, and mRNA are maturing, with more approved products and a growing late-stage pipeline.

In immunology, competition is increasing as new treatment mechanisms emerge and biosimilars widen access to existing therapies, although this also puts pressure on pricing.

AI is also becoming more important, helping companies identify drug targets, design molecules, and improve clinical trial planning.

Finally, technologies developed during the pandemic, such as mRNA vaccines and viral vectors, are now being applied beyond Covid-19, including in RSV, influenza, and even cancer vaccines.

Taken together, these trends suggest biotech is moving into a decade of broader innovation, with multiple treatment approaches competing and coexisting across major disease areas.

Asia-Pacific and Singapore: An emerging biotech innovation hub

APAC and Singapore rising as centres for advanced therapeutics

Beyond the US and Europe, Asia-Pacific is increasingly emerging as an important biotech hub.

The region is seeing rising activity in areas such as mRNA, cell and gene therapies, antibody-drug conjugates, and AI-enabled drug discovery.

Global pharmaceutical companies are also expanding their presence in Asia-Pacific, not just to run cost-efficient clinical trials, but also to tap into new science and build next-generation platforms.

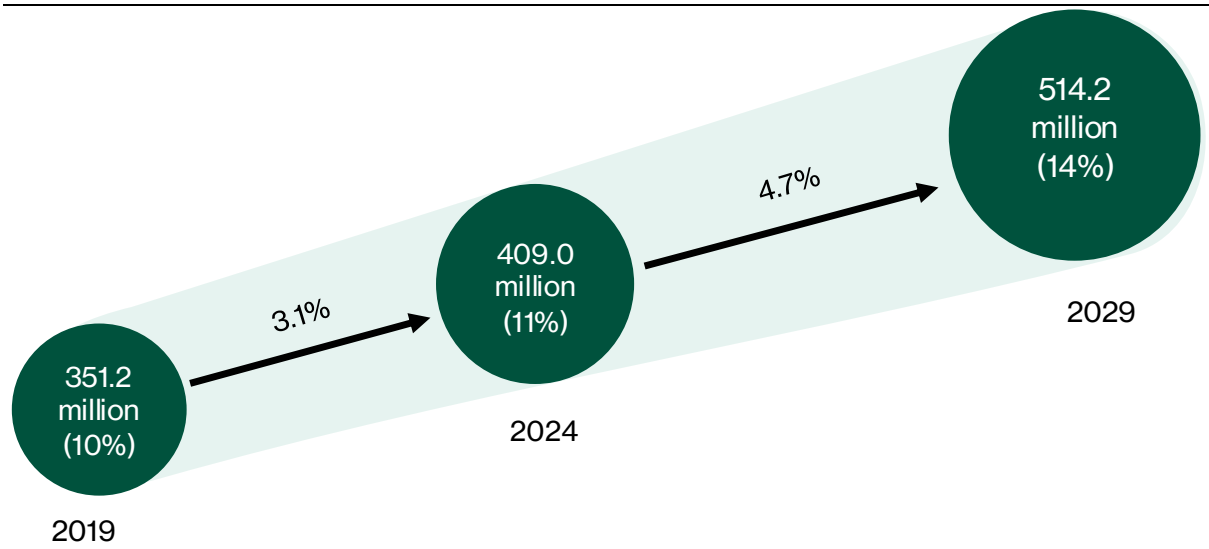
Funding patterns have also shifted. Since 2019, early-stage biotech funding has become more selective, while later-stage growth rounds have gained more traction. This suggests investors are becoming more focused on companies with stronger clinical proof points and clearer commercial potential.

The long-term opportunity is also supported by demographics. Asia's ageing population is growing rapidly, which is likely to increase the burden of chronic disease and create a larger structural market for biotech solutions across the region.

Across a dozen key Asian markets, the 65+ population is expected to grow at close to 4.7% per year through 2029, underlining the scale and persistence of demand for healthcare innovation in the region.

Geopolitics is also becoming more important in shaping the regional biotech landscape.

Figure 7: Population aged 65+ years in the 12 Asian markets is expected to grow 4.7% annually until 2029



Source: Economics Intelligence Unit (EIU)

Notes: Bubble represents the 65+ population and its % share of overall population. Markets included are China, Hong Kong, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam

As US-China tensions persist and supply chains are reconfigured, global pharmaceutical companies are looking to diversify R&D and manufacturing away from overly concentrated geographies. This is creating opportunities for markets such as Singapore, South Korea, Japan and Australia to play a larger role in the biotech value chain.

Within this regional shift, Singapore stands out as one of the most attractive biotech hubs in Asia.

Its strength rests on four key pillars.

- First, long term R&D support through successive Research, Innovation and Enterprise plans has provided steady backing for biomedical sciences, AI, translational medicine and advanced therapeutics.
- Second, Singapore offers political stability, strong rule of law and a trusted intellectual property regime, giving multinational companies greater certainty in a fragmented geopolitical environment.
- Third, the country has built a strong biopharma manufacturing base, with more than 60 facilities and a meaningful role in global pharmaceutical production.
- Finally, its dense translational research ecosystem, spanning A*STAR, EDDC, ACTRIS, DxD Hub, NUS, NTU and Duke-NUS, supports the journey from early research to clinical development.

These advantages are also visible on the ground. Clusters such as Biopolis and Tuas Biomedical Park host research labs, manufacturing facilities and regional headquarters for major pharma and medtech companies.

Collaborations between A*STAR, industry and academia have also produced tangible results, highlighting Singapore's ability to translate scientific research into real clinical opportunities.

Singapore-origin companies demonstrating global ambition

A growing group of Singapore-founded biotech companies shows how the local ecosystem is moving beyond its traditional role in research support, clinical trials, and manufacturing.

These companies are increasingly building globally relevant platforms across therapeutics, diagnostics, medtech, and AI-enabled healthcare, with many designed from the outset for international markets.

What stands out is that they are not just serving as enablers within the biotech value chain, but are beginning to create their own intellectual property, attract global capital and partnerships, and compete in end markets beyond Singapore.

Examples of Singapore private biotech companies

Hummingbird Bioscience reflects Singapore's growing role in advanced therapeutic discovery. What began as a local biotech focused on antibody design has developed into a globally integrated therapeutics company targeting disease pathways that were once considered difficult to treat.

Its platform has already attracted partnerships with major pharmaceutical companies such as Merck and Amgen, highlighting the commercial potential of Singapore-origin science.

In 2024, Hummingbird also spun off its antibody-drug conjugate platform into Callio Therapeutics, which raised US$187 million in Series A funding. This was one of the largest early-stage fundraisings for a Singapore-linked biotech, and a strong sign of continued global investor interest.

Respiree is an example of how Singapore's strengths in medtech and digital health are coming together. An A*STAR spin-off, the company combines wearable sensors, software and AI to support continuous cardio-respiratory monitoring.

Its FDA-cleared and CE-marked devices are already being piloted with hospitals in Singapore and overseas, helping to improve chronic disease management, detect deterioration earlier, and support more efficient clinical workflows.

This is especially relevant in Asia, where ageing populations and healthcare workforce constraints are creating growing demand for solutions that can support care delivery more effectively.

Nuevocor highlights Singapore's growing presence in next-generation genetic medicines. The company focuses on inherited heart muscle diseases and uses its PrOSIA mechanobiology platform to develop gene-based therapies for conditions such as LMNA-related dilated cardiomyopathy.

With its lead programmes moving towards early clinical development in major markets, Nuevocor also shows that Singapore's biotech ecosystem is increasingly able to support science-intensive and capital-heavy therapeutic platforms that require deep translational research and engagement with global regulators.

Tessa Therapeutics is one of Singapore's leading cell therapy companies, focused on next generation T-cell treatments for cancer.

Its approach aims to improve the persistence, precision and effectiveness of engineered T-cells, helping to address some of the limitations seen in earlier cell therapies.

Tessa has already advanced several programmes into clinical development and raised substantial private funding along the way, reflecting both the scientific potential and the capital-intensive nature of the cell therapy space.

Its progress also highlights Singapore's ability to support more complex therapeutic platforms that require advanced manufacturing and deep scientific capabilities.

Tychan is another example of a platform-driven biotech, focused on fully human monoclonal antibodies for infectious diseases. Its strength lies in speed — using a proprietary platform to identify, optimise and move antibody candidates into early clinical testing quickly.

This positions Tychan well in infectious disease preparedness, where the ability to respond rapidly can be just as important as developing any single product.

Engine Biosciences reflects the growing overlap between AI, computational biology and lab-based validation within Singapore's biotech ecosystem.

Rather than focusing only on improving existing molecules, the company uses its platform to identify previously overlooked biological targets, especially in cancer and other complex diseases.

This fits with the broader shift towards data-driven drug discovery, while also drawing on Singapore's strengths in biomedical research, data science and high-performance computing.

Examples of listed Singapore biotech companies

UltraGreen.ai is an example of how a Singapore-based company can grow into a global medtech player.

Now listed on the SGX Mainboard, the company supplies indocyanine green, or ICG, a dye that helps surgeons visualise blood flow more clearly during operations. It also provides imaging systems used in operating rooms.

UltraGreen says it has a significant share of the global ICG market and has installed more than 1,000 imaging systems worldwide.

Its PerfusionWorks software adds another layer by helping to turn what surgeons see on screen into clearer measurements, which can support better decision-making during surgery.

By combining dye sales with equipment and software, the company also has the potential to generate more recurring income as hospitals continue using its platform.

Among the more established names, Hong Kong-listed **Mirxes** shows how Singapore-based innovation can scale across the region.

Founded in Singapore, Mirxes has grown into a leading molecular diagnostics company. Its flagship product, GASTROClear, is a gastric cancer screening test built on proprietary microRNA technology, and it has completed a large clinical study involving more than 9,000 patients in China.

This gives Mirxes exposure to a large long-term opportunity in early cancer detection across Asia, where screening rates remain relatively low but healthcare demand is rising.

Beyond these globally oriented platforms, Singapore's listed healthcare sector also includes companies with more commercial-stage business models in pharmaceuticals, medtech distribution, and healthcare services, helping to anchor the ecosystem with more recurring revenue and operational scale.

iX Biopharma focuses on peptide-based drugs using proprietary oral thin-film delivery technology, offering a platform approach to improving bioavailability and patient compliance.

Hyphens Pharma International operates across generic and specialty pharmaceutical distribution and manufacturing, providing stable cash-flow exposure to healthcare consumption.

AJJ Medtech Holdings supplies medical devices and integrated diagnostic and imaging solutions, benefiting from hospital capital-expenditure and digitalisation trends.

ISEC Healthcare represents a hybrid model combining healthcare services with medtech-enabled delivery, reflecting the increasing convergence between care provision and technology.

APAC financing dynamics

Singapore: Emerging ecosystem with SGX & Nasdaq linkage

Singapore's biotech ecosystem has long had a strong early-stage base, supported by government R&D spending, translational research platforms, and biomanufacturing capabilities.

But compared with larger Asia-Pacific markets, fewer Singapore-origin biotech companies have listed at home.

That could gradually change.

SGX has been working on regulatory enhancements and a proposed SGX-Nasdaq dual-listing link, which could help reduce friction for growth biotech companies seeking to list and broaden access to both local and international investors.

Hong Kong: Chapter 18A as a listing anchor

Hong Kong has become Asia's leading biotech IPO market for pre-revenue and clinical-stage companies, helped by its Chapter 18A listing regime.

Since its launch, more than 70 biotech and medtech companies have listed under this framework, raising billions of US dollars in total. The market has been driven largely by Chinese biotech firms, but it has also attracted companies from Singapore, Korea and elsewhere in the region.

China: Venture + public depth

Mainland China remains a major source of biotech venture and crossover capital.

Local VC and private equity firms continue to fund a large number of early-stage biotech companies, while domestic exchanges such as Shenzhen and Shanghai's STAR Market provide public-market exit routes earlier in the development cycle.

This allows Chinese biotech companies to access funding even before reaching the stage typically required for a US IPO.

Japan & Korea: Later-stage and strategic players

Japan and South Korea have generally taken a more conservative approach to early-stage biotech listings.

In both markets, public listings have tended to skew towards later-stage biotech companies, commercial-stage names, and medtech or equipment businesses rather than earlier clinical-stage stories.

Investor participation also tends to be more cautious, with institutional and insurance capital often favouring businesses with more stable cash flows over those with higher binary risk.

Structural drivers shaping APAC funding flows

Government & policy support

Across APAC, public policy plays a significant role:

- China emphasizes innovation via capital markets and supportive regulation.
- Hong Kong purpose-built biotech listing regime.
- Singapore invests in translational platforms, co-innovation funds and ecosystem builders.

Investor sentiment & risk appetite

Biotech remains highly sentiment-sensitive:

- Risk-off periods narrow IPO windows and extend private rounds.
- Risk-on periods expand follow-ons and secondary offerings.
- Tools, CROs, CDMOs benefit from sectorwide R&D budgets independent of individual drug outcomes.

What this means for Singapore's biotech cluster

Taken together, these companies highlight how Singapore's biotech ecosystem is evolving.

Platform-based models are becoming more common, helping reduce reliance on any single asset. Many companies are also global from the outset, targeting international markets, partnerships and regulatory pathways rather than depending on domestic demand alone.

At the same time, the ecosystem is moving up the value chain, supporting more complex and capital-intensive areas such as cell therapy, biologics and AI-enabled discovery.

This suggests Singapore is no longer just a cost-efficient base for trials or manufacturing, but is increasingly developing into a regional innovation hub for diagnostics, therapeutics, medtech and digital health.

Implications for investors

For investors, this next wave of Singapore-based private biotech companies is also a reminder that returns in the sector often depend on funding cycles.

Figure 8: Biotech listing comparison

Feature	SGX (Singapore)	HKEx (Hong Kong)	Nasdaq (US)
Typical biotech stage	Later-stage, medtech, services; emerging biotech	Pre-revenue to Phase II (18A*)	Phase IIb–III, platform leaders
Pre-revenue listing allowed?	Limited / selective	Yes (Chapter 18A)	Yes, but market-driven
Specialist investor depth	Developing	Strong Asia-focused funds	Deepest global pool
Liquidity & research coverage	Moderate	Improving	High
Valuation tolerance for risk	Conservative	Moderate–High	High for differentiated assets
Typical exit path	SGX or dual listing	Primary HK listing	Primary US listing
Key strength	Stability, governance, hub role	Early-stage access in Asia	Scale, liquidity, valuation
Key constraint	Narrow biotech investor base	Volatility, China sentiment	High bar on data quality

**HKEX Chapter 18A Listing Framework allows for pre-revenue and clinical-stage biotech listings.*

Source: SGX, HKEx, Nasdaq, Beansprout analysis

More capital-intensive areas such as cell therapy and biologics tend to progress faster when funding is abundant. When capital markets tighten, companies are more likely to rely on strategic partnerships, licensing deals or milestone-based funding rather than pushing for an IPO quickly.

As conditions improve, the companies most likely to access public markets are usually those with differentiated platforms, credible clinical data and clearer regulatory paths.

In this context, Singapore's role as translational research and biomanufacturing hub matters. It increases the chance that strong private biotech companies become attractive partners or acquisition targets for global pharma and listed biotech firms.

For investors, that means exposure to Singapore's biotech growth story may come not just through future IPOs, but also through partnerships, M&A activity and the longer-term optionality of overseas listings.

A practical valuation framework

Approaches to valuing biotech across development stages

Interpreting clinical trials

Clinical trial results are among the biggest share price catalysts in biotech, but investors do not need medical training to assess them.

A useful starting point is whether the trial is measuring outcomes that truly matter.

The key question is not just whether the result is statistically significant, but whether it leads to better outcomes for patients, such as longer survival, fewer hospital visits, or improved quality of life.

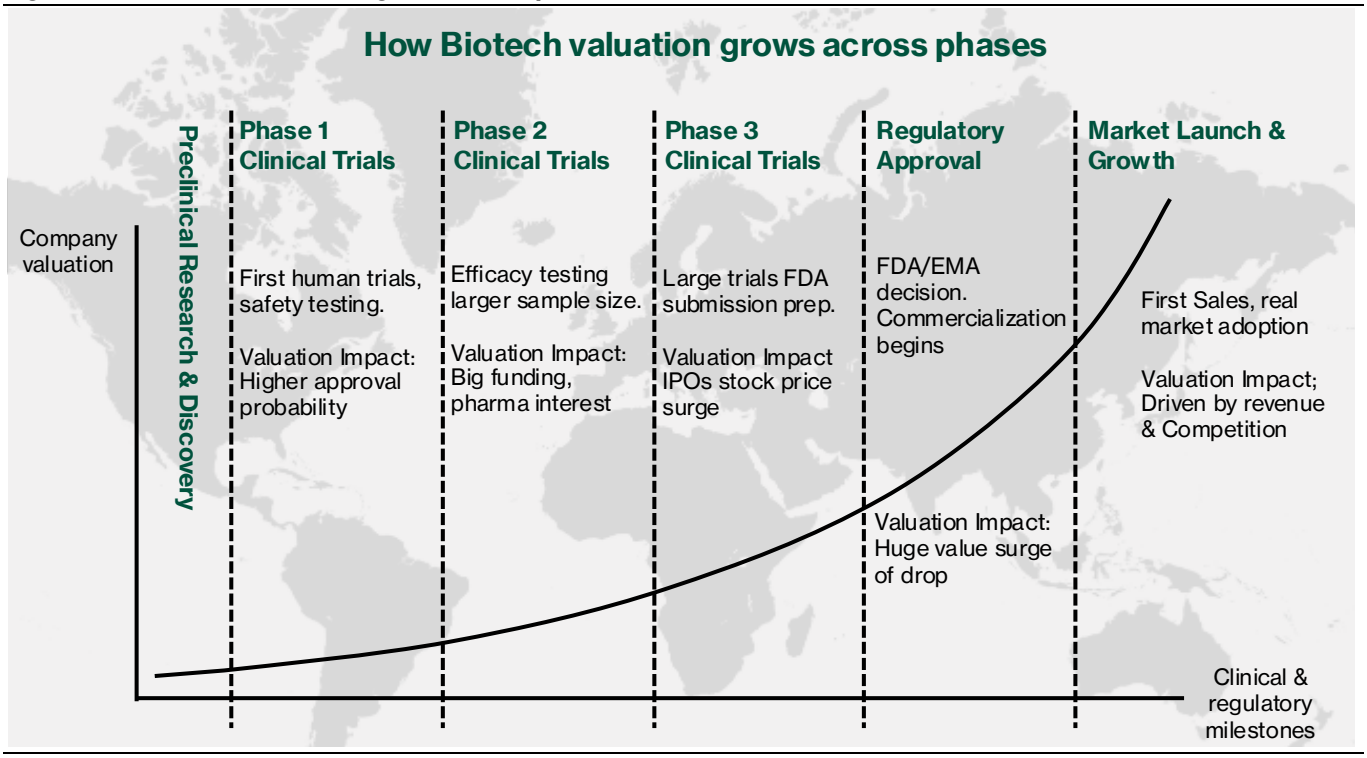
Safety is just as important. A treatment may show strong efficacy, but serious side effects or complex monitoring requirements can limit how widely it is used in practice.

Investors should also look at the competitive landscape. Trial results need to be judged against existing treatments to see whether the new therapy offers clear advantages. In crowded areas such as cancer or autoimmune disease, a small improvement may not be enough to support premium pricing or broad adoption.

Finally, execution and timing matter. Promising trial data does not always translate into commercial success if regulatory, manufacturing or launch challenges delay approval or slow adoption.

Investor expectations also matter. Even positive results can disappoint if the market had priced in an even stronger outcome.

Figure 9: How biotech valuation grows across phases



Source: Finro Financial Consulting

For biotech investors, this means balancing excitement around scientific progress with a realistic view of timing, competition and the likelihood of success.

How to value companies in the biotech sector

Valuing biotech companies is often very different from valuing traditional businesses, because revenue, profits and even product visibility can vary widely depending on where a company is in its development cycle.

Unlike consumer or industrial firms, which often have steadier cash flows and more predictable demand, biotech valuations are usually driven by clinical milestones, regulatory outcomes and the pace of commercial adoption.

For investors, this makes it especially important to use the right valuation framework for the right type of biotech business.

1. Early-stage / pre-revenue biotechs: probability-based valuations

For early stage biotechs, valuation is usually based less on current revenue and more on future potential.

- **One common approach is risk adjusted net present value,** where investors estimate the future sales of each drug candidate, apply a probability of success based on its development stage, and then discount those cash flows back to today. This reflects the binary nature of biotech, where one clinical result can sharply change a company's value.
- **Investors also look at comparable transactions**, such as licensing deals, partnerships or acquisitions involving similar assets, to get a sense of what the market may pay for a company at a similar stage.
- **Some companies can also command a platform premium.** These are businesses with broader technologies, such as AI driven drug discovery, novel antibody platforms or gene editing tools, where the value lies not just in one product but in the potential of the wider platform.

2. Clinical-stage biotechs: Data, timelines and market size drive valuation

Once a biotech company enters human trials, valuation becomes more sensitive to clinical progress and commercial potential.

At this stage, investors focus on whether the data is strong enough to move the drug closer to approval, and whether the market opportunity is large enough to justify that value.

Valuations are still often based on risk-adjusted models, but with higher probabilities of success as the drug advances through Phase 2 or Phase 3.

Investors also pay more attention to market size, likely pricing, reimbursement support, competitive positioning, and how much funding the company has to get through late-stage trials and launch.

This is why biotech share prices can move sharply on clinical data.

A single late-stage trial result can significantly raise or reduce valuation, depending on how it changes the market's view of approval odds and commercial potential.

3. Commercial-stage biotechs: Valuation starts to resemble traditional pharma

Once a biotech company has an approved product, investors can start valuing it more like a traditional business.

At this stage, common metrics include price-to-earnings, EV/EBITDA, EV/sales, and free cash flow yield, depending on how mature the business is. For faster growing companies, EV/sales may still matter more if profits are being held back by heavy R&D spending. Investors also tend to look closely at the quality of earnings, to see whether profits are supported by the core business or distorted by one-off items.

That said, commercial-stage biotech is not risk free.

Many companies still rely heavily on one or two blockbuster products, which means any concern around competition, safety, or patent expiry can have an outsized impact on valuation.

Biosimilars are another key risk, especially for mature biologic drugs, as they can put pressure on pricing and sales over time.

On top of that, reimbursement and pricing decisions by healthcare payers, especially in markets such as Europe and Japan, can also materially affect growth expectations.

This means a biotech stock may look cheap on headline earnings or dividend yield, but still struggle to create long term value if its next generation of products is not strong enough to offset declines in its older portfolio.

4. Life-science tools, CROs and CDMOs: more predictable, cash-flow driven valuations

Unlike drug developers, these companies make money by providing the tools and services that support the biotech industry. This includes life science tools firms such as Thermo Fisher and Danaher, CROs such as IQVIA and ICON, and CDMOs such as Lonza, Catalent and Samsung Biologics.

Because their earnings are generally more predictable than early-stage biotech, they are often valued using EV/EBITDA, EV/sales, P/E, and free cash flow yield. For CDMOs in particular, revenue growth and capacity utilisation are also important.

That said, these businesses are not completely defensive. When biotech funding weakens, smaller companies may cut lab spending or delay development work, which can reduce demand for CRO and CDMO services in the short term even if long term industry demand remains intact.

5. Medtech and diagnostics: installed base and recurring revenue matter

Medtech companies such as Intuitive Surgical and Boston Scientific are usually valued based on procedure growth, how widely their platforms are adopted, the strength of recurring consumables revenue, and future product upgrade cycles.

Because earnings for established medtech businesses are generally more predictable than for drug developers, investors often value them using P/E and EV/EBITDA multiples.

In general, slower growing device companies tend to trade at lower valuation ranges (e.g. 15–25x forward P/E or ~10–16x EV/EBITDA), while higher quality franchises with stronger growth, recurring revenue, and consistent innovation can command higher multiples (e.g. ~25–40x forward P/E or ~16–25x EV/EBITDA).

Companies with especially strong confidence in long term procedure growth and installed-base expansion may trade at premium valuations in stronger market environments.

One example is **UltraGreen.ai**, with a procedure-linked consumables component (ICG dye) and a software layer, it is currently trading at 19.5x forward P/E and 13.4x EV/EBITDA.

Figure 10: IPO readiness by lifecycle stage

Lifecycle stage	IPO readiness	Typical outcome
Pre-clinical / Discovery	Low	Private funding, partnerships
Phase I–II	Moderate	Selective IPOs, usually discounted
Phase IIb–III	High	Most attractive IPO window
Commercial	Very High	Broad investor base, earnings-led valuation

Source: Company data, Beansprout analysis

That said, even high quality medtech companies can face periods of softer growth. Hospital budget constraints, staffing shortages, and changes in elective procedure volumes can all affect demand, even when the underlying technology remains strong.

Current market appetite

Investor sentiment towards biotech has improved heading into early 2026, but the recovery remains selective.

Biotech stocks have regained momentum, yet the IPO market is still reopening cautiously. In the US, only 10 biotechs went public in 2025

Figure 11: Valuation table of global biotech companies

Symbol	Name	Category	Market Cap (USD billions)	P/E	Div Yield %	Perf % 1YR
LLY	Eli Lilly and Company	Large Pharma / Biopharma	825.8	25.3	0.8%	-0.6%
JNJ	Johnson & Johnson	Diversified Healthcare (Pharma + MedTech + Consumer)	548.3	19.7	2.3%	49.4%
ABBV	AbbVie, Inc.	Large Pharma / Biopharma	349.7	14.0	3.5%	5.6%
MRK	Merck & Co., Inc.	Large Pharma / Biopharma	271.8	21.6	2.9%	33.8%
ABT	Abbott Laboratories	Diversified Healthcare / MedTech & Diagnostics	163.5	17.1	2.6%	-26.2%
TMO	Thermo Fisher Scientific Inc.	Life-Science Tools & Services / Lab Systems	174.7	18.9	0.4%	10.4%
ISRG	Intuitive Surgical, Inc.	MedTech / Surgical Devices	165.3	45.1	0.0%	-9.4%
AMGN	Amgen Inc.	Large Pharma / Biopharma	183.3	15.2	3.0%	21.0%
DHR	Danaher Corporation	Diversified Life-Sciences & Equipment	126.7	21.2	0.8%	-9.3%
GILD	Gilead Sciences, Inc.	Large Pharma / Biopharma	160.4	15.1	2.5%	27.1%
BSX	Boston Scientific Corporation	MedTech / Medical Devices	86.9	17.3	0.0%	-43.1%
PFE	Pfizer Inc.	Large Pharma / Biopharma	150.6	8.9	6.6%	18.5%
SYK	Stryker Corporation	MedTech / Medical Devices	123.1	21.4	1.1%	-12.4%
MDT	Medtronic Plc	MedTech / Medical Devices	105.2	14.8	3.4%	0.2%
VRTX	Vertex Pharmaceuticals Incorporated	Biopharma / Specialty Pharma	109.4	22.4	0.0%	-14.6%
BMY	Bristol-Myers Squibb Company	Large Pharma / Biopharma	119.0	9.3	4.3%	23.4%
REGN	Regeneron Pharmaceuticals, Inc.	Biopharma / Specialty Pharma	76.0	16.0	0.4%	29.3%
IQV	IQVIA Holdings Inc	CRO / Clinical Services	27.0	12.5	0.0%	3.6%
ICLR	ICON Plc	CRO / Clinical Services	7.8	7.9	0.0%	-31.4%
4519-JP	Chugai Pharmaceutical Co., Ltd.	Large Biopharma (Japan)	83.5	25.7	1.7%	-8.4%
4502-JP	Takeda Pharmaceutical Co. Ltd.	Large Pharma / Specialty Pharma	52.7	37.5	3.8%	14.3%
4568-JP	Daiichi Sankyo Company, Ltd	Innovative Biopharma (Oncology)	31.4	13.7	3.4%	-30.5%
068270-KR	Celltrion, Inc.	Biopharma / Biosimilars	30.7	32.7	0.4%	26.6%
326030-KR	SK Biopharmaceuticals Co., Ltd.	Specialty Biopharma (CNS)	5.4	30.6	0.0%	-6.7%
207940-KR	SAMSUNG BIOLOGICS Co., Ltd.	CDMO / Biologics Manufacturing	46.3	35.9	0.0%	-7.3%
2269-HK	Wuxi Biologics (Cayman) Inc.	CDMO / Biologics Manufacturing	17.9	22.2	0.0%	45.6%
2359-HK	WuXi AppTec Co., Ltd. Class H	CRDMO / Drug Discovery & Manufacturing	49.2	20.2	1.5%	126.8%
1276-HK	Jiangsu Hengrui Pharmaceuticals Co., Ltd. Class H	Innovative Biopharma (China)	53.5	40.8	0.5%	19.1%
2629-HK	Mirxes Holding Company	Molecular Diagnostics / Precision Medicine	0.5	n.a.	n.a.	-58.7%
ULG-SG	UltraGreen.ai Limited	MedTech / Surgical Imaging & AI	1.5	17.6	0.0%	-8.6%
1J5-SG	Hyphens Pharma International.	Pharma Distribution & Specialty Pharma	0.08	18.5	447.8%	31.2%
40T-SG	ISEC Healthcare Ltd	Healthcare Services (Specialist Care)	0.15	14.5	184.1%	-3.4%
584-SG	AJJ Medtech Holdings Limited	MedTech / Devices & Diagnostics Distribution	0.01	n.a.	0.0%	207.4%
42C-SG	iX Biopharma Ltd.	Biotech / Drug Delivery Platform	0.30	n.a.	0.0%	1795.6%
8YY-SG	Embracing Future Holdings	Healthcare Equipment & Services	0.07	n.a.	0.0%	148.8%

Source: Factset, as of 28 Apr 2026

Note: Jiangsu Hengrui Pharmaceuticals, Mirxes, UltraGreen's performance are measured from first trading day.

compared with 26 in 2024, according to Dealogic data cited by Reuters, and aftermarket performance has been mixed.

Compared with the broader healthcare sector, biotech remains the more risk-on part of the market. Healthcare stocks generally hold up better through cycles because their cash flows are more defensive, while biotech tends to be more sensitive to interest rates, funding conditions and shifts in investor sentiment.

Over the past 12 months, biotech has outperformed both broader healthcare and the wider market, but it has also been more volatile. This rebound has been helped by easing rate expectations, clearer policy and regulatory signals, and a pickup in M&A activity that has supported valuations.

Even so, the funding window remains narrow. Investors are showing a clear preference for quality, with the strongest demand going to companies that have later stage pipelines, positive clinical data and clearer commercial potential, particularly in areas such as cancer, obesity-related therapies, precision medicine and respiratory disease. Earlier stage concept-driven stories are still finding it much harder to attract capital.

Key risks and challenges

Understanding scientific, regulatory and commercial risks

Clinical risk

Biotechnology carries a set of inherent risks that distinguish it from many other industries. Clinical risk is fundamental: therapies may fail to demonstrate sufficient efficacy, or unexpected safety signals may emerge at any stage of development. Even late-stage programmes can be derailed by unfavourable trial outcomes or adverse events.

Regulatory risk

Regulatory uncertainty remains significant, especially for novel modalities such as gene editing, cell therapies and RNA-based platforms where guidelines, review standards and precedents are still evolving. Shifts in regulatory expectations or additional data requirements can delay approvals or increase development costs.

Manufacturing and supply-chain risk

Manufacturing and supply-chain challenges are elevated for biologics, cell therapies and other complex modalities that rely on precise process controls, cold-chain logistics or highly specialised facilities. Any disruption – technical, quality-related or logistical – can materially affect timelines and commercial viability.

Competitive risk

Competition is intense across many therapeutic areas. In oncology, immunology and metabolic disease, multiple companies may target similar mechanisms of action. A competitor's positive clinical data can quickly alter perceptions of relative value, while the entry of generics or biosimilars can compress pricing and margins for established products.

Policy and reimbursement risk

Pricing pressure from governments and payers is an increasingly important factor. Policies designed to manage healthcare affordability can limit reimbursement, reduce launch prices or restrict patient access – all of which can affect peak-sales expectations and valuation.

Funding risk (especially for early-stage companies)

For early-stage companies, funding risk is particularly acute, especially in risk-off market conditions when capital becomes scarce and investors favour shorter paths to profitability. Access to capital markets can deteriorate rapidly, creating pressure to reprioritise pipelines or delay programmes.

Expectation risk

Expectation risk is often underestimated. Even objectively positive results may lead to share-price declines if the market had anticipated stronger efficacy, broader indications, faster adoption curves or more favourable commercial assumptions. Managing investor expectations is therefore critical.

Disclosure Appendix

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