

The top ten biopharma deals of 2024

With the help of DealForma, we review and analyze the highest-value biopharma deals of 2024.

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In aggregated financial terms, the top ten highest-value deals so far in 2024 could be worth over \$31 billion. Although the total for the corresponding period in 2023 exceeded \$53 billion, it included a mammoth \$22 billion agreement between Daiichi Sankyo and Merck, which was one of the most substantial deals of the past decade, making it difficult to draw direct comparisons between the figures for the two years. The potential monetary value of each deal in the 2024 list is more than \$2 billion, and a couple of the deals could reach at least double or even triple that. Although cardiovascular disease and dementia feature among these agreements, cancer is the most common focus, accounting for six of the top ten deals.

Protein drugs are a particular theme, as is access to early-stage candidates and technology, despite the increased risks associated with these phases of research and development (R&D). At the end of April 2024, for example, pharmaceutical powerhouse Novartis expanded its 2019 peptide-discovery collaboration with Japanese drug discovery/biotech company PeptiDream in a deal potentially worth \$2.89 billion. PeptiDream's proprietary Peptide Discovery Platform System (PDPS) enables the generation of highly diverse libraries of macrocyclic peptides for screening against biological targets; hits are optimized and then developed into peptide and small-molecule therapeutics or peptide-drug conjugates. As well as building a pipeline of peptide-based diagnostics and therapeutics, PeptiDream also sells radiopharmaceuticals and radiodiagnosics through its wholly owned subsidiary, PDRadiopharma.

Expansion of the agreement with PeptiDream is part of a radiopharma trend for Novartis, which also collaborated with Bicycle Therapeutics and 3B Pharmaceuticals in March and April of 2023, respectively. Under the terms of the multi-program agreement with PeptiDream, Novartis has extended payment for use of PeptiDream's platform to identify and optimize macrocyclic peptides against targets selected by Novartis, for potential development into radioligand therapies. In return, PeptiDream will receive \$180 million upfront and potentially as much as \$2.71 billion in milestone payments and royalties on product sales.

On July 24 this year, Novartis also struck an oncology-focused agreement with California-based Dren Bio, making it the only company to feature more than once in the top-ten listing. Under the terms of the deal, Novartis could potentially pay out \$3 billion to use the therapeutic antibody company's targeted myeloid engager and phagocytosis platform to develop novel bispecific antibodies that target myeloid cells for treating cancer.

Dren Bio uses its platform to generate bispecific antibodies that activate myeloid cells in a way that it says may result in greater efficacy and safety than other therapeutic modalities such as T-cell engagers and antibody-drug conjugates (ADCs). Among its

in-house development program is a first-in-class bispecific antibody, DR-0201, targeting CD8-positive T cells, which is currently in phase 1 testing in B-cell non-Hodgkin's lymphoma (B-NHL) patients.

Dren Bio and Novartis will jointly develop selected targeted myeloid-engager programs up until clinical candidate selection, with Novartis responsible for late-stage development.

The agreement with Dren Bio and the PeptiDream collaboration add to a recent spate of oncology deals by Novartis, including the €2.7 billion purchase of antibody company MorphoSys in February, and the licensing of Arvinas' androgen receptor protein degrader for prostate cancer in April (potentially costing \$1.16 billion).

Another biopharmaceutical company focusing on protein drugs is Dallas-based Instil Bio, which licensed, from biotech ImmuneOnco Biopharmaceuticals, two phase 1 clinical cancer candidates, including a bispecific antibody and an anti-cytotoxic T-lymphocyte protein 4 (CTLA4) antibody, both for solid tumors. Announced in early August, and potentially worth over \$2 billion, this deal demonstrates oncology persistence, coming after Instil Bio closed its UK manufacturing and stopped clinical trial activities in January. The company also ceased development of its tumor-infiltrating lymphocyte (TIL) therapy for non-small-cell lung cancer in March.

ImmuneOnco Biopharmaceuticals, which is based in Shanghai, is harnessing both the innate and adaptive immune systems with the

Buyers in the immunology market

Immunology deals were not heavily featured in the top ten highest-value deals in 2024 (Table 1), but there have been major company acquisitions in the area in the past two years.

Eli Lilly already has a strong presence in autoimmune disorders. Its psoriasis therapy Taltz (ixekizumab) is one of several approved monoclonal antibodies (mAbs) that target isoforms of the inflammatory cytokine interleukin-17 (IL-17), in addition to Novartis's IL-17A-targeted Cosentyx (secukinumab), and UCB Pharma's Bimzelx (bimekizumab-bkzx), which inhibits both IL-17A and IL-17F. Oral therapies that are potentially more convenient than injectable mAbs could provide an opportunity to break into this competitive market. In June 2023, Eli Lilly gained two potential oral IL-17 inhibitors, the small-molecule clinical candidates DC-806 and DC-853, through its acquisition of Dice Therapeutics for \$2.4 billion.

The potential for oral small-molecule therapies was also a driver of one of the largest acquisitions in 2024. In July, Eli Lilly agreed to pay \$3.2 billion for Morphee, a company that has a focus on developing oral small-molecule drugs targeting integrins for chronic diseases. Its lead candidate MORF-057 is an oral small-molecule inhibitor of $\alpha 4 \beta 7$ integrin for the treatment of inflammatory bowel diseases, which is being evaluated in phase 2 studies in ulcerative colitis and Crohn's disease.

Among the other partnerships in the field, Sanofi signed a deal with SyntheKine in January 2024, that was notable for its potential to provide first-in-class therapies targeting IL-10 signalling for inflammatory diseases. Through the deal, SyntheKine was paid \$40 million upfront and undisclosed milestones to use its cytokine-engineering experience to identify IL-10 receptor agonists for potential further development as therapeutics by Sanofi.

Credit: Klaus Vedfelt / Getty

Table 1 | Top ten partnership deals by value for the year-to-date as of 27 October 2024

Licensor and licensee	Announced	Total deal value (upfront payment)	Synopsis
Flagship Pioneering; GSK	July 2024	\$7,350 million (\$150 million)	GSK signed a research partnership with Flagship Pioneering to discover and develop a portfolio of medicines and vaccines with an initial focus on respiratory diseases and immunology. GSK has the exclusive option to license all 10 resulting therapies. GSK and Flagship will jointly fund up to \$150 million upfront. If GSK exercises its option, Flagship and its bioplatfrom companies are eligible for up to \$720 million in development milestones and preclinical funding, plus royalties, for each program.
Argo Biopharmaceutical Co. Ltd. (aka Bowang Pharmaceutical); Novartis	January 2024	\$4,165 million (\$185 million)	Argo Biopharmaceutical granted Novartis exclusive, worldwide rights to develop and commercialize a phase 1 RNA-based therapy with an option for up to two additional therapies for the treatment of cardiovascular diseases. Additionally, Novartis has exclusive, worldwide rights (excluding China) for a phase 1/2a therapy. Argo will receive \$185 million up front and is eligible for up to \$3.98 billion in option exercise fees, development, and commercial milestones, plus undisclosed royalties.
Prime Medicine; Bristol Myers Squibb (BMS) and Juno Therapeutics (Celgene)	September 2024	\$3595 million (\$110 million)	Prime Medicine granted Juno Therapeutics exclusive rights to develop ex vivo T-cell therapies using Prime Medicine's PASSIGE and Prime editing technology for undisclosed targets. Prime Medicine will receive \$55 million up front and \$55 million as an equity investment from BMS. Prime Medicine is eligible for up to \$185 million in preclinical milestones, up to \$1.2 billion in development milestones, and 'more than' \$2.1 billion in commercialization milestones, plus royalties.
Dren Bio; Novartis	July 2024	\$3,000 million (\$150 million)	Dren Bio granted Novartis exclusive rights to develop bispecific antibodies by combining Dren's targeted cell depletion platform, targeted myeloid engager, and phagocytosis platform with Novartis's research, development and commercial expertise for the treatment of cancer. Dren Bio will receive \$125 million up front, \$25 million in equity investment, and up to \$2.85 billion in milestones, plus royalties.
PeptiDream; Novartis	April 2024	\$2,890 million (\$180 million)	PeptiDream granted Novartis exclusive, worldwide rights to develop and commercialize peptide-drug conjugates. PeptiDream will use its peptide discovery platform system (PDPS) technology to identify and optimize macrocyclic peptide targets selected by Novartis. PeptiDream will receive \$180 million up front and is eligible for up to \$2.71 billion in milestones, plus royalties.
AviadoBio (formerly NeuroGeneUs); Astellas Pharma	October 2024	\$2,230 million (\$50 million)	AviadoBio granted Astellas an exclusive, worldwide option to develop and commercialize AviadoBio's AVB-101, an adeno-associated virus (AAV)-based gene therapy for the treatment of frontotemporal dementia with progranulin mutations and other potential indications. AviadoBio will receive up to \$30 million up front and \$20 million in equity. AviadoBio is eligible for up to \$2.18 billion including license fees and milestone payments, plus royalties if Astellas exercises its option.
AC Immune; Takeda Pharmaceutical	May 2024	\$2,200 million (\$100 million)	AC Immune granted Takeda an option to license the development and commercialization of AC Immune's ACI-24.060, an anti-amyloid beta (abeta) active immunotherapy candidate, by combining AC Immune's experience with active immunotherapy approaches and Takeda's expertise in neuroscience drug development and commercialization for the treatment of Alzheimer's disease. AC Immune will receive \$100 million up front, and up to \$2.1 billion in milestone payments.
ImmuneOnco Biopharmaceuticals (aka Immune Onco Biomedical Technology); Instil Bio	August 2024	\$2,120 million (\$10 million)	ImmuneOnco granted Instil Bio exclusive worldwide rights (excluding Greater China) to develop and commercialize ImmuneOnco's IMM-2510, a PD-L1xVEGF bispecific antibody, and IMM-27M, an anti-CTLA-4 antibody to treat solid tumors. ImmuneOnco will receive \$10 million up front and is also eligible for up to \$40 million in near-term milestones, up to \$270 million in development and regulatory milestones, and up to \$1.8 billion in commercial milestones, plus royalties.
MOMA Therapeutics; Roche	January 2024	\$2,066 million (\$66 million)	MOMA Therapeutics granted Roche exclusive, worldwide rights to develop therapies using MOMA's KnowledgeBase platform (KNOMATIC) for the treatment of cancer. MOMA will receive \$66 million up front and is eligible for up to \$2 billion in development and commercial milestones, plus tiered royalties.
CSPC Pharmaceutical Group; AstraZeneca	October 2024	\$2,020 million (\$100 million)	CSPC Pharmaceutical granted AstraZeneca exclusive, worldwide rights to develop CSPC's preclinical, oral Lp(a) disruptor, YS-2302018, alone or in combination with AZD-0780, an oral small-molecule PCSK9 inhibitor for the treatment of cardiovascular diseases. CSPC will receive \$100 million up front and is eligible for up to \$1.92 billion in development and commercialization milestones.

Source: DealForma database, 2024.

aim of developing more-effective cancer immunotherapies. One of the candidates being licensed by Instil Bio is ImmuneOnco's lead asset, IMM2510, a novel programmed cell death 1 ligand 1 x vascular endothelial growth factor (PD-L1xVEGF) bispecific antibody. Among its advantages, according to the company, is the fact that it can bind multiple VEGF receptor ligands, and its smaller molecular weight should improve antibody-dependent cellular cytotoxicity (ADCC) and tumor penetration. The other candidate to be licensed, IMM27M, is a next-generation anti-CTLA4 antibody, also with enhanced ADC activity plus reduced toxicity. Both candidates are in development for treating solid tumors and are also being tested in combination. Under the terms of the deal, ImmuneOnco will receive upfront and potential near-term payments totaling up to \$50 million, in addition to milestone payments that could exceed \$2 billion, plus sales royalties.

Making it into the top ten with an oncology-focused collaboration (but not involving protein drugs) was biopharma company Roche, which struck a five-year discovery collaboration potentially worth

\$2 billion with precision medicine company MOMA Therapeutics in early January. MOMA Therapeutics' bespoke proprietary KNOMATIC platform is focused on the motion and structure patterns of ATPases, and other difficult-to-target enzymes involved in cancer and other diseases, enabling new targets to be identified, validated and drugged.

The agreement, which came just two days after Roche announced a collaboration with MediLink Therapeutics to develop an ADC for treating solid tumors, gives Roche access to MOMA's knowledge base and KNOMATIC platform to develop precision oncology drugs against dynamic targets involved in cancer development. In return for use of its platform and responsibility for candidates up to pre-clinical development, MOMA will be given \$66 million in upfront cash and could collect development milestone payments exceeding \$2 billion. Roche will be responsible for clinical development and commercialization.

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