William Blair

October 2024

The Quarterly Rx: Q3 2024 U.S. Biopharma Recap



Q3 2024 U.S. Biopharma Market Summary – Key Takeaways

After nearly three years of a "macro" overhang on the biopharma sector, sentiment has markedly improved to close out Q3 following the Fed's highly anticipated interest rate cut in September



"Macro" Leaves Finally Falling Into Place

- Equity markets experienced increased volatility in the summer following the unwinding of the Yen carry trade, but major indices ended the quarter up after the Federal Reserve finally initiated its highly anticipated easing cycle
- With inflation seemingly cooling, investor focus has shifted to the labor market and the upcoming U.S. presidential election
- Investors currently anticipate up to two additional rate cuts before year-end and up to five additional cuts in 2025
- Two years since the Inflation Reduction Act was announced, on August 15, 2024, Medicare revealed the negotiated prices for the first 10 drugs that would be impacted; the news largely came and went as impacted companies managed expectations heading into the pricing



Bigger Bites at the (Private) Apple

- "Fewer but larger" remains the dominant theme in the private financing market, with average deal size remaining elevated at ~$95 million for the second quarter in a row; 2024 on track to surpass 2023 total proceeds raised across private financings
- Third consecutive quarter of double-digit "crossover" activity, with 10 deals announced in Q3 2024 for total proceeds of $1.6 billion; marking the first instance since 2021, boosting the supply of high-quality, soon-to-IPO candidates
- Notably, Q3 2024 saw a decline in the proportion of extension rounds, potentially signaling that we have passed the peak of the financing overhang in the private markets



Homecoming for IPOs

- Five IPOs priced in Q3 2024, raising a total of $1.2 billion in proceeds – four of the five priced after U.S. Labor Day (Bicara, MBX, Zenas, and BioAge) and experienced strong pricing and aftermarket outcomes, rekindling enthusiasm for a broader reopening of the IPO market
- 2 additional issuers publicly filed S-1s to close the quarter setting expectations for additional IPOs before the U.S. presidential election
- Reverse mergers activity continued at a steady rate in Q3 2024, with 4 transactions announced; however, average target net cash at close of $4 million was below the long-term average of $15 million



Pumpkin Spice and Everything Nice in the Public Markets

- Overall secondary activity (follow-ons, PIPEs, RDs) slowed in Q3 due to the elevated market volatility in early August and the traditional summer slowdown in late August, but rebounded meaningfully in September with 15 offerings priced raising $4.9 billion (median raise of $233.7 million) since U.S. Labor Day; despite the slowdown, 2024YTD activity and total proceeds have already surpassed 2023's total
- The PIPE frenzy calmed following Q1 2024's record breaking activity as regulatory scrutiny increased and investor sentiment for the product tempered, however Registered Direct activity remains elevated as investors continue to reverse directly into issuers
- Aftermarket performance of recent follow-ons has improved with median one day return of 9.7% and fewer issuers breaking issue price in the first month post pricing
- Clinical catalysts continue to drive equity offerings, with 5 of the top 10 movers successfully raising follow-on or PIPE capital post-data

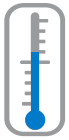


M&A and Partnering Bonfire Sputters

- M&A and partnering activity was anemic in Q3 2024, with only 11 M&A transactions and 39 partnerships announced; Morphic/Lilly was the sole $1b+ public M&A transaction this quarter
- "Next-generation" consolidators (mid-cap and non-traditional pharma) continued to drive M&A activity, accounting for 3 of the 4 deals over $1 billion in deal value in Q3 2024
- Partnering activity fell significantly from last quarter, bringing in only $1.7 billion in upfront payments and $28.3 billion in total deal value for licensors; only 10 of these deals brought in over $50 million in upfront
- Notable decrease in early-stage platform collaborations with only 17 such deals announced this quarter

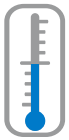
What We Are Hearing – Investor Sentiment and Outlook

An improving macro backdrop has increased investor appetite for the biopharma sector with expectations for a busier IPO market in 2025



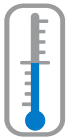
Biopharma Market

- Beginning of **Fed easing cycle largely viewed as a positive for the biopharma sector** by investors surveyed; the sector has typically outperformed in lower interest rate environments
- **Frustration with lack of meaningful public M&A** as large pharma drifts further along the risk curve to acquire assets at lower valuations, however investors remain optimistic for increased activity over the next 12 months
- Interest in I&I, neurology, and oncology remains high while ADCs are modality of greatest investor enthusiasm
- The XBI's shift from an equal-weighting to capitalization-weighting system has left **investors looking for indices to more accurately reflect small-cap biopharma sentiment**



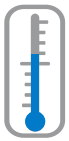
Outlook for Remainder of 2024

- **Upcoming U.S. presidential election is biggest near-term focus**, with investors looking to better understand how each candidate's policies may impact biopharma; investor concerns centered on policies that may impact drug pricing or increase U.S. government debt
- While inflation has cooled from the highs seen in 2022, it remains above the Fed target, so **investors remain keenly focused on path of interest rate changes for the remainder of 2024 and for 2025**
- Escalating geopolitical tensions in the **Middle East may create additional pockets of volatility**
- Despite improved sector outlook, **biopharma funds have experienced over $7 billion in net outflows year-to-date**



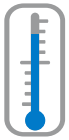
Private Financings

- "Crossover" appetite continues to perk up as **near-term path to liquidity for public investors crystallizes with the success of recent IPOs** and issuers look to "right size" valuations ahead of their public market debuts
- Round sizes remain elevated given focus from investors on providing sufficient **"inflection capital"**
- **Healthcare venture capital fundraising remains elevated** with 2024 on pace for approximately $20 billion in new fund formation, surpassing last year's total of $19 billion



IPOs

- **"Flight to quality" in the IPO market** with investors favoring clinical-stage opportunities ideally with proof-of-concept data in hand at time of offering and proven management teams with history of success
- **Timing until next catalyst increasingly in focus**; public market investors are favoring opportunities that will have data readouts within 6-12 months of IPO pricing
- Investors surveyed expect a few more IPOs before year-end but **activity will not pick up meaningfully until 1H 2025**
- Several investors have expressed interest in reverting to longer pre-COVID IPO roadshows

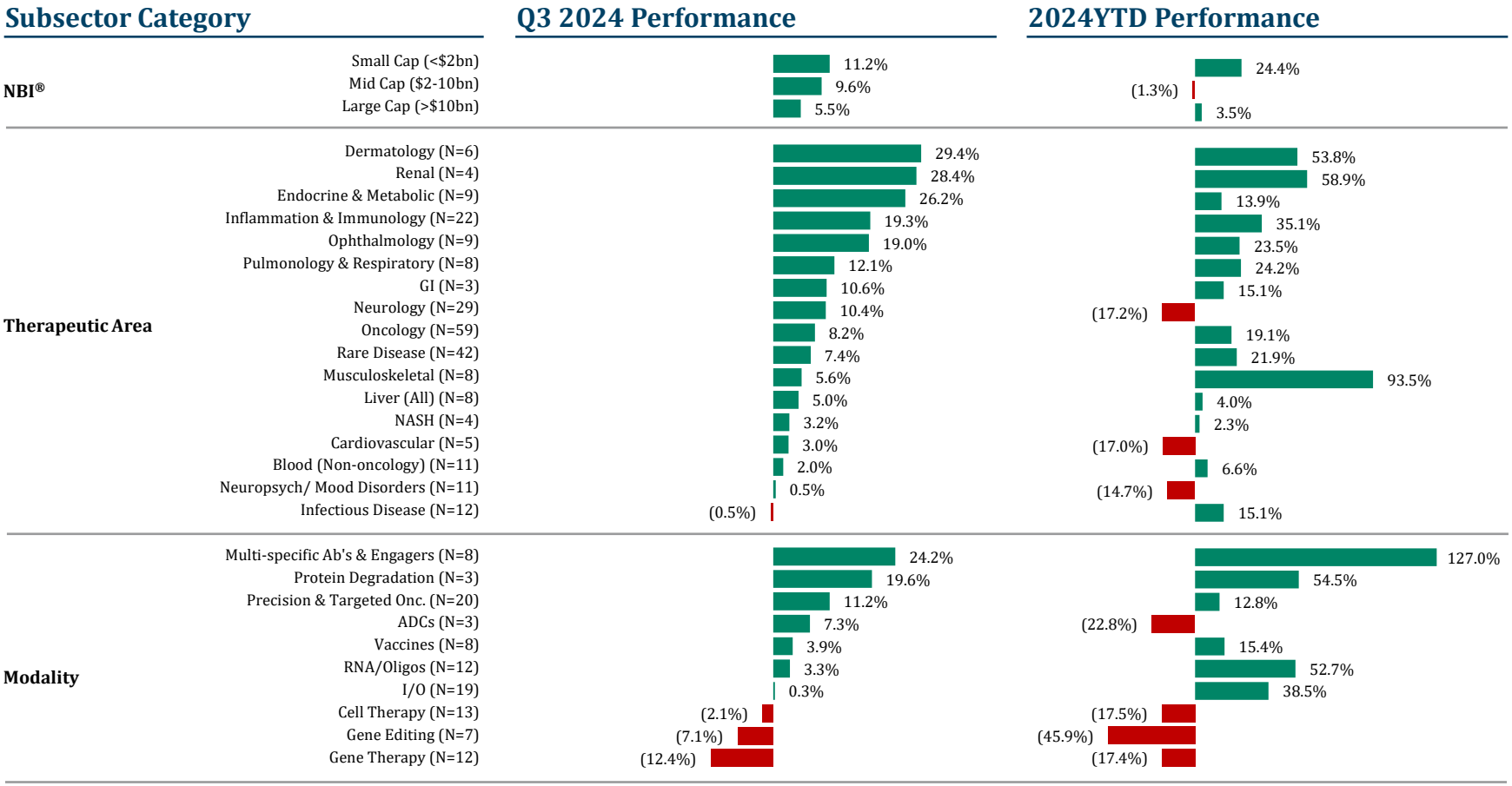


Secondaries

- **Appetite remains elevated to deploy capital in catalyst-driven offerings**, either pre- or post-data release
- Healthcare specialist investors continue to drive reverse inquiry activity
- Increased participation from long-only generalists in recent offerings as investors take a more risk-on stance with easing rates
- Q4 2024 includes **several expected small/mid-cap data readouts that may drive increased follow-on activity**, however the U.S. presidential election and year-end fund dynamics (several funds have an October/November fiscal year-end) may curb appetite

NBI® Subsector Market Performance

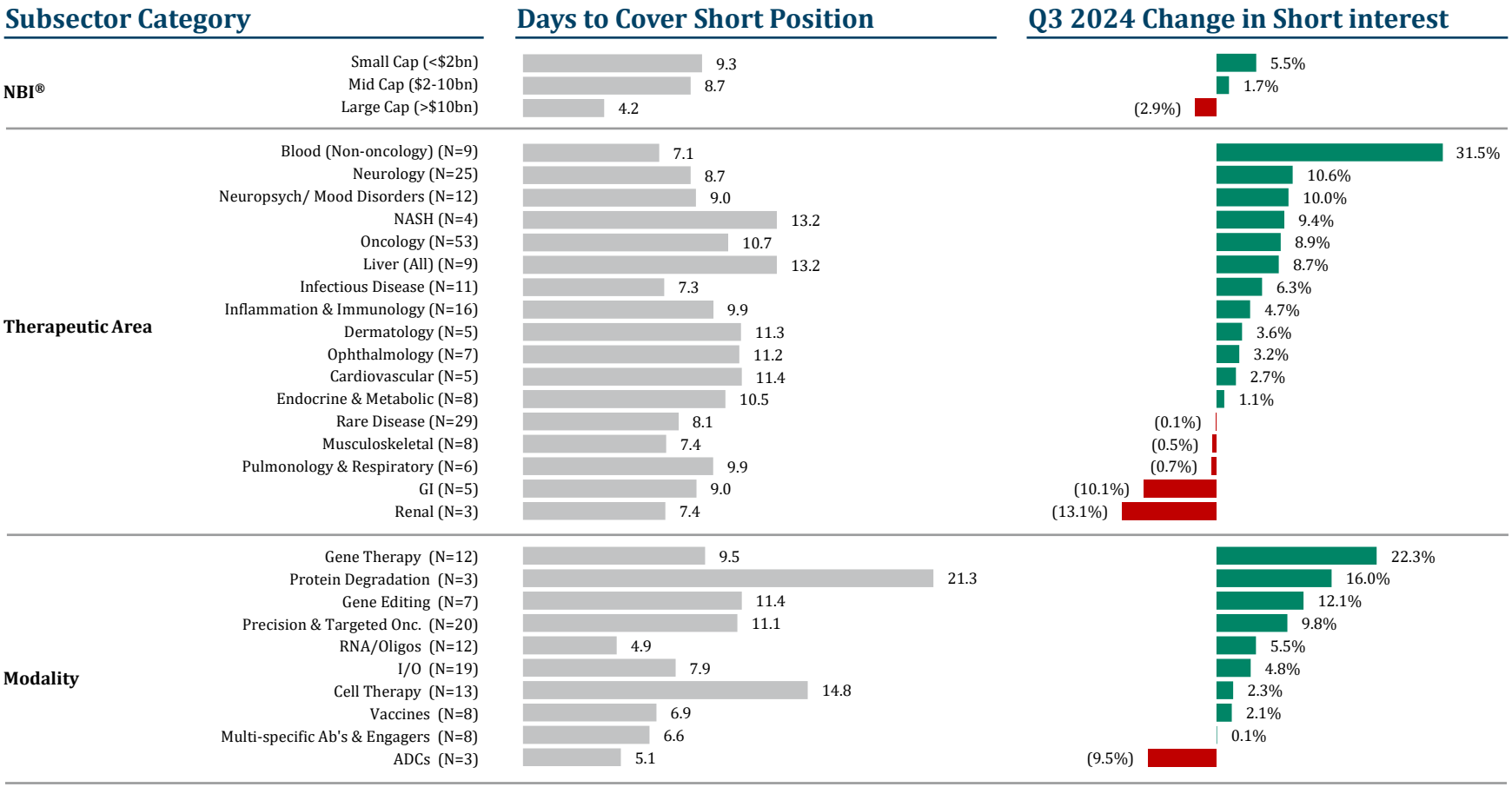
- *After a pullback in Q2, biopharma had strong Q3 performance across nearly all market caps, therapeutic areas and modalities and the NBI® ended the quarter up 4.9% in Q3 2024 and 9.1% in 2024YTD*
- *Dermatology and multi-specific antibodies & engagers were the top-performing therapeutic area and modality, respectively, in Q3 2024, driven by Revance's acquisition and Summit's positive Phase III data*



Note: Market capitalizations are as of the first trading day of each graph's performance period.
Subsector indices are equally weighted and averaged. Includes NBI® constituents' as of September 30, 2024, and excludes non-therapeutic focused companies in the NBI®.
Source: FactSet and William Blair internal reporting. Therapeutic area and modality based on William Blair analysis.

NBI® Subsector Q3 2024 Short Interest Trends

Investors looked to hedge their positions after continued momentum in the biopharma space by increasing their short interest exposure in most market caps, therapeutic areas, and modalities in Q3, but at a slower rate than in Q2

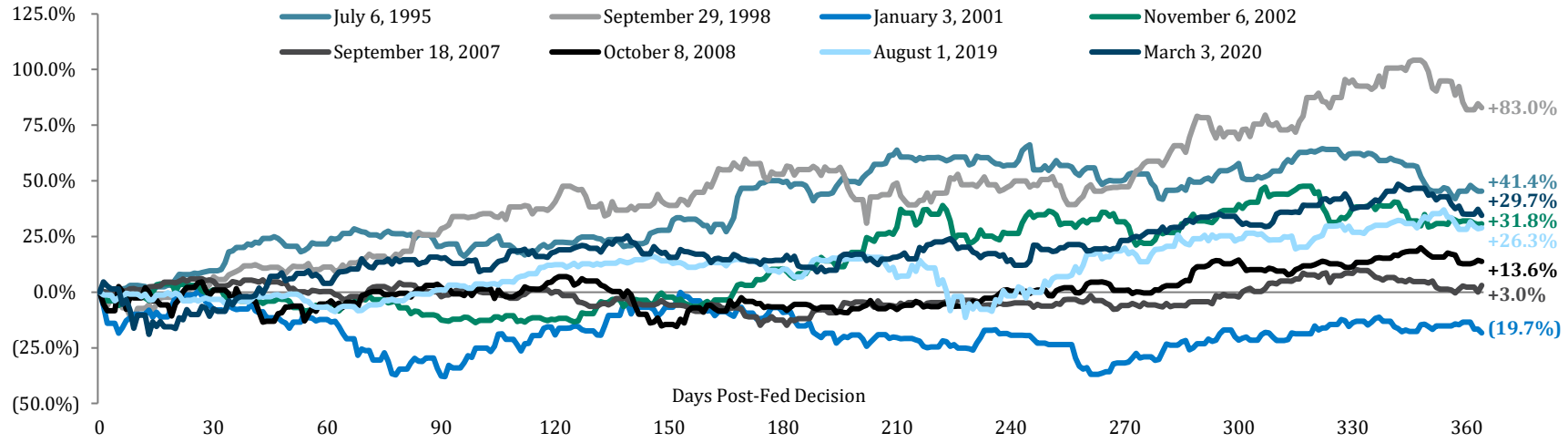


Note: NBI® constituents are equally weighted and averaged. Includes NBI® constituents' as of September 30, 2024, and excludes non-therapeutic focused companies in the NBI®.
Market capitalizations are as of the first trading day of the quarter. Days to cover short position calculated as total number of shares shorted / 30-day ADTV.
Source: FactSet, CapIQ, and William Blair internal reporting. Days to cover short position as of 9/15/24 settlement date. Short Interest change measured from 6/30/24 to 9/15/24 settlement dates.

Biopharma Performance During Falling Interest Rate Environments

- *Outlook continues to improve for biopharma broadly as the Federal Reserve cut interest rates for the first time since 2020 by 50bps*
- *NBI® has historically outperformed the Nasdaq when pre-announcement interest rates are above 5%*

Indexed One-Year Performance of the NBI® After First Fed Interest Rate Cut



	Fed Funds Rate			NBI® Performance		
Fed Ann. Date	**Pre-Ann**	**Post-Ann**	**1 Yr Post-Ann**	**1 Month**	**1 Year**	**1 Year vs Nasdaq**
Jul 6, 1995	6.00%	5.75%	5.50%	+22.1%	+41.4%	+19.9%
Sep 29, 1998	5.50%	5.25%	5.25%	+11.5%	+83.0%	+25.5%
Jan 3, 2001	6.50%	6.00%	1.75%	(9.2%)	(19.7%)	+2.1%
Nov 6, 2002	1.50%	1.25%	1.00%	(3.9%)	+31.8%	(7.5%)
Sep 18, 2007	5.25%	4.75%	2.00%	+4.5%	+3.0%	+18.4%
Oct 8, 2008	2.00%	1.50%	0.00%	(8.9%)	+13.6%	(8.5%)
Aug 1, 2019	2.50%	2.25%	0.00%	(2.2%)	+26.3%	(6.2%)
Mar 3, 2020	1.75%	1.25%	0.00%	+1.9%	+29.7%	(20.0%)
Sep 18, 2024	5.50%	5.00%	*???*	*???*	*???*	*???*

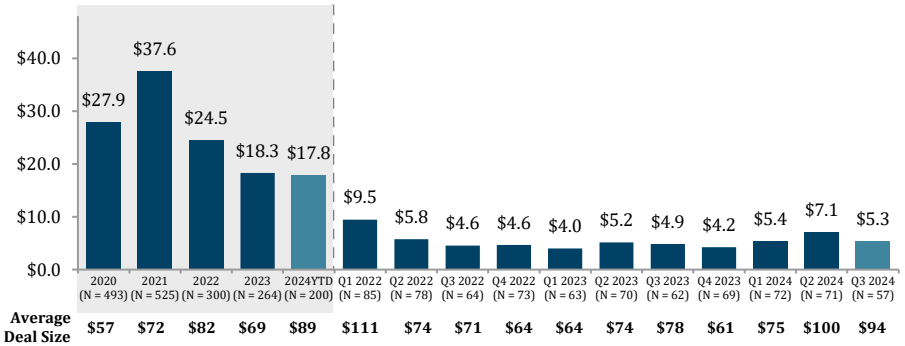
Note: Blue highlight indicates when NBI® outperformed the Nasdaq 1 year after the start of a Fed interest rate cutting cycle.
Source: FactSet as of September 30, 2024.

Biopharma Private Financings Trends

- *57 transactions in Q3 2024 raised total proceeds of $5.3 billion*
- *Average deal size remains elevated at $94 million and over 40% of private financings raised $100+ million in proceeds*
- *After two years of consecutive declines, 2024 is on track to surpass 2023 total proceeds raised*

Total Proceeds and Deal Volume

($ in billions)



Analysis by Series Round

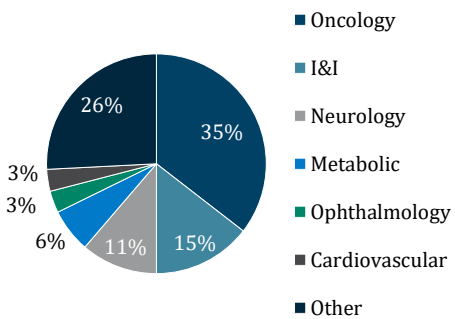
($ in millions, deal size represents median, includes extension rounds)

	2023				H1 2024				Q3 2024			
Series Round	Deal Size	Series Count	% Ext. Rounds	% Clin. Stage	Deal Size	Series Count	% Ext. Rounds	% Clin. Stage	Deal Size	Series Count	% Ext. Rounds	% Clin. Stage
Series A	$38	117	25%	32%	$62	53	21%	34%	$65	27	15%	30%
Series B	$51	94	26%	49%	$55	49	33%	63%	$84	18	22%	61%
Series C	$90	33	12%	79%	$55	29	28%	79%	$100	7	0%	100%
Series D+	$75	20	5%	85%	$110	12	0%	83%	$100	5	0%	60%
All Rounds	**$50**	**264**	**24%**	**48%**	**$55**	**143**	**27%**	**57%**	**$65**	**57**	**14%**	**51%**

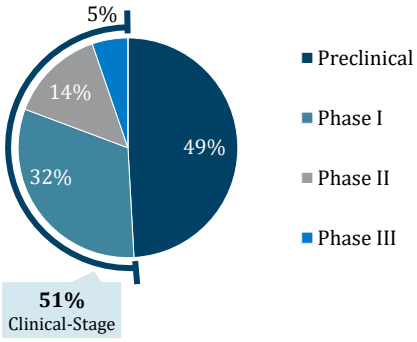
Noticeable decline this quarter in the proportion of extension rounds

Q3 2024 Breakdown By TA and Stage

Therapeutic Area



Stage of Development



Crossover Deals Analysis[1]

($ in millions) Quarter	Number of Deals	Median Deal Size	Median Pre-Money	Median Step-Up	Currently Public	Acquired
Q1 2021	33	$106	$218	2.1x	25	5
Q2 2021	19	$125	$250	2.2x	8	2
Q3 2021	21	$100	$260	1.7x	9	2
Q4 2021	8	$120	$150	3.1x	2	1
Q1 2022	11	$115	$350	1.6x	2	0
Q2 2022	7	$125	$145	1.8x	1	0
Q3 2022	5	$133	$370	1.2x	2	1
Q4 2022	3	$149	$129	2.1x	1	1
Q1 2023	9	$135	$150	1.3x	4	1
Q2 2023	6	$150	$480	1.7x	1	1
Q3 2023	12	$164	$260	1.3x	2	1
Q4 2023	6	$133	$195	0.9x	1	1
Q1 2024	10	$158	$300	1.1x	1	1
Q2 2024	14	$145	$198	1.4x	1	0
Q3 2024	**10**	**$135**	**$283**	**1.2x**	**1**	**0**

Source: CapIQ, PitchBook Data, Inc., and SEC Filings as of September 30, 2024.

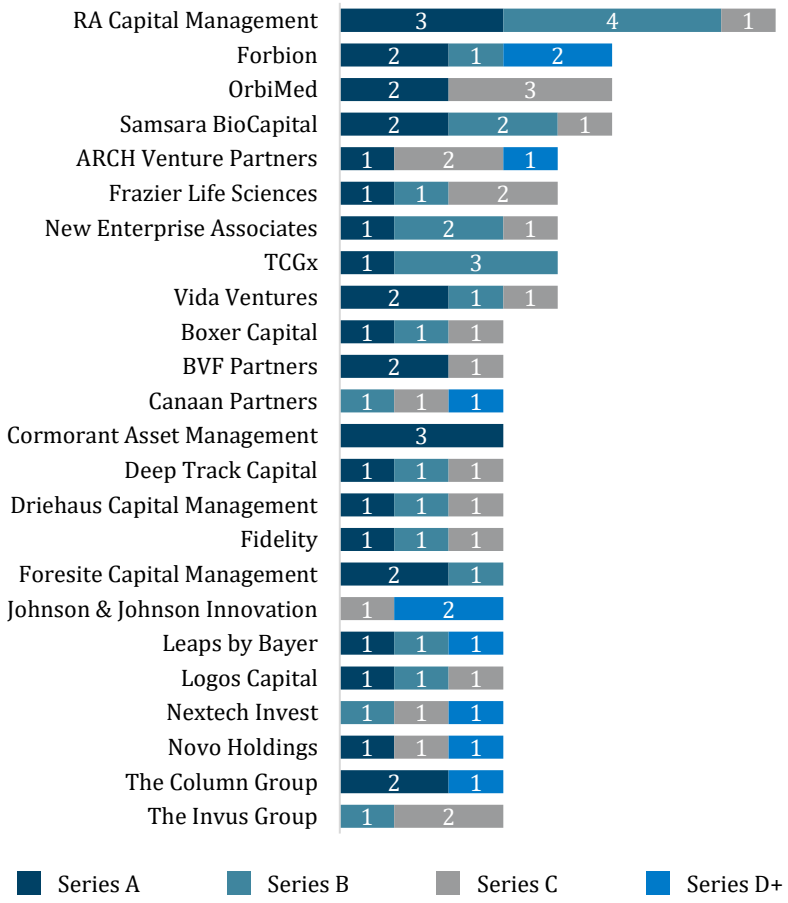
Note: Includes private financing deals and extension rounds with a minimum disclosed deal size of $5M, involving at least one U.S./EU healthcare investor. Excludes seed rounds. Ext = Extensions.

(1) Includes crossover rounds for companies that have completed an IPO as well as crossover rounds where the next round of financing will likely be an IPO: either a $50M+ raise (Series B onwards) or a $100M+ raise (Series A) with multiple crossover and/or large mutual funds in the syndicate).

Q3 2024 Most Active Private Biopharma Investors and New Funds Closed

- *Life sciences specialists have continued to be the most active investors in the private markets*
- *$10+ billion in new life sciences funds raised this quarter, including three funds over $1 billion*

Most Active Investors Across All Rounds



New Funds Closed

Investor Name	Fund Name	Close Date	Location	Fund Size ($M)
ARCH Venture Partners	ARCH Venture Fund XIII	9/26/24	Chicago, IL	$3,000+
asabys	Asabys Health Innovation Investments II	9/26/24	Barcelona, Spain	$200
BainCapital	Bain Capital Life Sciences IV	9/11/24	Boston, MA	$3,000
DCVC	DCVC Bio III	9/30/2024	Palo Alto, CA	$400
Flagship Pioneering	Flagship Pioneering Fund VIII	7/10/24	Cambridge, MA	$2,600
TPG	TPG Life Sciences Innovation Fund	8/6/24	Fort Worth, TX	$580
venBio	venBio Global Strategic Fund V	8/1/24	San Francisco, CA	$528

Source: PitchBook Data, Inc., and internal William Blair research as of September 30, 2024.

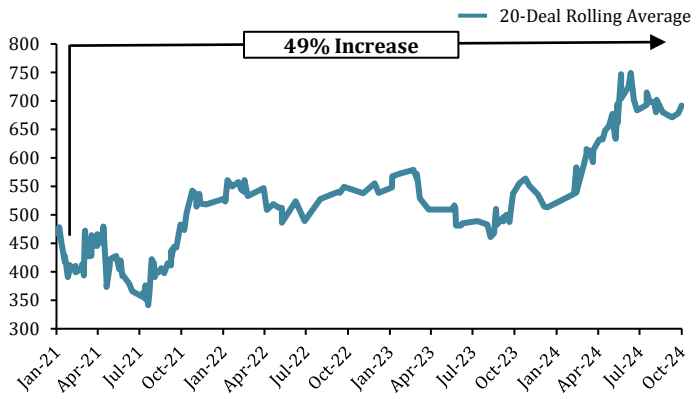
Q3 2024 Biopharma Crossover Financings

- *Increased appetite from crossover funds to deploy capital as the IPO market reopens*
- *Third consecutive quarter of double-digit "crossover" activity, with 10 deals announced raising $1.6 billion in total proceeds*

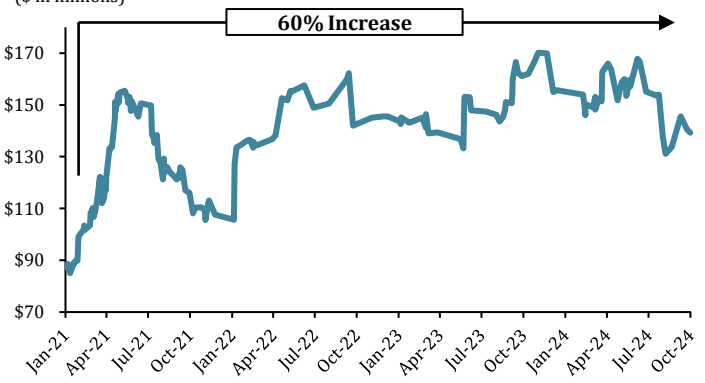
Deal Date	Company	Series	Deal Size	Lead Investors	Days Since Prior Round	Stage	Modality	Therapeutic Area
09/30/24	AKTIS ONCOLOGY	Series B	$175	Janus Henderson INVESTORS, RA CAPITAL, rtw	774	Phase I	Radiopharma	Oncology
09/23/24	vicebio	Series B	$100	TCGX	784	Phase I	Vaccine	Infectious Disease
09/09/24	CandiD THERAPEUTICS	Series A	$370	FAIRMOUNT, TCGX, venBio, venrock	NA	Phase I	TCE	I&I
08/20/24	PATHALYS PHARMA INC.	Series B	$105	TCGX	580	Phase III	Small Molecule	Nephrology
08/07/24	IDRx	Series B	$120	Blackstone, COMMODORE CAPITAL, RA CAPITAL	736	Phase I/Ib	Small Molecule	Oncology
08/05/24	MBX Biosciences	Series C	$64	DEEP TRACK CAPITAL	630	Phase II	Peptide	Endocrinology
08/01/24	Jade BIOSCIENCES	Series A	$80	FAIRMOUNT, venrock	NA	Preclinical	Antibody	I&I
07/23/24	ThirdArcBio	Series A	$165	Cormorant Asset Management, HILLHOUSE, VIDA VENTURES	NA	Preclinical	TCE	Oncology / I&I
07/16/24	CARDURION PHARMA	Series B	$260	ASCENTA CAPITAL	370	Phase II	Small Molecule	Cardiovascular
07/16/24	SCORPION	Series C	$150	FRAZIER HEALTHCARE PARTNERS, Lightspeed	1,286	Phase I/II	Small Molecule	Oncology

Rolling Average of Last 20 Crossover Deals by...

Days Since Prior Round



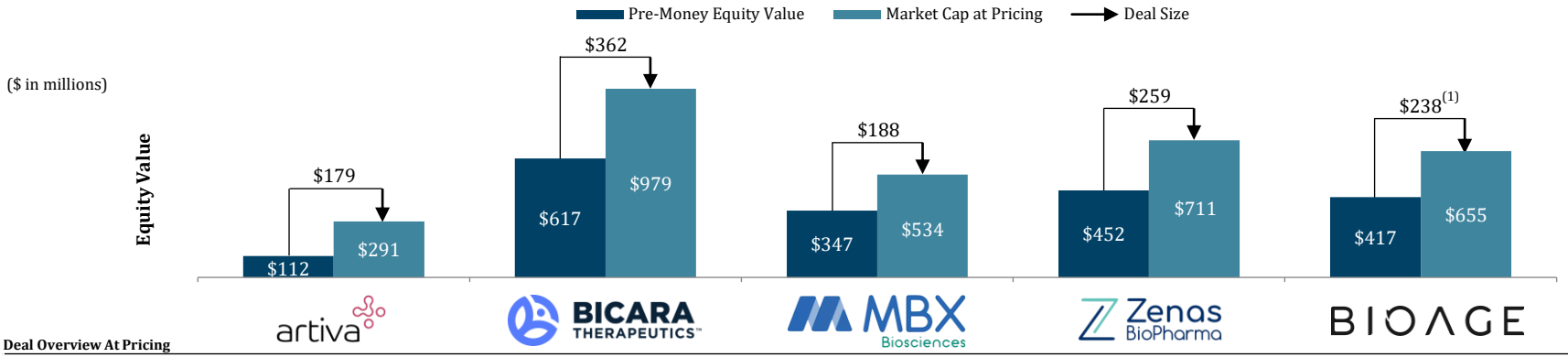
Average Deal Size



Source: CapIQ, PitchBook Data, Inc., and SEC Filings as of September 30, 2024.
Note: Includes crossover rounds for companies that have completed an IPO as well as crossover rounds where the next round of financing will likely be an IPO: either a $50M+ raise (Series B onwards) or a $100M+ raise (Series A) with multiple crossover and/or large mutual funds in the syndicate). Lead asset information shown. TCE = T-cell engager.

Q3 2024 Biopharma IPOs

Encouraging reopening of the IPO market after U.S. Labor Day, with 4 IPOs pricing; all upsized, priced in range, and had strong aftermarket performance, with a median 1-day return of 19%



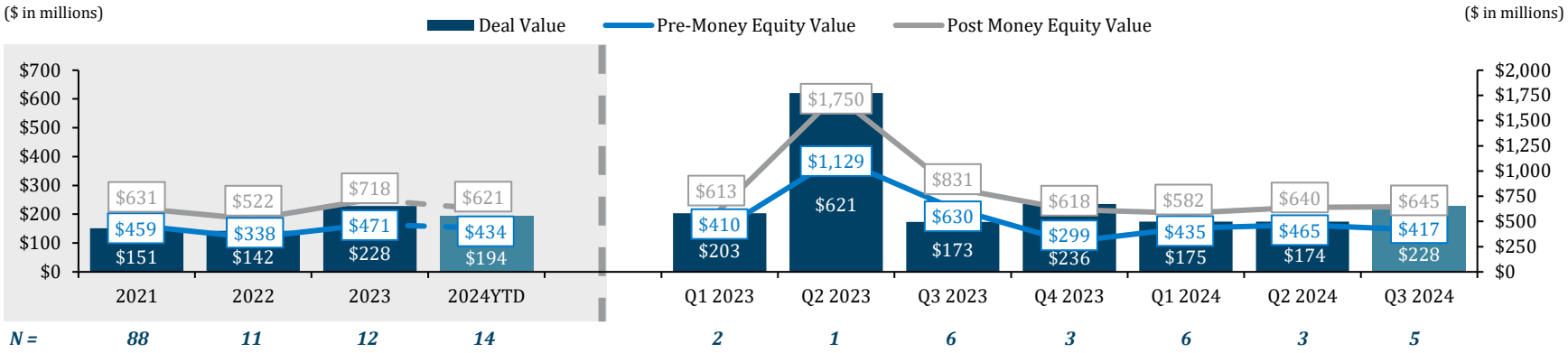
Deal Overview At Pricing					
Pricing Date	7/18/24	9/12/24	9/12/24	9/12/24	9/25/24
Offer Price	$12.00	$18.00	$16.00	$17.00	$18.00
Enterprise Value	$50	$413	$228	$268	$269
Step-Up	0.25x	1.41x	1.29x	1.14x	1.18x
Initial File/Offer vs. Range	Below	In Range	In Range	In Range	In Range
Deal Value as % of Market Value	61%	37%	35%	36%	36%
Key Pre-IPO/Crossover Investors	5AM Ventures, Acuta, Capital Group, Cormorant, EcoR1, Franklin, Janus, Logos, RA, Revelation, RTW, Surveyor, venBio, **Venrock**, Wellington	Acorn Bioventures, Aisling, **Braidwell**, Deerfield, Fairmount, F-Prime, Invus, Janus, Omega, Piper Sandler, RA, **TPG**	**Deep Track**, Driehaus, Frazier, NEA, Norwest, OrbiMed, RA, T. Rowe, Wellington	ArrowMark, **Delos**, Enavate, Fairmount, Federated, Longitude, **NEA**, **Norwest**, Pivotal BioVenture, Rock Springs, **SR One**, Superstring, Vivo, Wellington	Andreessen Horowitz, Cormorant, Longitude, OrbiMed, Pivotal Life Sciences, RA, RTW, Sands, **Sofinnova**, SV Health Investors
Post-IPO Performance					
Offer/1 Day	0%	+30%	+48%	+7%	+2%
Offer/Current	+29%	+42%	+62%	0%	+16%
Lead Asset at Pricing					
Name	AlloNK	ficerafusp alfa	MBX 2109	Obexelimab	Azelaprag
Phase	Phase I/II	Phase I/Ib	Phase II	Phase III	Phase II
Therapeutic Area	Oncology & I&I	Oncology	Endocrine	I&I	Metabolic
Modality	Cell therapy	Bispecific antibody	Peptide	Bispecific antibody	Small molecule
Indication	SLE, LN, Rheumatoid arthritis, Pemphigus vulgaris, Vasculitis, NHL, HL, Solid tumors, Hematological malignancies	HNSCC	Hypoparathyroidism	Immunoglobin G4-related disease	Obesity
Next Major Catalyst (Months)	6 to 11	6 to 15	9 to 12	12 to 15	10 to 12

Source: CapIQ, Dealogic, FactSet and SEC Filings as of September 30, 2024. ND = Not Disclosed. NA = Not Applicable.
Note: All valuations performed on basic share count basis. Includes U.S. IPOs only. Excludes best efforts IPOs and IPOs less than $25 million in gross proceeds.
Lead investors of prior private financing rounds in bold.
(1) Deal size includes proceeds from a concurrent PIPE in which 588,888 shares of common stock were sold at the public offering price of $18.00.

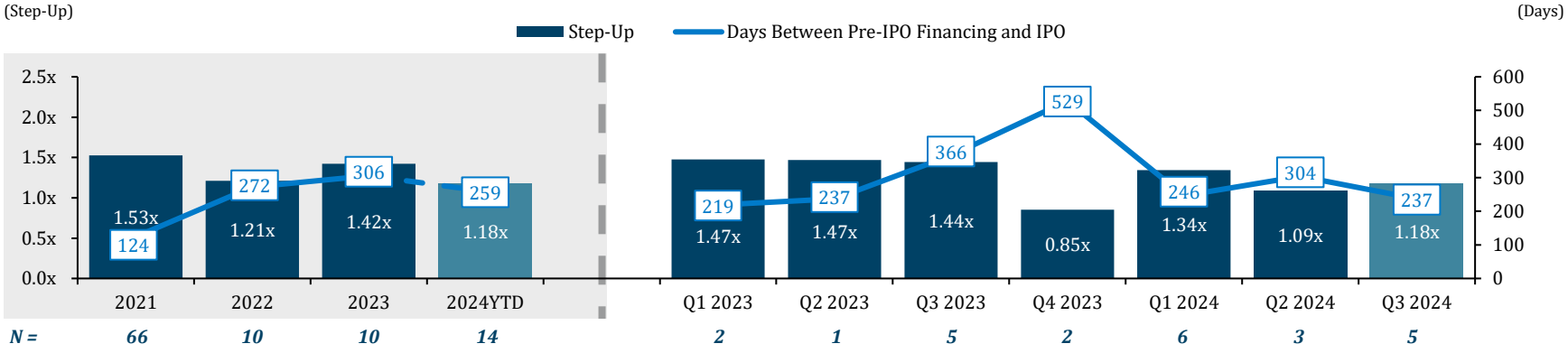
Biopharma IPO Trends

- *2024 IPO activity has surpassed 2023, and the backlog of companies looking to pursue IPOs continues to grow, including CAMP4 and Upstream, which are publicly on file*
- *IPO step-ups in Q3 2024 ticked up slightly to 1.18x with days between pre-IPO financing to IPO trending back downwards to <8 months*

Deal Sizing and Valuation



Pre-IPO-Financing-to-IPO Metrics(1)

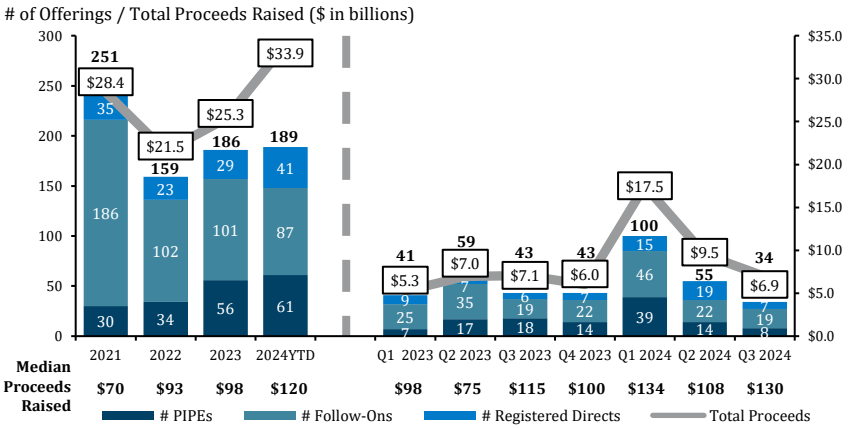


Note: Represents median values. Includes U.S. IPOs only. Excludes best efforts IPOs. Excludes IPOs less than $25 million in gross proceeds.
Source: CapIQ, Dealogic, FactSet, and SEC Filings as of September 30, 2024. Note: All valuations performed on basic share count basis.
(1) Pre-IPO-Financing rounds defined as pre-IPO financings completed with multiple crossover and/or large mutual funds in the syndicate.

Biopharma Follow-on, Registered Direct & PIPE Trends

- *While overall Q3 secondary activity declined given the historically slower summer, September was a very active financing month with 71% of the quarter's proceeds raised in the after U.S. Labor Day window*
- *The 6 largest offerings accounted for 52% of total secondary proceeds raised in Q3 2024; 5 of 6 were catalyst-driven*

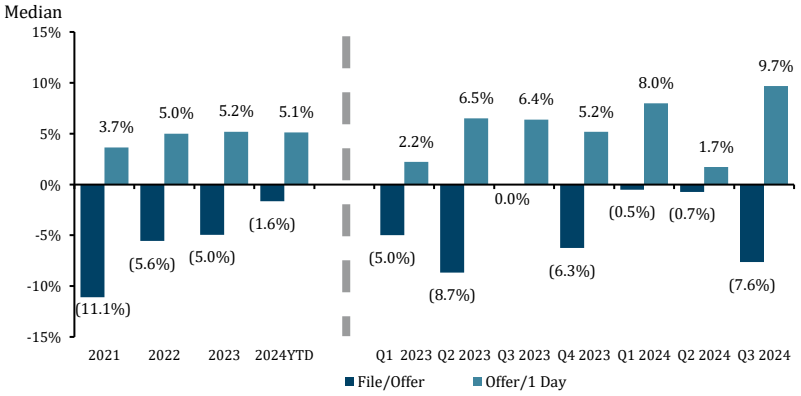
Deal Volume



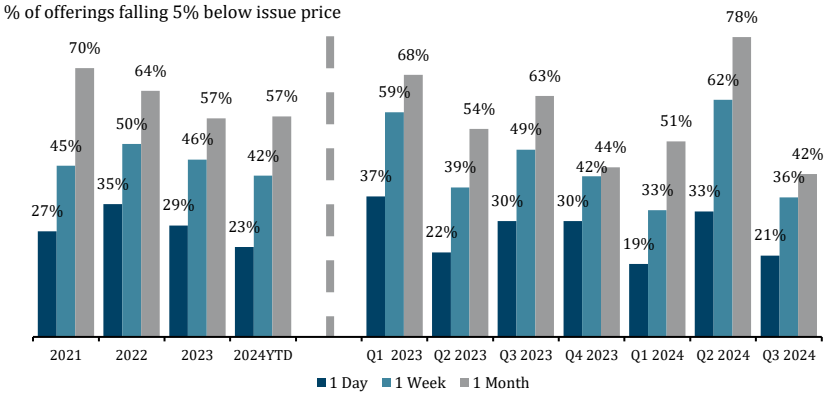
Offerings Over $300M Deal Value in Q3 2024

Pricing Date	Company	Deal Value	Deal Type	1-Day Return	Stage of Development	Catalyst/ Opportunistic
9/4/2024	VAXCYTE	$1,495	FMFO	+8.8%	Phase II	Catalyst
9/16/24	Nuvalent	$575	FMFO	+4.8%	Phase II	Catalyst
9/9/2024	IONIS	$500	CMFO	(2.6%)	Marketed	Opportunistic
8/14/2024	AVIDITY	$345	FMFO	+11.0%	Phase III	Catalyst
9/19/24	ascendis pharma	$345	FMFO	+0.8%	Marketed	Catalyst
7/9/2024	IDEAYA	$303	CMFO	+6.6%	Phase III	Catalyst

1-Day Performance Improving Despite Wider Discounts…



…As Less Offerings Break Issue Price



Note: Includes fully marketed follow-on offerings, confidentially marketed follow-on offerings, bought deals, PIPEs and registered directs. Excludes offerings with gross proceeds below $20 million. Median Pricing and Performance includes offerings with warrants.
Source: Dealogic as of September 30, 2024.

2023-2024YTD Strategic Alternatives Outcomes

While reverse merger activity has continued, the quality of public shells for such transactions has declined; the median target net cash for such transactions has only been $3 million this quarter

Announced Outcome	H1 2023	H2 2023	Q1 2024	Q2 2024	Q3 2024	Total
Reverse Merger Traditional reverse mergers with private companies	angion / elicio / vbl / Notable ADAMIS / DMK / Diffusion / EIP magenta / talaris / TOURMALINE aeglea / SPYRE / immunome	FREQUENCY / KORRO neoleukin / NEUROGENE AGEX / serina GRAPHITE BIO / LENZ HOMOLOGY / 32 BIO Selecta / Cartesian	AVROBIO / TECTONIC	eliem / Tenet Medicines ONCONOVA / TRANSPHYXOVO THERAPEUTICS KINTARA / TuHURA ARCA / ORUKA Reneo / OnKure	VYOME / ReShape Lifesciences -pieris- / palvella HEPION / Pharma Two B NLS Pharmaceutics / KADIMASTEM	24 Deals
Public-Public Merger Public-public mergers following strategic alternatives reviews	erytech / PHERECYDES TCR2 / Adaptimmune EQRx / REVOLUTION MEDICINES APPLIED MOLECULAR TRANSPORT / cyclo					4 Deals
Acquisition Program or full company buyouts following strategic alternatives reviews	Jounce / Concentra (1) Biosciences Apexigen / PYXIS ONCOLOGY Satsuma / SNBL SURFACE ONCOLOGY / Coherus	Pardes Biosciences / FORBION / EryDel QUINCE / ZEVRA FREELINE / Syncona LungTherapeutics / AILERON PATHOS THESEUS / Concentra Biosciences	2seventybio (2) / REGENERON Comera / Existing Investors gamida cell / HIGHBRIDGE ngmBIO / THE COLUMN GROUP KINNATE (3) / XOMA		KINETA / TuHURA	17 Deals
Chapter 11/ Closure/ Delisting Voluntary delisting/ liquidation/ dissolving	CALITHERA / Nabriva / CODIAK Rubius / MEDICINES / TRICIDA APTINYX / Athenex / CYTEIR imv / PEAR / PLX Oncorus / VYANT	9METERS / fresh tracks Histogen / Infinity ATRECA / Bellerophon excella / CohBar EVELO / Impel NexImmune	aravive / Athersys DMK (4) / INVIVO neubase nanoString / SOZOTECH	ACORDA / eFFECTOR EIGER / merrimack vaxxinity	ASLAN PHARMACEUTICALS VBI VACCINES Galera Therapeutics, Inc TRACON	42 Co.'s
# of Outcomes	30	24	14	10	9	87

Source: SEC Filings, Company Press Releases, and William Blair analysis as of September 30, 2024. Note: outcomes are categorized by half or quarter of announcement.

(1) Jounce entered into agreement to be acquired by Concentra Biosciences for $1.85 per share, plus additional CVR consideration, after terminating merger agreement with Redx announced on February 23, 2023.

(2) 2Seventy Bio entered into an asset purchase agreement with Regeneron to sell the its oncology and autoimmune research and development programs, clinical manufacturing capabilities, and related platform technologies on January 30, 2024. 2Seventy remains operational and will focus exclusively on progressing its lead asset, Abecma.

(3) On March 1, 2024, Kinnate entered into an asset purchase agreement with Pierre Fabre Laboratories for global rights to exafrenib and other pan-RAF program assets.

(4) DMK Pharma reverse merged with Adamis in February 2023, prior to its liquidation.

(5) Kineta entered into an agreement providing TuHURA Biosciences the right to acquire its sole clinical-stage asset, KVA12123, on July 8. 2024.

Venture Debt in Biopharma

Venture debt[1] volume was relatively muted in the third quarter after a very active first half of the year where activity already eclipsed 2023 levels

Market Overview

- After a very active first half of the year, the venture debt market cooled during the third quarter for public biopharma companies
  - Cash interest rates for venture loans remained relatively stable in Q3 2024
- An uptick in the number of venture debt lenders has led to a more competitive market with improved structures and terms
- However, the borrower-friendly environment has so far been limited to higher-quality, performing companies
  - The most favorable terms are being reserved for more established borrowers and those that recently raised equity
  - Companies facing growth headwinds and those without a recent equity raise to tout are not getting the same looks as their high-performing counterparts
  - Lenders are patiently picking their spots, waiting for high-quality deals to emerge before deploying capital
- With a significant amount of dry powder available and its minimally dilutive nature, venture debt will continue to be an attractive source of capital in 2024 and beyond

2024YTD Venture Debt[1] Financings for Public Biopharma Companies

($ in millions)

Date	Company	Available at Close	Total Facility[2]	Interest Rate	LTM at Close[3] Revenue	LTM at Close[3] EBITDA	Market Cap at Close	Debt / Mkt Cap	Facility / Mkt Cap	Phase of Development
08/27/24	ARCUS BIOSCIENCES	$50	$250	10.45%	$247	($264)	$1,599	3.1%	15.6%	Phase III
08/08/24	arrowhead pharmaceuticals	$400	$500	15.00%	$20	($530)	$3,214	12.4%	15.6%	Phase III
07/25/24	FORTRESS BIOTECH	$35	$50	12.44%	$83	($90)	$58	60.0%	85.7%	Commercial
05/15/24	Adaptimmune	$25	$125	9.65%	$18	($184)	$317	7.9%	39.4%	Commercial
05/14/24	Apellis	$375	$478	10.57%	$524	($402)	$5,000	7.5%	9.5%	Commercial
05/09/24	Coherus	$39	$39	12.82%	$302	($157)	$243	15.9%	15.9%	Commercial
05/02/24	Werewolf Therapeutics	$30	$60	10.30%	$16	($44)	$264	11.4%	22.8%	Phase I
04/30/24	TriSalus LIFE SCIENCES	$25	$50	13.46%	$22	($55)	$249	10.0%	20.1%	Phase I
04/23/24	tarsus	$75	$200	11.57%	$43	($155)	$1,264	5.9%	15.8%	Commercial
04/10/24	ZEVRA THERAPEUTICS	$60	$100	11.82%	$28	($55)	$206	29.1%	48.6%	Commercial
03/18/24	bluebirdbio	$75	$175	12.40%	$22	($132)	$278	27.0%	63.1%	Commercial
01/08/24	Abeona THERAPEUTICS	$20	$50	13.50%	$4	($44)	$145	13.8%	34.6%	BLA Filed
01/02/24	Verona Pharma	$50	$400	11.19%	$0	($66)	$1,617	3.1%	24.7%	Commercial
Mean (N=13)		**$97**	**$191**	**11.94%**	**$102**	**($168)**	**$1,112**	**15.9%**	**31.6%**	
Median		**$50**	**$125**	**11.82%**	**$22**	**($132)**	**$278**	**11.4%**	**22.8%**	
Minimum		**$20**	**$39**	**9.65%**	**$0**	**($530)**	**$58**	**3.1%**	**9.5%**	
Maximum		**$400**	**$500**	**15.00%**	**$524**	**($44)**	**$5,000**	**60.0%**	**85.7%**	

Source: CapIQ, PitchBook Data, Inc., and SEC filings as of September 30, 2024.
(1) "Venture debt" defined here as debt to borrowers who do not yet have positive cash flow.
(2) Represents total commitment and includes undrawn revolvers and additional tranches of debt / delayed draw facilities.
(3) LTM financials at time of close are as calculated by CapIQ.

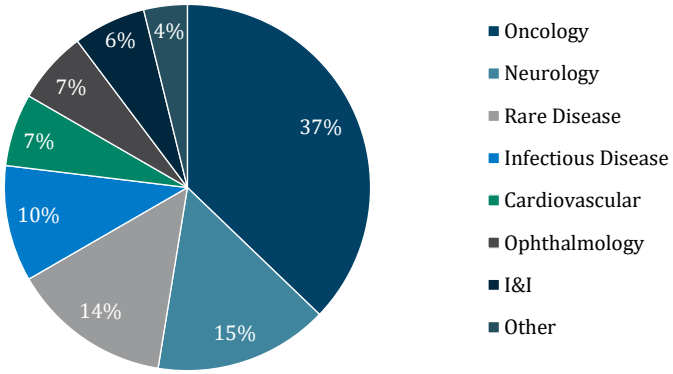
Q3 2024 Clinical Catalysts Analysis

- *5 of the top 10 movers successfully raised catalyst-driven follow-on offerings or PIPEs post-data; all 5 of these catalyst-driven financings occurred in the post-U.S. Labor Day window*
- *2 of the top 10 decliners were companies that had announced positive initial Phase I data in oncology*
- *Summit's positive Phase III data was the largest catalyst this quarter, gaining nearly $5 billion in one-day market cap*

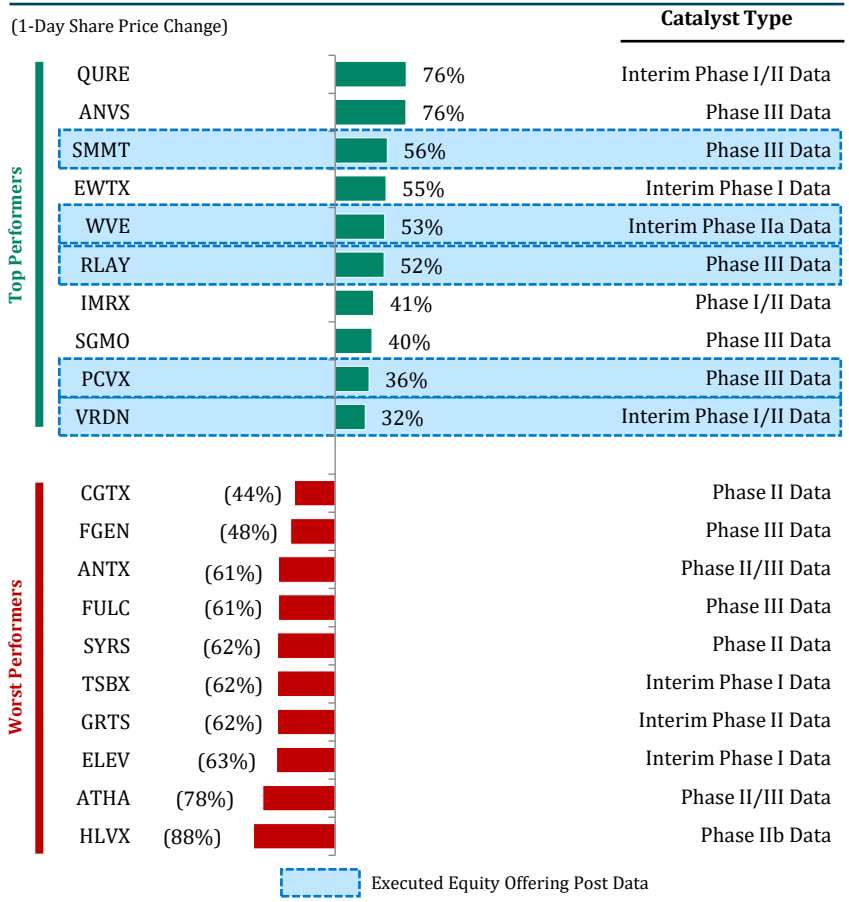
Key Takeaways

- William Blair analyzed 78 key clinical data readouts in Q3 2024 for U.S.-listed biopharma companies with a market cap between $25M-$30B
- Average stock price performance for "positive" clinical data (N=64):
  - 1-day performance: **+1.8%**
  - 1-week performance: **+4.5%**
- Average stock price performance for "negative" clinical data (N=14):
  - 1-day performance: **(40.5%)**
  - 1-week performance: **(43.2%)**
- 17 pivotal / Phase III trial readouts in Q3 2024 (of which 12 were positive)
- ~$3.9 billion in cumulative 1-day market cap gained across all clinical catalysts, led by positive data from Summit Therapeutics, Vaxcyte, Nuvalent and Ascendis

Breakdown of Clinical Catalysts by Therapeutic Area



Top 10 Positive/Negative Movers



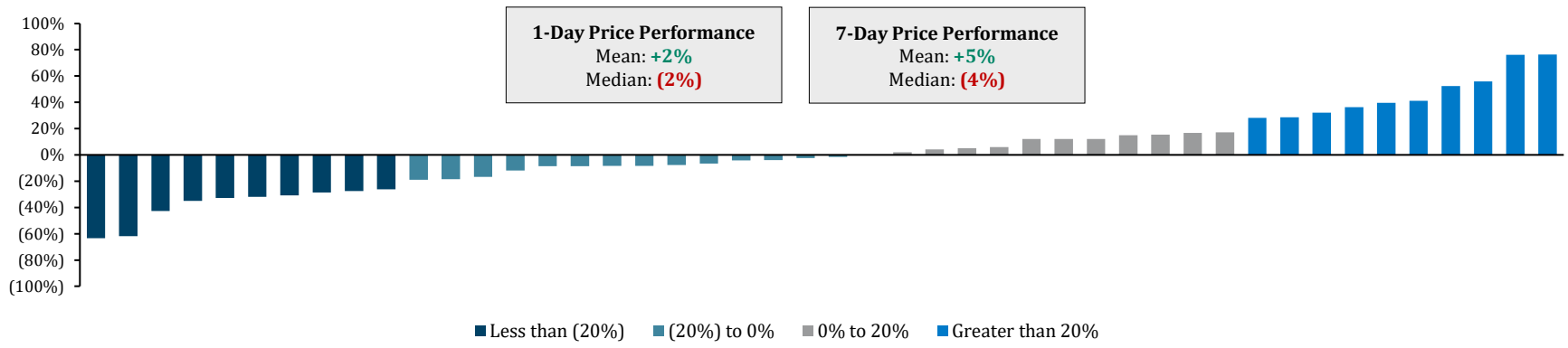
Note: Includes biopharma companies listed on major U.S. exchanges with market capitalization >$25M and <$30 billion at the time of catalyst. Positive/negative based on Company press releases.
Source: FactSet, Company press releases, SEC Filings and William Blair analysis as of September 30, 2024.

Q3 2024 Positive/Negative Clinical Catalyst Performance Detail

22% of positive clinical catalysts had a >20% one-day stock price movement, while 71% of negative clinical catalysts experienced a one-day price decline greater than 20%

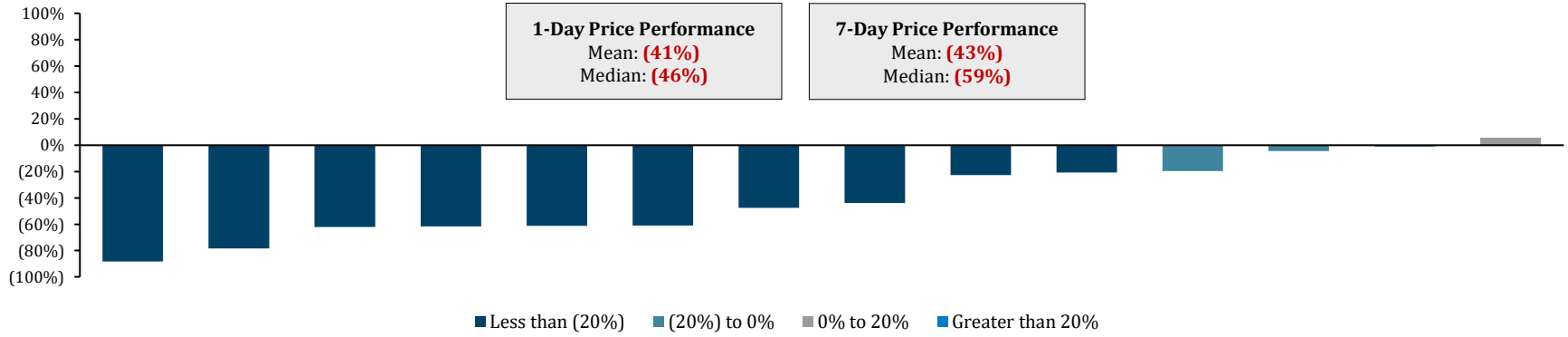
Performance Following a Positive Clinical Catalyst

1-Day Share Price Change (N=64)



Performance Following a Negative Clinical Catalyst

1-Day Share Price Change (N=14)



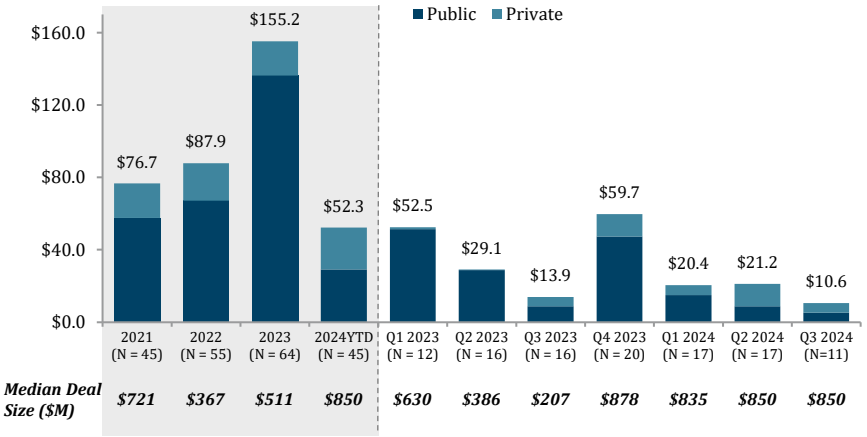
Note: Includes biopharma companies listed on major U.S. exchanges with market capitalization >$25M and <$30 billion at the time of catalyst. Positive/negative based on Company press releases.
Source: FactSet, Company press releases, SEC Filings and William Blair analysis as of September 30, 2024.

Q3 2024 Biopharma M&A Recap

- *Overall M&A activity slowed in Q3 2024, with only 11 deals announced and only one public M&A deal for >$1 billion in deal value (Morphic/Lilly)*
- *For the second consecutive quarter, private company M&A outpaces public company M&A; 2024 remains on track to be the first year since 2021 to have more private company acquisitions than public company acquisitions*

Total Deal Value & Volume

($ in billions)



Key Takeaways

- Higher median Q3 2024 total deal values and upfront values compared to 2023:
  - **Total Deal Value:** $850M in Q3 2024 (vs. $511M in 2023)
  - **Upfront (Cash + Equity):** $607M in Q3 2024 (vs. $248M in 2023)
  - **Milestones:** $177M in Q3 2024 (vs. $200M in 2023)
- Q3 2024 saw the slowest M&A activity since Q1 2022, with 11 deals totaling $10.6 billion
- Uptick in acquisitions of commercial-stage and small molecule companies:
  - 55% (6/11) of deals in Q3 2024 involved lead assets that were marketed/commercial-stage, compared to just 21% (13/64) of deals in 2023
  - 82% (9/11) of all deals for small molecule companies, the highest proportion of deals for small molecule programs in over 5 years
- Continued interest in oncology and I&I focused companies across both public and private M&A, representing 45% (5/11) of all M&A deals this quarter
- Lilly led with the largest deal, paying $3,200M for Morphic, a Phase II I&I-focused company
- "Next-generation" consolidators, including Boehringer Ingelheim, Organon, and Otsuka Pharma remain active in Q3 2024 and drove M&A activity, accounting for 3 of 4 deals over $1B in deal value

Q3 2024 M&A Activity Detail

($ in millions)

Public Company Transactions

Date	Target	Acquiror	Total Deal Value	Upfront Cash	Upfront Equity	Premium to Last Unaffected Date	Phase	Therapeutic Area	Modality
8/9/24	REVANCE	CROWN	$924	$924	-	89%	Marketed	Aesthetics	Peptide
8/7/24	Exscientia	Recursion	$688	-	$688	21%	Phase I/II	AI Drug Discovery	Small Molecule
8/6/24	GO THERAPEUTICS	PHARMACOSMOS	$405	$405	-	68%	Marketed	Oncology	Small Molecule
7/5/24	MORPHIC	Lilly	$3,200	$3,200	-	79%	Phase II	I&I	Small Molecule

Private Company Transactions

Date	Target	Acquiror	Total Deal Value	Total Upfront	Phase	Therapeutic Area	Modality
9/30/24	Regor Therapeutics Group *CDK Inhibitors*	Genentech	$850	$850	Phase I	Oncology	Small Molecule
9/18/24	dermavant	ORGANON	$1,200	$175	Marketed	Dermatology	Small Molecule
8/1/24	jmana	Otsuka	$1,125	$800	Phase Ib/II	Metabolic, Rare Disease	Small Molecule
7/29/24	NERIO THERAPEUTICS	Boehringer Ingelheim	$1,300	ND	Preclinical	Oncology	Small Molecule
7/29/24	IRONSHORE	Collegium	$550	$525	Marketed	Neurology	Small Molecule
7/22/24	VALINOR	GRUNENTHAL	$250	$250	Marketed	Gastro-enterology	Small Molecule
7/8/24	APEIRON	LIGAND	$128	$100	Marketed	Oncology	Monoclonal Antibody

Source: PitchBook Data, Inc., Company press releases and websites as of September 30, 2024.
Note: M&A activity includes biopharma deals with disclosed total deal value of $20M+. ND = Not Disclosed.

Summary of Investor Capital Returned from Q3 2024 Public Biopharma Acquisitions

Public biopharma acquisitions announced in Q3 2024 freed up an estimated $2.9 billion in institutional investor capital

($ in millions)

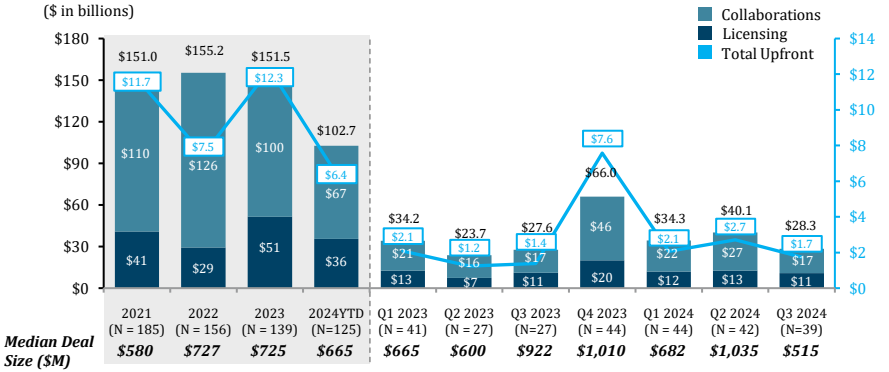
#	Institution	Total Estimated Capital Returned to Fund[1]	G1 THERAPEUTICS	MORPHIC	REVANCE
1	Fidelity Management & Research Co.	$430.3	✓	✓	✓
2	Wellington Management Co. LLP	$324.3	✓	✓	✓
3	EcoR1 Capital, LLC	$284.0		✓	
4	Tas Partners LLC	$157.8		✓	
5	Invus Public Equities Advisors LLC	$144.0		✓	
6	T. Rowe Price Associates, Inc.	$122.7	✓	✓	
7	Polaris Growth Management LLC	$113.5		✓	
8	Woodline Partners LP	$111.4	✓	✓	✓
9	Pictet Asset Management SA	$58.0		✓	✓
10	Franklin Advisers, Inc.	$42.1		✓	✓
11	GIC Pte Ltd.	$38.8			✓
12	Goldman Sachs & Co. LLC	$35.4	✓	✓	✓
13	Palo Alto Investors LP	$35.0			✓
14	OrbiMed Advisors, Inc.	$34.9		✓	✓
15	Eshelman Ventures LLC	$30.1	✓		
16	SilverArc Capital Management LLC	$27.7		✓	
17	Northern Trust Investments, Inc.	$25.8	✓	✓	✓
18	Charles Schwab IM, Inc.	$24.7	✓	✓	✓
19	Two Sigma Advisers LP	$24.4	✓	✓	✓
20	Polar Capital LLP	$23.8		✓	✓
21	Novo Holdings A/S	$21.4		✓	
22	MedImmune Ventures, Inc.	$21.1	✓		
23	MPM BioImpact LLC	$21.1	✓	✓	
24	BlackRock Advisors LLC	$19.1	✓	✓	✓
25	Stonepine Capital Management LLC	$18.6			✓
26	Rubric Capital Management LP	$17.7		✓	✓
27	Two Sigma Investments LP	$16.5	✓	✓	✓
28	JPMorgan IM, Inc.	$15.8	✓	✓	✓
29	Morgan Stanley & Co. LLC	$15.4	✓	✓	✓
30	Federated LLC	$14.9	✓	✓	✓

(1) Total estimated capital in millions returned to fund based on the cumulative $ value position of all target companies for shareholders on all exchanges.
$ value position calculated based on Q2 2024 publicly disclosed institutional ownership of target company multiplied by publicly disclosed latest announced per share acquisition price, excluding contingencies. Excludes all stock deals.
The following acquisitions were analyzed: Pharmacosmos Group acquies G1 Therapeutics for $7.15/share, Eli Lilly acquires Morphic Therapeutic for $57.00/share, and Crown Laboratories acquires Revance Therapeutics for $6.66/share.
Source: FactSet and William Blair Analysis as of September 30, 2024. The analysis does not include index funds, private brokerages, retail, management, strategic investors, and non-filers.

Q3 2024 Biopharma Partnership Trends

- *Overall activity tempered in Q3 2024, with 39 deals announced totaling over $1.7 billion in upfront value*
- *For the first time since Q1 2023, licensings comprised a majority of transactions for the quarter*
- *5/6 of the largest partnerships by upfront value in oncology, with bispecifics and radiopharma continuing to be an area of high strategic interest*

Total Deal Value and Volume



Top Partnerships by Total Upfront in Q3 2024

($ in millions)

Date	Licensor	Licensee	Total Deal Value	Total Upfront	Milestones	Phase	Therapeutic Area	Modality
7/2/2024	CureVac	GSK	$1,558	$430	$1,128	Phase II	Infectious Disease	RNA
8/6/2024	MERCK	Daiichi-Sankyo	$170	$170	NA	Phase I/II	Oncology	bsAb
7/24/2024	dren bio	NOVARTIS	$3,000	$150	$2,850	Discovery	Oncology	bsAb
7/1/2024	Radionetics	Lilly (1)	$1,140	$140	ND	Phase I	Oncology	Radiopharma
9/16/2024	RadioMedix / oranomed	sanofi	$356	$111	ND	Phase II	Oncology	Radiopharma
9/30/2024	prime medicine	Bristol Myers Squibb	$3,610	$110	$3,500	Discovery	Oncology	Cell Therapy

Key Takeaways

Licensings (N=20)

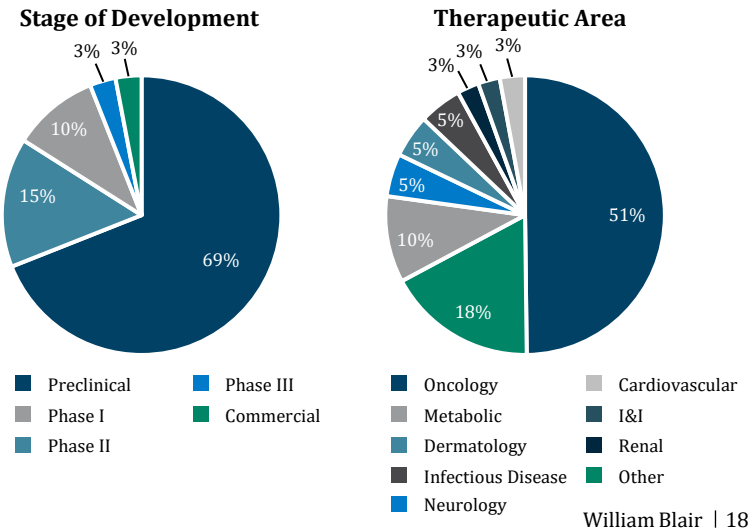
- Median deal terms for licensing agreements in Q3 2024:
  - **Total Deal Value:** $341M in Q3 2024 (vs. $680M in 2023)
  - **Upfront (Cash+Equity):** $48M in Q3 2024 (vs. $45M in 2023)
  - **Milestones:** $147M in Q3 2024 (vs. $595M in 2023)
- Antibody deals accounted for 40% of licensings in Q3 2024, up from 35% in 2023
- Genetic medicine (cell/gene therapy, RNA/oligo) comprised 15% of partnerships in Q3 2024, down from 24% in 2023; of note, no cell therapy-focused licensings were announced in Q3 2024, significantly down from 16% in 2023

Collaborations (N=19)

- Median deal terms for collaborations in Q3 2024:
  - **Total Deal Value:** $675M in Q3 2024 (vs. $882M in 2023)
  - **Upfront (Cash+Equity):** $50M in Q3 2024 (vs. $55M in 2023)
  - **Milestones:** $934M in Q3 2024 (vs. $1,000M in 2023)
- RNA/oligo-focused deals represented 32% of transactions in Q3 2024, up from 7% in 2023
- Early-stage collaborations totaled at 17 deals (89% of collaborations) this quarter with a median upfront of $50M, the lowest level of activity since Q3 2023

Breakdown of Partnerships in Q3 2024

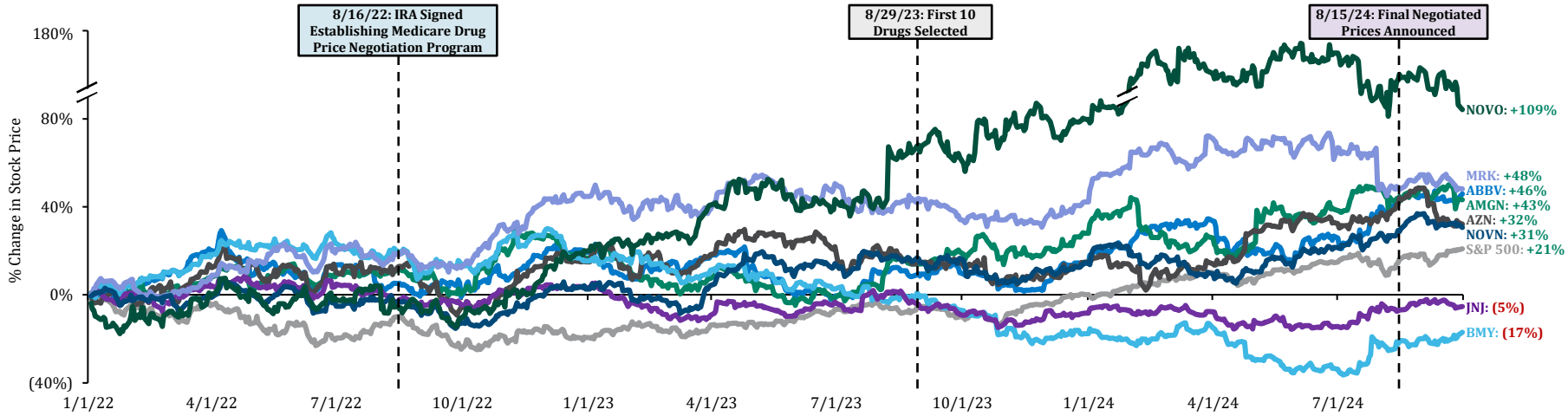
(N=39)



Source: Company press releases and SEC filings as of September 30, 2024.
Note: Excludes regional partnerships and partnerships with undisclosed deal terms.
(1) Transaction includes option for Eli Lilly to acquire Radionetics for $1B.

Looking Back at the IRA Impact – *Was the Bark Larger than the Bite?*

- *On August 15, 2024, final prices announced for the first 10 drugs selected for Medicare price negotiation under the IRA*
- *Publicly-traded companies impacted by the IRA have only seen a ~$3 billion (~7%) loss in 2026E revenue; despite this, the majority have outperformed the S&P 500 and other major indices since the IRA announcement*



($ in millions)

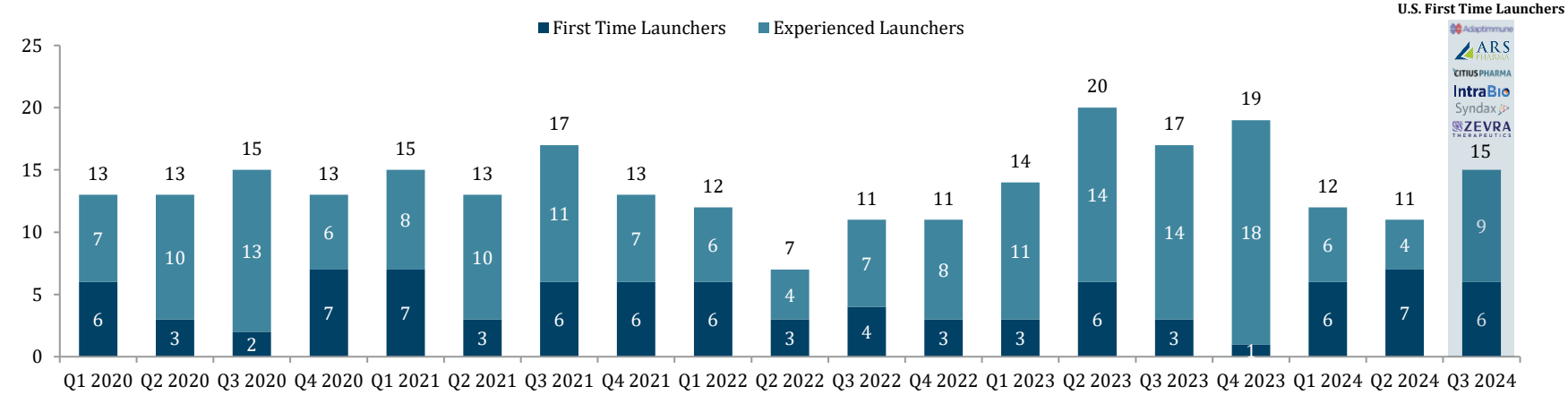
Company	Drug	IRA Announced – 1-Day Δ in Stock Price	2026E Revenue @ IRA Announcement	Drug List Announced – 1-Day Δ in Stock Price	2026E Revenue @ Drug List Announcement	Final Prices Announced – 1-Day Δ in Stock Price	2026E Revenue @ Price Negotiation Announcement
abbvie	Imbruvica	(0.8%)	$4,522	0.1%	$2,451	0.2%	$2,209
AMGEN	Enbrel	(1.0%)	$2,705	1.2%	$2,735	0.8%	$2,643
AstraZeneca	Farxiga	(0.1%)	$4,744	1.6%	$5,763	2.2%	$6,863
Bristol Myers Squibb	Eliquis	0.6%	$13,547	2.0%	$12,554	1.4%	$11,655
J&J	Xarelto, Imbruvica, Stelara	0.0%	$10,250	0.0%	$9,663	0.4%	$9,070
MERCK	Januvia	0.5%	$473	1.0%	$896	(0.2%)	$969
NOVARTIS	Entresto	0.0%	$5,576	0.6%	$5,792	(0.3%)	$5,601
NOVO NORDISK	Fiasp/NovoLog	0.3%	$2,427	0.5%	$2,199	1.7%	$2,209
Total 2026E Revenue			**$44,243**	**($2,189)**	**$42,054**	**($835)**	**$41,219**

Source: CapIQ as of September 30, 2024. Includes public companies impacted by the IRA. 2026E revenue data is based on consensus forecast projections for drugs facing IRA negotiations.

FDA Approval Trends and Upcoming SMID-Cap PDUFA Dates

- *Half of the 2024 approvals are for first-time launching companies (19/38), the highest proportion within the last decade, highlighting the growing importance of SMID-cap launchers*
- *15 upcoming PDUFAs for SMID-cap biopharma companies remaining in 2024*

FDA Approvals by Quarter



Upcoming 2024 SMID-Cap PDUFA Dates

Company	Product	Indication	Modality	PDUFA Date
Camurus	CAM2029	Acromegaly	Small Molecule	10/21/24
Iterum Therapeutics	Sulopenem	Uncomplicated UTIs	Antibiotic	10/25/24
Fortress / Journey Medical	DFD-29	Inflammatory lesions and erythema of rosacea in adults	Small molecule	11/4/24
PTC Therapeutics	Upstaza	AADC deficiency	Gene Therapy	11/13/24
Autolus Therapeutics	Obe-cel	Adult B-cell acute lymphoblastic leukemia	Cell therapy	11/16/24
Applied Therapeutics	Govorestat	Classic galactosemia	Small molecule	11/28/24
BridgeBio Pharma	Acoramidis	Transthyretin amyloid cardiomyopathy	Small molecule	11/29/24
Jazz / Zymeworks	Zanidatamab	HER2-positive biliary tract cancer	Antibody	11/29/24
Ionis	Olezarsen	Familial chylomicronemia syndrome	Oligonucleotide	12/19/24
Lexicon Pharma	Zynquista	Type 1 diabetes	Small molecule	12/20/24
Zealand Pharma	Glepaglutide	Short-bowel syndrome	Peptide	12/22/24
Syndax Pharma	Revumenib	r/r KMT-2Ar acute leukemia	Small molecule	12/26/24
Soleno Therapeutics	DCCR	Prader-Willi syndrome	Small molecule	12/27/24
Fortress / Checkpoint	Cosibelimab	Metastatic or locally advanced cutaneous squamous cell carcinoma	Monoclonal antibody	12/28/24
Neurocrine Biosciences	Crinecerfont	Congenital adrenal hyperplasia	Small molecule	12/29/24 (capsule formulation) 12/30/24 (oral solution)

Source: FDA.gov, Company press releases, SEC Filings, and William Blair analysis as of September 30, 2024.
Note: Reflects approvals and PDUFAs of NCEs/NMEs that are submitted via BLA/NDA (excluding biosimilars, generics and 505b2s without clinical trial data). PDUFAs do not include label extensions or supplemental applications.

William Blair Biopharma Investment Banking Team

Biopharma Investment Banking



Christian Hodneland, Ph.D.
Managing Director
chodneland@williamblair.com



John Sonnier
Managing Director
jsonnier@williamblair.com

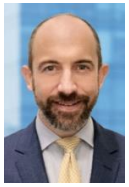


Jason Arnold
Managing Director
jarnold@williamblair.com



Eason Hahm
Director
ehahm@williamblair.com

Healthcare Equity Capital Markets



Steve Maletzky
Managing Director,
Head of Capital Markets
smaletzky@williamblair.com



Rakhee Bhagat
Managing Director
rbhagat@williamblair.com



Kevin Eisele
Managing Director
keisele@williamblair.com

Healthcare Leveraged Finance



Darren Bank
Director, Head of Healthcare
Leveraged Finance
dbank@williamblair.com

Healthcare M&A Advisory



Eugene Kim
Managing Director
ekim@williamblair.com

Healthcare Sales & Trading



Rich McDonald
Managing Director
Head of Healthcare Trading
rmcdonald@williamblair.com



Shantha Ozgen
Managing Director
Life Sciences Sales Specialist
sozgen@williamblair.com

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