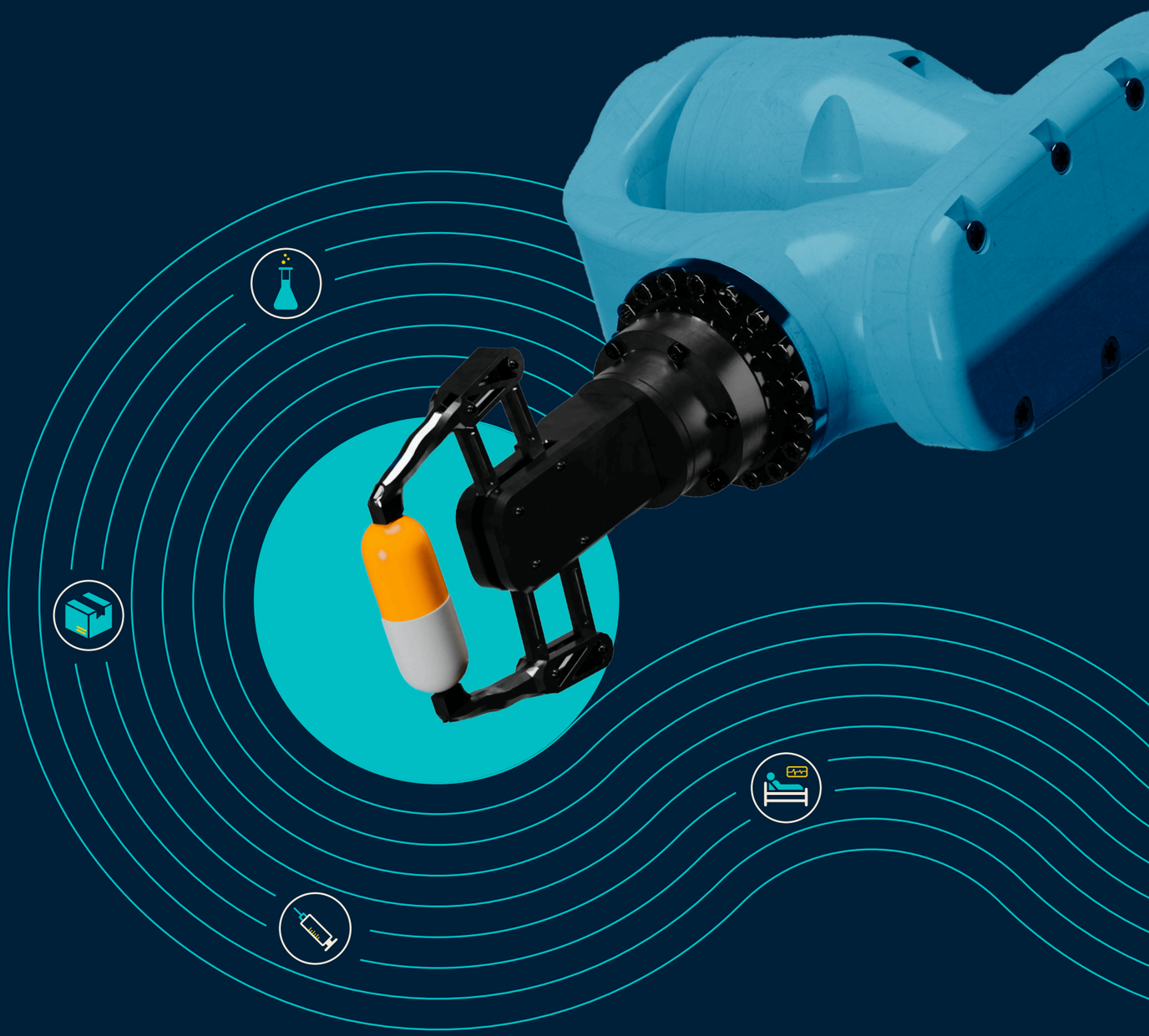
PitchBook

EMERGING TECH RESEARCH

Launch Report: Pharmatech

VC and PE trends and industry overview



Q1
2024

Contents

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Vertical overview

The pharmaceutical technology (pharmatech) sector, which includes contract research organizations (CROs), contract development & manufacturing organizations (CDMOs), and contract manufacturing organizations (CMOs), plays a pivotal role in the drug development process. Spanning from preclinical and clinical research to development and manufacturing, the sector is shaped by traditional and emerging drug modality technologies, ranging from small molecules to biologics, nucleic acids, and cell & gene therapies. Previous Morningstar analysis noted that 43% of the total market share of the CRO and CDMO market based on revenue was dominated by nine companies,[1] which highlights the concentrated nature of the space.

Investors in pharmatech include both VC and PE. Venture capitalists focus on funding emerging technologies from university labs to bring innovative services to the pharma industry, such as AI or cell & gene therapy methods. PE, on the other hand, focuses on buyouts of established late-stage or public entities with a traditional pharma focus, such as small molecule or biologics.

CROs play a crucial role in supporting preclinical and clinical research by leveraging emerging technologies to enhance drug discovery and development processes. Advancements in AI and new life science tools have been instrumental in building richer pipelines and developing stronger drug candidates, thus significantly impacting the efficiency of drug trials. Precision medicine is increasingly integrated into clinical research, with companies like Tempus leading the transformation of the space and planning an IPO. Decentralized trials have also become a critical component of clinical research infrastructures since the COVID-19 pandemic.

CDMOs facilitate the seamless transition from research phases to manufacturing, playing a critical role in both the development and commercial production of new therapies. Companies such as Resilience and ElevateBio have received substantial funding for their innovative contributions to cell & gene therapy technologies. CMOs focus on solving pharma and biotech challenges in the production of established drugs, generics, active pharmaceutical ingredients, and reagents, with much of the value coming from scale-up and expansion capabilities. The rapid scaling up of mRNA production during the COVID-19 pandemic, wherein government-funded CDMOs played a crucial role, demonstrated CDMOs' ability to adapt and expand capabilities in response to urgent market needs.

Pharmatech market dynamics are characterized by high switching costs and deep customer relationships due to the complexities and high stakes of clinical trials and drug manufacturing. Regulatory processes reinforce these dynamics, making it difficult for clients to switch providers without facing significant risks and delays. Continuous investment in new capabilities is essential for pharmatech firms to sustain and expand their market presence, and this has led to a growing trend of CDMOs adopting a one-stop-shop strategy to provide end-to-end solutions.

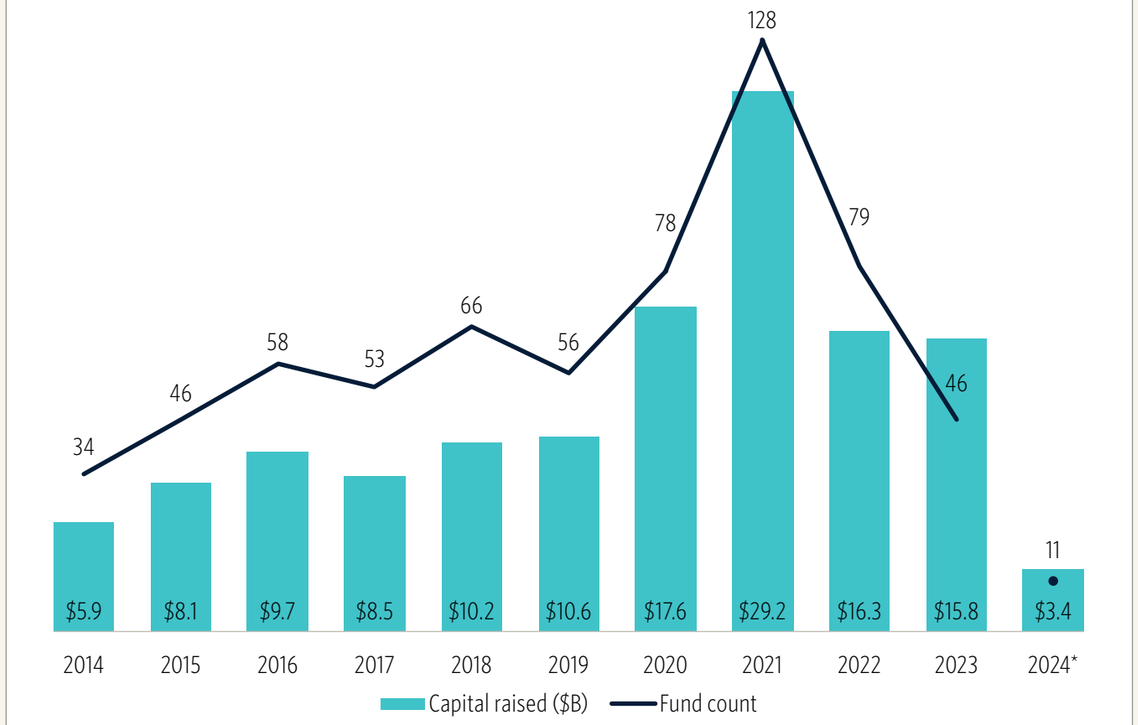
1: "Contract Research Organizations & Contract Development and Manufacturing Organizations," Morningstar Equity Research, Rachel Elfman and Ava Gams, November 2023.

VERTICAL OVERVIEW

The trend toward outsourcing is driven by the need for specialized expertise and efficiency in drug development, helping biopharma companies reduce costs and focus on core competencies. Pharmatech companies' financial performance depends primarily on contracts with biopharma firms, with revenue streams including clinical trial management and drug production. VCs look for IPOs and M&A exits, while PE investors seek to maximize value via consolidation, as exemplified by the PPD acquisition by Hellman & Friedman and The Carlyle Group, and its subsequent acquisition by Thermo Fisher Scientific. Add-on deals, such as Thermo Fisher's acquisition of Brammer Bio and Catalent's acquisition of Paragon Bioservices, further illustrate the consolidation trend, while some add-ons, like Resilience's acquisition of SwiftScale Biologics, focus on emerging technologies.

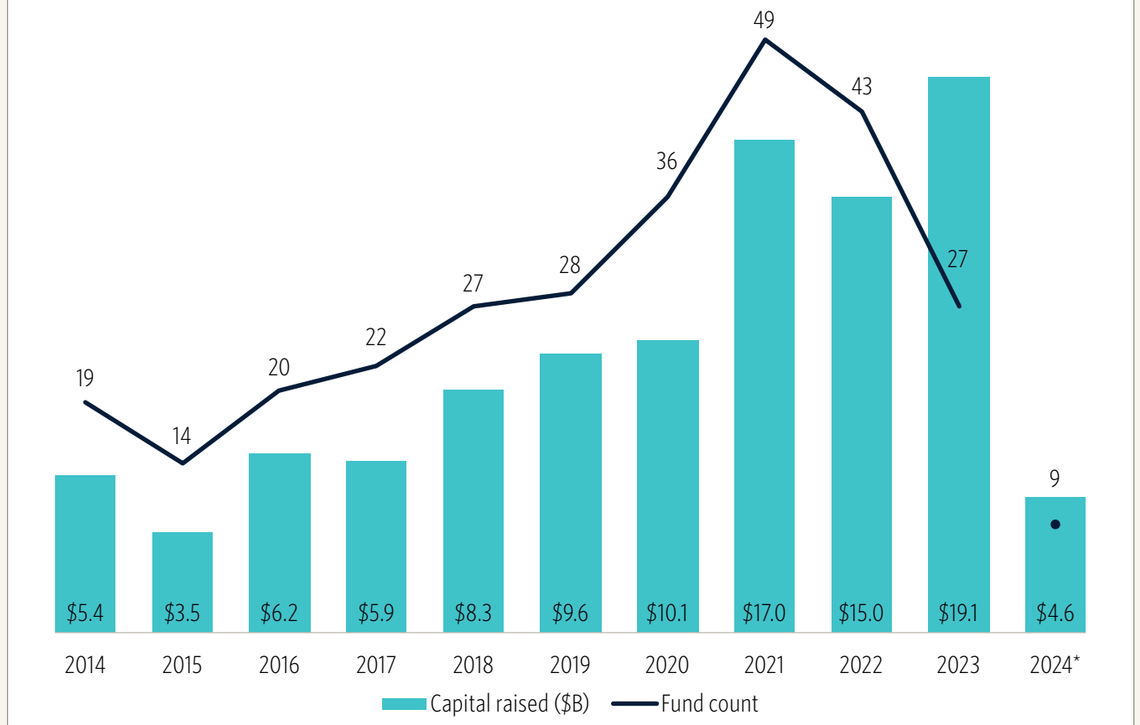
The sentiment among VCs remains cautiously optimistic, with a strong focus on clinical outcomes and late-stage venture successes. Interest in platforms capable of pioneering new modalities and targeting novel biological pathways remains high, driven by advancements in generative AI. The VC landscape in pharmatech is expected to evolve with an increasing focus on GLP-1s and complex modalities such as mRNA therapies and antibody-drug conjugates (ADCs). The demand for outsourcing large-scale manufacturing is projected to grow, thus providing significant opportunities for CDMOs to expand their capacity and adapt to these emerging trends.

Life sciences VC fundraising activity



Source: PitchBook • Geography: North America and Europe • *As of May 21, 2024

Healthcare PE fundraising activity



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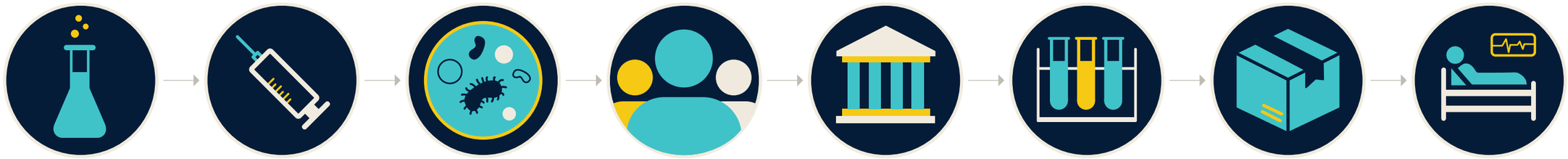
The CRO, CMO, and CDMO supply chain



Sources: PitchBook Emerging Tech Research and Morningstar

Q1 2020-Q1 2024 timeline

VC deal

October 23, 2020

Resilience, a biopharma company, emerges from stealth with $805.0 million in financing from investors including ARCH Venture Partners and 8VC. The company aims to transform drug and therapy manufacturing in the US, focusing on cell & gene therapies, viral vectors, vaccines, and proteins.

M&A

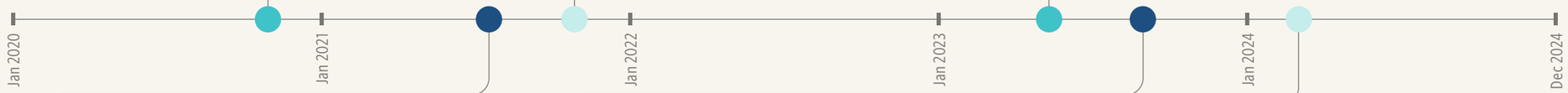
December 8, 2021

Thermo Fisher Scientific completes its acquisition of PPD, a leading global provider of clinical research services, for $16.0 billion. The deal expands Thermo Fisher's value proposition for biotech and pharmaceutical customers, advancing its work in bringing life-changing therapies to market.

VC deal

May 24, 2023

ElevateBio raises a $401.0 million Series D to expand its cell & gene therapy platform. The startup, led by industry executives, offers centralized research and manufacturing resources to accelerate the work of its partners.



PE deal

August 11, 2021

Parexel, a leading global CRO, is acquired by EQT IX fund and Goldman Sachs Asset Management from Pamplona Capital Management for $8.5 billion. The deal aims to capitalize on the growing market for outsourced clinical research services.

PE deal

September 20, 2023

Syneos Health, a global CRO headquartered in Morrisville, North Carolina, signs a definitive agreement to be taken private by Elliott Investment Management, Patient Square Capital, and Veritas Capital for $7.1 billion.

M&A

February 5, 2024

Novo Holdings enters into a merger agreement to acquire Catalent, a leader in enabling the development and supply of treatments, in an all-cash transaction valued at $16.5 billion. The deal represents a significant premium and aligns with Novo Holdings' strategy of investing in established life science companies.

Q1 2024 VC deal count summary

39
total deals

-7.1%
QoQ growth

-29.1%
YoY growth

-20.7%
YTD growth

Q1 2024 VC deal value summary

$0.7B
total deal value

46.5%
QoQ growth

-11.8%
YoY growth

-27.9%
YTD growth

Pharmatech VC ecosystem market map

This market map is an overview of venture-backed and growth-stage companies. Click to view the full map on the PitchBook Platform.

1 CROs

CRO - chemistry

CRO - biologics

CRO - nucleic acids

CRO - cell & gene therapy

CRO - clinical

2 CDMOs

CDMO - chemistry

CDMO - biologics

CDMO - cell & gene therapy

CDMO - nucleic acids

3 CMOs

CMO - chemistry

CMO - biologics

CMO - cell & gene therapy

CMO - nucleic acids

Pharmatech PE ecosystem market map

This market map is an overview of PE-backed companies in each segment that are currently active in PE portfolios. Click to view the full map on the PitchBook Platform.

1 CROs

CRO - chemistry

CRO - biologics

CRO - nucleic acids

CRO - cell & gene therapy

CRO - clinical

2 CDMOs

CDMO - chemistry

CDMO - biologics

CDMO - cell & gene therapy

CDMO - nucleic acids

3 CMOs

CMO - chemistry

CMO - biologics

CMO - cell & gene therapy

CMO - nucleic acids

VC and PE activity

VC activity in the pharmatech sector in Q1 2024 mirrored trends observed in the broader biopharma industry, with funding levels decreasing after the pandemic's peak. Private equity buyout deal counts have decreased since 2021, following the trend in the broader market. Compared to the high VC investment levels from 2020 to 2022, 2024's funding has moderated, indicating a market recalibration. In 2020, there was $5.0 billion in funding across 217 deals. In 2021, the investment surged to $9.4 billion across 295 deals. 2022 saw a slight decrease to $5.9 billion with 223 deals, and in 2023, the numbers dropped to $3.7 billion and 185 deals. Q1 2024 saw a further decrease to $749 million in funding across 39 deals. This significant reduction reflects a shift in the sector, possibly due to a combination of market saturation, economic adjustments, or shifts in investment strategies toward more targeted and potentially higher-yield biopharma ventures. In particular, VCs are staying away from the pharmatech space as funding is down and they have a preference for biopharma bets with assets. However, much of the movement in the space is dominated by concentrated bets by a few VCs.

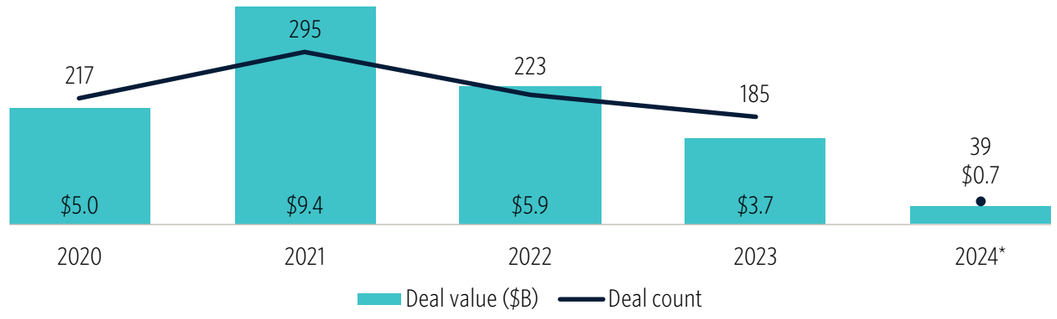
Investments in the pharma & biotech industry from 2020 to 2023 focused primarily on next-generation cell & gene therapy, decentralized trials, and biologics. Funding trends during this period show a sharp peak in 2021, followed by a steep decline. In 2020, the investment amount was $6.3 billion across 14 deals, which surged to $33.9 billion with 37 deals in 2021, reflecting the peak of pandemic-driven funding. However, this was followed by a significant drop in 2022 to $3.4 billion across 25 deals, with a slight decrease in 2023 to $3.3 billion across 14 deals. This pattern indicates a recalibration of market dynamics post-pandemic peak, with the industry refocusing on sustainable investment avenues and possibly more stringent selection criteria for funding.

PE deal activity in pharmatech fluctuated similarly during the pandemic, with deal count peaking in 2021 at 177. In recent years, the industry has seen varying levels of buyout and growth equity transactions, reflecting its dynamic nature. Since 2020's 69 deals, buyout deal count significantly increased, peaking in 2021 at 115 deals. This trend, however, began to recede with 96 deals in 2022, 91 in 2023, and a sharp drop to 11 deals projected for 2024. Similarly, growth equity transactions had 52 deals in 2020 and rose to 62 in 2021, indicating an active market phase. The subsequent years showed a gradual decline, with 58 deals in 2022, 40 in 2023, and a further reduction to six deals anticipated in 2024. The downward trend is primarily a result of broader market forces, but PE investors remain keenly interested in pharmatech, and activity should accelerate throughout the year.

Exit activity in pharmatech has fluctuated, with the significant VC bets during the pandemic initially boosting the sector. However, exit values have decreased since their peak in 2021. PE activity exit trends appear to be influenced by extreme events such as the PPD exit to Thermo Fisher, which skewed the overall exit values in 2021. Investment strategies have shifted toward fewer, more substantial deals. Economic factors including changes in healthcare policies and regulations have influenced investment decisions. Strategic patience is essential for realizing the potential of investments made during the pandemic period. PE bets initially seemed opportunistic in picking out the areas underserved by Big Pharma or contract services in-house developments and VC investors, but the focus has now shifted toward consolidation and optimizing existing capabilities.

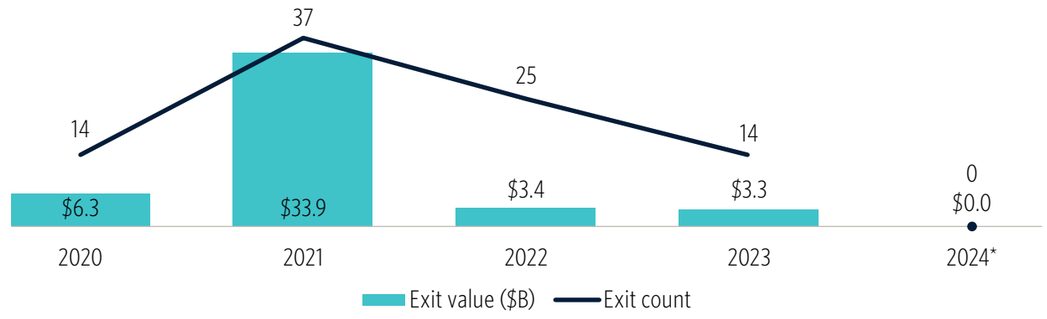
China has seen significant pharmatech investments, with several IPOs exceeding $500 million since 2020, including Hongyuan Pharmaceutical, OBiO Tech, OPM Biosciences, and Sinotherapeutics. In the US, investors remain focused on cell & gene therapies. The success of fundraising in the sector has increased investor confidence, and market exits have led to cautious optimism.

Pharmatech VC deal activity



Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech VC exit activity



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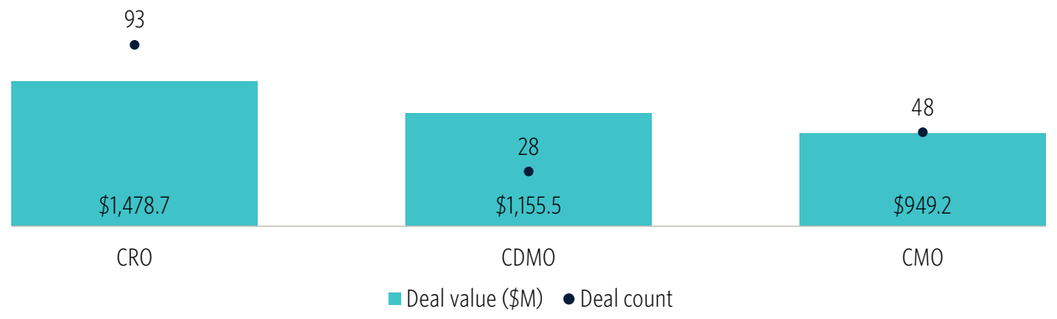
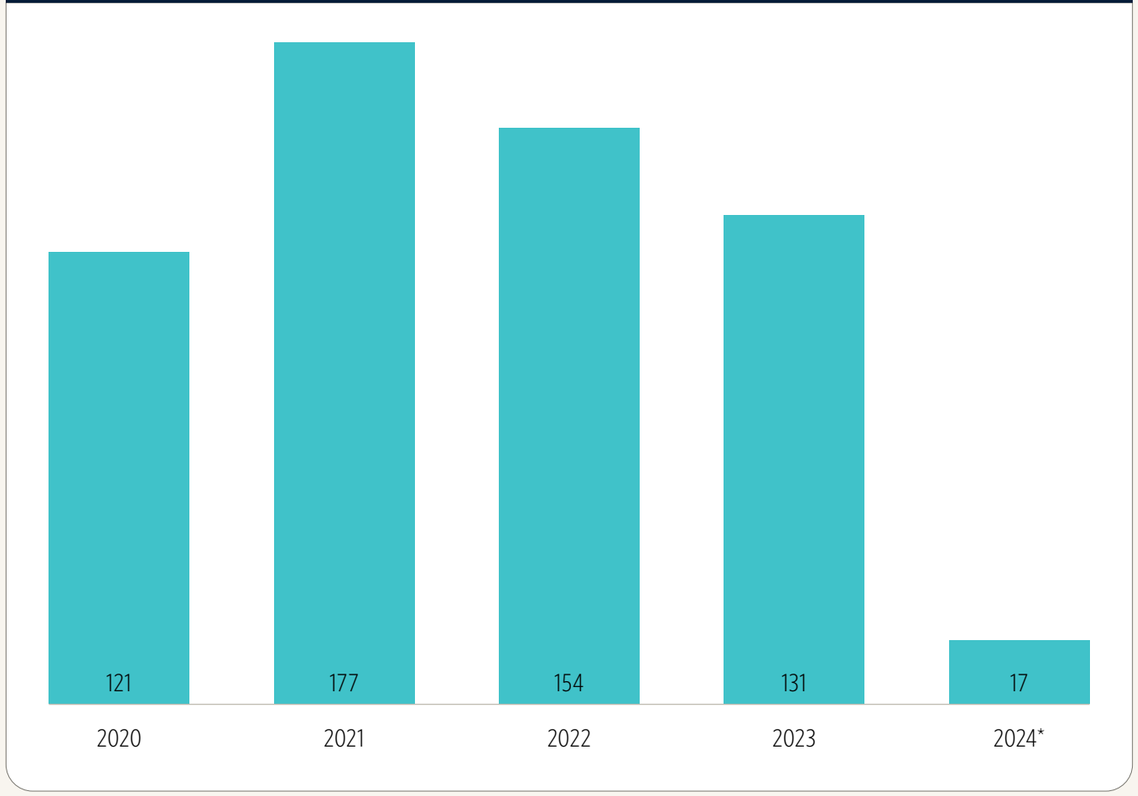
Trailing 12-month pharmatech VC deal activity by segment*



Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech PE deal count



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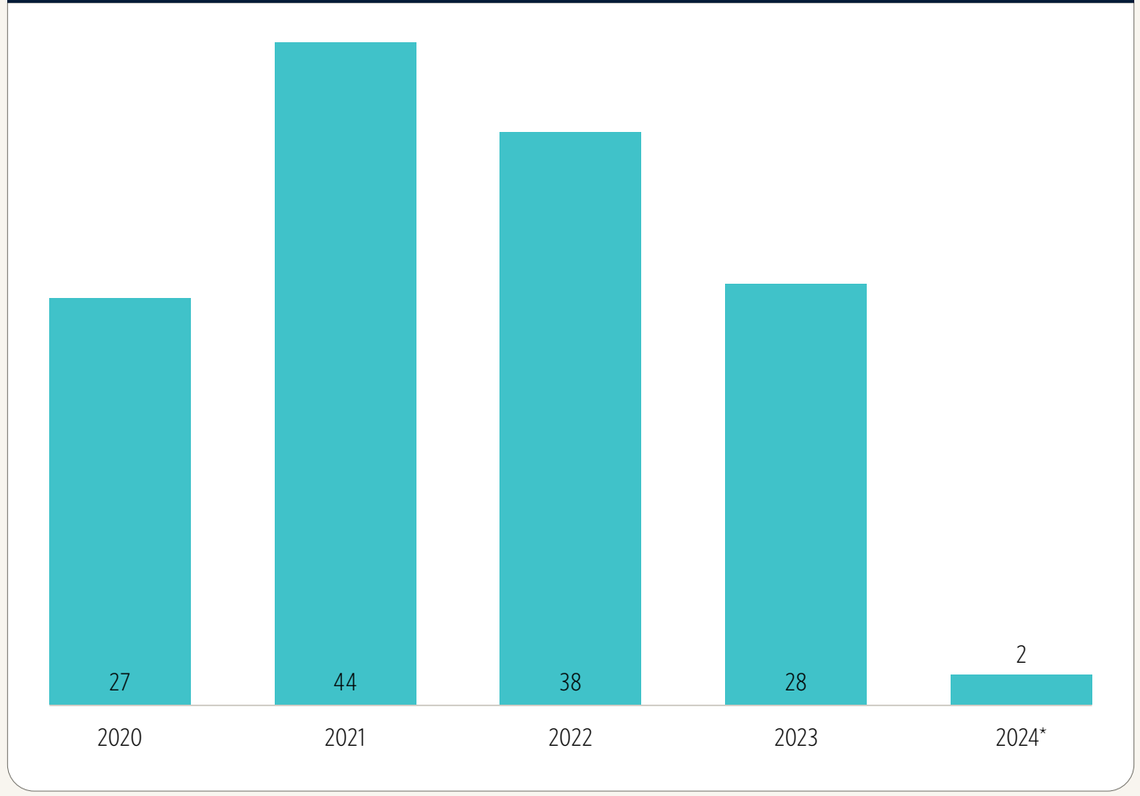
Pharmatech PE exit count



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Segment overview

Contract research organizations (CROs)

CROs support drug discovery and development by offering services such as preclinical testing, clinical trial management, and regulatory affairs. They help pharmaceutical companies navigate the complex process of bringing new drugs to market.

Contract manufacturing organizations (CMOs)

CMOs specialize in manufacturing services for pharmaceutical companies, providing scalable and cost-effective solutions for drug production, including API synthesis, formulation development, and packaging. They operate on a contract basis, thereby allowing pharmaceutical companies to outsource manufacturing and focus on their core competencies.

Contract development & manufacturing organizations (CDMOs)

CDMOs combine the services offered by CROs and CMOs, providing an integrated approach to drug development and manufacturing. They offer end-to-end solutions, from early-stage drug development to commercial production, forming strategic partnerships with pharmaceutical companies to streamline the drug development process.

CROs

Overview

A vital component of the pharma & biotech industry, the CRO segment provides outsourced research services for both preclinical and clinical stages of drug development. Preclinical CROs focus on early-stage research, including in vitro and in vivo studies, to assess the safety and efficacy of drug candidates before human trials. Clinical CROs specialize in the design, execution, and management of human clinical trials, from phase 1 to postapproval studies.

CROs offer a wide range of expertise and technologies to support drug development. Preclinical CROs employ advanced in vitro and in vivo models, high-throughput screening, and specialized imaging techniques to evaluate drug candidates. Clinical CROs utilize cutting-edge data management systems, decentralized clinical trial platforms, and AI-driven analytics for patient recruitment and monitoring.

Key legacy incumbents in the preclinical CRO space include Charles River Laboratories, Covance (now part of Labcorp), and Eurofins Scientific. In the clinical CRO segment, major players include IQVIA, ICON, Parexel, and PPD (now part of Thermo Fisher). These established companies offer comprehensive services and have a strong global presence.

However, several startups are emerging as potential disruptors in both the preclinical and clinical CRO segments. Preclinical CRO Emerald Cloud Lab utilizes robotic automation and machine learning (ML) to accelerate drug discovery and optimize preclinical studies for small molecules. Decentralized clinical trial platform Science 37 enables remote patient participation and monitoring, thus reducing costs and increasing patient engagement. Startups tend to be specialized, with many university spinouts focused on select modalities. These startups leverage innovative technologies and specialized expertise to address key challenges in drug development, such as efficiency, cost, and patient centricity.

The outlook for the CRO sector includes transformative opportunities in decentralized clinical trials and specialized services in next-generation therapeutics products. Companies such as Xilis, which is building an organoid platform, are positioned for growth due to clinical testing for precision medicine. Additionally, specialization in AI-driven drug discovery and cell & gene therapy manufacturing is increasingly vital for CROs aiming to capture market share in high-growth segments. Despite the promise, the sector faces challenges such as regulatory compliance and client concentration risks.

Subsegments within CRO include:

- **CRO - chemistry:** Providing research services for small-molecule drug development.
- **CRO - biologics:** Offering specialized services for the development of biological therapies, including proteins, peptides, antibodies, antibody conjugates, and vaccines.
- **CRO - cell & gene therapy (CGT):** Supporting the development of cell and gene therapies, including adeno-associated virus (AAV)-gene therapy, CRISPR-gene editing, CAR-T cell therapy, induced pluripotent stem cells (iPSCs), and others.
- **CRO - nucleic acids:** Assisting in the development of nucleic-acid-based therapeutics, including mRNA, RNA interference (RNAi), and small interfering RNA (siRNA).

- **CRO - clinical:** Focusing on the design and execution of clinical trials, including clinical trial management, data management and biostatistics, and regulatory affairs.

- **CRO - other:** Providing research services for emerging or nontraditional therapeutic areas, drug delivery, or consumer health products.

Business model

CROs support drug discovery and development for pharmaceutical companies, offering services such as preclinical testing, clinical trial management, pharmacovigilance, and regulatory affairs. CROs help navigate the complex process of bringing new drugs to market, providing expertise, resources, and flexibility.

The primary business model for CROs is fee-for-service, wherein companies charge clients based on the scope and complexity of the services provided. This allows pharmaceutical companies to outsource specific tasks or entire phases of the drug development process and thus manage costs and resources effectively. Fees vary depending on the type of service, project duration, and expertise required.

CROs may also offer risk-sharing models and receive a portion of the revenue generated by successful drug launches. This aligns the interests of the CRO and the pharmaceutical company, incentivizing high-quality work and support for the drug development program. Risk-sharing agreements can include success fees, milestone payments, or royalties based on sales.

Partnerships or licensing agreements between CROs and pharmaceutical companies provide access to the CRO's proprietary technologies, expertise, or intellectual property (IP) in exchange for royalties or milestone payments. Examples include:

- IQVIA's collaboration agreement with Agenus to develop an AI-based solution for oncology trials, leveraging IQVIA's data analytics capabilities and Agenus' immuno-oncology expertise.

- Parexel's partnership with Synexa Life Sciences to enhance decentralized clinical trials by combining Parexel's global clinical trial expertise with Synexa's innovative patient engagement and biosample collection capabilities.

- PPD's long-term strategic collaboration with Science 37 to advance decentralized clinical trials, leveraging Science 37's proprietary technology platform and PPD's global clinical trial expertise.

CRO contracts vary depending on the scope and complexity of the services provided, including provisions for project milestones, payment schedules, IP rights, and confidentiality obligations. CROs and pharmaceutical companies work closely to define engagement terms and thus ensure clear project objectives and expectations.

Industry drivers

Increasing research & development (R&D) spending: The pharma & biotech industry continues to invest heavily in R&D, with a focus on developing innovative therapies and expanding pipelines. In 2022, R&D spending continued to trend positively for both large pharma and mid-cap biotech companies, with 37 novel drugs approved by the Food and Drug Administration's (FDA's) Center for Drug Evaluation and Research, down from 50 in 2021.[2] However, in 2023, the FDA approved 55 novel drugs, showing a significant increase from the previous year.[3] This increase in R&D spending directly translates to higher demand for CRO services, as companies seek to outsource research and clinical trial activities to manage costs and improve efficiency.

M&A activity: The CRO segment is witnessing ongoing M&A activity, with a focus on capacity expansion and investments in new capabilities. The fragmented landscape of the CRO industry continues to provide fertile grounds for consolidation, as larger players seek to enhance their service offerings and gain market share. This M&A activity is attracting significant investment interest, as it allows investors to participate in the growth and consolidation of the CRO segment while benefiting from the increasing demand for outsourced research and clinical trial services. In many cases, the CRO will evolve into a full-service solution in the form of a CDMO. For example, Twist Bioscience provided DNA synthesis services and eventually provided biopharma development for antibody development.

VC and PE activity

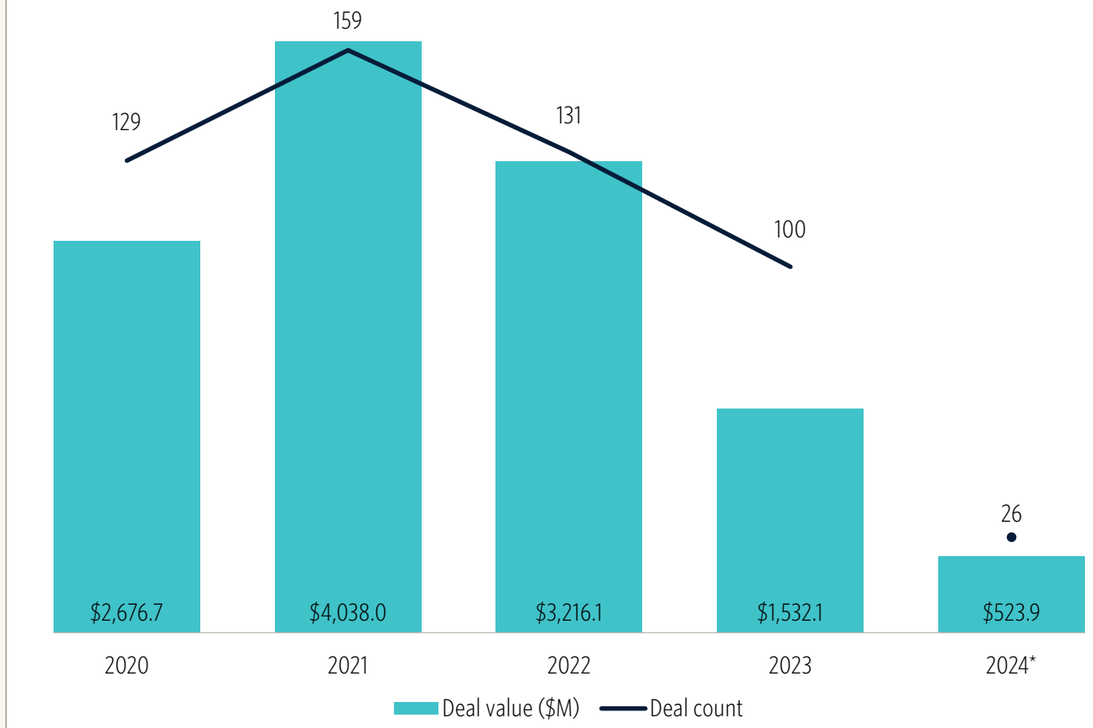
The VC landscape in the CRO segment has experienced notable shifts, with investment trends reflecting broader pharma & biotech industry dynamics. Interest from VCs and PE in preclinical and clinical CROs has surged, fueled by advancements in AI-powered drug discovery and the growing relevance of decentralized clinical trials and precision medicine.

After reaching a peak in 2021, VC and PE investments in the CRO sector declined despite continued innovations and market demand. In 2020, the sector attracted $2.7 billion across 129 deals, demonstrating robust activity as the industry responded to global health challenges. Investment peaked in 2021 with $4.0 billion spread across 159 deals, propelled by significant technological advances and the urgency of pandemic-related healthcare solutions. However, by 2022, the total investment dropped to $3.2 billion over 131 deals, and the downward trend continued into 2023 with only $1.5 billion from 100 deals. The preliminary data for 2024 shows a further contraction to $523.9 million across just 26 deals, indicating a significant recalibration in investment strategies.

Specific CROs like Mammoth Biosciences, which utilizes licensed CRISPR technology, have thrived by scaling partnerships and securing multiple contracts with sizable upfront payments. Noteworthy activity includes Thermo Fisher's acquisition of PPD for $17.4 billion and ICON's acquisition of PRA Health Sciences for $12.0 billion, both in 2021. These deals underscore the lucrative PE returns from well-established CROs and highlight the sector's pivotal role in advancing medical science, despite the general decline in investment numbers post-peak.

2: "Novel Drug Approvals for 2022," US Food and Drug Administration, March 18, 2024.
3: "Novel Drug Approvals for 2023," US Food and Drug Administration, June 18, 2024.

CRO VC deal activity



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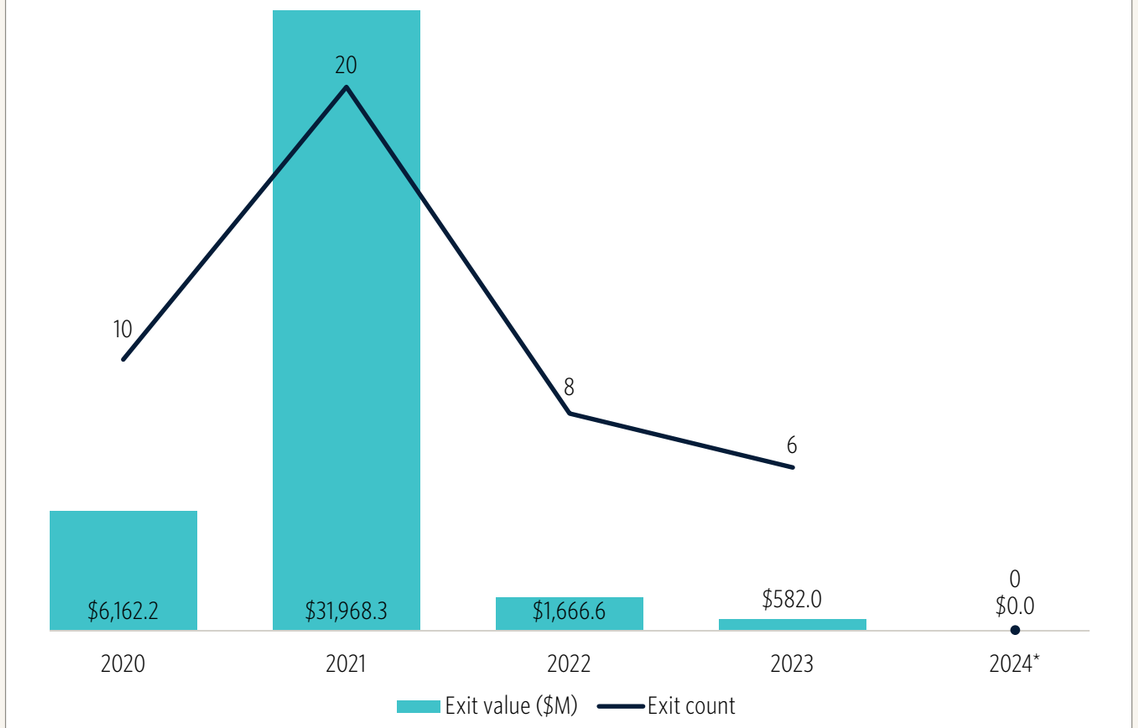
CRO VC exit activity



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Key CRO VC deals by deal value since 2020*

Company	Close date	Category	Deal value ($M)	Post-money valuation ($M)	Stage	Lead investor(s)
GRAIL	May 6, 2020	CRO - nucleic acids	$390.0	$3,840.0	Late-stage VC	N/A
XtalPi Technology	August 11, 2021	CRO - chemistry	$380.0	$1,968.0	Late-stage VC	5Y Capital, OrbiMed
Thrive Earlier Detection	July 24, 2020	CRO - clinical	$257.0	$677.0	Early-stage VC	Casdin Capital, S32
Delfi Diagnostics	July 18, 2022	CRO - nucleic acids	$225.0	$625.0	Early-stage VC	DFJ Growth
Paradigm	January 27, 2023	CRO - clinical	$203.0	$365.0	Early-stage VC	ARCH Venture Partners, General Catalyst
Synthego	February 17, 2022	CRO - nucleic acids	$200.0	$1,200.0	Late-stage VC	Perceptive Advisors
DNAnexus	March 8, 2022	CRO - nucleic acids	$200.0	$620.0	Late-stage VC	Blackstone
Owkin	November 18, 2021	CRO - nucleic acids	$180.0	$1,280.0	Late-stage VC	Sanofi
PathAI	May 18, 2021	CRO - chemistry	$165.0	$1,015.0	Late-stage VC	D1 Capital Partners, Kaiser Permanente
Formation Bio	September 30, 2021	CRO - chemical	$159.5	$1,000.0	Late-stage VC	Lachy Groom, Sam Altman

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CRO VC exits by exit value since 2020*

Company	Close date	Category	Exit value ($M)	Post-money valuation ($M)	Exit type	Acquirer
Ginkgo Bioworks	September 17, 2021	CRO - nucleic acids	$16,899.0	$19,399.0	Public listing	Soaring Eagle Acquisition
GRAIL	August 18, 2021	CRO - nucleic acids	$9,800.0	$9,800.0	Acquisition	Illumina
AbCellera	December 11, 2020	CRO - biologics	$4,828.3	$5,311.3	Public listing	N/A
Thrive Earlier Detection	January 5, 2021	CRO - clinical	$2,190.0	$2,190.0	Acquisition	Exact Sciences
Absci	July 22, 2021	CRO - biologics	$1,246.0	$1,446.0	Public listing	N/A
Schrodinger	February 6, 2020	CRO - chemistry	$842.6	$1,044.6	Public listing	N/A
Science 37	October 6, 2021	CRO - clinical	$720.0	$1,155.0	Public listing	LifeSci Acquisition II
Personal Genome Diagnostics	February 18, 2022	CRO - nucleic acids	$575.0	$575.0	Acquisition	Laboratory Corporation of America
Sinotherapeutics	August 22, 2022	CRO - chemistry	$565.1	$627.9	Public listing	N/A
R&G PharmaStudies	August 2, 2022	CRO - clinical	$526.5	$702.0	Public listing	N/A

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CRO incumbents*

Company	Key products	EV/NTM revenue	EV/NTM EBITDA
IQVIA	Clinical research, data management, and consulting services	3.6x	15.6x
Covance	Drug development, clinical trials, and nonclinical testing services	N/A	N/A
Parexel International	Clinical research, consulting, and medical communications	N/A	N/A
Pharmaceutical Product Development	Clinical research services, laboratory services, and patient-centric solutions	N/A	N/A
Icon	Clinical development services, commercialization, and consulting	2.9x	15.9x
Syneos Health	Clinical trial services, consulting, and commercialization solutions	1.9x	12.4x
Charles River Laboratories International	Drug discovery, safety assessments, and biopharmaceutical manufacturing	3.6x	14.3x
Eurofins Scientific	Laboratory testing services, drug development, and clinical diagnostics	2.9x	12.0x
Medpace	Full-service clinical development services for drug, biologic, and device programs	3.3x	17.4x

Source: PitchBook • Geography: Global • *As of March 31, 2024

Opportunities

AI & ML technologies: CROs are adopting these technologies to improve drug discovery, optimize clinical trial design, and accelerate patient recruitment. Startups leading the way include DNAnexus, which has raised $478.7 million, and PathAI, which has raised $395.5 million, in AI-driven drug discovery; and Unlearn.AI, which has raised $134.8 million, and Cyclica, which has raised $22.6 million, in improving clinical trial efficiency and patient stratification.

Precision medicine: As biopharma companies focus on developing targeted therapies based on patient-specific genetic and molecular data, CROs with expertise in biomarker discovery, companion diagnostics, and advanced analytics are well positioned for growth. Notable VC-backed leaders in the space include Tempus, which has raised $1.4 billion and combines AI with precision medicine to improve clinical trial design and patient outcomes, and Foresight Diagnostics, which has raised $71.2 million and focuses on liquid biopsy and companion diagnostics for precision oncology.

Risks and considerations

Biopharma funding challenges: Startups and smaller biotech companies may face difficulties in securing funding to advance their drug candidates to the next stage of development, which could lead to decreased demand for CRO services. The surge of layoffs in the biopharma sector after the pandemic was a key indicator, with examples such as Exscientia, which has raised $879.1 million, cutting down the AI-generated pipeline to two candidates and Beam Therapeutics cutting down to one candidate to preserve capital.

Saturated pipelines: Pharma & biotech companies may have rich pipelines but limited funding to take all their drug candidates through clinical trials, thus leading to a potential slowdown in the outsourcing of clinical trial services to CROs or developing more drug candidates with preclinical services. For example, AI-driven CROs have saturation hurdles with Big Pharma as they wait for the more mature candidates to go through trials.

CDMOs

Overview

The CDMO segment plays a crucial role in the pharma & biotech industry by providing outsourced development and manufacturing services for a wide range of drug modalities. CDMOs offer expertise and advanced technologies to support the production of small molecules, biologics, cell & gene therapies, and nucleic-acid-based therapeutics.

Key legacy incumbents in the CDMO space include Lonza, Catalent, Thermo Fisher (including Patheon), and WuXi AppTec (including WuXi Biologics). These players have established track records and offer a range of services across drug modalities. However, several startups are emerging as potential disruptors in the CDMO segment, focusing on niches and leveraging innovative technologies.

Notable startups experiencing significant growth in the CDMO segment include Resilience, a tech-focused CDMO that specializes in the development and manufacturing of complex medicines, including cell & gene therapies, viral vectors, and nucleic-acid-based therapies. Startup Cellares, which is developing an automated cell therapy manufacturing platform, aims to reduce the cost and complexity of cell therapy production. Additionally, startup Cellino Biotech uses AI and laser-based techniques to automate and scale stem cell production for regenerative medicine applications.

Subsegments within CDMO include:

- **CDMO - chemistry:** Providing development and manufacturing services for small-molecule drug candidates, including process development, scale-up, and commercial manufacturing.
- **CDMO - biologics:** Offering specialized services for the development and manufacturing of biological therapies, including proteins, peptides, antibodies, antibody conjugates, and vaccines.
- **CDMO - CGT:** Supporting the development and manufacturing of cell and gene therapies, including AAV-gene therapy, CRISPR-gene editing, CAR-T cell therapy, iPSCs, and other advanced therapies.
- **CDMO - nucleic acids:** Assisting in the development and manufacturing of nucleic-acid-based therapeutics, including mRNA, RNAi, and siRNA.
- **CDMO - other:** Providing development and manufacturing services for emerging or nontraditional therapeutic areas, drug delivery technologies, or consumer health products.

Business model

CDMOs offer an integrated approach to drug development and manufacturing, providing end-to-end solutions for pharmaceutical companies. CDMOs combine the services offered by CROs and CMOs, streamlining the drug development process and helping to bring products to market faster.

The primary business model for CDMOs is fee-for-service, wherein companies charge clients based on the scope and complexity of the services provided. This model allows pharmaceutical companies to outsource various stages of drug development and manufacturing, from early-stage research to commercial production.

CDMOs also engage in risk-sharing agreements with pharmaceutical companies, such as success fees, milestone payments, or royalties based on sales. These agreements align the interests of the CDMO and the pharmaceutical company and thus incentivize high-quality work and support for the drug development program.

Partnerships or licensing agreements between CDMOs and pharmaceutical companies provide access to the CDMO's proprietary technologies, manufacturing processes, or IP in exchange for royalties or milestone payments. Examples include:

- Thermo Fisher's $600 million investment in a new dedicated manufacturing facility for CSL to support the development and commercialization of CSL's recombinant factor IX product for hemophilia B.
- Lonza's licensing agreement with Cellectis to access Cellectis' TALEN gene-editing technology for use in Lonza's biomanufacturing services.
- Samsung Biologics' partnership with AstraZeneca to provide large-scale commercial manufacturing for AstraZeneca's biologics products.

Partnerships between CDMOs and pharmaceutical companies can range from project-specific collaborations to long-term strategic alliances. Deal terms can vary widely depending on the nature and scope of the engagement, including provisions for project milestones, payment schedules, IP rights, technology transfer, and quality assurance obligations.

In some cases, CDMOs offer build-to-suit or dedicated facility arrangements, constructing or dedicating a manufacturing facility specifically for a pharmaceutical company's products. These arrangements provide the pharmaceutical company with greater control over the manufacturing process and ensure dedicated capacity for their products.

Industry drivers

Growing demand for biologics: The increasing share of biologics in FDA approvals and the substantial investments made by biopharma companies in these drugs are driving growth in the CDMO segment. Compared to small molecules, biologics are more complex to evaluate in clinical trials and more difficult to produce, thus requiring specialized expertise and advanced manufacturing capabilities.

Investment, partnering, or M&A in next-generation drug-manufacturing capabilities: CDMOs are investing heavily in novel drug-manufacturing capabilities to meet the current and anticipated demand from their biopharma customers researching next-generation drugs using cell therapies, gene therapies, GLP-1s, and mRNA technologies. For instance, AmplifyBio partnered with RNAV8 for mRNA expertise, and Ginkgo Bioworks partnered with Sensible Biotechnologies for RNA manufacturing.

VC and PE activity

The CDMO sector has experienced a dynamic funding landscape in recent years, influenced by the growing demand for specialized manufacturing services. From 2020 to 2024, the sector witnessed a fluctuating trend in VC and PE investments. In 2020, there was $1.8 billion in VC funding from 45 deals, which almost doubled in 2021, marking the peak year with $3.6 billion from 60 deals. However, the subsequent years saw a decline, with $1.7 billion from 31 deals in 2022 and $1.2 billion from 34 deals in 2023. Preliminary data for 2024 shows a further contraction to just $59.7 million across six deals, indicating a significant recalibration in investment strategies or possibly market saturation.

These fluctuations suggest that investors are reassessing their strategies and adapting to the evolving market conditions. The decline in funding after the 2021 peak may be attributed to various factors such as market saturation, shifting priorities, or a more cautious approach to investments in the post-pandemic era. As the CDMO sector continues to mature and adapt to the changing demands of the pharmaceutical industry, it will be crucial to monitor these investment trends to gauge the overall health and growth prospects of the sector.

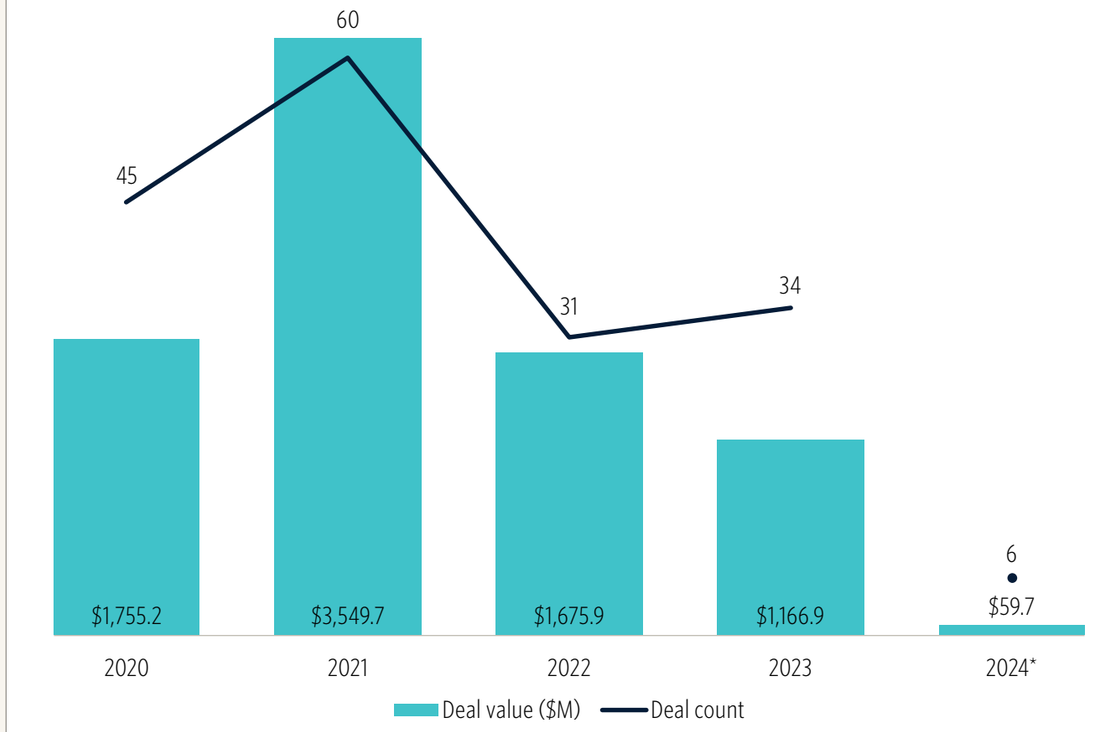
Despite these challenges, notable deals in the sector—such as Resilience's $625.0 million Series D for expanding its biomanufacturing capabilities, Evergreen Theragnostics raising a $26.0 million VC round to expand its radiopharma CDMO services, and Cellares' $82.0 million Series B aimed at developing its factory-in-a-box platform for cell therapy manufacturing—have demonstrated continued interest in specialized manufacturing and innovative technologies, especially for cell & gene therapies and advanced therapeutics. These deals, driven by large investments, suggest that while overall funding has decreased, significant capital is still being directed toward enhancing CDMO capabilities and services. This trend is also tied to the biopharma industry grappling with fundraising challenges. Despite this dip, confidence in future growth exists due to the advancement of clinical-stage biopharma deals. Preclinical deals, while numerous, were generally smaller compared with late-stage companies seeking approval, as they required fewer services.

On the PE deal activity end, recent data suggests that the pharmaceutical CDMO space has slowed despite a few large exits. This shift may be attributed to various factors, including regulatory changes, the impact of the pandemic on the pharmaceutical industry, and the evolving biopharma market dynamics to favor clinical assets. Despite this trend, overall interest in CDMOs remains strong and is fueled by the pandemic biotech funding boom and the escalating complexity of next-generation drug modalities, which have expanded the demand for CDMO services, as emerging biotech companies increasingly outsource manufacturing to concentrate on drug development.

CDMOS

Despite the recent downturn, Big Pharma leaders continue to rely on CDMO services to advance their drug portfolios, particularly in the costly biologics scale-up process. Investors are especially drawn to CDMOs offering specialized services, as these firms are well positioned to capture significant market share in high-growth segments like biologics manufacturing and cell & gene therapy support. This strategic investment focus was evident in the rush of major PE-driven M&A that reshaped the CDMO landscape in 2021, as investors sought consolidation across the fragmented space. Notable transactions included Danaher's acquisition of Aldevron, a CDMO specializing in plasmid DNA, mRNA, and proteins for cell & gene therapies, for $9.6 billion, and Charles River Laboratories' acquisition of Cognate BioServices, a CDMO focused on cell & gene therapy manufacturing, for $875.0 million. Since the flurry of activity in 2021, the pace of PE-driven M&A in the CDMO sector has quieted. However, the long-term growth prospects for CDMOs remain strong, as the increasing complexity of drug development and the ongoing need for specialized manufacturing services continue to drive demand for their expertise.

CDMO VC deal activity



Source: PitchBook • Geography: Global • *As of March 31, 2024

CDMO VC exit activity

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CDMO VC deals by deal value since 2020*

Company	Close date	Category	Deal value ($M)	Post-money valuation ($M)	Stage	Lead investor(s)
Resilience	October 23, 2020	CDMO - CGT	$755.0	$1,605.0	Early-stage VC	8VC, ARCH Venture Partners
ElevateBio	March 15, 2021	CDMO - CGT	$525.0	N/A	Late-stage VC	Matrix Capital Management
Asymchem Bio	October 13, 2022	CDMO - biologics	$357.2	N/A	Late-stage VC	N/A
Thousand Oaks Biopharmaceuticals	December 28, 2021	CDMO - biologics	$235.2	$1,365.9	Late-stage VC	CDH Investments, Gold Stone Investment
Probio Technology	April 21, 2023	CDMO - CGT	$224.0	N/A	Late-stage VC	Legend Capital
ABclonal China	December 8, 2021	CDMO - chemistry	$187.8	N/A	Late-stage VC	CMB International Capital, HongShan, Lucion Venture Capital
EirGenix	October 16, 2021	CDMO - biologics	$180.6	$992.1	Late-stage VC	N/A
Stelis	March 19, 2021	CDMO - biologics	$159.6	$632.1	Late-stage VC	TPG
Probio Technology	September 10, 2021	CDMO - CGT	$150.0	N/A	Late-stage VC	N/A
Touchlight	September 15, 2021	CDMO - nucleic acids	$126.7	$704.4	Late-stage VC	Bridford Group, Novator Partners

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CDMO VC exits by exit value since 2020*

Company	Close date	Category	Exit value ($M)	Post-money valuation ($M)	Exit type	Acquirer(s)
OBiO Technology	March 22, 2022	CDMO - CGT	$820.6	$1,029.3	Public listing	Haitong Innovation Capital Management, Shanghai Guoxin Investment, Zhangjiang Hi-Tech Investment
OPM Biosciences	September 2, 2022	CDMO - biologics	$724.0	$965.3	Public listing	N/A
Vigene Biosciences	June 28, 2021	CDMO - CGT	$350.0	$350.0	Acquisition	Charles River Laboratories International
Piedmont Animal Health	July 20, 2022	CDMO - chemistry	$210.0	$210.0	Acquisition	Dechra Pharmaceuticals
Cuorips	June 7, 2023	CDMO - CGT	$66.1	$85.3	Public listing	N/A
Lucy Scientific Discovery	February 9, 2023	CDMO - chemistry	$57.6	$65.1	Public listing	N/A
Xpress Biologics	October 5, 2021	CDMO - biologics	N/A	N/A	Buyout	ARCHIMED, Noshaq
Inventage Lab	November 22, 2022	CDMO - CGT	N/A	N/A	Public listing	N/A
Velesco Pharmaceutical Services	October 11, 2021	CDMO - chemistry	N/A	N/A	Buyout	Aurora Capital Partners, Pace Analytical Services, The Cambria Group
Chromocenter	January 1, 2023	CDMO - biologics	N/A	N/A	Acquisition	Sumika Chemical Analysis Service

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CDMO incumbents*

Company	Key products	EV/NTM revenue	EV/NTM EBITDA
Lonza Group	Biologics, small-molecule drug substances, cell & gene therapies, encapsulation and solid-dose forms	6.8x	21.9x
Catalent	Drug delivery technologies, biologic drugs, consumer health products, gene therapies	4.1x	15.3x
Thermo Fisher Scientific	Bioproduction, clinical trials services, viral vector services for gene therapy, cell culture media	5.9x	21.2x
WuXi AppTec	Small and large molecule R&D and manufacturing, cell therapy and gene therapy, laboratory services	7.1x	29.9x
Samsung Biologics Company	Biopharmaceutical manufacturing (including biosimilars), contract development, manufacturing of biologics	30.4x	72.8x

Source: PitchBook • Geography: Global • *As of March 31, 2024

Opportunities

Global expansion: The growing biopharma market in emerging economies presents significant opportunities for CDMOs. As healthcare access improves, disease prevalence rises, and healthcare investments increase in these regions, the demand for outsourced manufacturing services is expected to grow. CDMOs that can establish a strong presence in these markets, such as Samsung Biologics and WuXi Biologics, are well positioned to capitalize on this trend.

Cell & gene therapy support: The increasing demand for cell & gene therapies, particularly CAR-T cell therapies, is driving growth opportunities for CDMOs with expertise in this area. Startups like Cellares and Ori Biotech are developing good manufacturing practices (GMPs) in a box solution to automate and scale the production of cell therapies, thereby addressing the challenges of cost and complexity in this field. CDMOs that can offer support for the development and manufacturing of these advanced therapies, such as Lonza and Catalent, are poised to benefit from this growing market.

Risks and considerations

Emerging therapy success risks: The success of stem cell and gene-editing therapies is not guaranteed, and large investments are required to develop the necessary technologies and manufacturing capabilities. Failure to demonstrate efficacy or safety in clinical trials could lead to a slowdown in the adoption of these technologies and a decrease in demand for related CDMO services. Additionally, even when a product is successful in terms of value, there may be a lack of manufacturing support. For example, Bristol Myers Squibb (BMS) acquired RayzeBio in Q1, but a shortage of specialized active pharmaceutical ingredients for radiopharmaceuticals is delaying the trials of BMS' new radiopharma assets.

In-house capabilities and acquisitions by larger companies: Many larger companies are developing in-house capabilities for stem cell and gene-editing therapies, which could limit opportunities for CDMOs in these areas. For example, Sana Biotechnology is focusing on stem cell therapy, while Beam Therapeutics is dedicated to gene-editing technologies. Moreover, some large pharmaceutical companies are acquiring CDMOs to meet their manufacturing needs. A recent example is Novo Nordisk's acquisition of Catalent to address the growing demand for GLP-1 receptor agonists, which are used in the treatment of diabetes and obesity. This acquisition highlights the pressure on CDMOs to rapidly scale up production to meet the increasing demand and avoid supply shortages or lost opportunities.

GMP product quality challenges and capacity constraints: Maintaining consistent quality and adherence to GMPs is crucial for CDMOs. Any quality issues or noncompliance with regulations could result in product recalls, reputational damage, or a reduction in demand for CDMO services. As the demand for outsourced manufacturing services grows, CDMOs may face capacity constraints, particularly for specialized services such as cell & gene therapy production. Inability to expand capacity quickly enough to meet the increasing demand could limit CDMOs' growth potential. During the pandemic, many CDMOs invested heavily in expanding their mRNA vaccine-manufacturing capabilities to meet the sudden surge in demand. However, as the pandemic subsided, a risk of overcapacity emerged in this area, which could lead to reduced profitability and potential asset impairments.

CMOs

Overview

The CMO segment plays a vital role in the pharma & biotech industry, specializing in the production of various drug modalities. CMOs are equipped with state-of-the-art facilities, seasoned personnel, and cutting-edge technologies essential for manufacturing small molecules, biologics, cell & gene therapies, and nucleic-acid-based therapeutics. Although the terms “CDMO” and “CMO” are sometimes used interchangeably, this segment specifically focuses on reagents, APIs, packaging, supplies, and other components critical to the key drug modalities during the drug-development process.

In the CMO space, well-established incumbents such as Patheon (now part of Thermo Fisher), Catalent, Lonza, and Recipharm have proven track records and provide a broad spectrum of manufacturing services across drug modalities. Despite the dominance of these established players, the landscape is witnessing the rise of several startups poised to disrupt the traditional CMO model with new technologies. Market needs in the pipeline drive growth in the CMO sector. For example, Mytide Therapeutics, which focuses on the development and manufacturing of peptides, is benefiting from rising demand for GLP-1s. Elegen is known for its manufacturing services for long-strand oligonucleotides, which are key for cell & gene therapy.

As the CMO sector looks to the future, it is well positioned for growth, particularly in emerging markets that present new opportunities for geographic expansion, driven by increasing healthcare access and supportive government policies. However, CMOs must navigate challenges such as competitive pricing pressures and reliance on large pharmaceutical contracts. To maintain market competitiveness and attract ongoing VC and PE interest, CMOs will need to prioritize innovation and diversification strategies.

Subsegments within CMO include:

- **CMO - chemistry:** Providing manufacturing services for small-molecule drugs, including active pharmaceutical ingredients, generics, and specialty pharmaceuticals.
- **CMO - biologics:** Offering specialized services for the manufacturing of biological therapies, including biosimiliars, peptides, antibodies, proteins, and reagents.
- **CMO - CGT:** Supporting the manufacturing of established cell & gene therapies with cell production, stem cell, CRISPR protein, and other reagents.
- **CMO - nucleic acids:** Assisting in the manufacturing of nucleic-acid-based therapeutics, including DNA synthesis and mRNA production.
- **CMO - other:** Providing manufacturing services for emerging or nontraditional therapeutic areas or consumer health products.

Business model

CMOs provide specialized manufacturing services for pharmaceutical companies, offering cost-effective solutions for drug production, including active pharmaceutical ingredient synthesis, formulation development, and packaging. CMOs operate on a fee-for-service model, which allows pharmaceutical companies to outsource manufacturing and reduce capital expenditure.

CMOs specialize in specific areas of manufacturing, such as active pharmaceutical ingredient synthesis, solid dose formulation, or sterile injectable production. They also provide value-added services, including quality control, regulatory compliance, and supply chain management. CMOs focus on established drugs, particularly in the generic and consumer health product markets, where efficient manufacturing and cost control are critical.

Partnerships between CMOs and pharmaceutical companies range from one-off production contracts to long-term supply agreements. Examples include:

- Catalent's long-term strategic partnership with Moderna to manufacture its COVID-19 vaccine.
- Lonza's agreement to manufacture Moderna's COVID-19 vaccine in its facilities.
- Thermo Fisher's $600 million agreement with Novavax to exclusively manufacture its COVID-19 vaccine candidate.
- Samsung Biologics' partnership with GSK to manufacture biopharmaceutical products, with joint investments in facility expansion.

Deal terms typically include product specifications, quality standards, production volumes, pricing, and delivery schedules. There is a growing trend toward strategic partnerships and risk-sharing agreements, which involve joint investments in manufacturing infrastructure, technology transfer, or the development of proprietary manufacturing processes.

The CMO business model enables pharmaceutical companies to outsource production and focus on their core competencies. As the pharmaceutical industry faces pressure to reduce costs and improve efficiency, the role of CMOs is becoming increasingly important, particularly in the generic and consumer health product markets.

Industry drivers

Biosimilars: The increasing demand for biosimilars, as patents for blockbuster biologics expire, presents a significant growth opportunity for CMOs. As more biopharma companies enter the biosimilars market, the need for specialized manufacturing services will continue to rise. Leading CMOs with expertise in biologics manufacturing tend to be established players, such as Avid Bioservices and Samsung Biologics.

Global expansion: The expanding pharmaceutical markets in emerging economies, particularly in Asia and Latin America, are driving growth opportunities for CMOs. As local biopharma companies in these regions seek to develop and manufacture drugs for their growing populations, they often rely on the expertise and capacity of CMOs. On the PE side, Mubadala Capital is expanding global research by acquiring various CMOs, including its recent acquisition of KELIX Bio in North Africa.

VC and PE activity

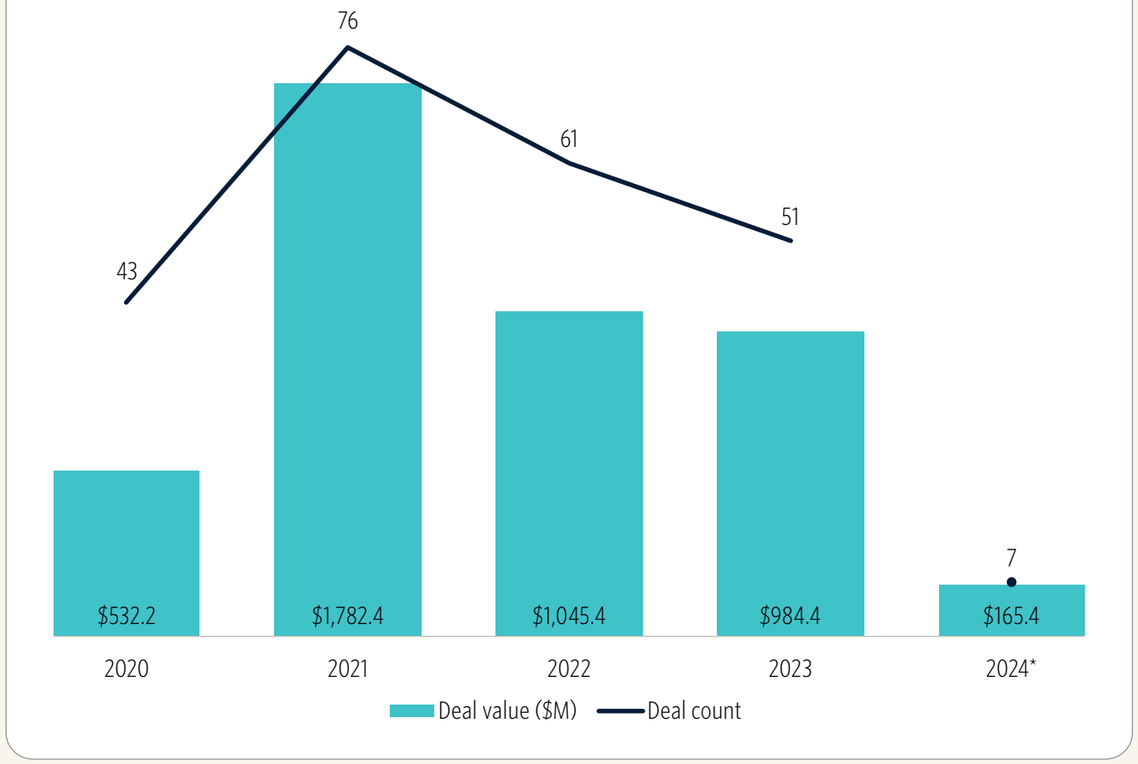
The CMO sector is undergoing significant transformations, with a growing emphasis on generics, biosimilars, and large-scale drug production. VC and PE firms are strategically investing in CMOs that specialize in high-volume manufacturing to address the increasing global demand for affordable medications. The shift in funding is shaped by the rising need for generics and biosimilars, fueled by patent expirations and the push for cost-effective healthcare solutions. While many CDMOs offer CMO services catering to this demand, a significant portion of the activity takes place outside the US, particularly in Asia, Latin America, and Europe.

In the recent funding cycle, 2020 saw $532.2 million with 43 deals, and 2021 witnessed a significant increase to $1.8 billion across 76 deals, showcasing a peak in investment interest. However, there was a noticeable downturn in the following years, with 2022 closing at $1.0 billion from 61 deals, and 2023 slightly lower at $984.4 million across 51 deals. The initial data for 2024 highlights a sharp contraction, with $165.4 million from only seven deals, indicating a considerable slowdown in the sector's investment activity. This trend underscores the ongoing adjustments in the CMO landscape, reflecting global economic pressures and shifts toward more sustainable investment practices.

Recent investment patterns reveal a preference for CMOs capable of handling complex manufacturing processes, especially for biosimilars, which must adhere to stringent safety and efficacy regulations. Mubadala, a prominent player in the global consolidation of the CMO space, has made several notable acquisitions, including of KELIX Bio, SGD Pharma, Capstone Nutrition, and Sebela Pharmaceuticals. These investments often focus on expanding production capacities and adopting advanced manufacturing technologies such as continuous manufacturing to improve scalability and efficiency. Strategic M&A in this segment highlights investor confidence in the profitability of generics and biosimilars.

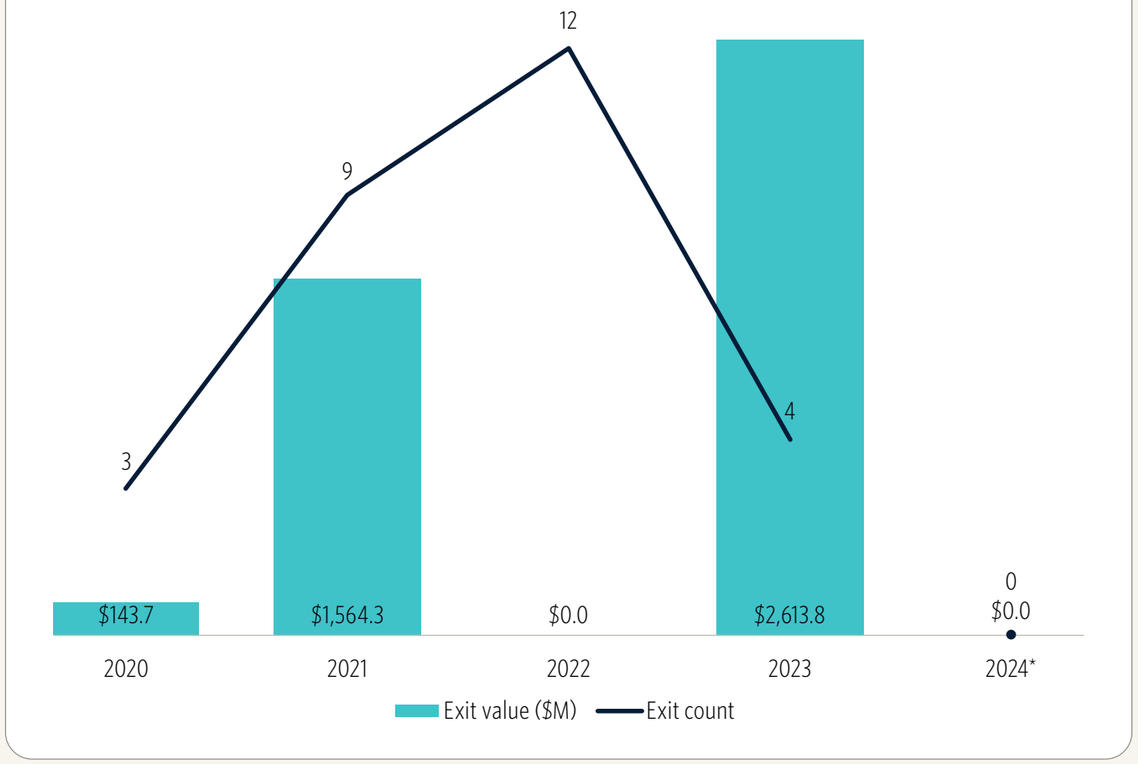
CMOS

CMO VC deal activity



Source: PitchBook • Geography: Global • *As of March 31, 2024

CMO VC exit activity



Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CMO VC deals by deal value since 2020*

Company	Close date	Category	Deal value ($M)	Post-money valuation ($M)	Stage	Lead investor(s)
Esco Lifesciences	May 26, 2021	CMO - biologics	$200.0	$844.2	Late-stage VC	Novo Holdings, Vivo Capital
Norchem Pharmaceutical	October 14, 2023	CMO - biologics	$77.0	$441.3	Late-stage VC	OrbiMed
Abiochem Biotechnology	October 27, 2021	CMO - chemistry	$65.3	$609.2	Late-stage VC	N/A
Apprentice	March 9, 2023	CMO - other	$65.0	$590.0	Late-stage VC	ICONIQ Growth
Tachem	December 1, 2023	CMO - chemistry	$41.7	$275.5	Late-stage VC	Citic Securities Investment, Gold Stone Investment
Phlow	April 5, 2023	CMO - chemistry	$36.0	$221.0	Early-stage VC	N/A
Selkirk Pharma	December 9, 2021	CMO - chemistry	$35.0	$235.0	Seed	N/A
Ruiye Medical	August 19, 2020	CMO - chemistry	$28.6	$415.5	Late-stage VC	N/A
Healthgen Biotech	October 9, 2020	CMO - biologics	$25.0	$218.9	Late-stage VC	N/A
Selkirk Pharma	September 6, 2023	CMO - chemistry	$24.1	$400.0	Seed	N/A

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CMO VC exits by exit value since 2020*

Company	Close date	Category	Exit value ($M)	Post-money valuation ($M)	Exit type	Acquirer(s)
Hongyuan Pharmaceutical Technology	March 20, 2023	CMO - chemistry	$2,551.5	$2,893.3	Public listing	N/A
Kaleo	December 28, 2021	CMO - biologics	$380.0	$380.0	Buyout	Marathon Asset Management, Princeton Biopharma Capital Partners
Telesis Bio	June 18, 2021	CMO - nucleic acids	$345.0	$451.7	Public listing	N/A
Avitide	September 30, 2021	CMO - biologics	$275.0	$275.0	Acquisition	Repligen
Duorui Pharmaceutical	September 29, 2021	CMO - chemistry	$253.1	$337.5	Public listing	N/A
San Nuo Technology	May 24, 2021	CMO - biologics	$166.3	$221.8	Public listing	N/A
Taienkang Pharmaceutical	March 29, 2022	CMO - chemistry	N/A	$742.2	Public listing	N/A
Fushilai	March 29, 2022	CMO - chemistry	N/A	$697.5	Public listing	N/A
PharmaResources	November 1, 2022	CMO - chemistry	N/A	$427.4	Public listing	N/A
SanLi Pharma	April 28, 2020	CMO - chemistry	N/A	$423.1	Public listing	N/A

Source: PitchBook • Geography: Global • *As of March 31, 2024

Key CMO incumbents*

Company	Key products	EV/NTM revenue	EV/NTM EBITDA
Recipharm	Pharmaceutical manufacturing including APIs, sterile and nonsterile products, and inhalation products	N/A	N/A
Cambrex	API development and manufacturing, custom development services for drug substances, advanced intermediates	N/A	N/A
Emergent BioSolutions	Vaccines, therapeutics, and biodefense products; contract manufacturing services for biopharmaceuticals	1.7x	11.2x
Siegfried Holding	Drug substance manufacturing (APIs), drug product manufacturing, and development services	2.6x	12.4x
Fareva	Generic drugs, cosmetics, household products, and industrial and agricultural products	N/A	N/A
Patheon	Drug development and manufacturing services including oral solid dose, sterile, and softgel formulations	N/A	N/A
Avid Bioservices	Biologics production specializing in monoclonal antibodies and recombinant proteins	5.8x	24.2x
Jubilant Pharmova	Pharmaceuticals, life science ingredients, drug discovery solutions, proprietary products in the US, radiopharmaceuticals	1.3x	N/A

Source: PitchBook • Geography: Global • *As of March 31, 2024

Opportunities

DNA synthesis to manufacturing: The increasing demand for synthetic DNA, driven by the growth of gene therapies and synthetic biology applications, presents a significant opportunity for CMOs. Startups like Twist Bioscience and Telesis Bio (formerly Codex DNA) are leading the way in this field, offering high-throughput DNA synthesis services to support the development of novel therapeutics and research applications.

GLP-1 peptides: The growing prevalence of diabetes and obesity is driving the demand for GLP-1 receptor agonists, a class of peptide-based drugs that help regulate blood sugar levels and promote weight loss. CMOs with expertise in peptide manufacturing, such as Amide Technologies, are well positioned to benefit from this trend as more biopharma companies develop and commercialize GLP-1-based therapies.

Risks and considerations

Regulatory hurdles: The regulatory requirements for manufacturing generics and biosimilars can be complex and can vary across regions. CMOs must navigate these regulatory landscapes and ensure compliance with quality standards, which can be a time-consuming and costly process. Failure to meet regulatory requirements could result in delays or rejections of products, thus slowing the growth of the CMO segment.

Competition and pricing pressures: As more CMOs enter the market and compete for clients, pricing pressures may intensify, particularly in the generics and biosimilars space where cost is a key factor. This could lead to reduced profit margins for CMOs and may slow their investments in new technologies and capabilities.

Appendix

Top VC-backed pharmatech companies by total VC raised to date*

Company	VC ($M) raised to date	Segment	Category	IPO probability	M&A probability	No exit probability
ElevateBio	$1,269.0	CDMO	CDMO - CGT	62%	36%	2%
XtalPi Technology	$732.9	CRO	CRO - chemistry	N/A	N/A	N/A
Human Longevity	$565.4	CRO	CRO - nucleic acids	91%	6%	3%
Synthego	$459.5	CRO	CRO - nucleic acids	96%	1%	3%
DNAnexus	$436.7	CRO	CRO - nucleic acids	45%	53%	2%
Probio Technology	$411.3	CDMO	CDMO - CGT	26%	65%	9%
Thousand Oaks Biopharmaceuticals	$381.4	CDMO	CDMO - biologics	N/A	N/A	N/A
Verana Health	$366.5	CRO	CRO - clinical	56%	42%	2%
Asymchem Bio	$357.2	CDMO	CDMO - biologics	N/A	N/A	N/A
AmplifyBio	$349.8	CMO	CDMO - CGT	56%	20%	24%

Source: PitchBook • Geography: Global • *As of March 31, 2024

Note: Probability data is based on PitchBook VC Exit Predictor methodology.

Top strategic acquirers of pharmatech companies since 2020*

Acquirer	Deal count	Investor type
Biosynth	7	PE-backed company
Velocity Clinical Research	6	PE-backed company
The Emmes Company	6	PE-backed company
Pace Analytical Services	5	PE-backed company
Revelation Pharma	5	PE-backed company
Medix Biochemica	4	PE-backed company
Discovery Life Sciences	4	PE-backed company
BioIVT	4	PE-backed company
North American Science Associates	4	PE-backed company
Thermo Fisher Scientific	4	Corporation
Symeres	4	PE-backed company

Source: PitchBook • Geography: Global • *As of March 31, 2024

Top VC investors in pharmatech companies since 2020*

Investor	Deal count	Pre-seed/ seed	Early-stage VC	Late-stage VC	Venture growth	Investor type
Casdin Capital	21	1	9	8	3	VC
Legend Capital	19	0	12	6	1	VC
Northpond Ventures	17	3	7	5	2	VC
HongShan	16	0	9	4	3	VC
GL Ventures	14	0	5	9	0	VC
8VC	14	1	4	9	0	VC
LYFE Capital	13	0	3	9	1	VC
F-Prime Capital	12	0	3	8	1	VC

Source: PitchBook • Geography: Global • *As of March 31, 2024

Top M&A and buyouts of pharmatech companies since 2020*

Company	Deal date	Deal value ($M)	Deal type	Country
Pharmaceutical Product Development	April 15, 2021	$15,990.0	M&A	US
GRAIL	September 20, 2020	$9,800.0	M&A	US
Aldevron	June 17, 2021	$9,600.0	M&A	US
Parexel International	July 2, 2021	$8,500.0	Buyout/LBO	US
Syneos Health	May 10, 2023	$7,100.0	Buyout/LBO	US
Taibang Biological Group	November 19, 2020	$4,760.0	Buyout/LBO	China
Simtra BioPharma Solutions	May 8, 2023	$4,250.0	Buyout/LBO	US
Olink Proteomics	October 17, 2023	$3,100.0	M&A	Sweden
Citeline	February 10, 2022	$2,574.7	Buyout/LBO	N/A
Thrive Earlier Detection	October 27, 2020	$2,190.0	M&A	US

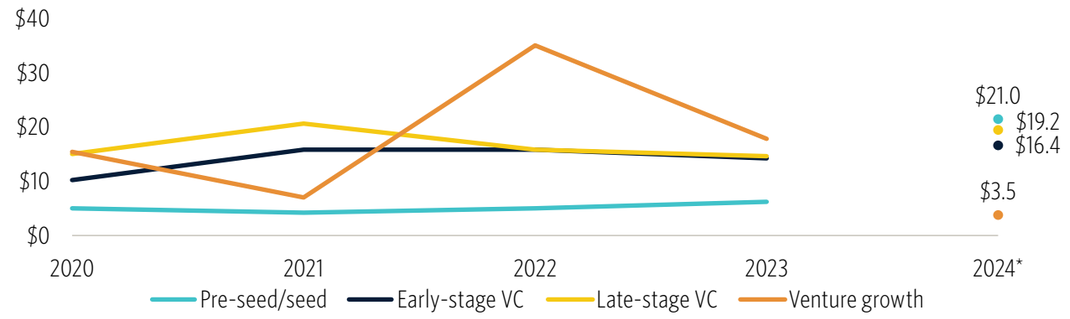
Source: PitchBook • Geography: Global • *As of March 31, 2024

Top PE investors in pharmatech companies since 2020*

Investor	Deal count	Primary investor type
Ampersand Capital Partners	19	Growth/expansion
GHO Capital	17	PE/buyout
ARCHIMED	17	PE/buyout
Kohlberg Kravis Roberts	15	PE/buyout
BroadOak Capital Partners	14	Growth/expansion
QHP Capital	9	PE/buyout
Water Street Healthcare Partners	7	PE/buyout
Ardian	7	PE/buyout
Advent International	7	PE/buyout
Linden	7	PE/buyout
Webster Equity Partners	7	PE/buyout

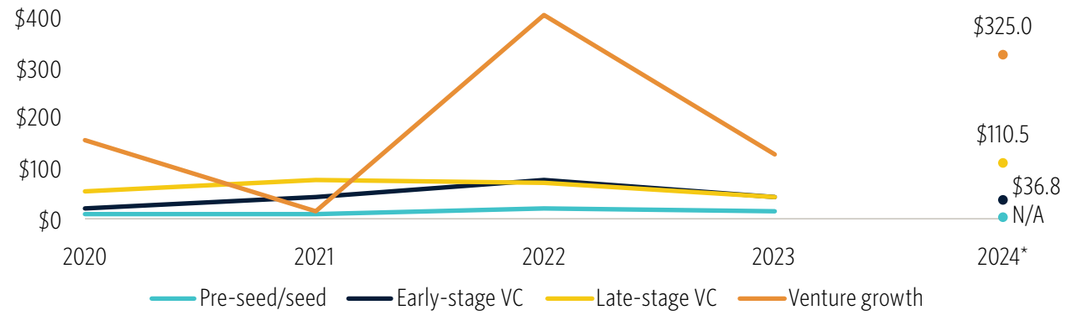
Source: PitchBook • Geography: Global • *As of March 31, 2024

Median pharmatech VC deal value ($M) by stage



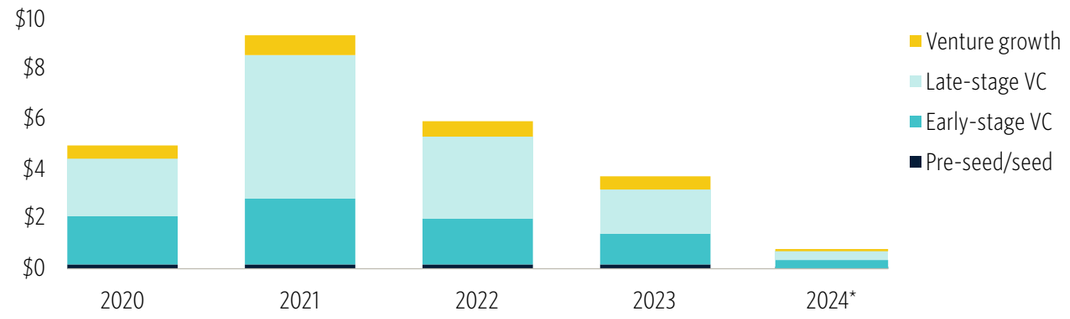
Source: PitchBook • Geography: Global • *As of March 31, 2024

Median pharmatech VC pre-money valuation ($M) by stage



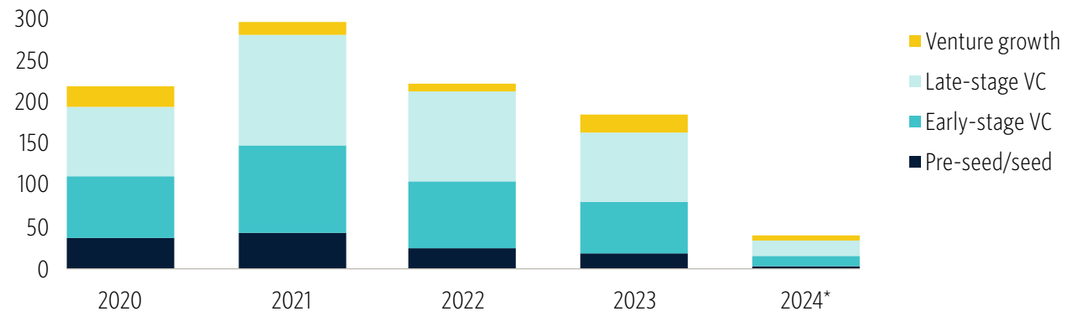
Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech VC deal value ($B) by stage



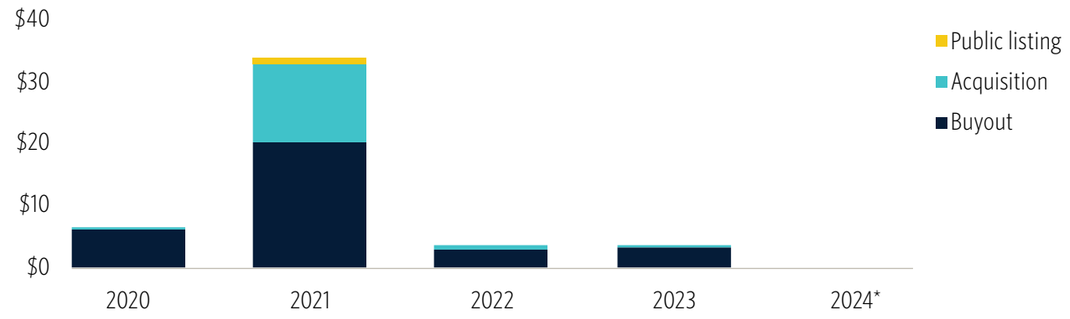
Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech VC deal count by stage



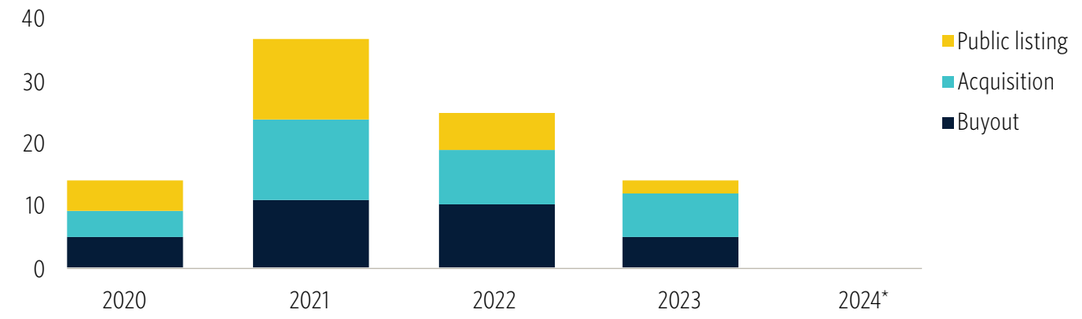
Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech VC exit value ($B) by type



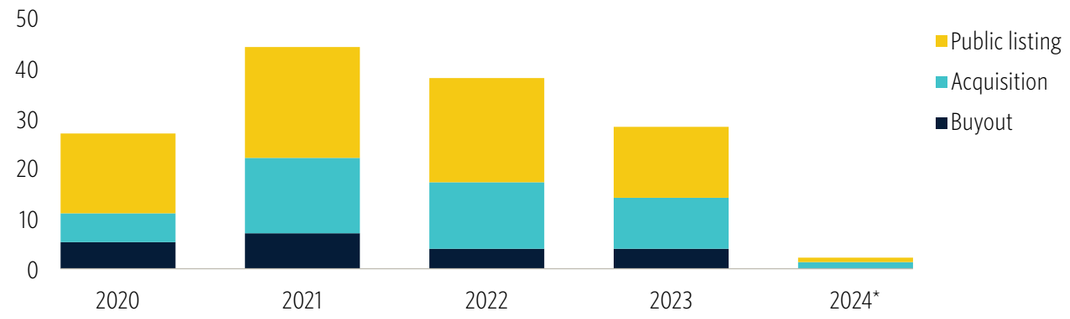
Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech VC exit count by type



Source: PitchBook • Geography: Global • *As of March 31, 2024

Pharmatech PE exit count by type



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About PitchBook Industry and Technology Research

Independent, objective, and timely market intel

As the private markets continue to grow in complexity and competition, it's essential for investors to understand the industries, sectors, and companies driving the asset class.

Our Industry and Technology Research provides detailed analysis of nascent tech sectors so you can better navigate the changing markets you operate in—and pursue new opportunities with confidence.

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