Pharma Licensing of the Future

EY Parthenon

Building a better working world

Content

1 Introduction – licensing in the pharmaceutical industry

Innovation is crucial to succeed in the life sciences arena. It is an essential factor for pharmaceutical and biotechnology companies to grow, medical doctors to cover unmet patient needs and patients to receive effective and innovative treatments. While innovation is key, it is often also an expensive and increasingly complex endeavor for players of all sizes.

In response to current challenges, pharmaceutical companies are increasingly turning to external innovation to gain access to new technologies and therapies, broadening their innovation horizon beyond their in-house R&D. This allows pharmaceutical companies to access developments from innovators and scientific teams located anywhere in the world. At the same time, this type of collaboration and partnering can open avenues of growth for small and mid-size innovators as well. It allows them to secure capital, capabilities, or access to continue their developments, introduce products to markets where they might not have a footprint, and strengthen their growth, to name a few benefits.

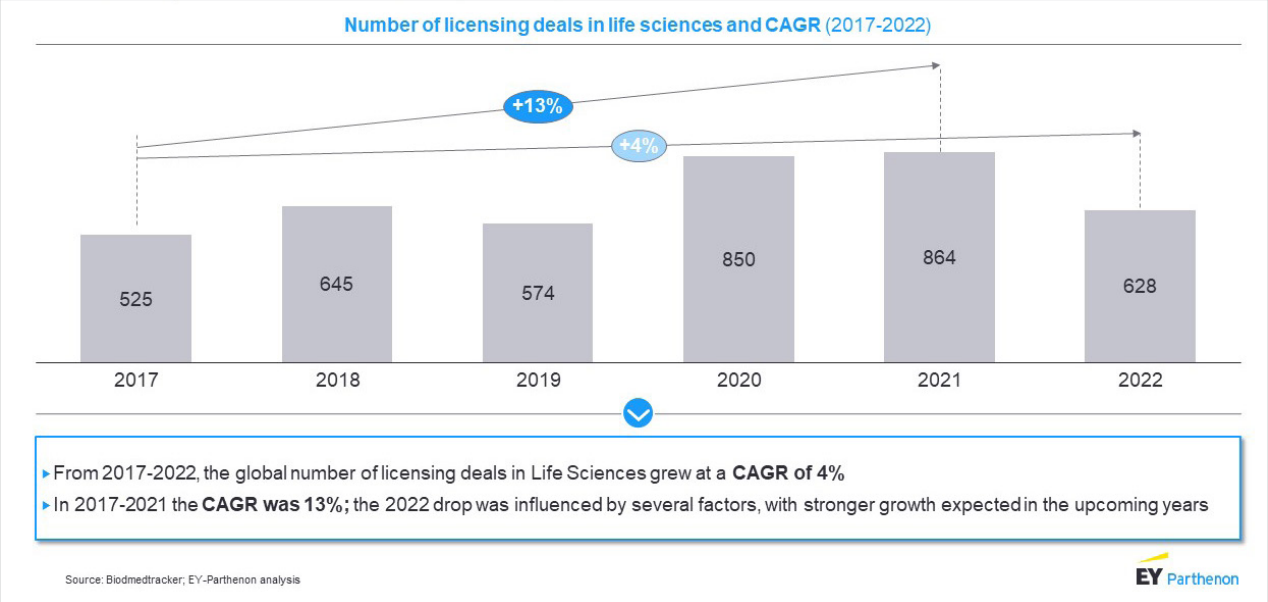
In a time where technology is advancing at an unprecedented pace, innovation speed is imperative for life science firms. Nevertheless, the current world economic situation, inflation, increasing regulation in the pharmaceutical industry, among other challenges, are hampering the ability and willingness of pharmaceutical companies and investors to embark into large deal-making.

In this complex environment, exploring investment options that could carry lower risk profiles, while enabling growth and access to external innovation is becoming key for life science players. This has been echoed by various recent public statements of Pharma leaders, who have acknowledged licensing as one of their key growth drivers, stating it enables them to grow their pipeline, while keeping risks low. We can observe that engaging into licensing deals seems to be becoming an increasingly attractive tool to access innovation.

Licensing deals in the life sciences industry enable the establishment of agreements that grant the licensee (party in-licensing) the right to use Intellectual Property (IP) developed/ owned by the licensor (party out-licensing) to develop, manufacture and/ or commercialize a product in one or more markets.

Having analyzed more than 4,000 life sciences deals[1] from 2017 to 2022 as per data registered by Biomedtracker, we saw a significant rise in the number of licensing deals executed between 2017 and 2021, reaching a CAGR of 13%. A strong increase in 2020 and 2021 could partially be driven by COVID-19 related deals (e.g., COVID-19 mRNA technologies). In 2022 we then observed a drop in deal making activities, presumably influenced by the unstable global macroeconomic situation, capital market uncertainty and a growingly challenging funding environment. This drop was also observed in M&A, which also slowed down in 2022[2].

[1] Biomedtracker accessed on 05.06.2023 (asset deals registered from 01.01.2017 to 31.12.2022)
[2] IQVIA (2022): Pharma Deals – Review of 2022



Graphic 1. Number of licensing deals in life sciences and CAGR (2017-2022)[3]

Going forward, we expect the execution of licensing deals to be a key tool for life science players, as companies increasingly face the need to boost their innovation universe while keeping risks low. This approach to deal-making enables portfolio and market expansions by players in-licensing assets, while injecting resources to players out-licensing their developments, incentivizing them to continue innovating despite the adverse environment. This can already be observed in 2023 with deals, both on the M&A as well as in the licensing side in therapeutic areas such as oncology and neurology, and in novel modalities like gene therapy.[4] However, with the several complexities markets currently face, it is key for life science firms and investors to fully understand the potential of targeted assets to ensure their investments are placed in the right opportunities.

[3] Biomedtracker accessed on 05.06.2023 (asset deals registered from 01.01.2017 to 31.12.2022)
[4] J.P. Morgan (2023): Biopharma Licensing and Venture Deals; Informa (2023): BMS And Prothena's Expanded Deal Shows Growing Confidence in Targeting Tau

2 Trends and market developments boosting licensing deals

Several trends and market developments across the globe are boosting the importance of licensing deals and increasing their attractiveness for life science companies and investors.

We mainly observe the following mega trends that influence licensing deal-making:

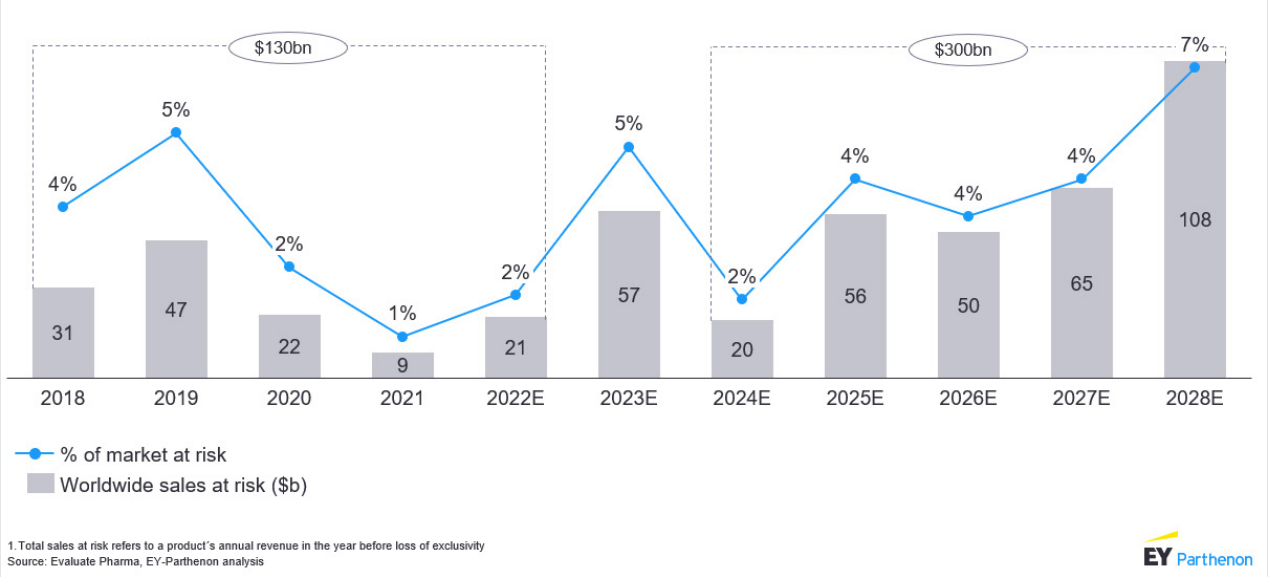
- **Upcoming patent cliff** in the next years
- **Higher cost of innovation**
- **Increasing price pressure** for pharmaceuticals
- A **complex financing environment**, among other challenges

These market developments all add-up to erode the margin of companies and their power to innovate. Thus, licensing is increasingly becoming a key tool to **untap innovation** and **increase efficiency**, while enabling pharmaceutical companies to **diversify their portfolio** and **expand their footprint**.

2.1. Licensing as a tool to overcome patent cliffs

Pharmaceutical companies continue to face the **loss of patent exclusivity** on revenue carriers like blockbusters such as biologics. This creates large revenue gaps as soon as their products lose patent due to the introduction of several generics or biosimilars, which in most cases enter the market already on day-1 after a patent expires. This fiercely increases competition, pushes down prices and leaves originators with revenue gaps which are often hard to recover by products developed in-house at the speed required.

In the past five years pharmaceutical companies faced the patent expiry of a pool of drugs with total sales of $130bn.[5] This year several patent expiries are in line, including the loss of exclusivity of top selling drugs like Humira (i.a. rheumatoid arthritis), Stelara (i.a. psoriasis), Vyvanse (i.a. ADHD[6]) and several other drugs, impacting further $57bn. When looking at the upcoming five years, we clearly see this trend continuing with additional drugs losing patent, impacting sales of close to $300bn, leaving them open to high competition, and generating revenue gaps for pharmaceutical originators.



Graphic 2. Worldwide sales at risk from patent expiration

The upcoming revenue gaps are increasing the need for originators to look beyond their in-house R&D, expand their innovation horizon and access developments worldwide at a faster pace. In-licensing deals are a powerful tool to enable pipeline and portfolio replenishment, preventing revenue and growth gaps. Identifying the right therapeutic areas that fit into the company's portfolio, attractive targets and suitable partners is not always easy, but it is key to establishing successful partnerships and is essential to de-risking investments. Therefore, a broad market view, a targeted asset scouting, and a clear understanding of the assets' potential are key points to consider, execute and understand before embarking in a partnership.

Pharmaceutical companies facing patent expiries in the near future, need to take action to close revenue gaps, and continue leading in the market. A fast but well-planned pipeline expansion at different stages of development, as well as portfolio enhancements leveraging external innovation will be crucial for success.

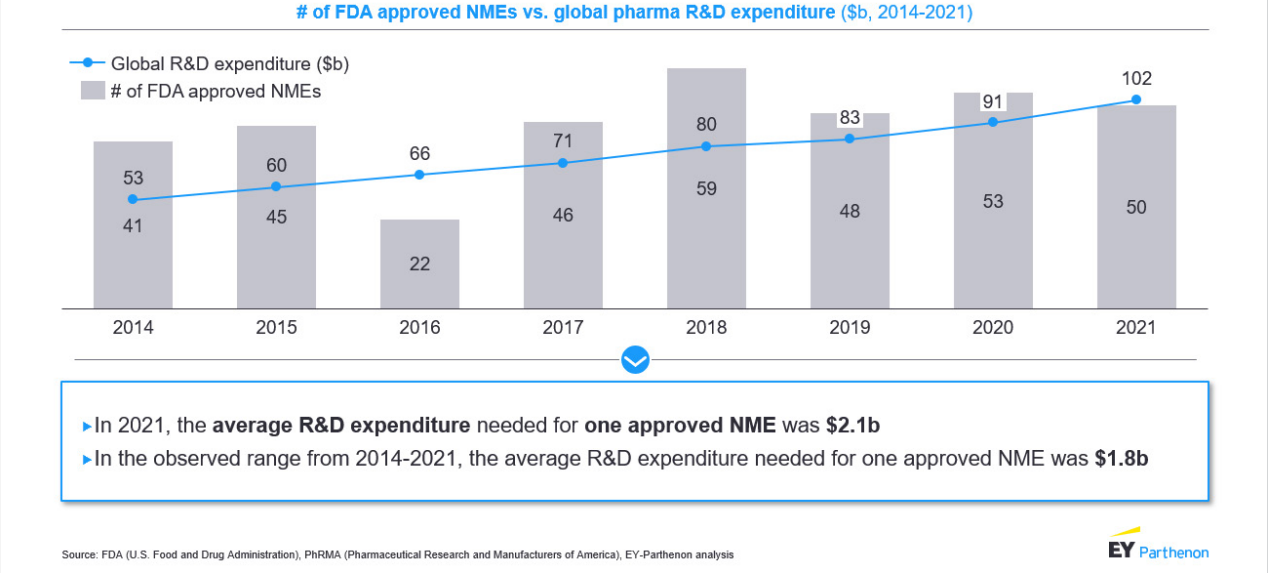
While patent cliffs are a challenge for originators, they open the opportunity for generic players to develop biosimilars and generics. These assets can be out-licensed to maximize their market reach. Several dimensions need to be analyzed to find the right partners. For example, ensuring the selected partner has the right commercial footprint and capabilities to succeed in the markets granted to them.

[5] Evaluate Pharma (2022): World Preview
[6] ADHD, attention deficit hyperactivity disorder

2.2 Licensing as a tool to increase the cost-efficiency of innovation

As technology becomes more advanced, the **cost of innovation is also increasing**. Small and medium companies are often a strong source of innovation but are not always able to entirely fund their own developments and bring them to market.

The rising cost of innovation can be observed when analyzing the increasingly higher R&D spending compared to the number of new drugs approved per year. As an example, according to OECD data, the number of approvals per inflation-adjusted R&D spending in the USA has declined steadily since the 1980s, resulting in less drugs approved per $b spent[7]. The average R&D productivity of pharmaceutical companies since 2014 has been approximately 46 NMEs approved by the FDA per year, and one NME every $2.1b. The R&D spending per NME approved by the FDA has increased by almost $1b since 2014.



Graphic 3. Number of FDA approved NMEs vs. global pharma R&D expenditure

While new modalities, orphan drugs and more complex drugs open promising therapeutic options for patients, and offer high growth potential to pharmaceutical companies, they also usually have increased development costs. This raises the **pressure on innovation efficiency** for life science players and investors, as they might need to invest more to bring innovation to the market.

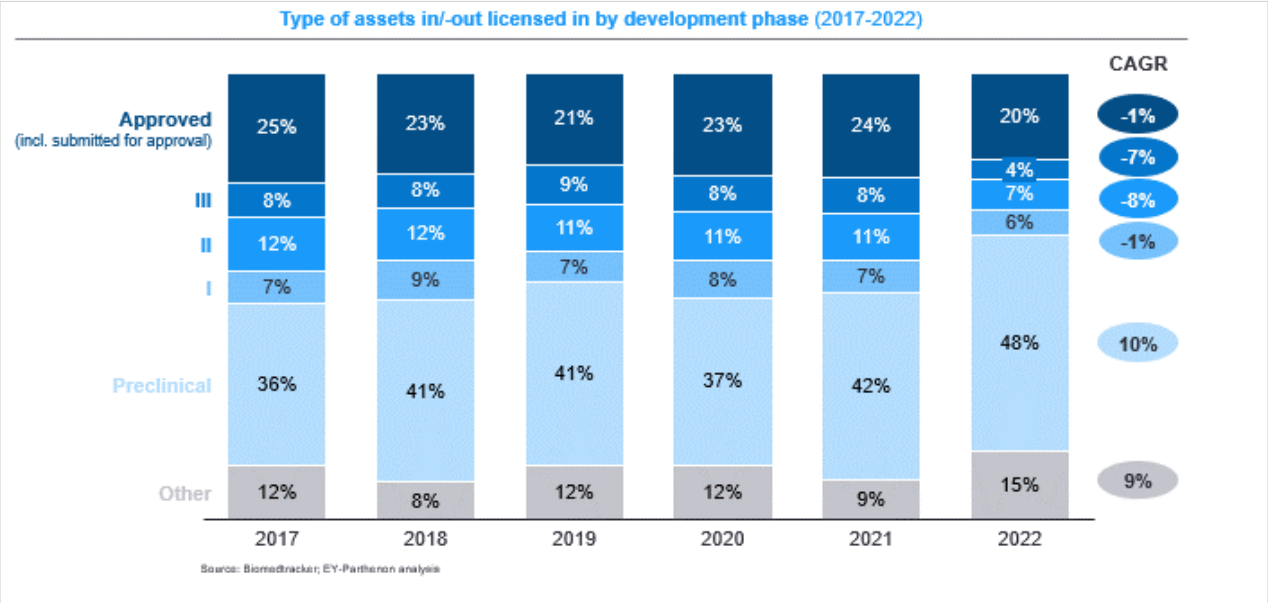
Price pressure is also an increasing concern for pharmaceutical companies. While discovering innovative treatments is becoming more expensive, health insurances, regulators, governments, and other stakeholders like payers in both developed and developing markets, aim to reduce the price of pharmaceuticals and the cost of healthcare in general. There is an overall increased public attention to the pricing of pharmaceuticals.

Increased price pressure might reduce the ability of pharmaceutical companies to spend large amounts on innovation and makes it harder for new developments to attract investors. This could also increase the attractiveness of exploring licensing deals. They allow pharmaceutical companies to **access innovative assets at different stages of development**, and consequently, at different cost levels. In-licensing enables pharmaceutical companies to weigh their investment decisions considering the profile, potential and development stage of the targeted asset.

[7] OECD (2019): Health at a Glance

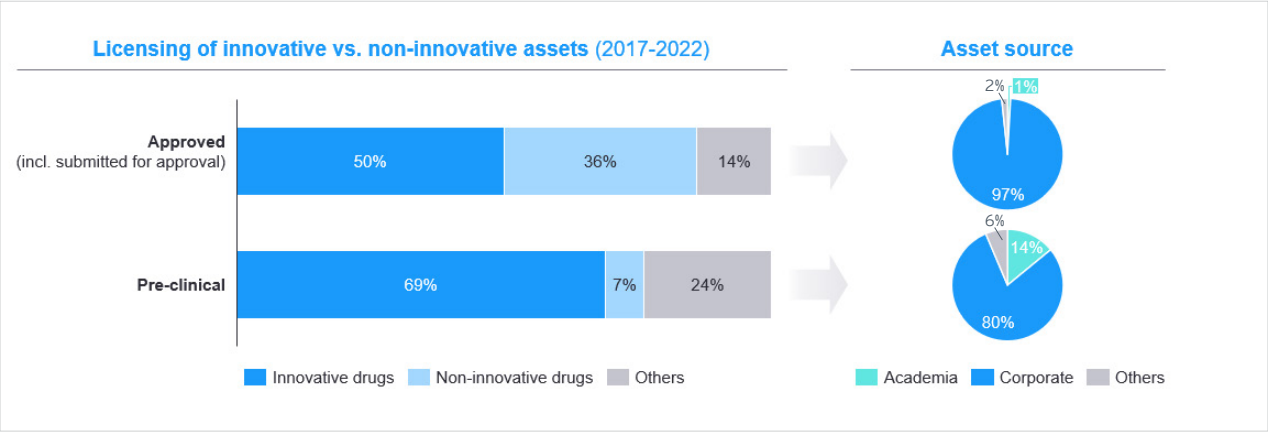
EY-Parthenon teams analyzed the type of assets in-/out-licensing by development phase between 2017 and 2022. We observed an increase in the number of assets in-licensed at early stages of development. The **deal value** of these early assets is typically lower than that of assets closer to market.

This approach to deal-making can allow companies to access external innovation, while keeping costs low. Instead of betting on a single asset close to market and thus, embarking in an expensive deal, some pharmaceutical companies seem to prefer to diversify their investments, by gaining access to several assets at early stages of development at lower costs.



Graphic 4. Type of assets in-/out-licensed by development phase (2017-2022)

This trend might continue to increase as biotechnology companies currently face a challenging financing environment. This might lead them to partner their assets at earlier stages of development, instead of waiting for them to be closer to market. For pharmaceutical companies, this can be an attractive opportunity to access innovation, including novel modalities. While late-stage assets often bear less development risks, partnering several assets at early stages of development can increase the overall cost-efficiency of pharmaceutical pipelines.



Graphic 5. Profile and source of assets in-/out-licensed per development phase (2017-2022)

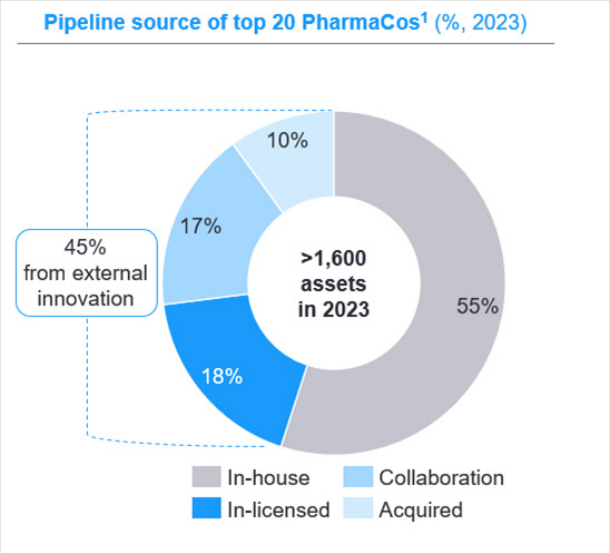
Looking closer into assets in-licensed during the preclinical stage, we observed that the number of innovative assets far outweighs the number of non-innovative assets. This contrasts with the in-licensing of approved assets, where we see a more even distribution between innovative and non-innovative drugs. We can observe that innovation is typically in-licensed during early stages of development.

Notably, the share of novel modality assets was 18 times higher in the preclinical stage than among approved assets. This further emphasizes that investors tend to jump on early-stage opportunities when it comes to innovative assets, especially in novel modalities. In our study, we also analyzed the source of the assets out-licensed. Academia is an important early-stage innovation source, with up to 14% of preclinical assets out-licensed coming from the academic world, compared to only 1% of drugs in approved stage.

Companies looking to in-license should consider these points when scouting for potential assets to prevent overlooking attractive opportunities, especially at early stages. At the same time, companies planning to out-license their developments should analyze the best timing to do so, according to their specific strategy and goals.

2.3 Licensing as a tool to diversify portfolios

External innovation is an efficient option for pharmaceutical companies to diversify their portfolio and increase their revenue while reducing their R&D costs. We expect to see an increase in the number of licensing deals, as large pharmaceutical companies look for alternative and more flexible deal-making options to access developments.

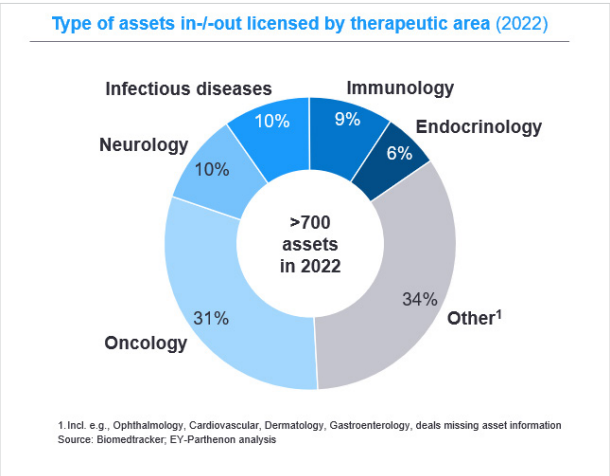


This trend can already be observed at leading pharmaceutical companies, which leverage external innovation to fill a large part of their pipeline and boost their portfolios.

EY-Parthenon teams analyzed the pipelines of leading PharmaCos to observe their degree of external innovation.[8] Roughly 45% of the assets in the pipelines of the top 20 PharmaCos in 2023 originate from external innovation, leveraging licensing, collaborations, and acquisitions. Accessing external innovation is a growing need and practice. This has also been recently emphasized by leaders of large PharmaCos.

Graphic 6. Pipeline source of top 20 PharmaCos (based on 2022 revenue[9])
1. Pipeline including all indications per asset and combination products; "Collaboration" incl. unspecified partnerships

While **in-licensing is often used as a tool to untap innovation** by large pharmaceutical companies, it can also be leveraged by local players. For the latter, in-licensing can enable the introduction of innovative treatments in countries where their launch is delayed or not covered by originators. Potential reasons for this include a lack of market presence, high cost of patented products (e.g., biologics) or country-specific reimbursement conditions by some healthcare systems, among other barriers.



When analyzing the **type of assets licensed by therapeutic area** for the year 2022 as a snapshot, we can observe an emphasis on deal-making around oncology assets, an area with high unmet patient needs and high market growth potential.

While oncology provides an attractive outlook, it is key for companies to analyze the most attractive and suitable therapeutic area on which to invest considering several further dimensions and their own capabilities and portfolios. This is essential to increase the probability of success in the integration, launch and commercialization of the in-licensed assets.

Graphic 7. Type of assets in-/out-licensed by therapeutic area (2022)

[8] Company websites, press releases, annual reports
[9] Top 20 pharma companies by 2022 revenue as per FiercePharma data (2023)

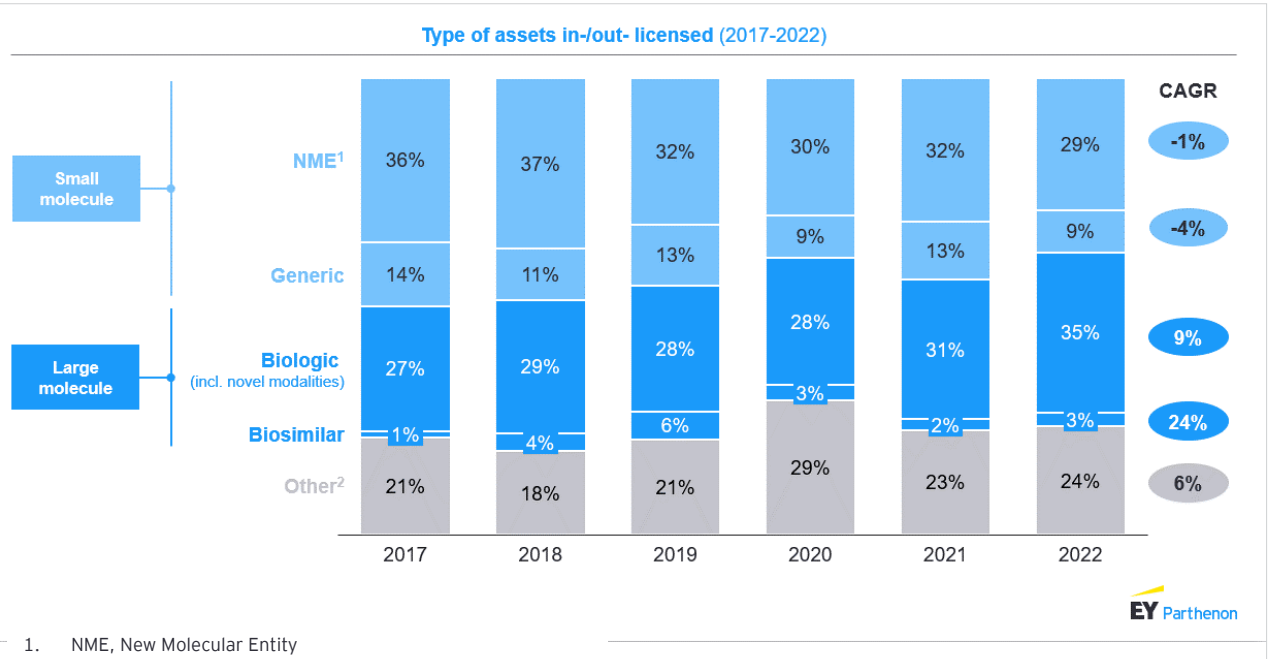
2.4 Licensing as a tool to strengthen financing

When looking at the **out-licensing** side of the deals, we can also observe several strategic rationales to out-license assets.

Innovation in recent years has been marked by the increasing importance of **new modalities and the emphasis on personalized medicine**. Innovation in both areas is expensive, leading small innovators like biotechnology firms to seek partnerships with larger firms to support the cost of development and enable drugs to reach the market.

EY-Parthenon teams analyzed the type of assets which have been in-/out-licensed in the past years. With regards to drugs licensed, we can observe a significant increase on the number of deals concerning biologics and biosimilars since 2017.

While in 2017 approximately 171 out of 626 assets licensed concerned biologics, this number has increased to more than 261 out of 747 in 2022. The number of assets licensed when looking at novel modalities has almost doubled over on the same period. When analyzing the development of biosimilar deals, we can also observe a CAGR of 24% on this timeframe, indicating strong growth. This trend is expected to continue increasing steadily, as more biologics (including blockbusters) face patent expiry in the near future.



1. NME, New Molecular Entity
2. Incl. devices, vaccines, diagnostics, technologies, AI-based drug discovery, deals missing asset information

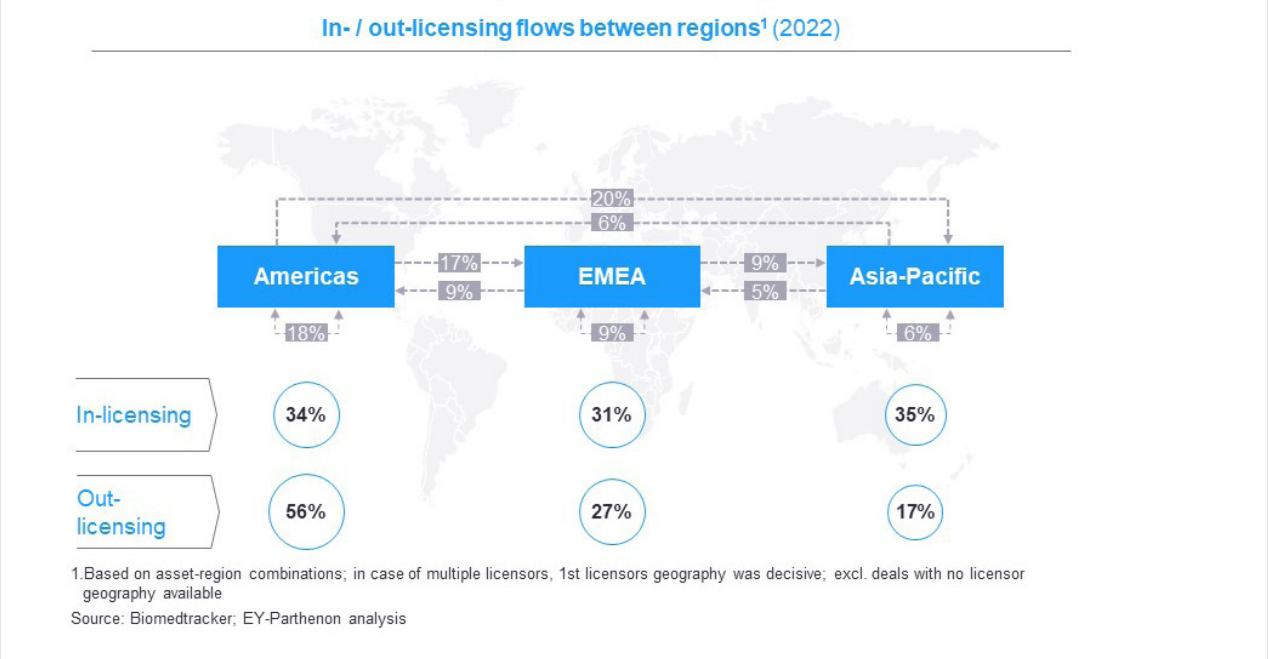
Source: Biomedtracker; EY-Parthenon analysis

Graphic 8. Type of assets in/-out licensed in 2017-2022

The expiry on the patent exclusivity of biologics has led to the development of several **biosimilars** worldwide, which have the potential to enable access to these treatments at a lower price in several markets and reach a larger patient pool than their originators. Nevertheless, launching these products can be an expensive endeavor for which developers can benefit from seeking partnerships to support development costs and reach market access.

2.5 Licensing as a tool to expand footprints

Deals on all type of assets have been realized across all regions in the past years. Asia-Pacific is the region with the highest level of in-licensing, presumably influenced by several factors, such as increasing health expenditure in the region, as well as a growing population. Most of the assets in-licensed in Asia-Pacific come from the Americas, followed by EMEA. The Americas are the largest source of assets being out-licensed, with the US representing the largest portion presumably influenced by a robust R&D infrastructure, strong intellectual property protection, and a comparably favorable funding environment.

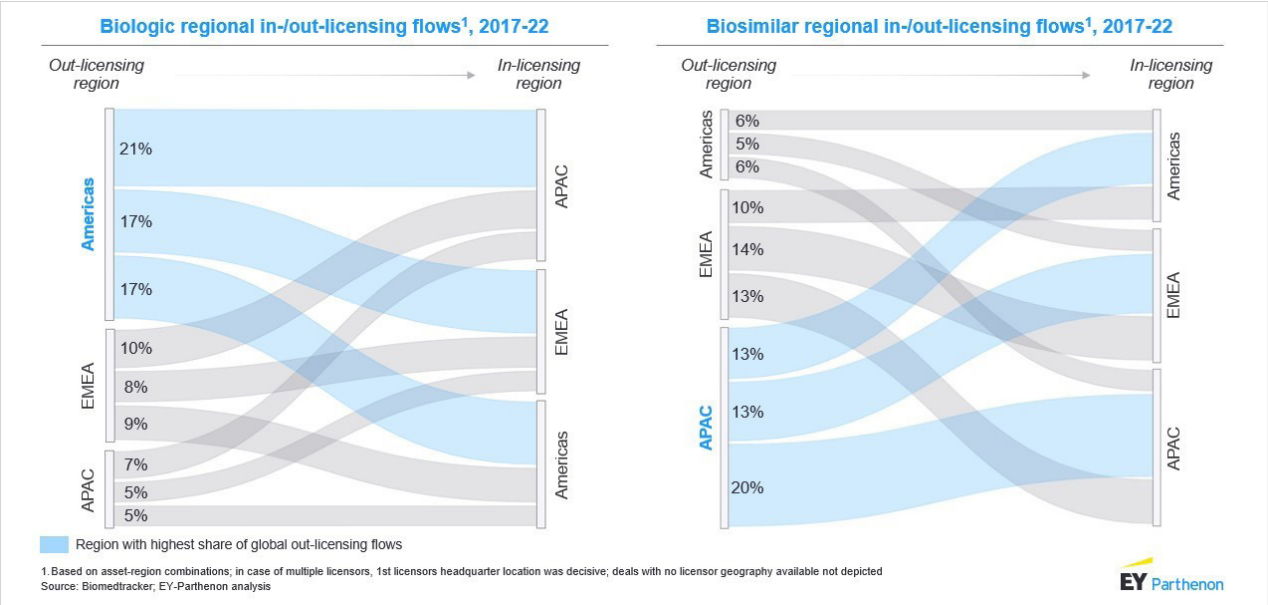


Graphic 9. Regional in-/out-licensing flows between regions (2017-2022)

In recent years, we have observed large generic firms located in developing markets like India entering the biopharma arena through the development of biosimilars and we have also seen biotechnology companies in other geographies such as South Korea focusing on biosimilars, recognizing the high potential of this type of asset. While these companies can offer attractive pricing conditions due to low manufacturing costs, they can face a set of challenges when attempting to enter high potential, yet highly regulated markets like USA and Europe, or large but highly fragmented markets like Latin America or Asia.

Some of these companies have turned to licensing deals not only to **support the cost of development**, but also to **navigate the complex regulatory environment** of large potential markets and to **reach high sales** in regions where they do not have direct footprint, by leveraging the commercial presence of established firms. We expect this trend to continue and increase further, considering not only the loss of exclusivities expected in the upcoming years, but also when analyzing the growing number of biosimilars in the pipeline of companies across the globe.

EY-Parthenon teams analyzed the type of assets in-/out-licensed between regions over the past six years. While most innovative biologics out-licensed come from the Americas, especially from the US, we can observe Asia-Pacific as the region out-licensing the most biosimilar assets. We expect Asia-Pacific to continue being a strong source of biosimilars in the upcoming years, increasing the competition among marketed biosimilar drugs, and adding price pressure considering their ability to manufacture at lower cost.



Graphic 10. Biologic vs. Biosimilar licensing flows (2017-2022)

Licensing deals are executed across the globe. They can increase the potential of assets, maximize market access, strengthen access to innovation and medicines in general, among other advantages. Nevertheless, an increasingly complex geopolitical environment might reshape the geographies partnering in the upcoming years. The pharmaceutical industry is increasingly considered as a strategic sector by governments, which adds pressure on regionalizing supply chains in several areas, including pharmaceuticals.

While licensing is a powerful tool to expand the footprint of pharmaceutical developments across the globe and untap markets outside the core regions of companies, these global developments should also be considered before entering partnering agreements, to analyze their potential impact and minimize risks.

3 Implications for life science companies

Life Science companies navigate an increasingly complex environment. They are faced with a pressing need to innovate in order to grow, while having to tackle several hurdles which erode their ability to do so.

To continue leading in the market, life science companies need to find ways to expand their pipeline horizon, while keeping risks low and maximizing the market potential of their developments. While licensing can be an effective strategy to enhance growth for both licensees and licensors, scrutinizing investments and partnerships is key to find the right opportunities and enable long-term growth. There are several key considerations for pharmaceutical companies as they navigate the life sciences arena in the upcoming years. They are relevant for both, companies looking to gain access to innovation or increase their R&D efficiency, and for companies looking to expand the footprint of their assets or strengthen their financing. To select the right strategy and approach, it is key to understand the potential of engaging in deal-making, but also the risks.

The following points depict selected key considerations for companies looking for growth in the life sciences industry, leveraging in- or out-license as strategy.

1. **Expand pipeline horizon**
   - The need to innovate is increasing and the speed required is challenging to reach by focusing only on in-house developments. Accessing external innovation is crucial to fill revenue gaps and increase innovation speed.
   - Life science companies should add emphasis in actively identifying attractive targets to enhance their pipeline, and strengthen their portfolios and sales in the upcoming years.
2. **De-risk while growing**
   - While innovation is an imperative in life sciences, its cost is increasing. The current world landscape calls for lower risk investments, while enabling growth and access to innovation.
   - Life science players can benefit from engaging into licensing deals to access innovation, while reducing risks and costs. Identifying the right assets and partners is key for success.
3. **Untap market potential**
   - Companies developing innovative assets or biosimilars can benefit from actively out-licensing their developments to secure capital, achieve market readiness, or expand their patient pool beyond their own geographical reach.
     On the other hand, life science players can leverage in-licensing to improve market share in their key markets.
4. **Scrutinize investments**
   - Although licensing can be a powerful growth tool, a careful analysis of several dimensions is essential to find the right deals and strengthen future success.
   - Companies looking to in-license should fully understand the potential of licensing candidates before embarking into partnerships, to close high-potential yet low risk deals.

4 How EY-Parthenon teams can support

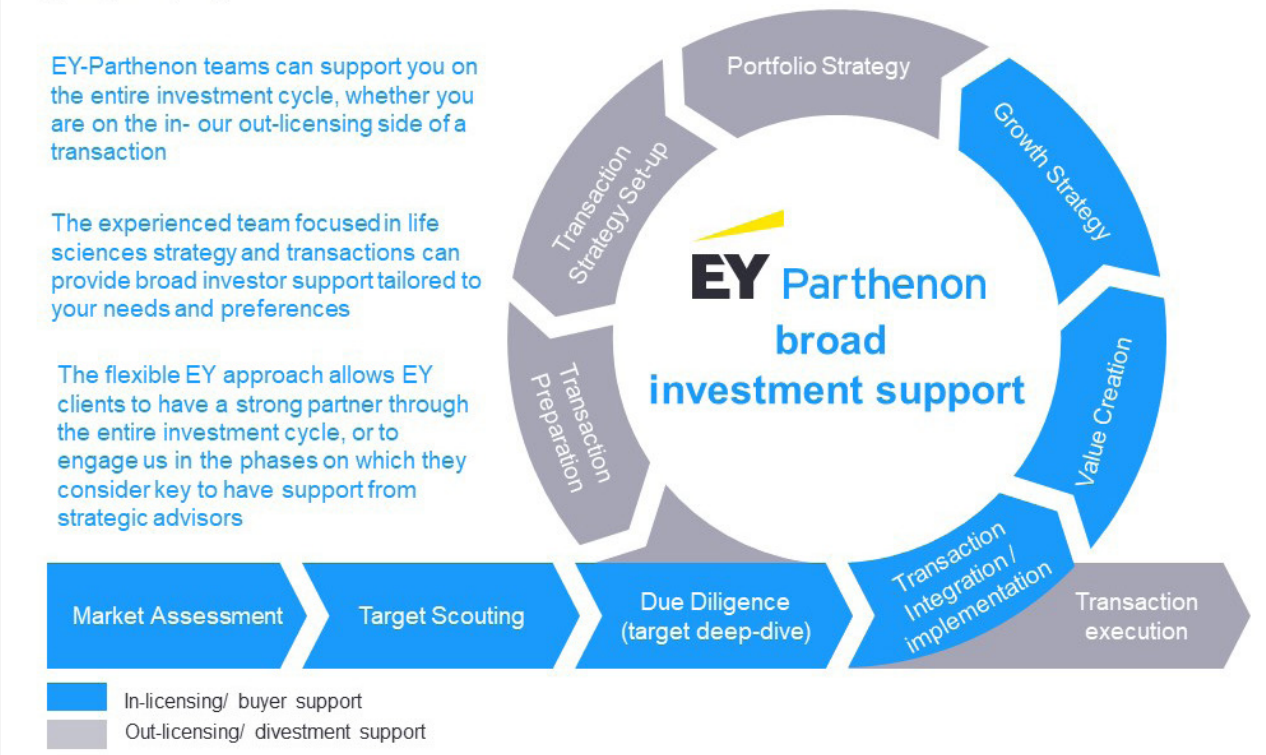
While licensing deals can be a powerful innovation tool for pharmaceutical companies, they can also incur high costs and fail to meet the planned return on investment (ROI) if the deal outcome is unsuccessful. Reasons for an unsatisfactory ROI are manifold e.g., due to a failed asset development, launch delays, higher competition than expected, cultural differences among partners, an inefficient licensing process, or further challenges.

Therefore, a clear asset and market understanding, backed by solid analyses and supported by a strong underlying transaction strategy are key to find the right assets for companies seeking to in-license, and the right partners and asset valuation for companies looking to out-license.

Typical challenges faced by **companies seeking to in-license** is accurately choosing the most attractive and suitable market segment and therapeutic area for investment. This includes identifying the right asset, fully understanding its potential, opportunities and challenges, and the market where it aims to play. In addition, it's crucial to understand and assess the suitability and strength of the selected partner(s).

Companies seeking to out-license also face a set of challenges that is key to prepare for. Finding the right partner(s), understanding the potential of the asset(s), preparing insightful, professional and attractive marketing materials to attract the right potential partners and executing a competitive transaction process are essential points to enhance value and close deals within a short timeframe.

EY-Parthenon teams have broad experience supporting large and small players across all markets in their partnership endeavors, providing broad investment support, on the in-licensing as well as out-licensing side. The life sciences strategy and transactions team has a track record of effectively supporting companies to in-license assets, from market and target assessment to integration and growth strategy, as well as supporting to effectively out-license assets at different stages of development, through a structured out-licensing approach and strong global network, allowing EY clients to find the right partners and enhance their deal value.



Graphic 11. EY-Parthenon broad investment support service offering

To effectively use licensing as a tool for cost-efficient innovation it is key to have a clear plan, a strong strategy and experienced know-how to analyze the options and execute the right deals.

5 Methodology

More than 4,000 life sciences deals, including more than 5,000 assets from 01 January 2017 to 31 December 2022 were analyzed using data from Biomedtracker (accessed on 05 June 2023). Additional sources used for complementing research include S&P Capital IQ, company websites and press releases.

To identify licensing transactions in the Biomedtracker data, EY team has applied a two-step approach: First, all entries including the term "Licensing" in the deal characteristics according to Biomedtracker were included. Second, EY team individually scanned the Biomedtracker deal summaries of the remaining entries for validation and excluded other deal types e.g., Joint Ventures or Acquisitions. In case a transaction contained a licensing element among others, it was considered a licensing transaction in the present analyses.

For the analysis of licensor geographies (Graphics 9, 10), in case of multiple licensors the geography of the first licensor was decisive. In case one asset was out-licensed for several regions, the respective asset was counted for each region. For the analysis of assets per development stage (Graphic 4), products were considered as "approved" as soon as approved by regulatory authorities in any single market.

For the analysis of pharmaceutical companies' development pipelines (Graphic 6), EY team has leveraged publicly available information including press releases, company websites, as well as annual and analyst reports. Assets we categorized as "collaboration" if there was no information on the specific nature of collaboration publicly available. The companies selected for this analysis were the top 20 pharmaceutical companies based on 2022 global revenues.[10]

[10] FiercePharma (2023): The top 20 pharma companies by 2022 revenue

EY | Building a better working world

EY exists to build a better working world, helping to create long-term value for clients, people and society and build trust in the capital markets.

Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.
Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via ey.com/privacy. EY member firms do not practice law where prohibited by local laws. For more information about our organization, please visit ey.com.

About EY-Parthenon
EY-Parthenon teams work with clients to navigate complexity by helping them to reimagine their eco-systems, reshape their portfolios and reinvent themselves for a better future. With global connectivity and scale, EY-Parthenon teams focus on Strategy Realized – helping CEOs design and deliver strategies to better manage challenges while maximizing opportunities as they look to transform their businesses. From idea to implementation, EY-Parthenon teams help organizations to build a better working world by fostering long-term value. EY-Parthenon is a brand under which a number of EY member firms across the globe provide strategy consulting services. For more information, please visit ey.com/parthenon.

EYG no. 009734-23Gbl.

ey.com

Dr. Markus von Minden
markus.von.minden@de.ey.com,
Partner, EY-Parthenon Gmbh,
Germany

Rubi Gonzalez
Rubi.Gonzalez@Parthenon.ey.com,
Director, EY-Parthenon Gmbh,
Germany

Acknowledgement
Special recognition goes to Jacob Richelshagen for his contribution to this report.