White Paper

# IQVIA Pharma Deals

## *Half-Year Review of 2023*

**LUCY HAGGERTY,** Analyst, Global Market Insights, IQVIA
**SWATI SHARAN,** Senior Insights Associate, Global Market Insights, IQVIA
**TASKIN AHMED,** Associate Director, Global Market Insights, IQVIA

# Table of contents

# Introduction

Deal activity in the life sciences sector slowed considerably in H1 2023 as the fragile macroeconomic environment deterred companies from entering certain types of transactions. After dropping off significantly in H1 2022, M&A activity continued to remain muted in H1 2023 in terms of deal volume as fluctuating valuations and the threat of enhanced antitrust scrutiny discouraged potential purchasers. Nevertheless, aggregate spending on M&A rose to US$100.5 B, with the 4 largest deals of the period accounting for 66% of this total.

Following the announcement of the first mega-deal since 2019 in Q1 2023, big pharma made a conservative return to the M&A market in Q2 2023 with Merck & Co., Astellas and Novartis all signing deals each worth in excess of US$3 B.

With significant collaborative activity focused on its lead asset Keytruda® (pembrolizumab), Merck & Co. achieved the title of the most prolific dealmaker in H1 2023 vs. H1 2022, climbing six places in the deal activity rankings since H1 2022. However, overall transaction volume for the leading big pharma companies was down relative to the same period the previous year. Licensing deal flow for life science companies also diminished relative to H1 2022, as licensees became more selective in the types of assets they wished to invest in. Despite aggregate deal spend decreasing, average upfront payments for all licensing deals rose in H1 2023, thanks in part to an increase in the number of deals centered on later stage assets and escalating asset valuations. Similarly, collaborative R&D activity plummeted below pre-pandemic levels in H1 2023 as many pharma giants began to narrow their therapeutic focus on key growth opportunities. Once again, oncology remained the most popular therapy area for dealmaking in terms of deal volume, driven by a high demand for innovative multi-targeted approaches.

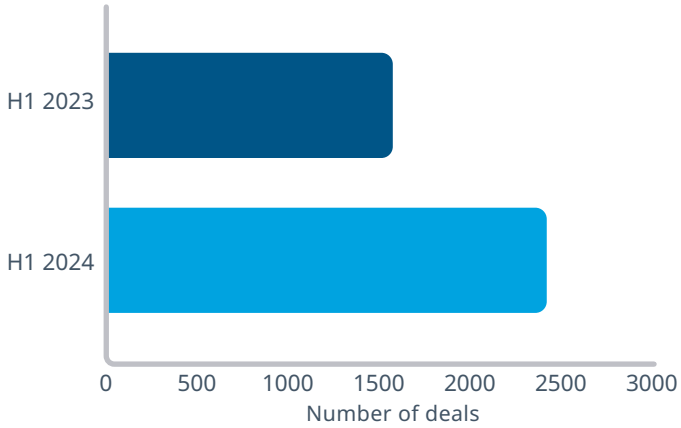
*After a significant slowdown in 2022, overall deal activity remained muted in the first half of 2023 as macroeconomic uncertainty, rising interest rates and high inflation reduced companies' appetite for dealmaking.*

# M&A deal volume slows as uncertainies remain

After a significant slowdown in 2022, overall deal activity remained muted in the first half of 2023 as macroeconomic uncertainty, rising interest rates and high inflation reduced companies' appetite for dealmaking. Excluding standalone research grants, the number of agreements signed in the life sciences sector decreased by 36% in H1 2023 versus H1 2022 according to the IQVIA Pharma Deals database of publicly disclosed deal activity (Figure 1).

As in 2022, biotech companies were faced with a tight capital environment together with private and venture capital (VC) investors deterred by interest rate hikes and soaring inflation. As a result, the pace of biotech lay-offs continued to build in H1 2023 as companies began to narrow their R&D focus and place programs on hold in hope to extend their cash runways. Previously having the upper hand from plentiful capital during 2020 and 2021, biotechs are now reliant on prospective partners and buyers to help raise cash and stay afloat. However, pressures from the Inflation Reduction Act for Medicare drug price negotiations as well as increased US Federal Trade Commission (FTC) scrutiny means big pharma are now deterred to enter certain high-ticket transactions and if so, only offering much lower upfront payments.

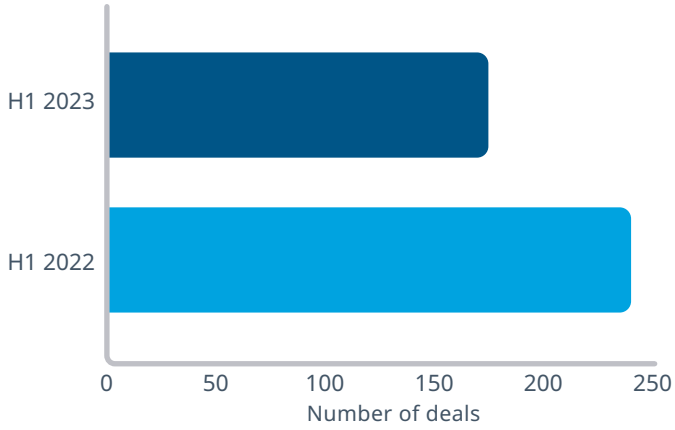
**Figure 1: Number of all deals (excluding funding awards), H1 2022 vs. H1 2023**




Source: IQVIA Pharma Deals.

Despite high hopes for an upturn in acquisition activity, life sciences companies demonstrated even less of an appetite for M&A (defined here as Mergers, Business Acquisitions and Divestments, signed but not necessarily completed) in H1 2023. Amid macroeconomic headwinds and continued market volatility, the number of M&A deals announced by life science companies dropped 28% from H1 2022 to H1 2023 (Figure 2).

**Figure 2: Number of M&A deals, H1 2022 vs. H1 2023**




Source: IQVIA Pharma Deals.

In contrast, the aggregate total value of all M&A deals signed in H1 2023 soared by 85% to US$100.5 B and similarly, the mean total deal value increased 185% from US$560 M in H1 2022 to US$1,595 M in H1 2023 (Table 1). However, the dataset is skewed significantly by the inclusion of the announcement of the acquisition of Seagen by Pfizer in March for US$43 B. Excluding this mega-deal, the aggregate and mean total deal value increased by just 6% and 66%, respectively, while the median total deal value, which removes any effects from other outliers, decreased by 23%. Interestingly, four M&A deals exceeded US$5 B in value in H1 2023, compared with only 1 deal in H1 2022. Despite this increase in spending, biopharma companies are continuing to favor modestly priced bolt-on acquisitions as opposed to transformational M&A, as the increased scrutiny from the US FTC means these big-ticket deals will be potentially subject to prolonged timelines.

**Table 1: Aggregate, mean and median values of M&A deals, H1 2022 vs. H1 2023**

| ALL DEALS | H1 2022 | H1 2023 | CHANGE |
|---|---|---|---|
| AGGREGATE VALUE OF ALL M&A DEALS | US$54,380 M | US$100,541 M | +85% |
| MEAN DEAL VALUE | US$560 M | US$1,595 M | +185% |
| MEDIAN DEAL VALUE | US$125 M | US$97 M | -22% |
| **ALL DEALS** (EXCLUDING PFIZER/SEAGEN) | **H1 2022** | **H1 2023** | **CHANGE** |
| AGGREGATE VALUE OF ALL M&A DEALS | US$54,380 M | US$57,541 M | +6% |
| MEAN DEAL VALUE | US$560 M | US$928 M | +66% |
| MEDIAN DEAL VALUE | US$125 M | US$96 M | -23% |

Source: IQVIA Pharma Deals.

Table 2 (on the following page) presents the top 10 M&A deals of H1 2023 ranked by total potential deal value which includes non-therapeutic focused acquisitions. Combined, these deals were worth a total of US$85 B, equivalent to 85% of the aggregate value of all M&A deals signed in this period. In contrast, the top 10 M&A deals of H1 2022 had a combined value of US$34.8 B, with only one deal exceeding US$10 B. After a slow end to 2022, Q1 2023 saw some renewed big pharma appetite for modestly priced bolt-on transactions as well as the first US$40 B+ buyout since Bristol Myers Squibb (BMS) purchased Celgene in 2019 for US$74 B (Deal no. 89733).

After months of swirling rumors, Pfizer signed the deal to takeover antibody-drug conjugate (ADC) specialist, Seagen, in March at a 33% premium and total deal value of US$43 B (Deal no. 118119). Through the acquisition, Pfizer gains access to Seagen's ADC technology as well as its portfolio of marketed medicines across solid tumors and hematologic malignancies, including three ADCs: Adcetris® (brentuximab vedotin), Padcev® (enfortumab vedotin) and Tivdak® (tisotumab vedotin). This follows on from Pfizer's bolt-on acquisitions of Biohaven Pharmaceuticals (Deal no. 112860) and Global Blood Therapeutics (Deal no. 114732) in 2022. Since its announcement in March, the deal has already been subject to two documentation requests from the antitrust regulators, however the companies still expect the deal to close later this year or in early 2024.

For late-stage and marketed assets, big pharma continued to opt for M&A over licensing in H1 2023 to gain near-term revenue generators at discounted prices. In a return to diabetes R&D, Sanofi announced the acquisition of Provention Bio for US$2.9 B, which was driven by the latter's marketed drug, Tzield™ (teplizumab-mzwv), a CD3-directed antibody approved in the US in November 2022 to delay the onset of Stage 3 type 1 diabetes (T1D) in adults and pediatric patients aged 8 years and older with Stage 2 T1D (Deal no. 118115).

**Table 2: Top M&A deals of H1 2023 ranked by total deal value**

| TOTAL DEAL VALUE | COMPANIES | DEAL DRIVER |
|---|---|---|
| US$43 B | Pfizer, Seagen | Antibody-drug conjugate (ADC) technology and four approved oncology medicines. |
| US$10.8 B | Merck & Co., Prometheus Biosciences | Investigational monoclonal antibody, PRA023, a humanized monoclonal antibody directed to tumor necrosis factor (TNF)-like ligand 1A (TL1A), a target associated with intestinal inflammation and fibrosis. |
| US$7.1 B | Syneos Health, Veritas Capital/ Patient Square/Elliot Investment | Clinical research and commercialization services. |
| US$5.9 B | Astellas, Iveric Bio | Complement C5 inhibitor, avacincaptad pegol, for geographic atrophy secondary to age-related macular degeneration. |
| US$4.25 B | Baxter, Advent/Warburg Pincus | Streamline portfolio to create standalone contract development and manufacturing organization. |
| US$3.5 B | Novartis, Chinook Therapeutics | Clinical and preclinical programs for rare, severe chronic kidney diseases. |
| US$3.1 B | Globus Medical, Nuvasive | Complementary musculoskeletal technology portfolios. |
| US$2.9 B | Sanofi, Provention Bio | CD3 directed antibody, Tzield (teplizumab-mzwv), with US approval for the delay of Stage 3 type 1 diabetes. |
| US$2.61 B | Sartorius, Polyplus | Transfection reagents and plasmids for cell and gene therapies. |
| US$2.4 B | Eli Lilly, DICE Therapeutics | DELSCAPE technology platform, oral therapeutics for chronic diseases in immunology. |

Source: IQVIA Pharma Deals.

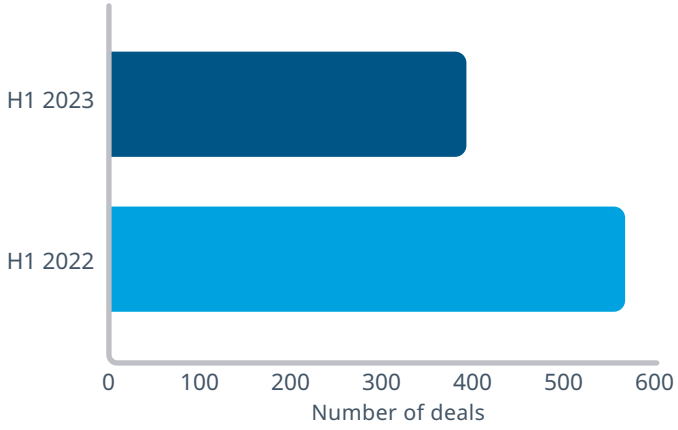
In an attempt to diversify away from Keytruda® (pembrolizumab) which is rapidly approaching patent expiry, Merck & Co. agreed to pay US$200 per share — a premium of 75% — to acquire Prometheus Biosciences for US$10.8 B (Deal no. 118667). Similarly looking to extend its growth runway and to potentially compensate its declining sales of Xtandi® (enzalutamide), Astellas agreed to acquire Iveric Bio for US$5.9 B (Deal no. 118864) to access the latter's Zimura (avacincaptad pegol) which since received FDA approval in August 2023, under the brand name Izervay, for the treatment of geographic atrophy secondary to age-related macular degeneration.

Private equity interest in the life sciences sector remained high in H1 2023, with a consortium of private investment firm affiliates composed of Elliott Investment Management, Patient Square Capital and Veritas Capital acquiring Syneos Health for US$43 per share in cash in a transaction valued at approximately US$7.1 B, including outstanding debt (Deal no. 119144). Additionally, in order to streamline its strategic focus, Baxter opted to divest its BioPharma Solutions (BPS) business to private equity investor Advent International and growth investor Warburg Pincus, in a deal valued at US$4.25 B in cash (Deal no. 119074). The transaction represents an important milestone in Baxter's ongoing business transformation and now as a standalone company, BPS plans to operate as an independent end-to-end CDMO providing a range of services, from clinical research to commercial deployment.

# Streamlined companies drive licensing activity down

Licensing deal volume in the life sciences sector fell 31% from H1 2022 to H1 2023, in line with the decline in overall deal activity (Figure 3). While licensing remains a favored risk-mitigating method by companies to access external innovation, the decline in activity in H1 2023 suggests that companies are becoming more selective in the types of assets they wish to invest in as they reprioritize and streamline their portfolios.

**Figure 3: Number of licensing deals, H1 2022 vs. H1 2023**




Source: IQVIA Pharma Deals.

The aggregate potential total deal value of all licensing deals signed in H1 2023 was US$56.1 B, 19% lower than in H1 2022, in part due to fewer deals having disclosed financials (Table 3). At US$539 M, the mean total deal value for all licensing deals in H1 2023 was 11% higher than the equivalent figure for H1 2022 (US$485 M), while the median total deal value, which ignores the distorting effects of outliers, rose by 51% to US$275 M, providing evidence of a surprising upward trend on deal spend. Six licensing deals had a total potential deal value in excess of US$2 B in H1 2023 compared with just four such deals in H1 2022. Moreover, there were a smaller number of deals valued at less than US$200 M in H1 2023 compared with H1 2022.

Comparably, the mean cash upfront payment for licensing deals increased from US$27 M in H1 2022 to US$40 M in H1 2023, an increase of 46%, although the median value rose by only 15% to US$15 M. There were a greater number of deals involving licensing fees of more than US$100 M in H1 2023 (6 versus 4 in H1 2022), indicative of potential price inflation as well as cautious licensees being more willing to commit larger sums of cash in return for more established and less risky assets.

**Table 3: Aggregate, mean and median value of licensing deals, H1 2022 vs. H1 2023**

| ALL DEALS | H1 2022 | H1 2023 | CHANGE |
|---|---|---|---|
| AGGREGATE VALUE OF ALL LICENSING DEALS | US$68,904 M | US$56,120 M | -19% |
| MEAN TOTAL DEAL VALUE | US$485 M | US$539 M | +11% |
| MEDIAN TOTAL DEAL VALUE | US$182 M | US$275 M | +51% |
| MEAN UPFRONT PAYMENT | US$27 M | US$40 M | +46% |
| MEDIAN UPFRONT PAYMENT | US$13 M | US$15 M | +15% |

Source: IQVIA Pharma Deals.

The top 10 partnering deals by upfront consideration in H1 2023, excluding settlement deals and product acquisitions, are shown in Table 4.

**Table 4: Top partnering deals (excluding settlements and product acquisitions) by upfront payment, H1 2023**

| TOTAL DEAL VALUE | UPFRONT PAYMENT | COMPANIES | INTEREST AREA | DEVELOPMENT PHASE |
|---|---|---|---|---|
| US$1130 M | US$400 M | Takeda, Hutchmed | Fruquintinib, an oral inhibitor of VEGFR -1, -2 and -3, for the treatment of patients with metastatic colorectal cancer. | Launched |
| Undisclosed | US$245 M | Janssen, Cellular Biomedicine | Investigational CD20-directed autologous CAR-Ts, C-CAR039 and C-CAR066, for the treatment of non-Hodgkin's lymphoma. | Phase I/II |
| Undisclosed | US$200 M | BioNTech, OncoC4 | Anti-CTLA-4 monoclonal antibody candidate, ONC-392, in various cancer indications. | Phase II |
| US$4410 M | US$175 M | Neurocrine Biosciences, Voyager Therapeutics | Gene therapy products directed to the gene that encodes glucosylceramidase beta 1 (GBA1) for the treatment of Parkinson's disease and other diseases associated with GBA1. | Discovery; Preclinical |
| US$1670 M | US$170 M | BioNTech, Duality Biologics | Topoisomerase-1 inhibitor-based antibody-drug conjugates, DB-1311 and DB-1303. | Phase II; Preclinical |
| US$330 M | US$100 M | Vertex, CRISPR Therapeutics | Gene editing technology, known as CRISPR/Cas9, to develop hypoimmune cell therapies for type-1 diabetes (T1D). | Discovery |
| US$593 M | US$90 M | GSK, Scynexis | Brexafemme (ibrexafungerp tablets), a US FDA approved, antifungal for the treatment of vulvovaginal candidiasis (VVC) and for reduction in the incidence of recurrent VVC (RVVC). | Launched |
| US$82.5 M | US$82.5 M | Alimera Sciences, EyePoint Pharmaceuticals | US commercialization rights for uveitis treatment, Yutiq (fluocinolone acetonide intravitreal implant). | Launched |
| US$2080 M | US$80 M | Genentech, Belharra Therapeutics | Chemoproteomics drug discovery platform to develop small molecule medicines in multiple therapeutic areas. | Discovery |
| US$120 M | US$75 M | Regeneron, Sonoma Biotherapeutics | New regulatory T-cell (Treg) therapies for autoimmune diseases leveraging Regeneron's VelociSuite technologies. | Discovery |
| US$231 M | US$75 M | Catalyst Pharma, Santhera Pharma | North America rights to vamorolone, a synthetic steroid for the treatment of Duchenne muscular dystrophy. | Preregistration |

Source: IQVIA Pharma Deals.

With a staggering US$400 M upfront payment as well as up to US$730 M in additional potential payments relating to regulatory, development and commercial sales milestones, the top partnering deals list of H1 2023 is headed by Takeda's licensing agreement with Hutchmed to develop and commercialize the latter's fruquintinib outside of mainland China, Hong Kong and Macau (Deal no. 117325). Similarly, seeking a low risk asset by investing in an established product, GSK paid Scynexis US$90 M upfront for the latter's FDA-approved antifungal drug, Brexafemme® (ibrexafungerp tablets), for the treatment of vulvovaginal candidiasis (VVC) and for reduction in the incidence of recurrent VVC (RVVC) (Deal no. 118392). The deal excluded Greater China, where Hansoh Pharma holds an exclusive license to the drug (Deal no. 104448).

Following the successful launch of its Legend Biotech-partnered CAR-T cell therapy Carvykti® (ciltacabtagene autoleucel) (Deal no. 83007), Janssen handed over US$245 M upfront and the promise of further milestone payments to Cellular Biomedicine for two CD20-directed autologous CAR-Ts, C-CAR039 and C-CAR066, being investigated in non-Hodgkin's lymphoma (Deal no. 118873).

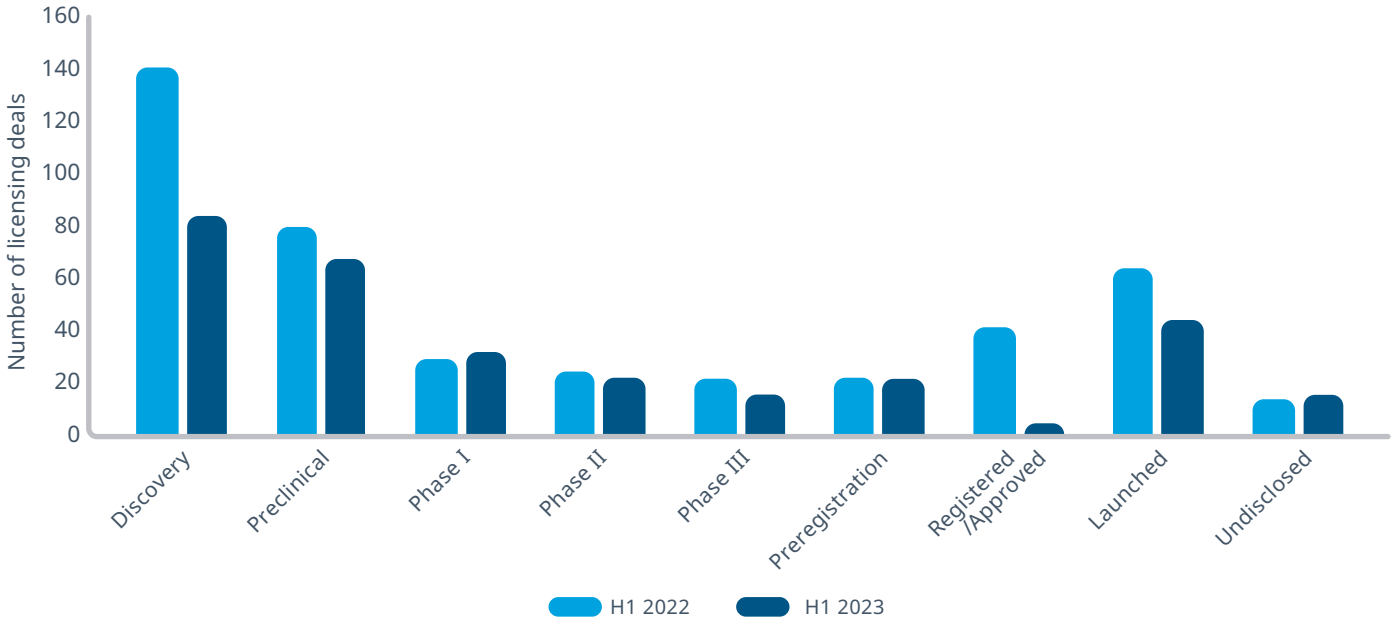
Flush with cash from the success of its Pfizer-partnered COVID-19 vaccine (Deal no. 97661), BioNTech was particularly busy on the dealmaking front in H1 2023 with continued focus in oncology. In March, the biotech paid US$200 M upfront to OncoC4 to co-develop and commercialize the clinical stage candidate, ONC-392, as a monotherapy or combination therapy in multiple tumor indications (Deal no. 118234). The following month, it signed an antibody-drug conjugate (ADC) pact with Duality Biologics which involved a US$170 M upfront payment and up to US$1.5 B in milestones (Deal no. 118436).

After the biotech boom in 2021, the challenging financial markets in 2023 have left many innovative companies searching for pharma partners in H1 2023 to help raise cash to progress their developments. Some have been more successful than others, for example, Sonoma Biotherapeutics, which raised one of the largest fundraising rounds in 2021 of US$265 M, is now set to receive US$75 M upfront, including a US$30 M equity investment by Regeneron in exchange for co-developing regulatory T cell (Treg) therapies for ulcerative colitis, Crohn's disease and two other undisclosed indications, with a Regeneron option for a fifth indication. (Deal no. 118347). And shortly after rising out of stealth mode with US$130 M in cash in January 2023, Belharra Therapeutics partnered with Genentech to develop small molecule drugs in multiple indications including oncology, immunology and neurodegenerative diseases in a deal worth up to US$2.08 B (Deal no. 117071).

Figure 4 presents an analysis of therapeutic licensing deals by development phase. Where deals concern multiple assets or assets in different stages of development for different indications, the highest achieved development phase has been selected for the analysis. Where an asset is in different development phases in different territories, the highest achieved development phase has been used. The level of licensing activity for therapeutic programs decreased 29% from H1 2022 to H1 2023, in line with the overall downward trend for licensing deals in the life sciences sector over this period. The volume of license agreements for discovery and preclinical stage assets was down 40% and 15% respectively in H1 2023, perhaps reflecting the desire of potential licensees to wait until assets are more established in order to de-risk potential deals. However, it must be noted that option-based platform deals, which are typically signed at the discovery stage, are not included in this analysis.

Out of the 42 licensing deals for registered/approved assets in H1 2022, 29 of those were non-exclusive sublicensing deals that the Medicines Patent Pool signed with generics manufacturers in H1 2022 for COVID-19 antivirals such as molnupiravir and nirmatrelvir/ritonavir in low- and middle-income countries, accounting for the apparent significant decline in H1 2023. Excluding these deals, the decline was in line with the overall decline in deal activity.

**Figure 4: Therapeutic licensing deals by development stage, H1 2022 vs. H1 2023**




Source: IQVIA Pharma Deals.

Figure 4 is noteworthy for the somewhat sustained licensing activity for clinical-stage assets from H1 2022 to H1 2023, with the number of deals involving Phase I assets increasing by 14%, suggestive of a shift to earlier clinical stage dealmaking. One of the largest single-asset Phase I licensing deals of H1 2023 saw Lilly pay Confo Therapeutics US$40 M upfront to license global rights to CFTX-1554, an angiotensin II type 2 receptor (AT2R) inhibitor that utilizes a non-opioid approach to treat peripheral (neuropathic) pain (Deal no. 117917). Despite the field facing multiple setbacks in previous years, Lilly continues to invest in treatments for pain, as CFTX-1554 will join its existing portfolio which includes a transient receptor potential ankyrin 1 (TRPA1) antagonist, LY3526318, being tested as a non-opioid treatment for chronic pain conditions as well as SSTR4 agonist, LY3556050.

*The level of licensing activity for therapeutic programs decreased 29% from H1 2022 to H1 2023, in line with the overall downward trend for licensing deals in the life sciences sector over this period.*

## Merck & Co. leads deal activity rankings

Merck & Co. was the most prolific dealmaker in the first 6 months of 2023 with 21 publicly disclosed deals, 1 more than the same period the previous year (Figure 5). The company has climbed six places in the deal activity rankings since H1 2022, overtaking companies such as Roche, Novartis and Johnson & Johnson (J&J) – all of which have lower deal activity in 2023 versus the same period in 2022 - to reach the top position. However, over 50% of the company's deals announced were clinical trial collaborations centered on Keytruda® (pembrolizumab).

J&J signed 19 deals in H1 2023, which was down 17% on the same period the previous year. In April, Janssen licensed Pipeline Therapeutics' Phase II-ready neurology compound, PIPE-307, in a deal worth up to US$1.075 B (Deal no. 118653). The candidate has already received IND clearance from the US FDA to initiate clinical development in relapsing-remitting multiple sclerosis (RRMS) patients.

After heading the deal activity rankings in H1 2022, Roche saw its activity decline 38% in H1 2023 as the company announced 18 deals which were largely

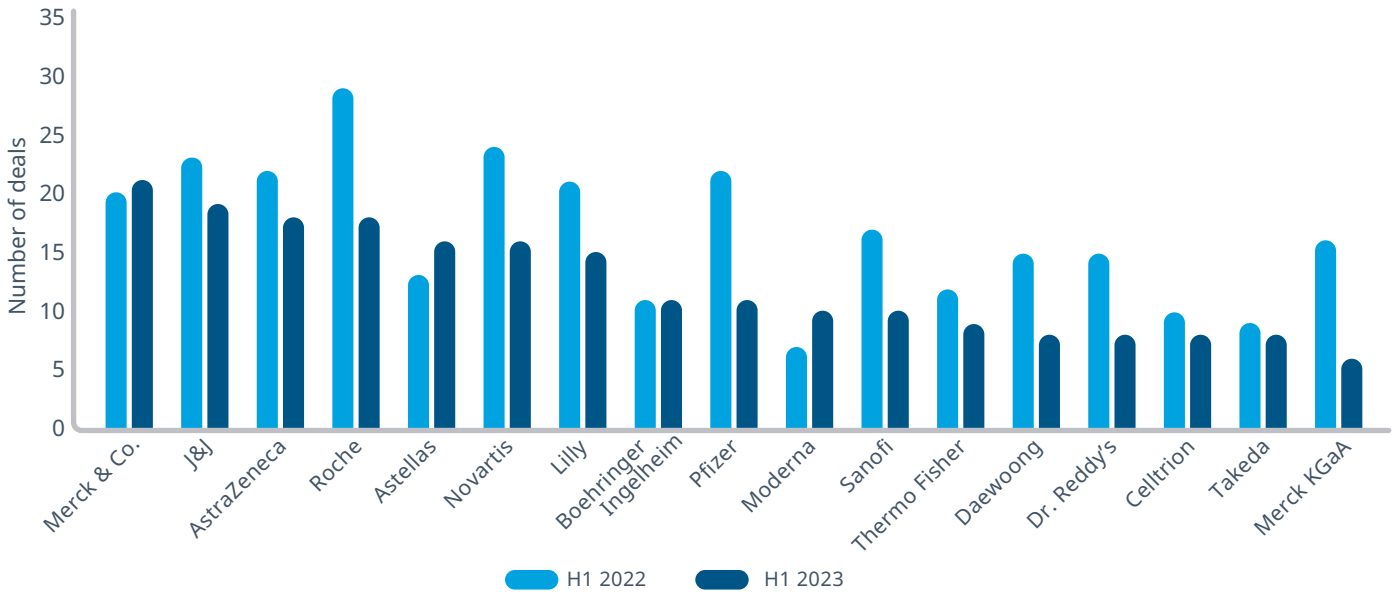
focused on oncology assets and the development of companion diagnostics and assays. Roche's Genentech kicked off the year by signing a small-molecule discovery pact with Kronos Bio for the treatment of cancer, in which the former paid out US$20 M upfront as well as preclinical, clinical and regulatory milestones that could top US$554 M in order to leverage Kronos' drug discovery platform for the development of GLP-Tox-ready candidates that modulate transcription factor targets (Deal no. 117233). Faced with rising competition from AstraZeneca and Daiichi Sankyo's Enhertu (trastuzumab deruxtecan), Roche inked a US$680 M deal with China-based biotech, Zion Pharma, to develop and commercialize ZN-A-1041, an oral tyrosine kinase inhibitor targeting HER2 (Deal no. 119016).

In line with its strategic commitment to growth, in a stark contrast to many of its peers, Astellas upped its deal activity from H1 2022 to H1 2023 by 23% with its focus on gene and cell therapies. In January, Astellas established a US$350 M alliance with Selecta Biosciences for IdeXork, a next-generation immunoglobin G (IgG) protease that will be developed by Astellas for use with AT845, an investigational, adeno-associated virus-based treatment for late-onset Pompe disease in adults, as well as any other of its gene therapy products (Deal no. 117191).

Also focused within the same field, Astellas signed an exclusive license agreement with Kate Therapeutics for KT430, a preclinical gene therapy that delivers a functional copy of the MTM1 gene via a novel MyoAAV capsid to treat X-linked myotubular myopathy (XLMTM) (Deal no. 119558).

Moderna also saw its deal activity increase in H1 2023, climbing 43% compared to H1 2022, in its bid to diversify away from COVID-19 vaccines. In January, the biotech paid CytomX Therapeutics US$35 M upfront to create mRNA-based conditionally activated therapies utilizing Moderna's mRNA technologies and CytomX's Probody therapeutic platform, for the potential treatment of oncology and non-oncology conditions (Deal no. 117127). The following month, Moderna gained access to Personalis' NeXT Platform™ for use in the upcoming clinical studies evaluating mRNA-4157/V940, an investigational personalized cancer vaccine, jointly developed by Moderna and Merck & Co. (Deal no. 72186) (Deal no. 117533).

**Figure 5: Most prolific dealmakers, H1 2022 vs. H1 2023**

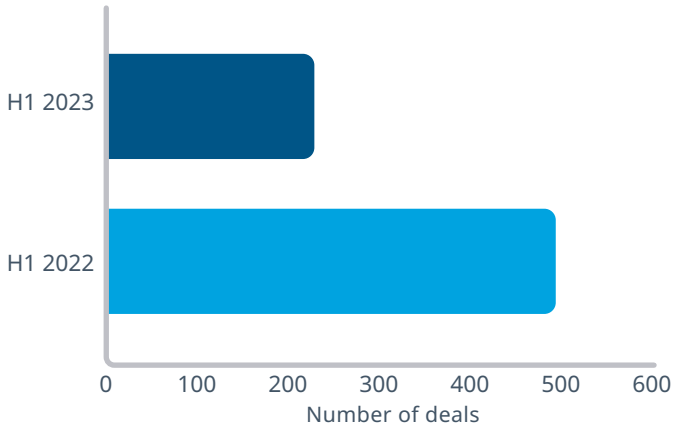



Source: IQVIA Pharma Deals.

# R&D alliance activity drops to below pre-pandemic levels

The number of collaborative R&D alliances (defined here as discovery or preclinical-stage deals that involve two or more parties actively collaborating on R&D) fell by 54% from H1 2022 to H1 2023 and dropping below pre-pandemic levels (Figure 6). Despite the need to drive long-term growth, in a time of considerable uncertainty, pharmaceutical companies remain cautious as to how they spend their cash and in turn, have become more selective in the collaborations they enter. As many pharma giants continue to divest their deprioritized assets, companies have also started to terminate existing non-progressive collaborations to cut costs and narrow their therapeutic focus. Therefore, poorly differentiated programs, or those that are perceived as being high risk, are being eschewed in favor of those that offer a strong therapeutic proposition in line with their own portfolios.

**Figure 6: Number of collaborative R&D deals, H1 2022 vs. H1 2023**




Source: IQVIA Pharma Deals.

In parallel, the aggregate total deal value for collaborative R&D deals declined 12% from H1 2022 to H1 2023 to reach US$36 B. While the mean total deal value fell 17% to US$654 M, the median total deal value dropped from US$475 M to US$257 M, a decline of 46% (Table 5). Upfront payments for collaborative R&D deals also fell, with risk-averse pharmaceutical companies increasingly keen to minimize upfront expenditure and defer investment decisions until development milestones have been achieved.

Selected collaborative R&D deals are profiled in Table 6.

Despite the significant slowdown, for certain programs and technologies, particularly those that offer the prospect of spawning new therapeutic classes, life science companies were still willing to sign off on large deal values. Voyager Therapeutics' collaboration with Neurocrine Biosciences, which made the top 10 ranking in Table 4, was the largest collaborative R&D deal of H1 2023 in terms of total potential deal value, with the initial US$175 M consideration including US$136 M in cash plus an equity investment of approximately US$39 M (Deal no. 117216). Building upon an existing CNS-focused partnership looking at Parkinson's disease and Friedreich's ataxia (Deal no. 90225), the companies joined forces again in January to develop the latter's glucosylceramidase beta 1 (GBA1) gene therapy program for Parkinson's disease and other GBA1-mediated diseases. Shortly behind was AbbVie's R&D alliance with Immunome for the discovery of up to 10 novel antibody-target pairs arising from three specified tumor types leveraging Immunome's Discovery Engine (Deal no. 117157). Further expanding its presence in the cancer field, AbbVie also formed another collaboration partnership in H1 2023 with Anima Biotech to discover and develop mRNA biology modulators for three targets across oncology and immunology (Deal no. 117203).

The field of targeted protein degradation, which aims to hijack the body's natural protein degradation mechanism to develop therapeutics against drug targets typically thought to be "undruggable", continued to attract significant R&D alliance activity involving big pharma in H1 2023. In April, Merck & Co. signed a US$2.55 B pact with Austrian biotech, Proxygen, (Deal no. 118476) and Astellas paid Cullgen US$35 M upfront to discover multiple protein degraders, leveraging Cullgen's uSMITETM (ubiquitin-mediated, small molecule induced target elimination) platform (Deal no. 119708).

The wave of technological innovation within the cell and gene therapy field has resulted in a proliferation of early-stage collaboration deals for discovery platforms relating to next-generation therapeutic modalities.

**Table 5: Aggregate, mean and median values of collaborative R&D deals, H1 2022 vs. H1 2023**

| ALL DEALS | H1 2022 | H1 2023 | CHANGE |
|---|---|---|---|
| AGGREGATE VALUE OF ALL COLLABORATIVE R&D DEALS | US$40,839 M | US$35,994 M | -12% |
| MEAN TOTAL DEAL VALUE | US$785 M | US$654 M | -17% |
| MEDIAN TOTAL DEAL VALUE | US$475 M | US$257 M | -46% |

Source: IQVIA Pharma Deals.

**Table 6: Selected Collaborative R&D deals, H1 2023**

| TOTAL DEAL VALUE | UPFRONT PAYMENT | COMPANIES | INTEREST AREA | DEVELOPMENT PHASE (NO. PROGRAMS/ TARGETS) |
|---|---|---|---|---|
| US$2800 M | US$30 M | AbbVie, Immunome | Antibody-target pairs arising from three specified tumor types using Immunome's Discovery Engine. | Discovery (up to 10) |
| US$2550 M | Undisclosed | Merck & Co., Proxygen | Molecular glue degraders. | Discovery (multiple) |
| US$1920 M | Undisclosed | Novo Nordisk, Life Edit Therapeutics | Gene editing therapies for rare genetic disorders as well as more prevalent cardiometabolic diseases. | Discovery (up to 7) |
| US$1900 M | US$35 M | Astellas, Cullgen | Targeted protein degraders leveraging Cullgen's uSMITE™ targeted protein degradation platform. | Discovery (multiple) |
| US$1876 M | US$40 M | Moderna, Generation Bio | Nucleic acid therapeutics for liver targeted programs. | Preclinical (up to 5) |

Source: IQVIA Pharma Deals.

In May, Novo Nordisk partnered with Life Edit Therapeutics in a deal worth up to US$1.92 B to discover and develop gene editing therapies against a select set of therapeutic targets (Deal no. 119423). Life Edit established a further R&D partnership with Moderna to combine its gene editing technologies with Moderna's mRNA platform to advance in vivo gene editing therapies against a select set of therapeutic targets (Deal no. 117819). Widening its presence in the field, Moderna also paid Generation Bio US$40 M upfront and potential deal value of more than US$1.8 B to develop nucleic acid therapeutics for liver targeted programs (Deal no. 118288).

*The wave of technological innovation within the cell and gene therapy field has resulted in a proliferation of early-stage collaboration deals for discovery platforms relating to next-generation therapeutic modalities.*

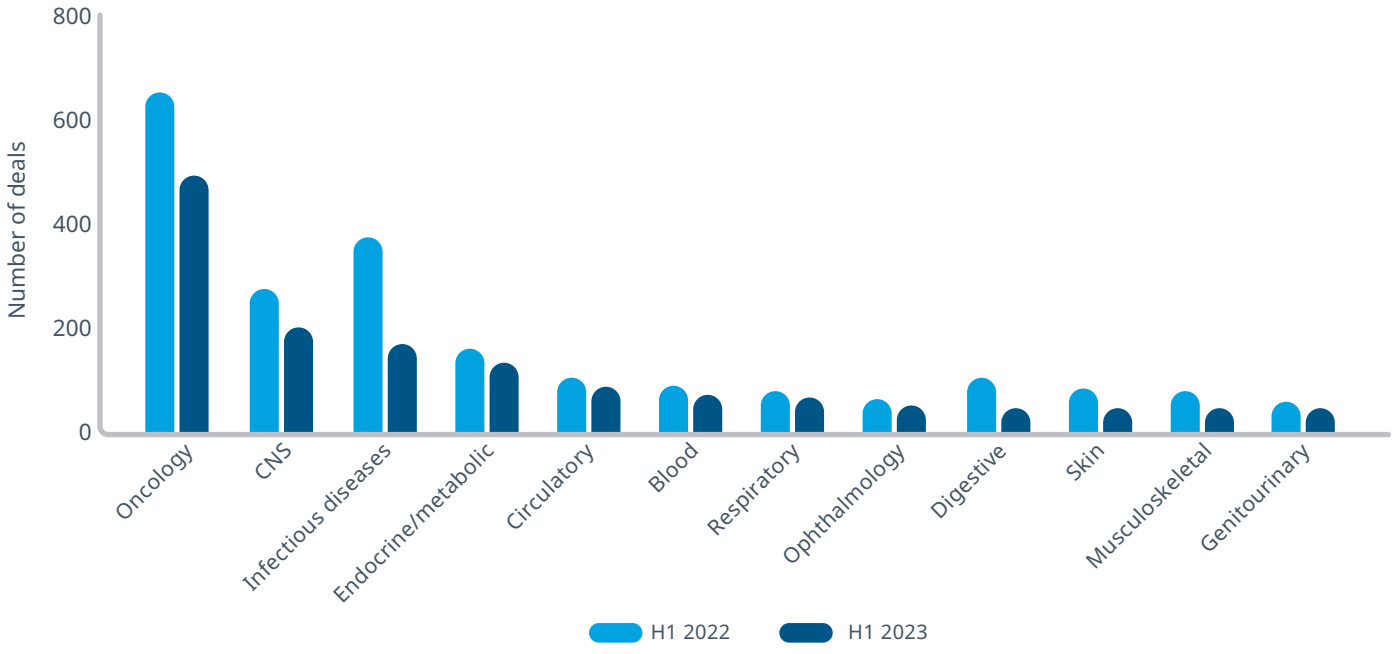
# Oncology continues to drive dealmaking

Oncology was once again the most popular therapy area for dealmaking in the life sciences sector in H1 2023, although deal volume was reduced on a semi-annualized basis in line with overall deal activity (Figure 7). Of the deals signed in H1 2023 that were ascribed an indication, approximately 41% involved oncology and approximately 17% involved CNS diseases. Despite the multiple challenges faced in CNS drug development, recent regulatory advancements have sparked an uptick in deal activity in recent years. Lilly's Prevail Therapeutics was particularly active in the area in H1 2023, signing collaborations with Scribe Therapeutics for the development of CRISPR-based in vivo therapies for neurological and neuromuscular disease (Deal no. 119159) and with Capsid Biotherapeutics to develop non-invasive gene therapies for CNS diseases (Deal no. 117177).

As COVID-19 collaborations continue to wane, infectious diseases deal activity dropped to third place as approximately 54% less deals involving the therapy area were announced in H1 2023 compared to the same period last year. However, following reports of deadly fungal infections on the rise, anti-fungal treatments are beginning to peak interest with Astellas' asset purchase agreement with Sandoz for Mycamine (Deal no. 117405) and previously discussed licensing agreement between GSK and Scynexis for brexafemme. Without exception, all therapy areas included in the analysis recorded a decline in deal activity from H1 2022 to H1 2023, with infectious, digestive, and skin diseases showing the largest percentage decreases (54%, 50% and 39%, respectively).

In search for access to cutting-edge innovation and technical expertise, key oncology players continued to commit large sums of money to uphold their positions in the increasingly competitive market. In March, Novartis paid Bicycle Therapeutics US$50 M upfront and committed up to US$1.64 B in milestone payments to develop Bicycle® radio-conjugates (BRCs) for multiple agreed upon oncology targets (Deal no. 118336). Less than two months later, Bicycle's modalities peaked another big pharma's interest as Bayer paid US$45 M upfront for the development of radionucleotides spanning multiple oncology targets (Deal no. 119059).

**Figure 7: Number of deals, excluding grants, by therapeutic area, H1 2022 vs. H1 2023**




Source: IQVIA Pharma Deals.

In its largest deal of the period, BMS paid Tubulis US$22.75 M upfront and potentially up to US$1 B in milestones to develop differentiated antibody-drug conjugates (ADCs) for the treatment of solid tumors (Deal no. 118741). This deal is an example of intensifying big pharma interest in the ADC space, with AstraZeneca (Deal no. 117834) and Eisai (Deal no. 118974) also signing billion-dollar deals in H1 2023 aimed at developing next-generation ADCs.

Notable deals in the metabolic diseases field in H1 2023 include Sanofi's collaboration with Maze Therapeutics, which is focused on Maze's glycogen synthase 1 (GYS1) program, including clinical candidate MZE001 in development for the treatment of Pompe disease, worth up to US$750 M (Deal no. 118872) and Novartis' US$87.5 M asset purchase agreement with Avrobio for the latter's investigational hematopoietic stem cell (HSC) gene therapy program for the treatment of cystinosis (Deal no. 119252).

## Outlook for H2 2023

Despite factors constraining dealmaking activity in the life sciences sector in H1 2023, many drivers of deal activity persist which could provide the backdrop for a more active second half of 2023. Several big pharma companies are facing looming patent cliffs in coming years so will need to deploy their sizeable cash reserves and invest in medium and near-term revenue generators to address these impending pipeline gaps. Heading into the latter half of the year, constraining factors such as the effect of the US IRA on pricing will be better understood and there should be less uncertainty surrounding business conditions, which could in turn lead to an uptick in activity.

With the hope that markets will begin to stabilize and thereby reset valuations, there is an optimistic view on the outlook for M&A activity in H2 2023. However, mega-mergers will continue to be mostly off the cards with smaller, asset-driven bolt-on acquisitions of up to US$15 B likely to continue to be the favored route for big pharma rather than transformative buyouts. Biogen's US$7.3 B purchase of Reata Pharmaceuticals (Deal no. 120454) and Eli Lilly's US$1.9 B acquisition of Versanis Bio (Deal no. 120267) are early examples of this in H2 2023.

With minimal IPOs and public funding expected for the remainder of the year, struggling early-stage companies will increasingly look to partnerships and collaborations to maintain cash flow and stay afloat. Large pharma companies are likely to follow a risk averse approach and enter heavily backloaded deal structures to access innovative technologies and programs at potentially discounted prices. That said, with significant cash reserves to deploy, companies are still willing to pay richly for quality evidence-backed assets. A recent example of this is Roche's agreement with Alnylam Pharmaceuticals where it committed US$310 M cash upfront and up to US$2.8 B more in milestones to co-develop and co-commercialise Phase II investigational RNAi therapy, zilebesiran, for the treatment of hypertension in patients with high cardiovascular risk (Deal no. 120366). Out-licensing of deprioritized assets by big pharma will also continue to be seen as companies reprioritize their pipeline and focus on their highest growth opportunities. For example, Pfizer agreed to out-license its portfolio of preclinical rare disease gene therapies to AstraZeneca's Alexion Pharmaceuticals for US$1 B in July (Deal no. 120431).

Oncology deal flow is expected to continue dominating the dealmaking landscape, with significant investment in innovative immunotherapies as companies pay to access next-generation technologies that seek to overcome the limitations commonly associated with existing approaches, as evidenced in Takeda's recent collaboration with FStar Therapeutics for next-generation multispecific antibodies (Deal no. 120074) and Beigene's partnership with DualityBio for the development of ADCs for solid tumors (Deal no. 120128). After a slowdown in H1 2023, the level of collaborative R&D is expected to pick up again as key players under pressure to achieve growth targets will rely on external R&D to supplement any future revenue erosion. Collaborations that may attract the highest valuations could be cell and gene therapies, targeted protein degradation and ADCs.

# About the authors

**LUCY HAGGERTY**
Analyst, Global Market Insights,
IQVIA

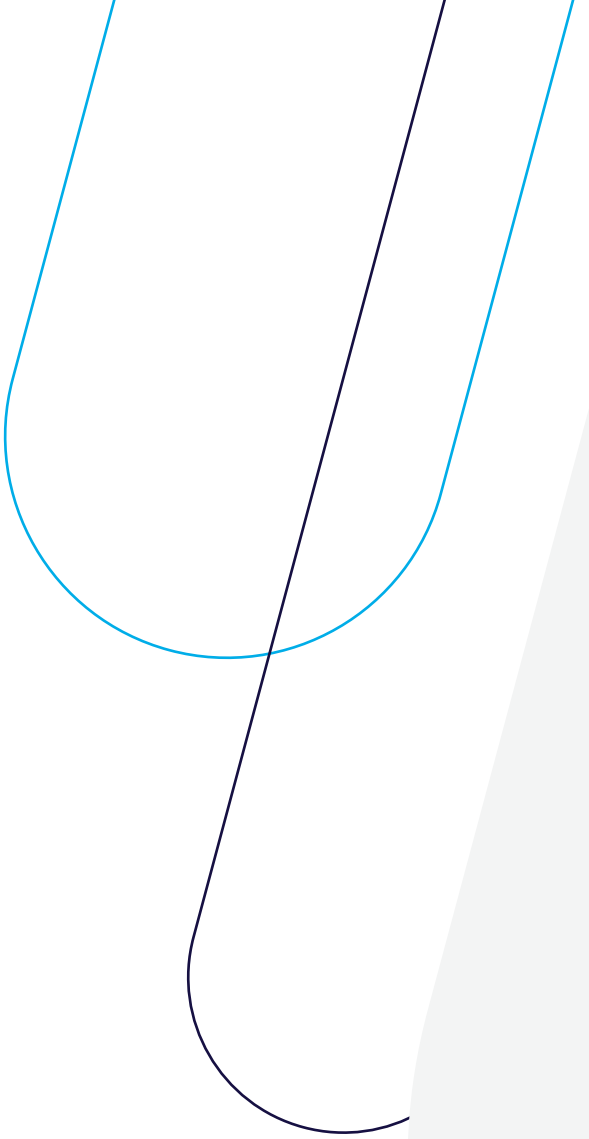
Lucy is an Analyst in the IQVIA Pharma Deals and Analytics Link team. She specializes in biopharma deals and alliances as well as company data research, analysis and forecasting. Lucy graduated from Imperial College London with a Master's degree in Chemistry with Medicinal Chemistry.

**SWATI SHARAN**
Senior Insights Associate,
Global Market Insights,
IQVIA

Swati holds a Master's degree in Bioinformatics from Delhi Technological University. She is currently working within IQVIA as a Senior Insights Associate in the Analytics Link and Pharma Deals team and has experience in competitive intelligence and pipeline analysis in the pharmaceutical industry.

**TASKIN AHMED, MBA**
Associate Director,
Pharma Deals,
IQVIA

Taskin has been working in the field of market research and healthcare business intelligence for over 10 years, previously at Intelligentsia and Thomson Reuters. During this time, he was responsible for research, analysis and development of biopharma industry focused reports, journals and databases. He has evolved his expertise in the pharmaceutical licensing deals and alliances area developing business relationships with pharmaceutical companies globally. Taskin holds an MBA from the University of Surrey Business School.



**CONTACT US**

Twitter: @IQVIA_GMI

LinkedIn: IQVIA Global Market Insights

**iqvia.com/contactus**