

# HSBC Venture Healthcare Report

*Are we out of the woods yet?*

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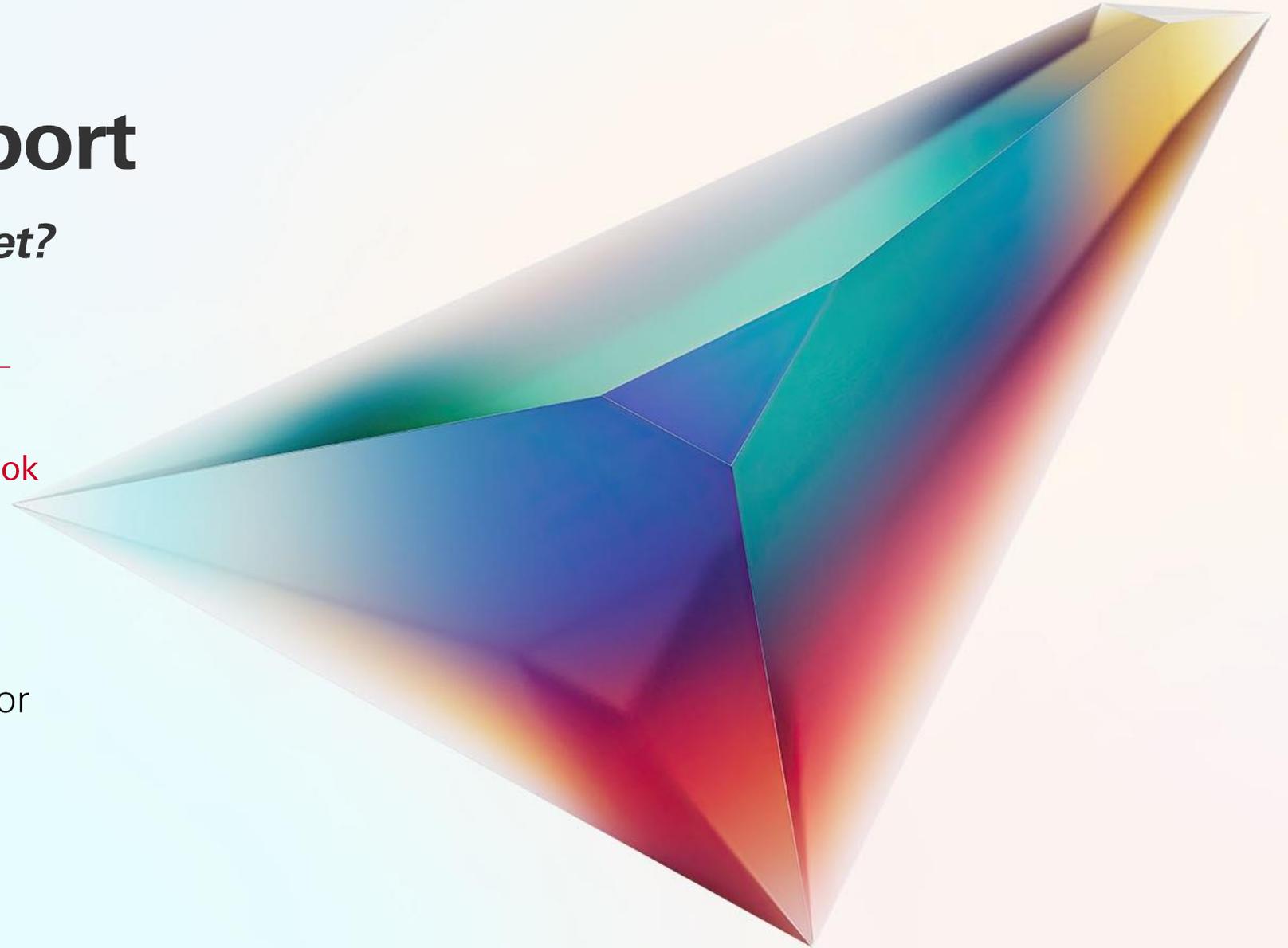
HSBC Innovation Banking Analysis  
2023 Year-End Recap and 2024 Outlook

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# HSBC Venture Healthcare Report: 2023 Annual

HSBC Innovation Banking's 2023 Venture Healthcare Report, written by our Life Science & Healthcare team, provides a deep dive into the venture investment and exit activity across both U.S. and Europe. We balanced the data with our team's deep sector expertise to provide thought provoking analysis and predictions for 2024.

2023 investment was down but equaled 2H 2022's pace. It was the strongest companies, with demonstrated value creation, that were able to secure new investment. If we learned anything in 2023, it's that disruption can create an ideal environment for real innovation. With global economic uncertainty expected to continue into 1H24, more transformation – partnership activity, continued convergence between tech and healthcare, and an increasing focus on patient needs – i.e. consumer demands – is sure to be on the horizon.

We hope you enjoy our year-end report and leverage it as part of your own analysis of current industry trends. Think of us as your partner, your trusted advisor, and an extension of your team – now with the strength and stability of HSBC's global platform.



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In addition, for more than a decade, Jonathan has written comprehensive reports on the venture healthcare ecosystem, covering venture fundraising, investment, valuations and exits. These reports have been widely cited in the ecosystem and he often speaks at major investor and industry conferences. He has more than 23 years of healthcare banking experience.

Jonathan earned a B.S. in business administration from the University of California, Riverside, and a J.D. from Santa Clara University.



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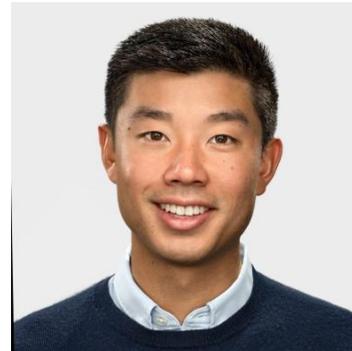
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# HSBC Venture Healthcare Report



- 6 2023 Annual Recap**
- 7 VC Investment in Healthcare**
- 8 Biopharma Investments and Exits**
- 24 Dx/Tools Investments and Exits**
- 39 Deep Dive: Computational Biology**
- 43 Med Device Investments and Exits**
- 57 Healthtech Investments**
- 64 2024 Outlook**

# HSBC Venture Healthcare Report: 2023 Annual Recap

## General Overview

The healthcare market stabilized in 2023. The rate of new investments fell 28%, however, the top 10% of deals still successfully secured substantial funding rounds with step-up valuations. A significant contingent of companies raised new rounds at revised valuations, adhering to the notion that a “flat valuation is the new up-round”. However, almost half of 2023 financings obtained insider rounds<sup>1</sup> to meet revised milestone expectations and, ideally, pave the way to new investor-led rounds. VCs faced intricate investment decisions themselves. Those without new funds had to navigate existing portfolio support, considering return expectations, dry powder, and the timing of their next fund. Some funds downsized as their own fundraising encountered setbacks. We are not out of the woods yet, as we anticipate many demanding financings situations in 2024.

## Healthtech

In 2023, there was a 42% reduction in investment and a 32% decrease in deals. Investors focused on portfolio management and decreasing burn rates to extend runways through insider bridges or extensions of prior rounds. This effectively tempered overall deal volume. That said, 2023 still saw growth above pre-pandemic levels, denoting market stabilization and a return to right-sized deal sizes and valuations. The strongest companies that demonstrated smart growth and value creation (clinical and economic) secured new investor-led financings, many at step-ups.

## Med Device

First-financing activity started strong in Q1, but gradually declined each subsequent quarter due to investor conservatism, impacting deal pace. Overall, total med device investment remained stable, however deal count was down by 20%. Companies within the neuro and imaging sub-sectors raised increased dollars, while non-invasive monitoring companies witnessed a significant decrease in funding. In large later-stage deals, pivotal trials and commercialization rounds remained stable, marked by heightened investment from VCs with freshly closed funds and the continued support of growth investors. M&A deal values were strong, with notable Q4 exits signaling investors to re-engage or risk missing out on opportunities.

## Biopharma

Insider rounds accounted for 40% of deals, however VCs returned to leading new Series B deals. Clinical data was a key focus, with Series B now meaning “be” in the clinic. Some pre-clinical deals too far away from data were deemed too risky to be fundable in the current environment. 2H 2023 saw a resurgence of crossover investors leading prominent deals - choosing teams, themes, assets and syndicate with step-ups to post-money values reminiscent of 2021. IPOs and private M&A were limited in 2023, but public M&A of recent IPOs remained robust, signaling acquirer appetite remains.

## Dx/Tools

Early-stage investment in dx/tools significantly decreased after Q1 as both dx tools and dx analytics first-financing investments dried up by more than 40%. Overall, dx/tool investment was down in 2023 but remained stable compared to the downcycle pace observed in 2H 2022. Despite the availability of valuation resets, new investors are discerning, and growth investors have largely exited the market. Nevertheless, the top 5% of later-stage deals managed to secure new financings with substantial up-round valuations, with corporates leading four of the top eight valued deals.

# Venture Capital ("VC") Investment in Healthcare 2023, US and Europe

**Insider rounds and less large deals drove investment to 2H 2022 "down-cycle" pace**



**Biopharma**



**Dx/Tools**



**Med Device**



**Healthtech<sup>1</sup>**

**Quarterly Totals**

	Biopharma	Dx/Tools	Med Device	Healthtech <sup>1</sup>	Quarterly Totals
<b>Q1</b>	\$5.2B/163 Deals	\$1.7B/107 Deals	\$1.4B/127 Deals	\$3.4B/208 Deals	<b>\$11.7B/605 Deals</b>
<b>Q2</b>	\$5.9B/143 Deals	\$1.5B/118 Deals	\$1.9B/122 Deals	\$2.8B/166 Deals	<b>\$12.1B/549 Deals</b>
<b>Q3</b>	\$6.4B/155 Deals	\$1.6B/93 Deals	\$1.6B/113 Deals	\$2.4B/175 Deals	<b>\$12.0B/536 Deals</b>
<b>Q4</b>	\$5.4B/152 Deals	\$1.4B/105 Deals	\$2.1B/112 Deals	\$2.0B/166 Deals	<b>\$10.9B/535 Deals</b>

**'23 \$22.9B/613 Deals \$6.2B/423 Deals \$7.0B/474 Deals \$10.6B/715 Deals**

**2023 Total Activity \$46.7B / 2,225 Deals**

**Investment down; on pace vs 2H '22**

Venture investments in healthcare saw a 28% decrease from 2022 and 53% decline from 2021. Nevertheless, this year's pace for both dollars and deals remained consistent with 2H 2022, marking the onset of the current downturn.

**Key drivers for investment decline**

1) Increased prevalence of add-on/insider rounds<sup>2</sup> compared to new investor-led financings.

Insider rounds accounted for 48% of all venture healthcare financing in 2023, not including first-financing<sup>3</sup> investments.

Insider rounds, designed to provide additional cash burn aimed at reaching a missed or changed value-infection milestone, were smaller than new investor-led deals.

2) Drop in large \$200M+ financings.

Only 25 deals of \$200M+ took place in 2023, versus 50+ per year over the past few years. Later-stage deal sizes trended smaller in 2023, as multiple well-funded deals opted for insider rounds, using the additional cash burn to try and "catch-up" to very ambitious last-round valuations from 2020 and 2021.

Data from PitchBook as of 12/15/23; December investment deals and dollars from 12/1/23 to 12/15/23 doubled in this slide to provide best efforts December totals. Covers private, venture-backed investment. <sup>1</sup>Healthtech deals that overlap with other healthcare sectors are not counted in the healthtech totals in this slide. Including overlap, healthtech total investment in 2023 was \$12.9B. <sup>2</sup>Insider rounds defined as equity/convertible financings where only insiders participate, typically at smaller amounts. <sup>3</sup>First-financing defined as initial Seed or Series A financing of \$2M+. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.



# Biopharma Early-Stage: First-Financing Analysis

2023 Annual

# Biopharma First-Financing<sup>1</sup> Analysis

2023, US and Europe



**Significant investment slowdown; shift to clinical-stage, larger first-financings**

## Early-Stage Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN \$158M   12 Deals	FEB \$409M   15 Deals	MAR \$321M   12 Deals
	Q1 Activity \$888M   39 Deals		
Q2 2023	APR \$179M   9 Deals	MAY \$371M   9 Deals	JUN \$595M   16 Deals
	Q2 Activity \$1.1B   34 Deals		
Q3 2023	JUL \$339M   11 Deals	AUG \$398M   19 Deals	SEPT \$534M   20 Deals
	Q3 Activity \$1.3B   50 Deals		
Q4 2023	OCT \$411M   11 Deals	NOV \$287M   15 Deals	DEC \$264M   20 Deals
	Q4 Activity \$962M   46 Deals		
2023 Total Activity \$4.2B   169 Deals			

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 ↓ 39%

2021 ↓ 57%

2020 ↓ 38%

2019 ↓ 24%

### Activity dropped in 2023

2023 investments declined for two primary reasons. First, investors slowed their investment pace, as they navigated existing portfolio financings and considered longer stretches between fundraises. This was apparent in both dollars (down 39%) and deals (down 42%) versus 2022.

Secondly, traditional early-stage investors opportunistically ventured into later-stage deals. This strategy allows them to supplement previous financings or lead down rounds for compelling missed opportunities.

### Clinical data often vital for Series B funding

Overall, first-financing deals appear to be closer to the clinic compared with previous years. Excluding the top 10% of deals, which are typically driven by the narrative and team and are further away from the clinic, series A financing needed to propel a company to generate clinical data, in order to position it for a subsequent new investor-led round.

### Go big from the get-go

Larger first-financing deals seem to be following a common playbook: appoint a strong CEO, identify a development candidate and raise \$40M+ (syndicated with two or more larger investors) to reach Phase I data. There were 36 first-financing deals that raised at least \$40M in 2023.

Data from PitchBook as of 12/15/23; December investment deals and dollars from 12/1/23 to 12/15/23 doubled in this slide to provide best efforts December totals. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+.

<sup>2</sup>Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma First-Financing<sup>1</sup> by Indication

2023, US and Europe



**Neuro surged and platform dropped as investors shifted from pre-clinical**



## Neuro first-financing soared

Total neuro investment increased 40% as investors' general shift from pre-clinical to clinical investments in 2023 extended to early-round neuro investment. Nine of the twenty neuro first-financing deals were clinical-stage companies, including five Phase II or Phase III companies (MAPS, Tisento, Transcend, Neuvivo and Neonc),

## Most first-financing indications were down

Platform, auto-immune, and anti-infective investments decreased by over 50%. Oncology investments declined from 2022 but remained stable with 2H 2022 activity. Pre-clinical deals with established biology gained investor interest, while pre-clinical deals with new biology faced funding challenges.

Orphan rare deals came to a halt in 2H 2023, with no first-financings, possibly due to IRA pressures.

## Largest First-Financings in Biopharma



## Big deals focus on clinic, diverse indications

Of the largest 10 deals, all surpassing \$80M, half of the companies were already in the clinic, with four of the top five in or poised for Phase II or Phase III. Notably, only three of ten were platform or oncology deals. Contrary to later-stage activity, there was just one deal (Beacon) focused on gene or cell therapy and a single computational biology company (Paratus).

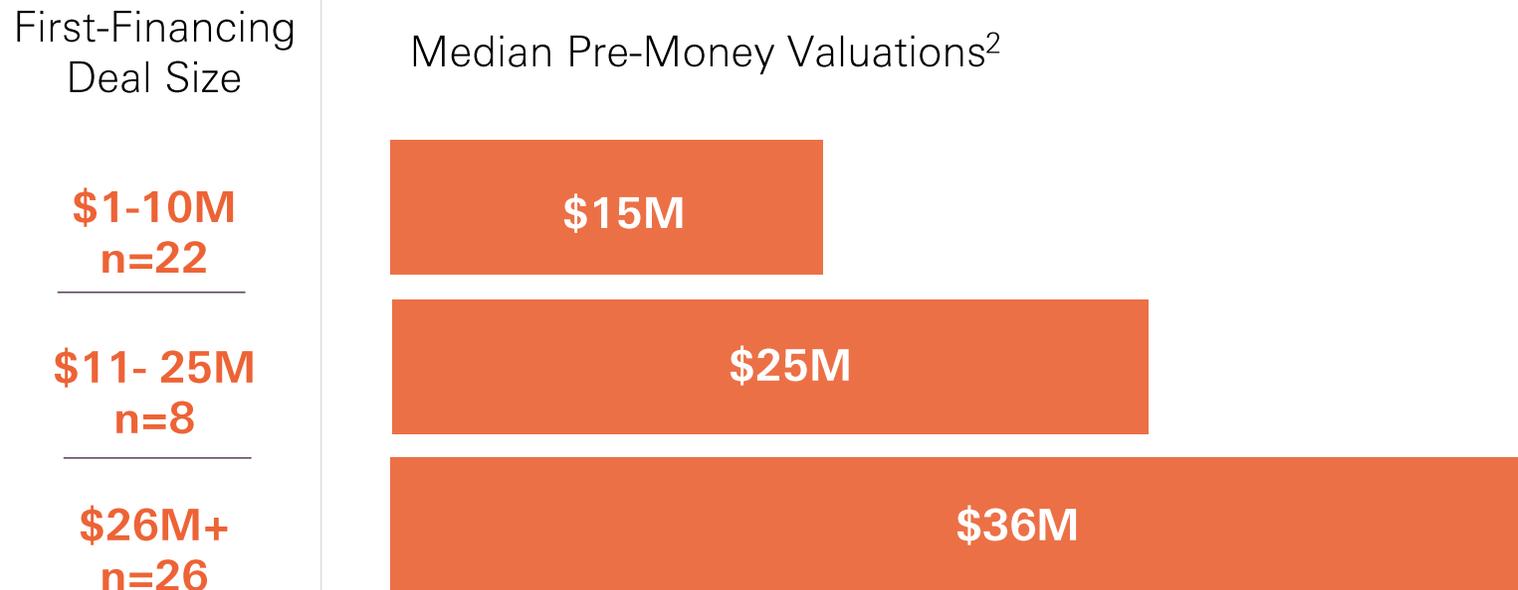
Data from PitchBook though 12/15/23. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma First-Financing<sup>1</sup> Pre-Money Analysis 2023, US and Europe



**Clinical emphasis drove larger deals, higher valuations**

## First-Financing Median Pre-Money Values



Approximately 40% (56 deals) of first-financing investments in biopharma contained pre-money valuation information for this analysis.

Despite the down-cycle, larger first-financing deals increased to help resolve near-term financing risk, resulting in overall larger deal sizes. 2023 pre-money valuations saw a significant increase from 2022, with the median valuation reaching \$21M (up 24%) versus 2022. This chart provides a detailed breakdown of pre-money values by deal size.

In 2023, five out of the top eight first-financing pre-money valuations were clinical stage, with a notable emphasis on neuro-related deals, including Fibrobiologics, Transcend, and the orphan/rare neuro company BrainRepair. Additionally, two of the eight largest pre-money deals were categorized as pre-clinical comp bio companies (EvolutionaryScale and NewLimit).

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+.

<sup>2</sup>Valuation information, including pre-money valuations, based on PitchBook data. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.



# Biopharma Investment: All Venture Deals

2023 Annual

# Biopharma VC Investment (All Deals)

2023, US and Europe



**Investment stable versus 2H 2022; focus on clinical stage with 2H Crossover uptick**

## Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN	FEB	MAR
	\$1.5B   51 Deals	\$1.7B   53 Deals	\$2.0B   59 Deals
<b>Q1 Activity \$5.2B   163 Deals</b>			
Q2 2023	APR	MAY	JUN
	\$1.5B   38 Deals	\$2.5B   53 Deals	\$1.9B   52 Deals
<b>Q2 Activity \$5.9B   143 Deals</b>			
Q3 2023	JUL	AUG	SEPT
	\$1.7B   44 Deals	\$2.1B   49 Deals	\$2.6B   62 Deals
<b>Q3 Activity \$6.4B   155 Deals</b>			
Q4 2023	OCT	NOV	DEC
	\$1.7B   50 Deals	\$1.9B   47 Deals	\$1.8B   55 Deals
<b>Q4 Activity \$5.4B   152 Deals</b>			
<b>2023 Total Activity</b>		<b>\$22.9B   613 Deals</b>	

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 ↓ 23%

2021 ↓ 42%

2020 ↓ 18%

2019 ↑ 30%

### Investors slow-played new activity

While there was a 23% decrease in overall investment in biopharma from 2022, the decline was less pronounced than in first-financing<sup>1</sup> deals. Interestingly, compared to funding pace of 2H 2022, both investments and deals remained stable in 2023. Securing new investors amid low deal urgency and high financing risk proved challenging. Insider and add-on rounds comprised almost half the equity financings and set the stage for some difficult valuation adjustments in 2024.

### Crossover upswing in 2H

Larger financing rounds returned in 2H 2023, contributing ten of the sixteen deals that surpassed \$200M+. Traditional crossover investors participated as new funders in half of those deals, most of them clinical stage. This may signal optimism for public market appetite in late 2024. Regardless, these financings provide multiple years of runway and the bankroll to hopefully achieve major development milestones.

### Largest financings buck trend to clinical

Contrary to the focus on clinical narratives, six of the largest ten financings in 2023 were still pre-clinical.

Data from PitchBook as of 12/15/23; December investment deals and dollars from 12/1/23 to 12/15/23 doubled in this slide to provide best efforts December totals. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>2</sup>Using specific PitchBook search functions to approximate sector specific funding. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma VC Investment by Indication

2023, US and Europe



**Neuro held ground as Platform/Oncology dipped; clinical-stage asserted dominance**



## Neuro dollars stable as Platform, Oncology down

Platform deals boomed in 2021 and early 2022 with strong public market backing for compelling pre-clinical narratives. In 2023, the focus shifted towards clinical assets or funding for initial clinical data. Thus, pre-clinical platform investments declined by 44%.

There was a similar trend of decrease in funding in oncology (27% down from 2022), and a shift towards clinical data/clinical-stage companies, with nine of the fifteen oncology financings at or above \$100M already in the clinic.

Neuro was the only indication to fund a similar number of deals and dollars in 2023. Neuro venture investment historically trended towards clinical stage. Thus, the robust activity was not a surprise. Among the top ten neuro deals, eight were in the clinical stage, with five in Phase II or later.

## Gene/Cell Therapy and Comp Bio led biggest deals

In 2023, the main focus of the largest deals was cell and gene therapy, featuring four out of the top five deals. Two of the biggest deals fell into the computational bio category (Metagenomi and Generate Biomedicines).

## Largest Deals in Biopharma



Data from PitchBook as of 12/15/23; Covers private, venture-backed investment. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma Most Active Investors<sup>1</sup>

2023, US and Europe



**VC top investor count decreased; corporate remained stable, trending later-stage**

<u>First-Financing<sup>2</sup></u>		<u>All Deals</u>	
All Investors	VC	Growth <sup>3</sup>	Corporate
8 RACAPITAL	11 ARCH VENTURE PARTNERS	16 RACAPITAL	14 ALEXANDRIA Venture Investments*
7 ARCH VENTURE PARTNERS	8 EQT Life Sciences	8 Cormorant Asset Management	10 Lilly
5 ALEXANDRIA Venture Investments*	8 Forbion.	7 BainCapital LIFE SCIENCES	9 G/
5 KdT Ventures	8 NOVO holdings	7 INVUS	7 sanofi
4 VERSANT ventures	7 SOFINNOVA PARTNERS	6 DEEP TRACK CAPITAL	6 Bristol Myers Squibb*
3 POLARIS PARTNERS	6 F-PRIME	6 MUBADALA CAPITAL	6 NOVARTIS
3 Flagship Pioneering	6 INSIGHT VENTURE PARTNERS	5 TCGX	4 astellas
3 <sup>4</sup> SOFINNOVA PARTNERS	6 <sup>4</sup> OrbiMed Healthcare Fund Management	4 Fidelity INVESTMENTS	4 <sup>4</sup> MRL VENTURES FUND

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Most Active Investors only include first investment into a portfolio company, not follow-on financings. <sup>2</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>3</sup>Growth Investors defined as investment firms that typically invest in later-stage companies that either are revenue scaling or the round is anticipated to be the last before an IPO. <sup>4</sup> Some categories had ties for number of deals, and list was curtailed due to space. Note that families of funds are combined for this slide, as are corporate and corporate venture with the same parent. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

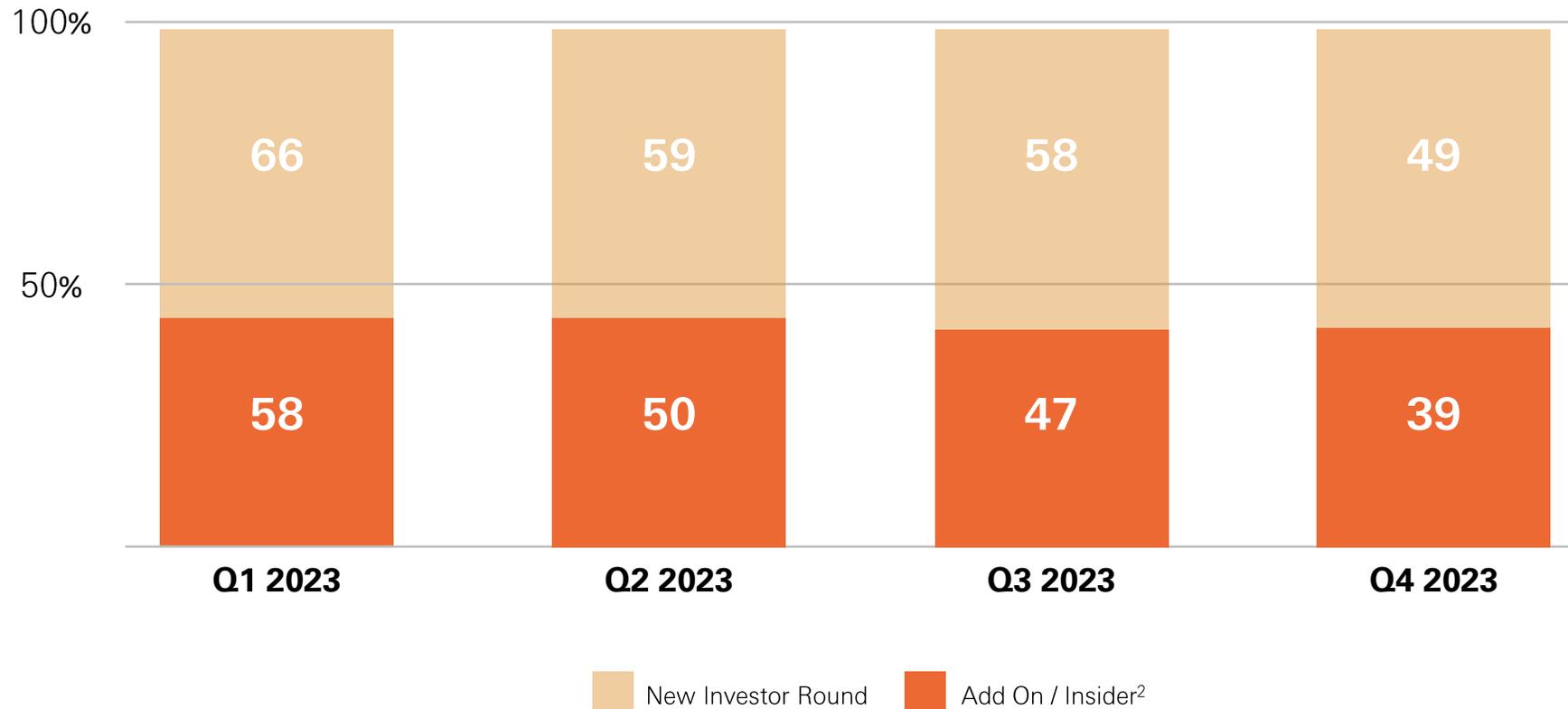
# Biopharma Financing New vs Insider Analysis

2023, US and Europe



*Insider rounds swelled as companies dealt with valuation/milestone challenges*

## Deal Breakdown by Equity Rounds (Post First-Financing<sup>1</sup>)



### Insider rounds abound as companies deal with valuation and milestone challenges

In 2023, many companies opted for add-on/insider rounds, responding to new investors' demands for advanced clinical data. While providing essential cash for value creation, these insider rounds pose a risk of depleting investors' dry powder, potentially compromising long-term funding options. Furthermore, limited capital from a smaller insider round poses an additional challenge by restricting multi-asset development and could affect the strength or quality of the lead asset study, making results less clear. Companies at a distance from clinical data faced significant challenges in new fundraising, and insider rounds may not provide enough runway to get to clinical data.

### Platform/Oncology closed more new investor deals

Platform and oncology successfully closed more new investor rounds than other indications. Auto-immune, dermatology, dietary, gastrointestinal, and metabolic indications opted for more insider round activity.

### Insider rounds unveiled multiple dimensions

We speculate that VC fund dynamics will play an even more substantial role in determining company support in 2024.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Post First-Financing defined as the round following the first equity financing of \$2M+. <sup>2</sup>Add On/Insider rounds defined as new investor-led equity deals smaller than the prior round, or equity/convertible financings where only insiders participate. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma New Investor Step-Up<sup>1</sup> Analysis

2023, US and Europe



**Pre-clinical gene/cell therapy excited Series A VCs; Phase II Drove Series B Upticks**

## Step-Up Analysis by Round

Rounds Covered	New VC-led Deals in data set	Median Pre-Money (\$M)	Median Deal Size (\$M)	Median Step-up	# Down Rounds
Seed to A	27	\$44	\$36	1.6x	4
A to B	48	\$124	\$75	1.4x	3
B to C	18	\$231	\$51	1.3x	3
Post C	8	\$292	\$50	1.3x	2

If you were able to convince a new investor to come in and lead a new round, this is what step-ups looked like in 2023. In 2023, 45% of new investor-led deals disclosed valuations, with a median biopharma step-up of 1.4x. This provides validation to the market that companies can still attain up-rounds, as there were at least 91 new investor-led financing rounds achieving step-ups (21% of total deals).

Only 12% of these deals featured down-rounds (12 deals). This is emblematic of companies continuing to leverage insider rounds in 2023 versus closing a new financing with a value re-set. We anticipate a higher prevalence of new investor-led down rounds in 2024.

### Seed to A step-ups bifurcated by stage

The top two step-ups in Series A were clinical stage, Transcend (neuro) and ARTBIO (oncology), both over 10x. Notably, four of the eight largest step-ups were pre-clinical gene therapy platform deals, each with a step-up multiple larger than 3x.

### Series A to B step-ups led by phase II

The top three step-ups in Series B were phase II deals Advantage Therapeutics (neuro), Zetagen (orthopedic) and ReCode (respiratory), each with a step-up over 3x.

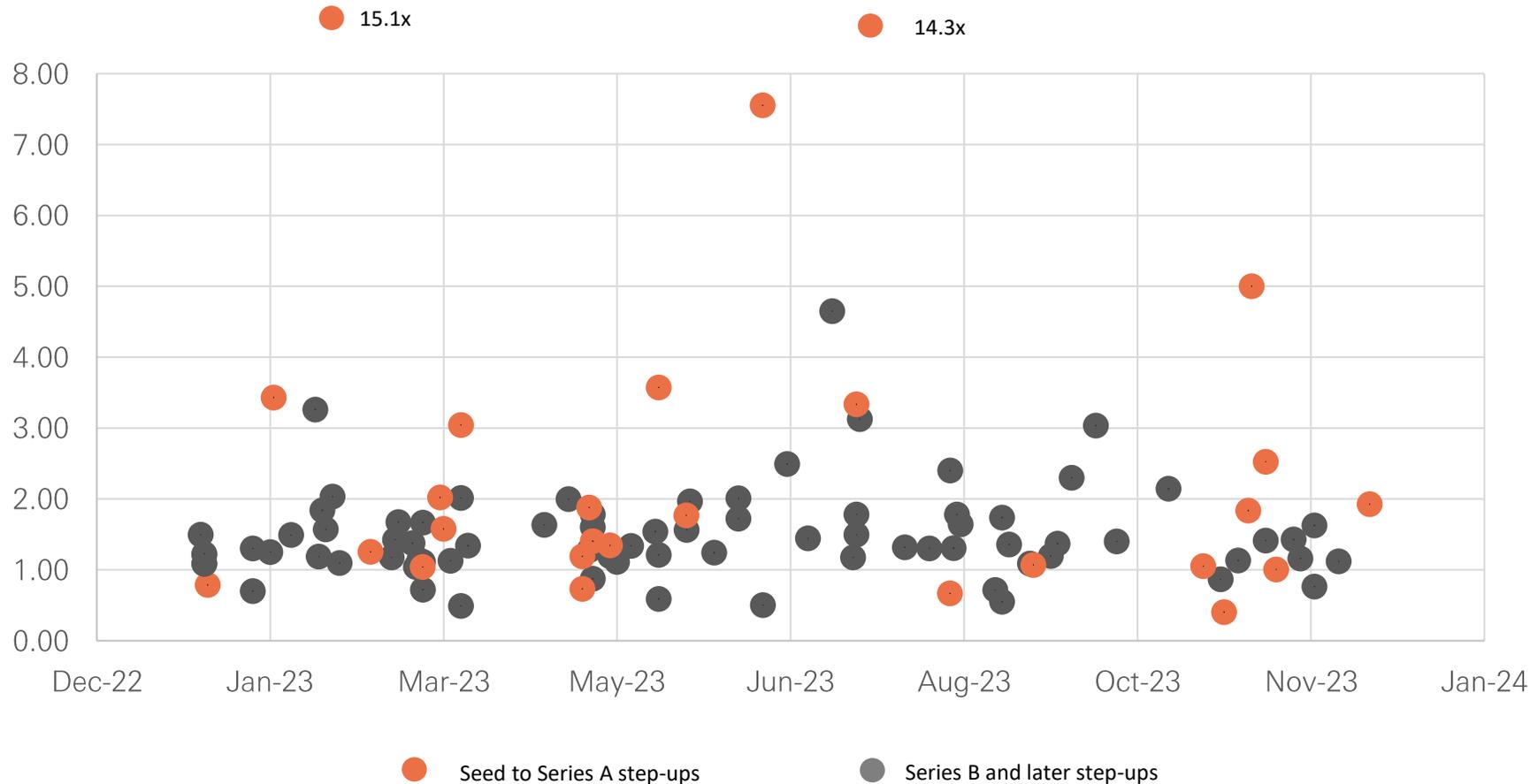
Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>New Investor Step-Up refer to companies that had a new investor in its 2023 financing, with that equity financing equal to or greater than the last financing round. Companies included if valuation information was available for both the new and last financing. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma New Investor Step-Up<sup>1</sup> Analysis

2023, US and Europe



**Step-ups values trended lower as new investor activity dropped in Q4**



The data presented examines the 45% of all new investor-led financings in 2023 that contained enough information to calculate a valuation multiple.

The lower-than-expected occurrences of down rounds were directly attributed to higher prevalence of insider rounds and convertible note activity. Many companies used the additional funds to hit missed or revised milestones and value inflection events, aiming to grow into now frothy valuations from the previous round.

New investor activity decreased in Q4, with post Series A deal numbers down and later-stage step-up calculations congregated around 1x. 2H 2023 saw mostly insider rounds and bridges. We expect to see a surge of new-investor led down rounds in 2024.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>New Investor Step-Up refer to companies that had a new investor in its 2023 financing, with that equity financing equal to or greater than the last financing round. Companies included if valuation information was available for both the new and last financing. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma Largest Post-Money Values<sup>1</sup>

2023, US and Europe



*Pre-clinical deals led valuations; corporates boosted funding as crossovers return*

## Largest Post-Money Valuations by Biopharma Indication

Indication	Company	Date	Deal Size (\$M)	Round	Post \$ (\$M)	Stage	Lead Investor(s)
Platform	 Eikon Therapeutics	6/1/23	\$141	C	\$3,640 (Up)	Pre-Clinical	Unknown
Anti-Infective	Generate:Biomedicines	9/6/23	\$273	C	\$2,000 (Flat)	Phase I	Corporate + Crossover
Metabolic	 CARMOT THERAPEUTICS	5/25/23	\$150	E	\$1,250 (Up)	Phase II	Crossover + VC
Platform	 KRIYA THERAPEUTICS	7/26/23	\$430	C	\$865 (Up)	Pre-Clinical	Venture Growth
Platform	 ADARx PHARMACEUTICALS	8/9/23	\$200	C	\$840 (Up)	Phase I	Crossover + Venture Growth
Platform	 Stramsen BIOTECH	10/20/23	\$10	A	\$807 (N/A)	Pre-Clinical	Corporate
Auto-Immune	 SONOMA BIOTHERAPEUTICS	3/28/23	\$30	B1	\$715 (Flat)	Pre-Clinical	Corporate
Platform	 ORBITAL THERAPEUTICS	4/26/23	\$270	A	\$702 (Up)	Pre-Clinical	Crossover + Sovereign + VC
Respiratory	 ReCode THERAPEUTICS	9/19/23	\$260	B	\$700 (Up)	Phase II	Corporate + Crossover + VC

### Top values secured by pre-clinical deals

While most new investors demanded clinical data to write checks in 2023, promising early-stage companies with strong syndicates continued to raise capital. Interestingly, five of the nine highest post-money valuations were pre-clinical deals.

### Corporates supported funding and exits

Many of these deals had corporate investors as leads, providing big pharma/biotech with the ability to closely follow those companies. Big pharma remained highly engaged in adding pipeline assets, as evident in the strong M&A activity of recent public venture-backed deals. Even in a challenging IPO environment, these large private fundraises give companies substantial capital to develop multiple assets and run fully powered, robust clinical trials, which should whet the appetite of big biotech/pharma M&A in the long term. The Carmot equity financing, to potential IPO, to private M&A is a great example of this.

### Crossovers resumed activity in 2H

We saw crossover activity return in 2H 2023. In this difficult market it will likely take the right theme, a clear asset story and a strong syndicate to IPO in 2024.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Valuation data, including post-money values, from PitchBook. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.



# Biopharma Investment: Private M&A and IPO Analysis

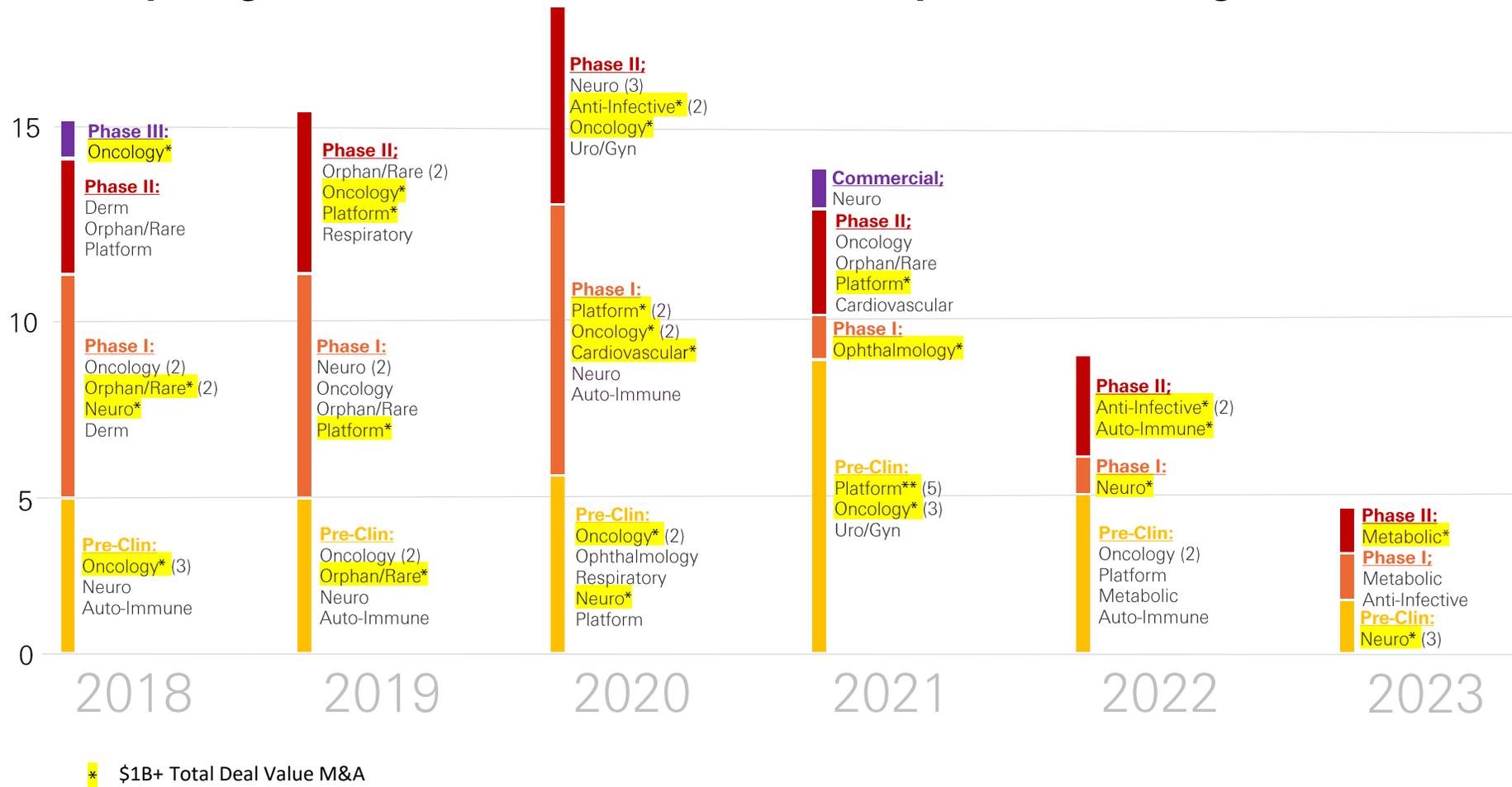
2023 Annual

# Biopharma Private VC-Backed M&A<sup>1</sup>

2018 – 2023



Early-stage M&A continued, with smaller up-fronts but larger total deal size



## Larger milestones for early-stage M&A

Pre-clinical and phase I deals “early-stage” accounted for 50% or more of private venture-backed M&A activity since 2018, totaling 50 exits between 2018-2022. In 2023, early-stage M&A persisted, with five out of six private deals occurring at pre-clinical or phase I stage. The median upfront payment for early-stage 2023 M&A was only \$110M, marking a 50% decrease from the historical early-stage median of \$247M. Nonetheless, this still represented a positive median multiple (4.5x) based on invested capital. Furthermore, early-stage milestones to be achieved were robust, with a median total deal value reaching \$655M, surpassing historical median totals of \$503M. Notably, more than 50% of early-stage M&A from 2018-2022 were either platform or oncology (27 deals), while neither indication was represented in 2023 M&A.

## Surprising early neuro M&A

As previously mentioned, neuro was the only indication to show consistent venture investment versus 2022, with 2023 investment predominantly focused on late-stage clinical. Historically, neuro private M&A was also late-stage (four out of seven occurring in phase II or later since 2020), making it surprising to see three pre-clinical neuro M&A deals in 2023.

<sup>1</sup>BiopharmaM&A defined as private, venture-backed M&A with an upfront payment of at least \$75M. Data Sources: PitchBook, public news articles and conversations with investors and companies.

# Biopharma Private VC-Backed M&A<sup>1</sup> Analysis

2018 – 2023



Three private M&A in 2023 exceeding \$1B total deal values, two focused on obesity

## M&A Median Values

Year	Deals	Up-Front (\$M)	Milestone TBE (\$M)	Total Deal (\$M)
2018	15	\$140	\$400	\$480
2019	15	\$250	\$375	\$600
2020	20	\$315	\$138	\$608
2021	15	\$370	\$350	\$525
2022	9	\$320	\$100	\$405
2023	6	\$305	\$500	\$828

\* \$1B+ Total Deal Value M&A

## Notable M&A Deals



M&A remained robust in 2023, with a decidedly pronounced focus on venture-backed IPOs from recent years. However, all six private M&A deals in 2023 were announced in 2H, which may indicate valuation capitulation by both companies and investors in the private market. This bodes well for an uptick in private M&A in 2024.

### Three \$1B+ total deal values in 2023

In 2023, there were three private venture-backed deals with a total deal value exceeding \$1B. Each of these raised above \$100M in private capital. Two of the three, Inversago (Phase I) and Carmot (Phase II), were specifically focused on obesity assets and the broader metabolic space.

### Neuro re-invigorated by early-stage M&A?

Despite the decidedly clinical-stage focus of neuro investment in venture in 2023, three pre-clinical neuro deals were acquired, with two of the three focused on early-stage Parkinson's assets. Merck was both an investor and acquirer in Caraway, while Abbvie exercised an acquisition option put in place with Mitokinin in 2021.

<sup>1</sup>Biopharma M&A defined as private, venture-backed M&A with an upfront payment of at least \$75M. Data Sources: PitchBook, public news articles and conversations with investors and companies. Thanks to Mind Machine for slide strategy, creative and design.

# Biopharma Private VC-Backed IPO<sup>1</sup> Analysis

2018 – 2023



***IPOs driven by later-stage, established assets; trading highly dependent on data***

## IPO Activity 2018-2023

Date	Venture-Backed IPOs
2018	55
2019	50
2020	83
2021	96
2022	19
2023	11

## 2023 Largest IPOs by Dollars Raised

Date	Deal	Time to IPO (yrs) <sup>2</sup>	Step Up/Down to IPO <sup>3</sup>	IPO \$s Raised (\$M)	IPO Market Cap Post (\$M)	Perf. % (+/-) 12/31/23
5/5/23	 ACELYRIN	2.6	1.4x	\$540	\$1,670	-59%
9/15/23	 RayzeBio	3.1	1.0x	\$311	\$940	Acquired by BMS for \$4.1B. (+245%)
7/13/23	 APOGEE THERAPEUTICS	1.5	Unknown	\$300	\$809	+64%
11/13/23	 CARGO THERAPEUTICS	1.6	0.9x	\$281	\$580	+54%
9/15/23	 Neumora	1.9	1.3x	\$250	\$2,580	+0%
2/9/23	 MINERALYS	1.1	1.6x	\$192	\$624	-46%

In 2023, almost every IPO was fully subscribed or oversubscribed by existing private investors. At launch these books still ended up more heavily covered by insider syndicates compared to previous years. The absence of generalists in the biopharma markets contributed to the subdued initial performance of 2023 IPOs. However, on a positive note, companies were able to IPO quickly from first venture round (median 1.7 years to IPO), getting these companies into the public market ahead of important data read-outs. At year end four out of the six largest IPOs were trading above their IPO price, with three deals exceeding 50% gains. Notably, RayzeBio (lead oncology asset in Phase III) IPO'd in September and was acquired at the end of the year by BMS for \$4.1B. Interestingly, the only three deals able to achieve a step-up from their mezzanine round to their pre-money IPO value had the poorest post-IPO performances.

Biopharma IPOs defined as private, venture-backed deals with an IPO raise of at least \$25M. <sup>2</sup>Time to IPO calculated as time between first venture financing or spin-out and date of IPO. <sup>3</sup>Step Up/Down to IPO calculated as follows: divide last private round post-money valuation with IPO pre-money valuation. Data Sources: PitchBook, public news articles and conversations with investors and companies. Thanks to Mind Machine for slide strategy, creative and design.

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# Dx/Tools Early-Stage: First-Financing Analysis

2023 Annual

# Dx/Tools First-Financing<sup>1</sup> Analysis

2023, US and Europe



**First-Financings dropped in 2023; strong pre-money valuations for larger deals**

## Early-Stage Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN \$149M   13 Deals	FEB \$48M   8 Deals	MAR \$273M   17 Deals
	Q1 Activity \$470M   38 Deals		
Q2 2023	APR \$110M   13 Deals	MAY \$137M   16 Deals	JUN \$44M   9 Deals
	Q2 Activity \$291M   38 Deals		
Q3 2023	JUL \$87M   8 Deals	AUG \$26M   5 Deals	SEPT \$75M   10 Deals
	Q3 Activity \$188M   23 Deals		
Q4 2023 Prelim	OCT \$132M   15 Deals	NOV \$57M   8 Deals	DEC \$8M   4 Deals
	Q4 Activity \$197M   27 Deals		
<b>2023 Total Activity \$1.1B   126 Deals</b>			

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 ↓ 31%

2021 ↓ 8%

2020 ↑ 27%

2019 ↑ 45%

### Big decline in first-financings post Q1

2023 first-financing investment slightly decreased compared with 2021 and 2022 but remained higher than investment from preceding years. Notably, we saw a significant decline in 2023 activity after Q1. Most of the investment concentrated in eight first-financings of at least \$30M each, while overall deal numbers decreased 30% compared to both 2022 and 2021.

### Pre-Money valuations up for larger deals

Despite later-stage valuation declines, first-financing pre-money valuations were robust. For the nine first-financing<sup>3</sup> deals raising upwards of \$20M, the median pre-money valuation reached a notable high of \$36M.

The decreased number of first-financing deals was primarily attributed to competing VC interests, the disappearance of later-stage growth funds, and the challenges in the IPO and M&A environment. Additionally, opportunistic investors who served as prolific early-stage players between 2020 and early 2022 have largely disappeared. VCs are currently challenged with the responsibility of supporting companies in the dx/tools sector from inception through the revenue ramp-up stage, requiring more dry powder than originally anticipated. Corporate acquirers are more internally focused than hungry for M&A, and any M&A appetite (especially in tools) seems to be focused on the product being de-risked and close to accretive.

Data from PitchBook as of 12/15/23; December investment deals and dollars from 12/1/23 to 12/15/23 doubled in this slide to provide best efforts December totals. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>2</sup>Using specific PitchBook search functions to approximate sector specific funding from previous years. <sup>3</sup>Reviewing first-financing deals with disclosed valuation information. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Dx/Tools First-Financing<sup>1</sup> by Subsector

2023, US and Europe



**Dx Analytics, Dx Tests funding plunged; R&D tools up, focused on gene/cell therapy**



## Dx Analytics, Dx Tests pipelines dried up

In 2023, first-financing for R&D tools continued to attract the lion's share of deals and investment capital, slightly exceeding the 2022 totals. However, both dx analytics (45% decrease in dollars, 58% decrease in deals) and dx tests (51% decrease in dollars, 42% decrease in deals) showed sharp first-financing declines.

## Dx Analytics activity

The top three dx analytics deals accounted for 40% of all the first-financing capital deployed in this subsector. Notably, two of the three largest deals, Artera (J&J, Koch) and OncoVerity (Argenx), both had outside-sector corporate investors in their syndicate.

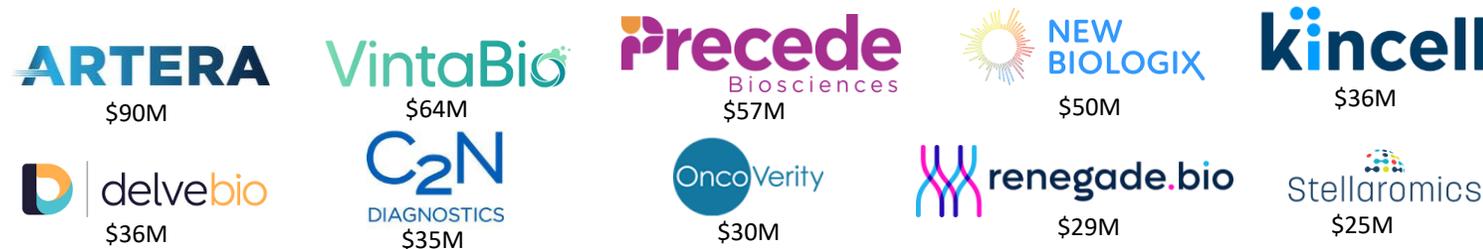
## Dx Tests activity

Two of the three largest first-financings were commercial stage companies C2N (neuro) and Renegade.bio (anti-infective). The largest deal, Precede, is pre-commercial and focuses on liquid biopsy. Key indications for first-financing investment were anti-infective (11), oncology (6) and neuro (6). A deeper analysis showed that in dx tests deals, the decline in later-stage investment was less pronounced compared to first-financings. This suggests a continued backing for existing venture-backed initiatives, however, indicates a slowdown in refilling the pipeline with new start-ups.

## R&D Tools activity

The key focus of the top tools deals was on gene and cell therapy companies. VintaBio and NewBiologix focus on gene therapy production and manufacturing while Kincell focuses on cell therapy. Other gene therapy-focused first-financings included BlueWhale, Camena, and Vecprobio.

## Largest First-Financings in Dx/Tools

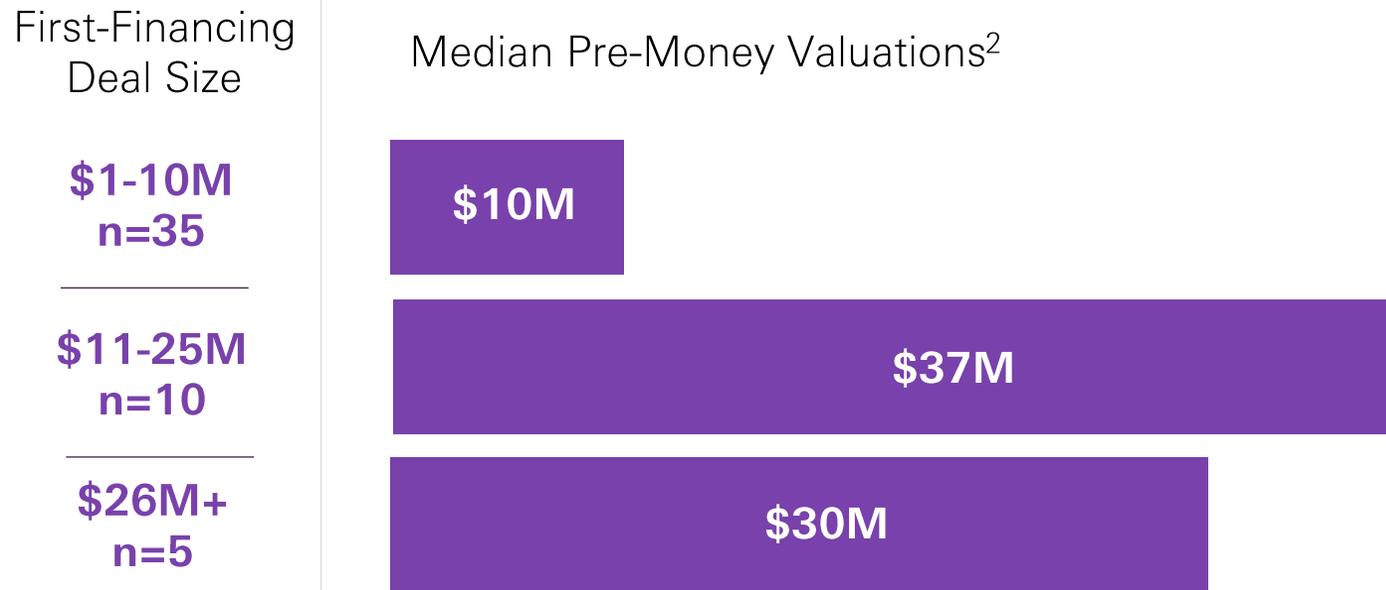


Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.



**Strong valuations for bigger first-financing deals despite investment malaise**

## First-Financing Median Pre-Money Values



Pre-money valuation information was disclosed in 41% of 2023 first-financing deals.

In 2023, the median pre money was \$15M on a deal size of \$5M. However, we noted very strong valuations for bigger first-financings.

This chart provides a detailed breakdown of pre-money values by first-financing deal size.

### **Pre-Money values by subsector were similar**

#### R&D Tools:

\$14M pre-money valuation, with a median deal size of \$8M.

#### Dx Analytics:

\$15M pre-money valuation, with a median deal size of \$4M.

#### Dx Test:

\$11M pre-money valuation, with a median deal size of \$5M.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+.

<sup>2</sup>Valuation information, including pre-money valuations, based on PitchBook data. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.



# Dx/Tools Investment: All Venture Deals

2023 Annual

# Dx/Tools VC Investment (All Deals)

2023, US and Europe



**2023 mirrored 2H 2022; overall investment stable as big deals staged 2H rebound**

## Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN \$746M   32 Deals	FEB \$265M   27 Deals	MAR \$680M   48 Deals
	Q1 Activity \$1.7B   107 Deals		
Q2 2023	APR \$799M   52 Deals	MAY \$478M   41 Deals	JUN \$245M   25 Deals
	Q2 Activity \$1.5B   118 Deals		
Q3 2023	JUL \$527M   34 Deals	AUG \$499M   25 Deals	SEPT \$598M   34 Deals
	Q3 Activity \$1.6B   93 Deals		
Q4 2023 Prelim	OCT \$538M   38 Deals	NOV \$566M   31 Deals	DEC \$307M   36 Deals
	Q4 Activity \$1.4B   105 Deals		
2023 Total Activity \$6.2B   423 Deals			

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 ↓ 37%

2021 ↓ 58%

2020 ↓ 43%

2019 ↑ 20%

### Investment pace similar to 2H 2022

In 2023, dx/tools investment continued the subdued activity observed in 2H 2022, as they declined over 50% compared with the previous six quarters (2021 – 1H 2022). VC consensus for new investments hovered between extreme selectivity and “pencils down”. Recent high performing IPOs are still down, undermining confidence for later-stage investment. Despite open discussions on valuation resets, investors remained cautious, seeking ideal deals and adhering to the adage of “Don’t buy anything on sale you would not buy for full price”. IPO uncertainty adds to later-stage investment hesitation, compounded by intellectual property concerns in the R&D tools subsector.

### Larger financings mount comeback in 2H

Larger deals exceeding \$100M decreased in 2023, dropping from over twenty in 2022 to just eight in 2023. Nevertheless, 2023 financings over \$75M more than doubled from 1H to 2H (from four to ten), totaling fourteen deals. Six of the top fourteen are leveraging computational bio (4 R&D Tools, 2 Dx Tests).

Data from PitchBook as of 12/15/23; December investment deals and dollars from 12/1/23 to 12/15/23 doubled in this slide to provide best efforts December totals.. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>2</sup>Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Dx/Tools VC Investment by Subsector

2023, US and Europe



**Dx Analytics hit 4-year low; R&D Tools deals treaded water, led by comp bio**



### Dx Analytics investment significantly declined

The Dx Analytics subsector hit a four-year low, experiencing a 56% decrease in investment and 33% decline in deals compared to 2022. Dx analytics companies primarily focused on oncology (15 deals), led by Artera, Adela and OncoVerity. The second most active indication was neuro/behavioral health (13 deals), led by RapidAI, HoIMusk, and iLLUME AI. The third most active indication was cardiovascular (8 deals), led by Heartaflow, Elucid, and Viz.ai.

### Dx Tests activity remained stable

While down roughly 50% from 2020 and 2021, investment dollars and deals mirrored 2022. By indication, oncology headed up dx test investment (24 deals), led by Harbinger Health, Universal Diagnostics and Foresight. Anti-infective was the second most active indication, led by Facible, Pattern, and Renegade.bio. The third most active indication was neuro (11 deals), led by Octave, C2N, and BRAINBox Solutions.

### R&D Tools investment slightly retreated

R&D Tools deals decreased by 33% from 2022. Computation bio thrived in this subsector, comprising seven of the top fourteen deals, led by Iambic and Inceptive.

## Largest Deals in Dx/Tools



Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Dx/Tools Most Active Investors<sup>1</sup>

2023, US and Europe



*Diverse group of corporate investors upped investment pace; VC retreated*

<u>First-Financing<sup>2</sup></u>		<u>All Deals</u>					
All Investors		VC	Growth <sup>3</sup>	Corporate			
3	Gaingels	4	khosla ventures	3	BGF	4	MERCK
3	HAWKTAIL	4	FUTURE PLANET CAPITAL	2	Ampersand	4	Johnson & Johnson
2	INSIGHT VENTURE PARTNERS	3	European Innovation Council	2	CASDIN CAPITAL LIFE SCIENCE INVESTMENTS	3	illumina
2	Johnson & Johnson	3	Gaingels	2	MARSHALL WACE	3	labcorp
2	DC >C Data Collective	3	HAWKTAIL	2	mercia asset management	3	NOVARTIS
2	KdT Ventures	3	PLUGANDPLAY	2	Telegraph Hill PARTNERS	3	Bristol Myers Squibb™
2	mercia asset management	3	North East Fund <small>Supported by the European Regional Development Fund</small>	3	NVIDIA	3	AsahiKASEI
2 <sup>4</sup>	VERVE VENTURES	3 <sup>4</sup>	4BIO CAPITAL	3		3	

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Most Active Investors only include first investment into a portfolio company, not follow-on financings. <sup>2</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>3</sup>Growth Investors defined as investment firms that typically invest in later-stage companies that either are revenue scaling or the round is anticipated to be the last before an IPO. <sup>4</sup> Some categories had ties for number of deals, and list was curtailed due to space. Note that families of funds are combined for this slide, as are corporate and corporate venture with the same parent. Data Sources: PitchBook, company websites, internal analysis.

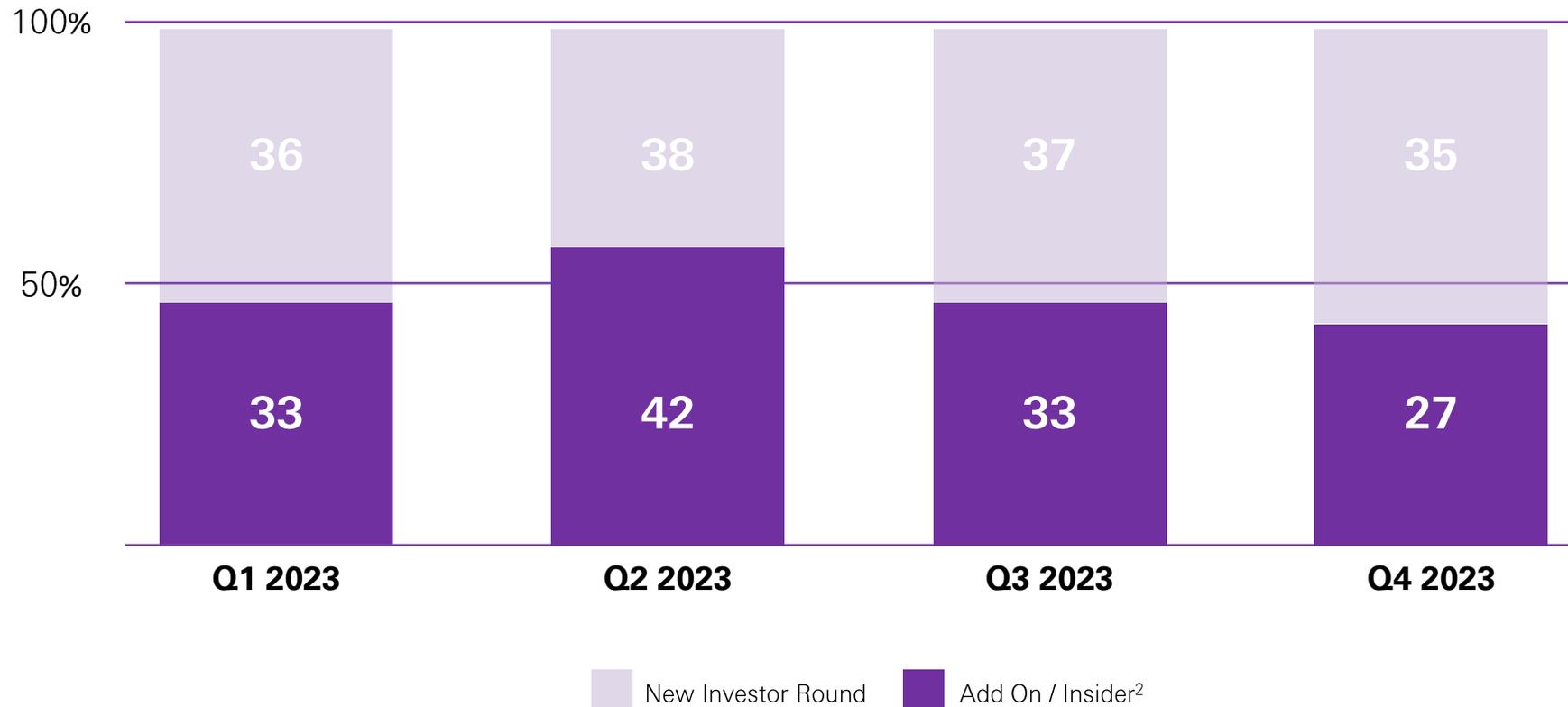
# Dx/Tools New vs Insider Financing Analysis

2023, US and Europe



*VCs were cautious, seeking new deals with strong commercial growth, profit path*

## Deal Breakdown by Equity Rounds (Post First-Financing<sup>1</sup>)



Add-on/Insider rounds<sup>2</sup> (“insider rounds”) constituted 49% of the disclosed financings in 2023. Numerous existing syndicates provided their portfolio companies with insider rounds, mainly to help assist with revenue scale-up. Most new investors slowed their pace, seeking robust commercialization growth and a path to profitability to lead new rounds. Similar to other sectors, investors willing to invest new capital are in an advantageous position. They can conduct thorough due diligence and wait for more revenue scale without significant concerns of losing a deal.

### **R&D Tools secured new rounds as Analytics activity falls**

R&D Tools had more new investor rounds than insider deals (56%) driven by novel technologies and lower cap-ex SAAS-based business models that entered the market.

The dx analytics subsector had the lowest percentage of new investor rounds (44%), possibly due to lingering valuation challenges faced by companies that overlap with the healthtech sector. The question of funding responsibility remains a heavy overhang, with growth and crossover investors distancing themselves from this subsector as IPOs have dried up.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Post First-Financing defined as the round following the first equity financing of \$2M+. <sup>2</sup>Add On/Insider rounds defined as new investor-led equity deals smaller than the prior round, or equity/convertible financings where only insiders participate. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Dx/Tools New Investor Step-Up<sup>1</sup> Analysis

2023, US and Europe



**Strong Seed to Series A step-ups; small but mighty group of Series C deals**

## Step-Up Analysis by Round

Rounds Covered	New VC-led Deals in data set	Pre-Money (\$M)	Median Deal Size (\$M)	Median Step-up	# Down Rounds
Seed to A	23	\$44	\$15	1.7x	1
A to B	19	\$54	\$22	1.4x	3
B to C	5	\$250	\$60	1.9x	0
Post C	4	\$95	\$21	1.2x	1

If successful in securing a new investor to lead a new round, this was the landscape of dx/tools step-ups in 2023. In 2023, 35% of new investor-led deals disclosed valuations, with a robust step-up median of 1.5x. This provides validation to the market that companies can still attain up-rounds, as there were at least 47 new investor-led financing rounds achieving step-ups (17% of total deals).

### Series A step-up median down vs 2022

The median step-up value from Seed to Series A decreased by 37% compared to 2022, however the step-up multiple remained high at 1.7x. This outcome was predominantly influenced by good step-ups across all three subsectors. R&D Tools deals showed strong step-ups including Nucleus Radiopharma, Nagi and Vernal. In the dx analytics subsector, InnerPlant and AccurKade achieved step-ups exceeding 2x, as did dx test deals 4D Path and Evvy.

### Small contingent of strong Series C

Many Series B deals closed insider rounds in 2023, while those that did raise Series C closed larger deals at high valuations. The deals with a step-up above 2x included dx analytics deals Covera and Rapid AI, and R&D tool deal Causaly.

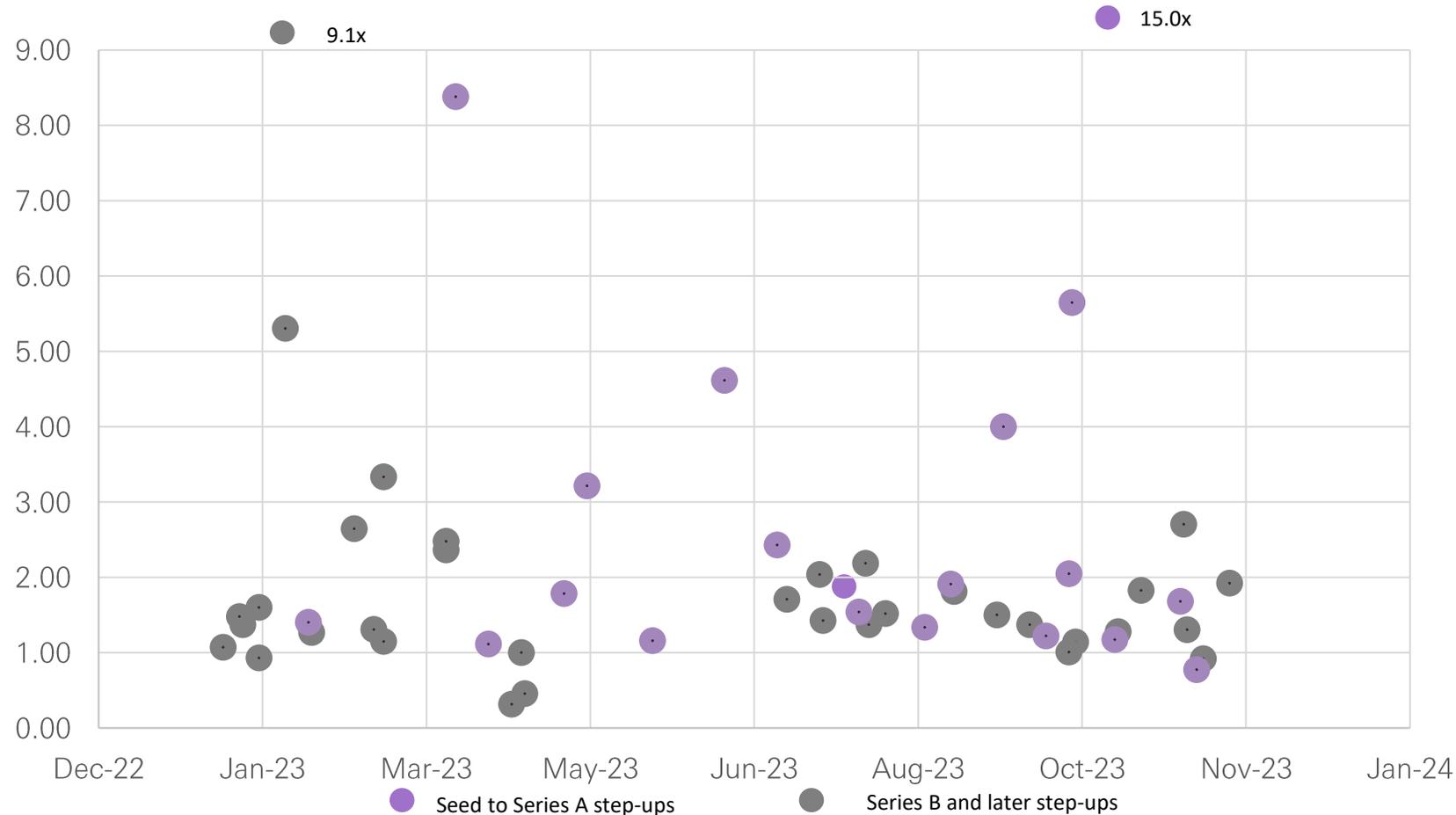
Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>New Investor Step-Up refer to companies that had a new investor in its 2023 financing, with that equity financing equal to or greater than the last financing round. Companies included if valuation information was available for both the new and last financing. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Dx/Tools New Investor Step-Up<sup>1</sup> Analysis

2023, US and Europe



**2H saw increase in new investor-led deals with bigger median step-up values**



The data presented examines the 35% of all new investor-led financings in 2023 that contained enough information to calculate a valuation multiple.

### Strong early stage

Despite substantial challenges in private financing and public market access, strong valuation step-ups were seen in Series A financings throughout 2023.

### Dx Tests tend to down-rounds

Three of the five down rounds in this year's data involved dx test companies. Two of the three were valuation re-sets in 1H 2023, experiencing declines of over 50% from their last round pre-money values that exceeded \$200 million.

### 2H upswing in deal count/step-ups

In dx/tools we noted more data points in 2H (30 deals to 23), less down rounds (2 step-downs versus 3) and a slightly higher step-up median.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>New Investor Step-Up refer to companies that had a new investor in its 2023 financing, with that equity financing equal to or greater than the last financing round. Companies included if valuation information was available for both the new and last financing. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Dx/Tools Largest Post-Money Values<sup>1</sup>

2023, US and Europe



**Corporate and VC supported up-rounds, as most growth investors remain weary**

## Largest Post-Money Valuations by Dx/Tools Subsector

Subsector	Company	Date	Deal Size (\$M)	Round	Post \$ (\$M)	Type of Round	New/Lead Investor(s)
R&D Tool	colossal	1/31/23	\$150	B	\$1,450 (Up)	New Investor	Growth
R&D Tool	ASIMOV	1/5/23	\$175	B	\$1,225 (Up)	New Investor	Growth
R&D Tool	CELLARES	8/23/23	\$255	C	\$675 (Up)	New Investor	Corporate
Dx Analytics	Paige	3/16/23	\$20	C1	\$650 (Flat)	Add-on/Insider Round	Undisclosed
Dx Analytics	RAPIDAI	7/27/23	\$75	C	\$600 (Up)	New	Corporate
Dx Test	Harbinger Health	9/28/23	\$140	B	\$520	New	VC + Corporate
R&D Tool	Inceptive	9/7/23	\$100	A	\$500 (Up)	New	VC + Corporate
Dx Test	truvian	7/1/23	\$44	C	\$449 (Flat)	Add-on/Insider Round	PE + Family Office + VC

### Top valuations still yielded step-ups

Despite a 50% decline in the top eight highest values deals from 2022 and a 64% drop from 2021, the 2023 top valued financings continued to find up-round support (five of the seven were up-rounds, and two were flat).

### Corporate, VCs led big deals

Traditional VCs and Corporates re-emerged as lead investors in six out of the eight top-valued deals. Corporate equity capital will be critically important for the ecosystem over the next 12 months as we anticipate previously active growth investors to remain wary of leading new deals.

### Painful valuation re-sets to come?

Notably, ten of the top sixteen largest private valued companies from 2021 and 2022 have not secured additional fundraising through 2023 and will likely need to finance in 2024. Of the six top deals that did raise additional capital, one IPO'd (Oxford Nano), one raised an up-round (Freenome), one was undisclosed and three raised add-on rounds. Monitoring the type of financing (and associated valuation) these remaining ten companies secure will be an interesting test of equity appetite in 2024.

Data pulled from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Valuation data, including post-money values, from PitchBook. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis.



# Dx/Tools Investment: Private M&A Analysis

2023 Annual



# Dx/Tools Private VC-Backed M&A<sup>1</sup> by Indication

2018 – 2023

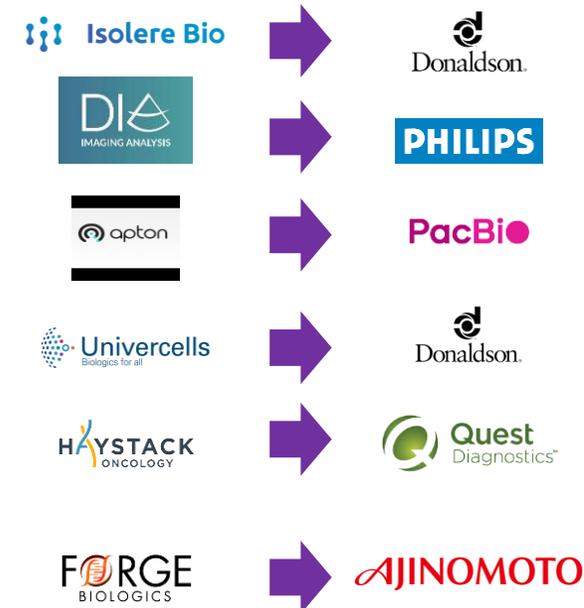


**Depressed M&A deal count and values persisted; exits showed quicker times**

## M&A Median Values

Year	Deals	Up-Front (\$M)	Milestone TBE (\$M)	Total Deal (\$M)
2018	10	\$126	-	\$161
2019	6	\$68	-	\$83
2020	11	\$350	-	\$350
2021	25	\$225	-	\$270
2022	5	\$100	-	\$100
2023	6	\$117	\$13	\$129

## Notable M&A Deals



### 2023 M&A activity remains cautious

M&A slightly increased from last year but remained behind 2021 activity. Upfront medians were relatively modest, trailing the level of activity seen in 2020-2021.

### Up-fronts reflect 3x returns

Based on invested capital the approximate median upfront returns on M&A in 2023 exceeded 3x. The median time to exit of these deals was appealing, totaling three years from the close of their first-financing. However, in the current downturn, the market favors buyers, with most strategics seeking de-risked, accretive products.

### Limited dx test activity; Donaldson doubles down on venture deals

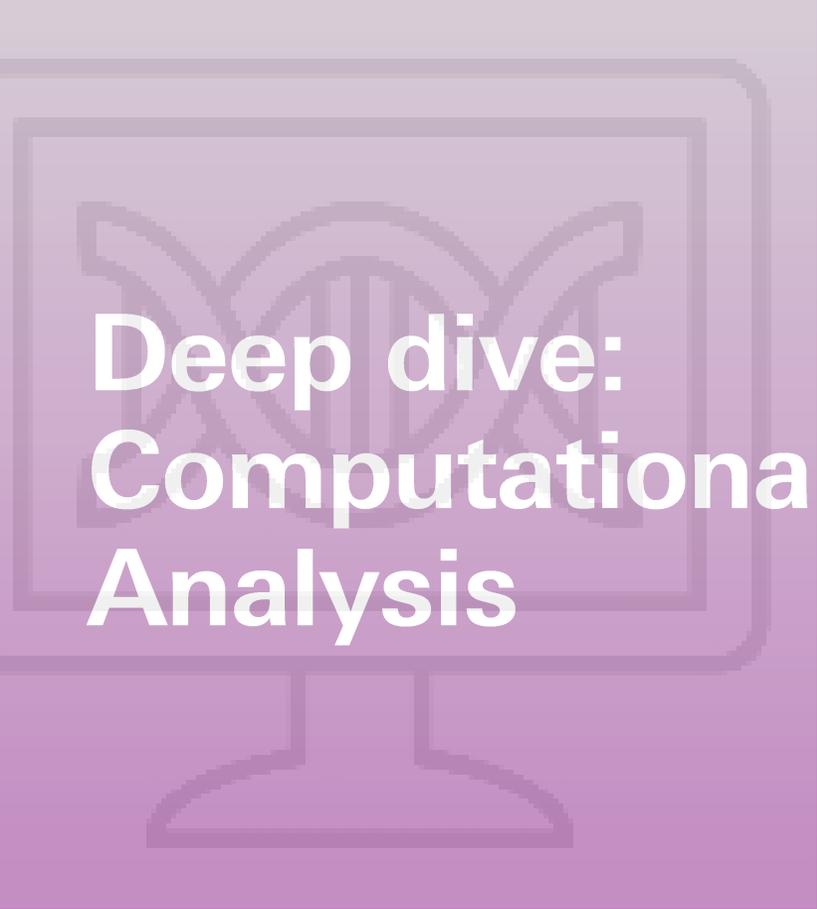
Quest's acquisition of Haystack, the sole dx tests acquisition in 2023, was in the liquid biopsy space, an area that remains crowded with numerous private venture-backed entrants.

Over the last few years, Donaldson has been strategically acquiring emerging tools companies, buying two smaller deals in 2021, aimed at scaling their life sciences business. The company acquired two more venture-backed deals in 2023.

<sup>1</sup> Dx/Tools M&A defined as private, venture-backed M&A with an upfront payment of at least \$50M.

Data Sources: PitchBook, public news articles and conversations with investors and companies.

Thanks to Mind Machine for slide strategy, creative and design.



# Deep dive: Computational Biology Analysis

# Computational Biology: Landscape

2023, US and Europe



## Four main comp bio categories

↑ Logos arranged in ascending order based on increasing deal size

### AI Drug Discovery (AIDD)

#### Post First-Financing



#### First-Financing<sup>1</sup>



First-Financing:	All deals:
\$500M Raised	\$2.5B Raised
18 Deals	57 Deals

### Insight Platforms & Infrastructure (IPI)

#### Post First-Financing



#### First-Financing



First-Financing:	All deals:
\$140M Raised	\$1.3B Raised
19 Deals	50 Deals

### Diagnostics (DX)

#### Post First-Financing



#### First-Financing



First-Financing:	All deals:
\$35M Raised	\$740M Raised
9 Deals	39 Deals

### Clinical Response Predication (CRP)



First-Financing:	All deals:
\$90M Raised	\$400M Raised
5 Deals	18 Deals

In 2023, we identified 158 computational biology (comp bio) companies and analyzed 164 financing rounds that resulted in a cumulative funding of \$4.9B.

For this analysis, to qualify as a comp bio company, firms must apply computational tools to acquire novel chemical or biological insights in therapeutics, R&D Tools, and DX sectors only; have a leadership member with computational expertise; and raise over \$2 million in a financing round closed in 2023.

**Companies were classified into four categories**, based on their products and use of computation:

- **AIDD**: optimization and discovery of novel targets, molecules, and delivery systems.
- **IPI**: bio/chem characterization, development of data banks, computational infrastructure, and bio-manufacturing.
- **DX**: diagnostics and long-term monitoring of biological markers.
- **CRP**: personalized medicine, clinical decision support software, and drug response prediction.

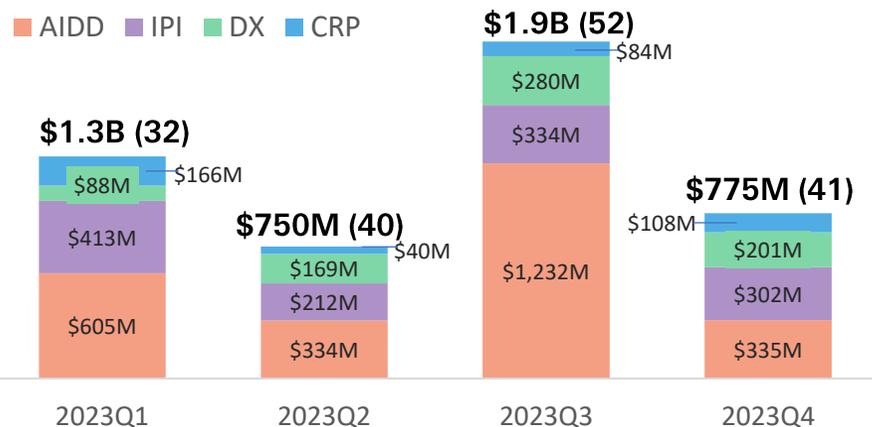
Data Sources: PitchBook, company websites, internal analysis. First-Financing defined as the first equity round of at least \$2M

# Computational Biology: Top Indicators

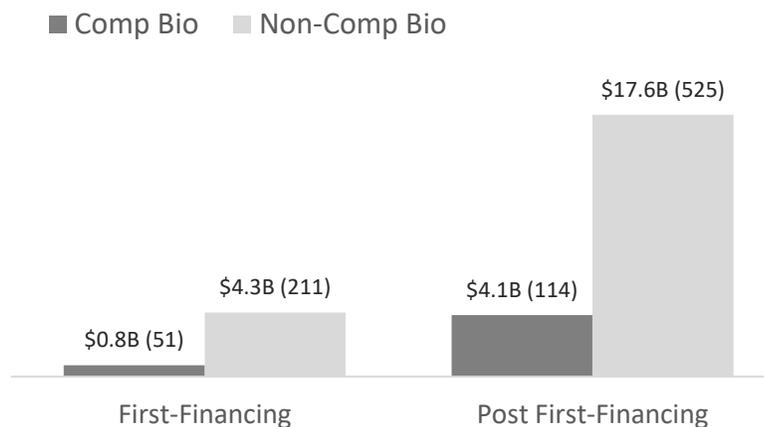
2023, US and Europe



## Dollars Raised by Quarter (Deals)



## Dollar Raised vs. Non-Comp Bio



## Top Three Post-Money Valuations by Category<sup>1</sup>

Company	Deal Size	Valuation	Company	Deal Size	Valuation
<b>eikon</b> therapeutics	\$141M	\$3.6B	<b>ASIMOV</b>	\$175M	\$1.2B
<b>Generate</b>	\$273M	\$2.0B	<b>Inceptiv</b>	\$100M	\$500M
<b>Genesis Therapeutics</b>	\$224M	\$424M	<b>causaly</b>	\$60M	\$310M

Company	Deal Size	Valuation	Company	Deal Size	Valuation
<b>Harbinger Health</b>	\$140M	\$520M	<b>UNLEARN</b>	\$15M	\$265M
<b>truvian</b>	\$44M	\$449M	<b>ALTO NeuroScience</b>	\$60M	\$230M
<b>Cytovale</b>	\$84M	\$169M	<b>PATHOS</b>	\$30M	\$205M

## Top Investors<sup>1</sup> – First-Financing

Investor	Deals
<b>Gaingels</b>	2
<b>RACAPITAL</b>	2
<b>ARTIS VENTURES</b>	2
<b>KdT Ventures</b>	2
<b>INSIGHT PARTNERS</b>	2
<b>AIX Ventures</b>	2

## Top Investors – Post First-Financing

Investor	Deals
<b>NVIDIA</b>	7
<b>ALEXANDRIA Venture Investments</b>	5
<b>Gaingels</b>	5
<b>P&amp;E Bio</b>	3
<b>Bristol Myers Squibb</b>	3
<b>NOVARTIS</b>	3

2023 comp bio companies comprised 18% of all Biopharma and Dx/R&D tools, in both deals and total investments. Among first-financing deals, the median deal size was smaller for comp bio with \$5.2M versus \$7M for non-comp bio. Contrastingly, among post first-financing, the median deal size was significantly larger for comp bio with \$20M compared with \$12M.

Q1 and Q3 saw a surge in investment capital, driven by a few large investments including AIDD companies Metagenomi (Q1), Generate Biomedicines (Q3), and Genesis Therapeutics (Q3), each exceeding \$200M. Overall, twelve comp bio companies raised rounds exceeding \$100M, representing 39% of total capital investments. Among them, six fell under the AIDD category, and five under IPI. A common theme among these companies is their focus on using AI for discovery platforms and molecular design, and the majority are in early pre-clinical stages. No CRP company ranked in the top twelve.

The select few investors engaged in multiple investments concentrated their focus towards AIDD and IPI. In 2023, we saw a mix of traditional biopharma investors (BMS, Novartis), and increasingly engaged corporate investors in the comp bio arena. Notably, NVIDIA, a longstanding collaborator with start-up life science companies offering high-performance computing tools, invested in seven new ventures, six of which were in later stages. Early-stage VCs, such as Artis, KdT, DCVC Bio and Dimension (a new fund started by comp bio veterans) are key players.

Data from PitchBook as of 12/15/23. <sup>1</sup>Companies shown include only ones with reported new-round valuation on PitchBook as of 12/15/2023. <sup>1</sup>Top Investors only include first investment into a portfolio company, not follow-on financings. Data Sources: PitchBook, company websites, internal analysis.

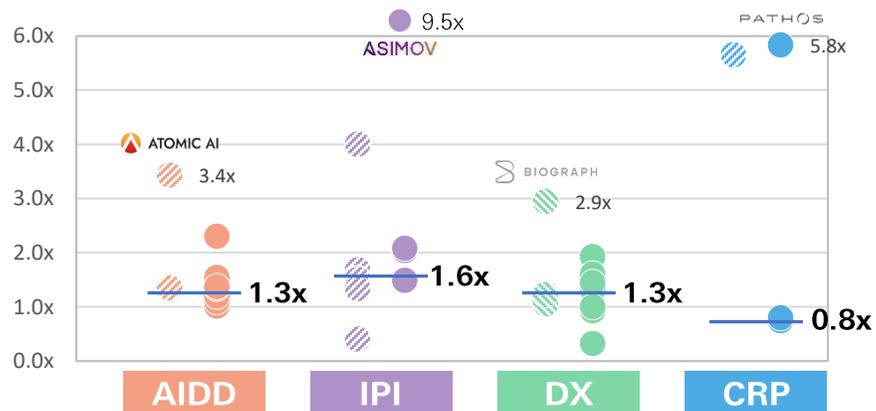
# Computational Biology: Step-Ups Analysis<sup>1</sup>

2023, US and Europe



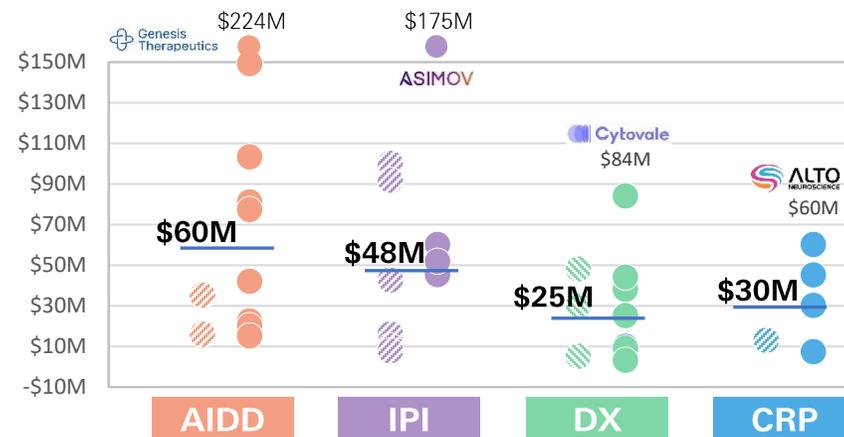
## Comp Bio Step-Ups Multipliers (n=38)

Seed to series A Later stages Median



## Comp Bio Step-Up Deal-Sizes (n=38)

Seed to series A Later stages Median



## Largest Step-Ups

Company	Category	Deal Size	Step-Up	Round	Valuation
ASIMOV	IPI	\$175M	9.6x	A → B	\$1.2B
PATHOS	CRP	\$30M	5.8x	A → B	\$205M
NAGI BIOSCIENCE	CRP	\$12.81M	5.7x	Seed → A	\$46M
Inceptivē	IPI	\$100M	4.0x	Seed → A	\$500M
ATOMIC AI	AIDD	\$35M	3.4x	Seed → A	\$125M

## Step-Up Analysis by Round

Round	New VC-led Deals	Pre-Money (Median)	Deal Size (Median)	Step-Up (Median)	# Down Rounds
Seed → A	12	\$23M	\$16M	1.5x	1
A → B	16	\$91M	\$27M	1.4x	2
B → C	7	\$175M	\$60M	1.4x	3
Post C	1	\$115M	\$38M	1.3x	0

In 2023, **only 24% of new investor-led comp bio ventures disclosed valuations (38 deals)**, showcasing an overall step-up median of 1.3x. Among comp bio categories, IPI displayed the highest median step-up indicator at 1.6x, trailed by AIDD and DX, both at 1.3x step-up median. Notably, CRP was the sole category with a step-down indication of 0.8x. However, it's important to note that only five CRP companies disclosed step-up information, with three undergoing down rounds, potentially not reflecting the entire category. AIDD led median deal sizes for companies with step-up data, securing \$60M, while IPI followed closely. Interestingly, the median deal size in CRP (\$30M) surpassed that of DX (\$25M), aligning with the trend where the overall median deal size in CRP (\$15M) is greater than that of DX (\$8M).

The majority of step-up values ranged between 1x to 2x, encompassing 22 companies, with ten additional ventures surpassing the 2x threshold. Notably, all top five companies were involved in seed to A or A to B rounds. This aligns with the trend where Series A exhibited the highest median step-ups per round, gradually decreasing in later stages.

Data from PitchBook as of 12/15/23. <sup>1</sup>Companies shown include only ones with reported new-round valuation on PitchBook as of 12/15/2023. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Deal Sources: PitchBook, company websites, internal analysis.



# Med Device Early-Stage: First-Financing Analysis

2023 Annual

# Med Device First-Financing<sup>1</sup> Analysis

2023, US and Europe



**Early-stage activity declined; corporate deals up as industry downturn extended**

## Early-Stage Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN \$82M   11 Deals	FEB \$63M   13 Deals	MAR \$107M   10 Deals
	Q1 Activity \$252M   34 Deals		
Q2 2023	APR \$45M   7 Deals	MAY \$85M   11 Deals	JUN \$86M   10 Deals
	Q2 Activity \$216M   28 Deals		
Q3 2023	JUL \$32M   9 Deals	AUG \$41M   6 Deals	SEPT \$86M   12 Deals
	Q3 Activity \$159M   27 Deals		
Q4 2023	OCT \$55M   5 Deals	NOV \$40M   8 Deals	DEC \$56M   6 Deals
	Q4 Activity \$151M   19 Deals		
2023 Total Activity \$778M   108 Deals			

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 ↓ 18%

2021 ↓ 40%

2020 ↓ 18%

2019 ↑ 10%

### Falling investment in 2023

In 2023, first-financing investment in the med device sector declined by 18% from 2022, with funding and deals decreasing in each successive quarter. This reduction was primarily attributed to investors' focus on insider rounds and opportunistic investments in later-stage ventures. Given the emphasis on later-stage investments, early investors faced challenges in finding compatible syndicate partners, especially at a time where financing risk mitigation is at its prime. This reduction reinforces the idea that the ongoing decrease in first-financing of med devices will extend well into 2024, as investors tend to overcorrect based on the current market cycle.

### Increased corporate investment

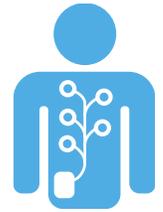
Anecdotally, during 2023 we heard of more corporate investors engaged in first-financing deals, although small strategic investments are not well tracked. Typically, in down cycles, collaboration increases among early-stage companies, venture investors and corporates as product/strategic fit becomes even more essential. Specifically, we anticipate more VC/corporate "build to buy" collaborations going forward.

Data from PitchBook as of 12/15/23; December investment deals and dollars from 12/1/23 to 12/15/23 doubled in this slide to provide best efforts December totals. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+.

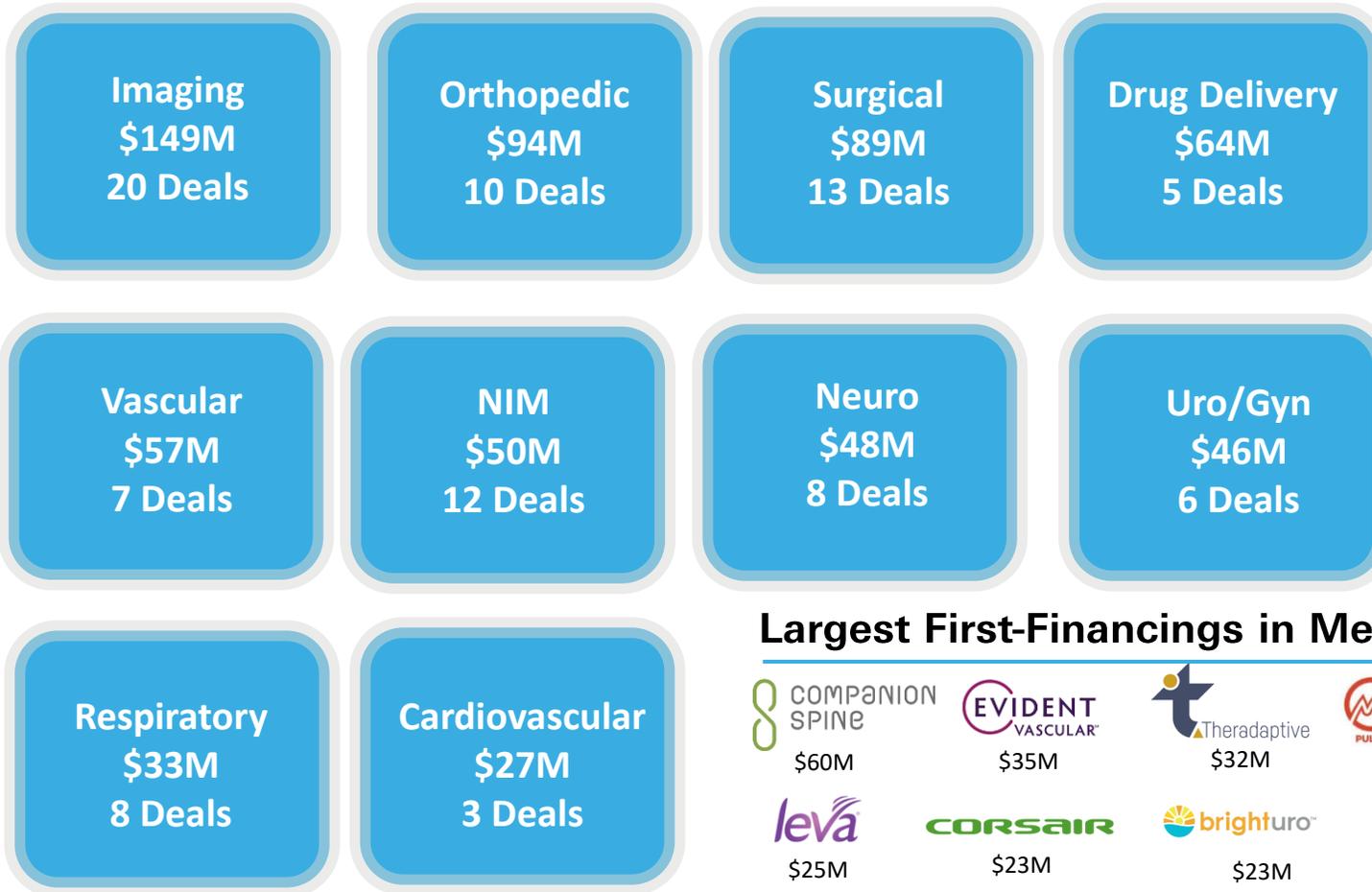
<sup>2</sup>Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Med Device First-Financing<sup>1</sup> by Indication

2023, US and Europe



**510(k) deals up as PMA hesitancy remained; Neuro deals stable while NIM declined**



## Largest First-Financings in Med Device



### PMA<sup>3</sup> deals rare; 510(k)<sup>2</sup> pathway deals up

First-financing activity during this downturn shifted away from clinical-trial heavy PMA<sup>3</sup> opportunities such as cardiovascular deals (3 deals in total). Deal hesitancy may be linked to the challenges that early clinical trial PMA companies face in securing new investor-led Series B funding.

Orthopedic and imaging companies, which typically prioritize quicker-to-market 510(k) clearance-focused deals, exceeded 2022 investments.

### Neuro investment stable; NIM declines

Neuro investment remained stable compared to 2022, with neurostim and brain/computer interface technologies taking the lead.

Non-invasive monitoring (NIM) continued its two-year decline in first-financing dollars, decreasing by 75% from 2022, as investors appeared to focus on 2020-2021 NIM portfolio.

### Diverse set of larger, early-stage deals

Seven of eight largest first-financing deals spanned different indications, with drug delivery being the only indication featuring two deals (Theradaptive and Corsair Pharma).

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>2</sup>510(k) is medical device clearance to commercialize that typically does not include clinical trials. <sup>3</sup>Pre Market Approval (PMA) is a commercialization approval path that typically requires human clinical trial data. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

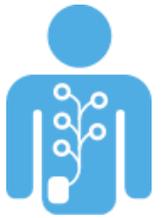


# Med Device Investment: All Venture Deals

2023 Annual

# Med Device VC Investment (All Deals)

2023, US and Europe



**Investment held steady; anticipate consolidation and financing challenges in 2024**

## Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN \$658M   47 Deals	FEB \$431M   40 Deals	MAR \$355M   40 Deals
	Q1 Activity \$1.4B   127 Deals		
Q2 2023	APR \$729M   45 Deals	MAY \$413M   34 Deals	JUN \$749M   43 Deals
	Q2 Activity \$1.9B   122 Deals		
Q3 2023	JUL \$573M   43 Deals	AUG \$360M   31 Deals	SEPT \$626M   39 Deals
	Q3 Activity \$1.6B   113 Deals		
Q4 2023	OCT \$378M   29 Deals	NOV \$1.2B   45 Deals	DEC \$510M   38 Deals
	Q4 Activity \$2.1B   112 Deals		
2023 Total Activity \$7.0B   474 Deals			

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>1</sup>)

2022 ↓ 19%

2021 ↓ 25%

2020 ↑ 4%

2019 ↑ 16%

### Consistent device investment

Driven by later-stage commercialization and pivotal trial funding, investment dollars remained steady versus the previous three years. Med device continues to be the most consistent healthcare sector during the past three years.

Deal count was down in 2023, due to a reduction in the number of first-financing deals.

These times have posed challenges for companies, as many investors hesitated to invest in the current climate, instead opting to wait for the next investment round, seeking reduced technology risk.

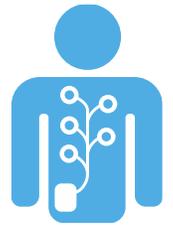
### 2024 predicts more pain than promise

Anticipating a slowdown after a strong 2022, 2023 device investment remained consistent. However, beneath the surge of larger, later-stage deals, many mid-stage companies are still operating on diminishing cash from insider rounds. We anticipate financing needs for many of these deals will come to fruition in early to mid-2024. This will result in some new rounds but also significant consolidation, and in some cases, shutdown.

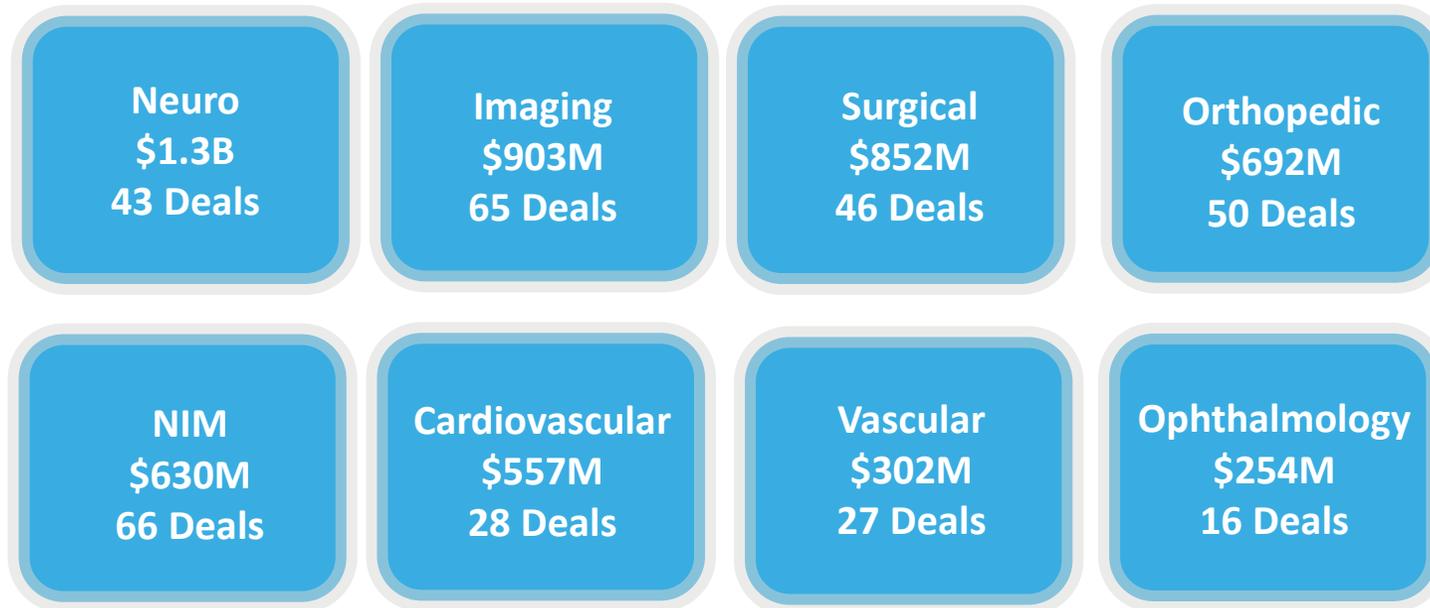
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# Med Device VC Investment by Indication

2023, US and Europe



**Pivotal funding led to neuro upswing, heart failure deals; NIM faced tough market**



### Neuro, Imaging saw big investment jumps

Neuro deals, mostly focused on neurostim technology, dominated the sector’s investment, hitting record levels. Three of the top five largest neuro deals raised capital to fund pivotal clinical trials. Three neuro deals were specifically focused on brain/computer interface technologies (Neuralink, Paradromics, and Precision). Imaging investment (which includes equipment+software) was up 40% in 2023. Two of the three largest deals (RefleXion and Lumicell) focused on oncology.

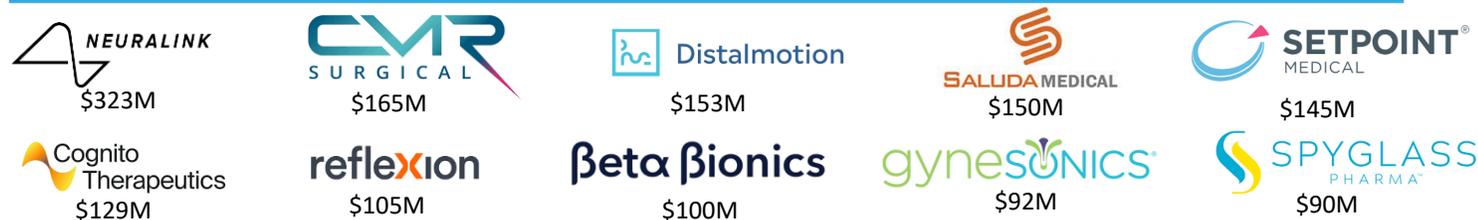
In 2023, we observed increase investments in orthopedics. The largest three deals focused on commercialization growth, while the next three centered on pivotal trials.

We noted consistent later-stage investment in cardiovascular, with the top three deals funding pivotal trials in heart failure – Alleviant, Corwave, and BioVentrix.

### NIM plummeted

Non-invasive monitoring funding decreased by over 40%, falling short of the \$100M, \$1B post-money financings from 2020-22. The two top investments for the indication both experienced down-round financings.

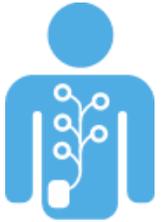
## Largest Deals in Med Device



Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Med Device Most Active Investors<sup>1</sup>

2023, US and Europe



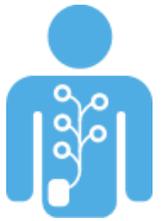
**Growth investor list remained stratified; More corporate investment in 2H 2023**

<u>First-Financing<sup>2</sup></u>		<u>All Deals</u>					
All Investors		VC	Growth <sup>3</sup>	Corporate			
5		11		2		3	
3		6		2		3	
2		4				2	
2		3				2	
2		3				2	
2		3				2	
2		3					
2 <sup>4</sup>		3 <sup>4</sup>					

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Most Active Investors only include first investment into a portfolio company, not follow-on financings. <sup>2</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>3</sup>Growth Investors defined as investment firms that typically invest in later-stage companies that either are revenue scaling or the round is anticipated to be the last before an IPO. <sup>4</sup> Some categories had ties for number of deals, and list was curtailed due to space. Note that families of funds are combined for this slide, as are corporate and corporate venture with the same parent. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

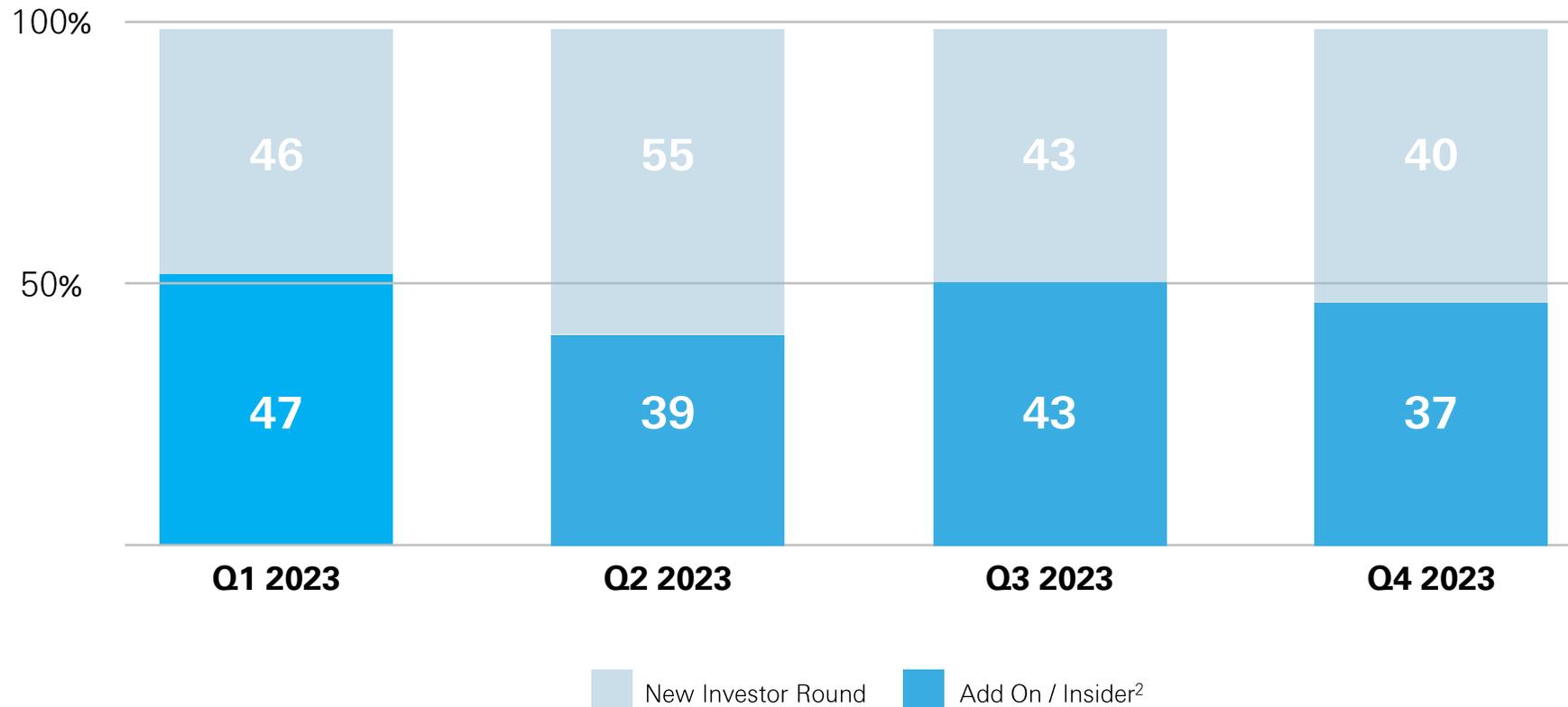
# Med Device New vs Insider Financing Analysis

2023, US and Europe



**Insider rounds increase in 510(k) deals**

## Deal Breakdown by Equity Rounds (Post First-Financing<sup>1</sup>)



### Insider/add-on deals continued in 2023

During up-cycle times, new investor rounds typically account for 70% of financing deals. In down-cycles like now, insiders provide more capital to help companies achieve valuation inflection points that hopefully will lead to a new investor financing. In early-stage deals, companies utilize insider capital for development or clinical data/IDE approval; for commercial deals, insider funding can be used to jump-start a stalled business, spur faster growth or help fund to profitability.

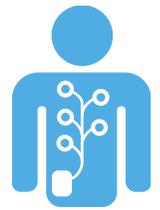
### 510(k) deals show more insider rounds

In 2023, insider-round activity was prominent in NIM, Vascular, drug delivery, and orthopedic indications. The companies in these indications often pursue 510(k) clearance, which do not need clinical trials or FDA approval. Many of these deals utilized insider rounds to prolong runway and build revenue momentum, strategically waiting out the slowdown in add-on M&A seen over the past few years.

<sup>1</sup>Post First-Financing defined as the round following the first equity financing of \$2M+.

<sup>2</sup>Add On/Insider rounds defined as new investor-led equity deals smaller than the prior round, or equity/convertible financings where only insiders participate. Data

Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.



*Top deals secured up-round valuations, however later-stage down-rounds grew*

## Step-Up Analysis by Round for new investor led financings

Rounds Covered	New VC-led Deals in data set	Median Pre-Money (\$M)	Median Deal Size (\$M)	Median Step-up	# Down Rounds
Seed to A	11	\$20	\$10	2.3x	1
A to B	26	\$45	\$20	1.5x	8
B to C	17	\$58	\$25	1.2x	5
Post C	20	\$177	\$46	1.2x	7

If successful in securing a new investor to lead a new round, this was the landscape of med devices step-ups in 2023. This year, 40% of new investor-led deals disclosed valuations, with a step-up median of 1.3x. This provides validation to the market that companies can still attain up-rounds, as there were at least 50 new investor-led financings achieving step-up valuations in med device (14% of the total deals).

### Seed to Series A step-ups were robust

The top three step-up valuations from Seed to Series A, Invicta Medical (respiratory), Morphoceuticals (surgical regenerative) and Venostent (vascular), exceeded 3x.

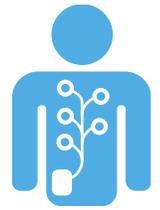
### Over 30% of Series B and later deals in this dataset were step-down rounds

From Series A to B financings, Paradromics and Precision, both neuro-focused, secured two of the top three step-ups; Imaging companies Alume, View Point and Navigation Sciences ranked fourth through sixth in terms of step-up size. However, almost one in three Series B and later deals suffered down-rounds.

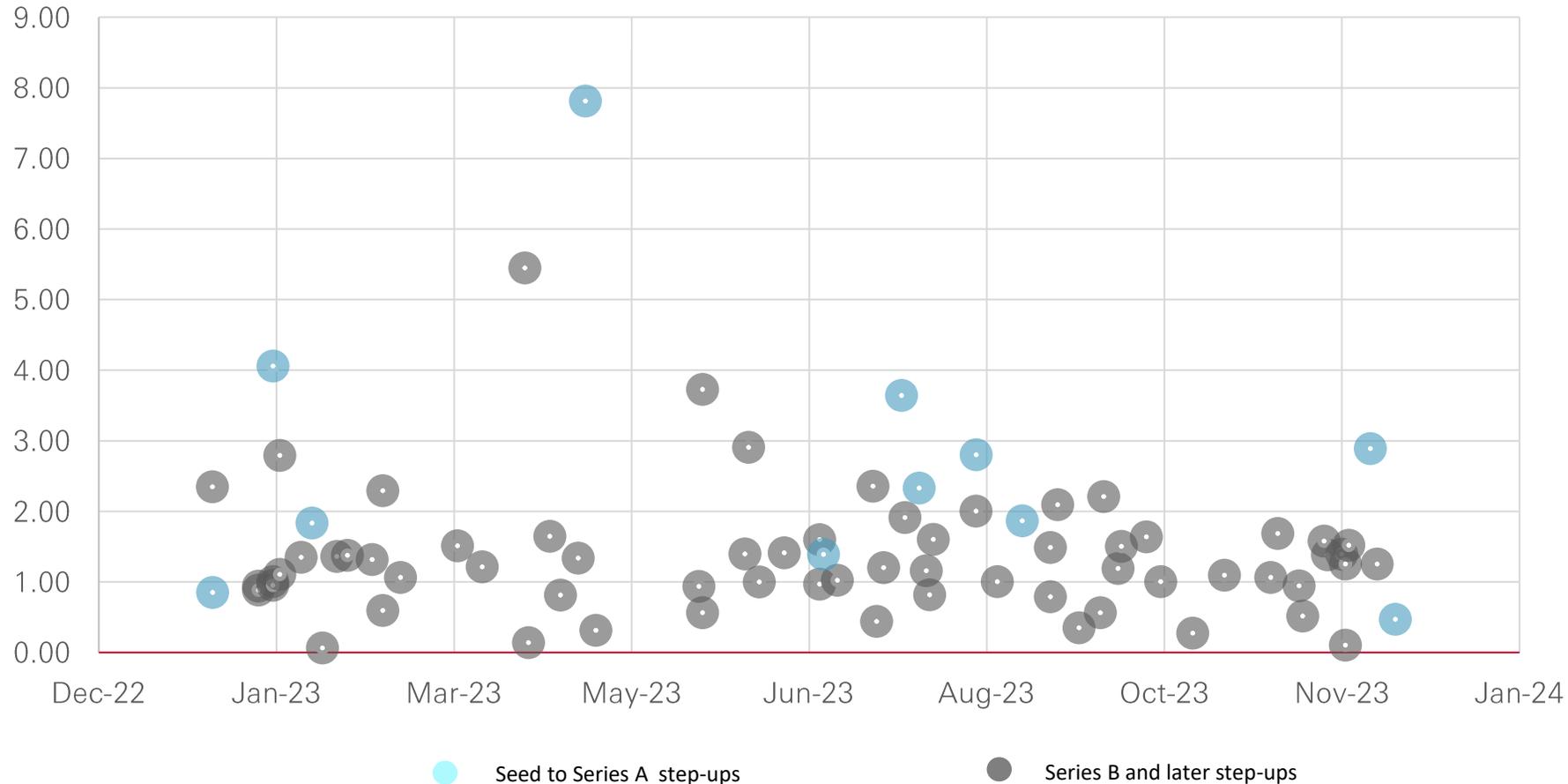
Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>New Investor Step-Up refer to companies that had a new investor in its 2023 financing, with that equity financing equal to or greater than the last financing round. Companies included if valuation information was available for both the new and last financing. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Med Device New Investor Step-Up<sup>1</sup> Analysis

2023, US and Europe



**Strongest step-ups focused in 1H; Imaging, Cardiovascular led biggest upticks**



The data presented examines the 40% of all new investor-led financings in 2023 that contained enough information to calculate a valuation multiple.

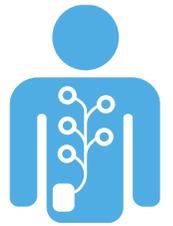
**Median step-ups consistent in 2023**  
Deals and median step-up values were consistent in both halves of 2023, although 1H had a higher step-up average (1.7x in 1H and 1.4x in 2H). The largest step-ups were observed in early-stage deals during 1H (Invicta, Paradromics Morphoceuticals and Artelon).

**Large step-ups in cardiovascular and imaging; step-downs in NIM**  
Imaging (1.6x), ophthalmology (1.5x) and cardiovascular (1.3x) displayed the highest step-up medians among indications with four or more data points. However, six NIM financings in our dataset included four down-rounds, with a median step-down of 0.8x.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>New Investor Step-Up refer to companies that had a new investor in its 2023 financing, with that equity financing equal to or greater than the last financing round. Companies included if valuation information was available for both the new and last financing. Step-Ups calculated using Pitchbook valuation data for previous and new 2023 financing. Calculated as follows: Divide new 2023 Pre-money Valuation by previous round post-money valuation. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Med Device Largest Post-Money<sup>1</sup> Values

2023, US and Europe



**Valuations remained resilient; recent M&A may foster VC FOMO in 2024**

## Largest Post-Money Valuations by Med Device Indication

Indication	Company	Date	Deal Size (M)	Round	Post \$ (M)	Stage	Lead Investor(s)
Neuro	 NEURALINK	11/22/23	\$323	D	\$3,520 (Up)	Early Clinicals	VC
Imaging	 reflexion	11/15/23	\$105	F	\$1,000 (Up)	Commercial	Growth
NIM	 Beta Bionics™	9/30/23	\$100	D	\$500 (Down)	Commercial	VC
Oral	 LIGHTFORCE	6/16/23	\$83	D	\$400 (Up)	Commercial	VC + Growth
Neuro	 relievant	4/14/23	\$50	G	\$350 (Down)	Commercial	Growth
Orthopedic	 AgNovos™ BIOSCIENCE	6/9//23	\$31	B	\$331 (Flat)	Pivotal Trial	Undisclosed
Neuro	 Paradromics	4/4/23	\$50	A3	\$300 (Up)	Development Stage	VC
Cardiovascular	 Supira MEDICAL	11/21/23	\$40	D	\$300 (Up)	Early Clinicals	Crossover

### Largest valuations slightly dropped

Private valuations declined in 2H, however, the top post-money values in med devices have declined about 50% less than observed in other sectors. The median valuation of the largest eight post-money valuations in 2023 decreased by approximately 25% from the top eight valued deals in 2021-22.

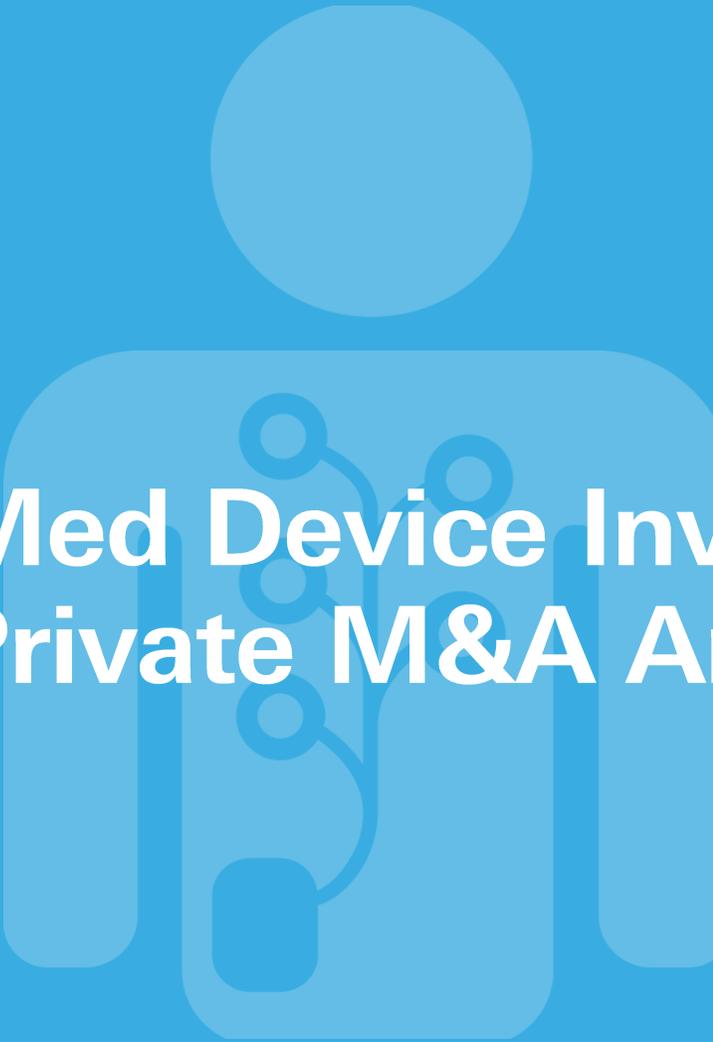
### Mixed stage focus for larger valuations

We observed among the top deals a combination of early-stage, pivotal trial, and commercial financings. Traditional VC led four of the deals, two companies in the development stage and two commercial companies. This strongly indicates that VCs have resumed funding new deals. Interestingly, even in the face of many valuation re-sets, three of the four highest valued VC-led deals were step-ups.

### M&A values up in 2023; good outcomes foster FOMO

Overall, M&A deal size increased in 2023. Relievant closed a slight down-round financing in April and later executed an M&A of \$850M upfront in September. It was gratifying to see a substantial exit following a valuation reset, with the overall M&A median up-front and total deal value double in size compared to the past few years. This promising exit and the overall growth in M&A deal values are expected to help push investors into funding new deals.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. <sup>1</sup>Valuation data from PitchBook, including post-money values. Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

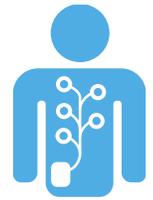


# Med Device Investment: Private M&A Analysis

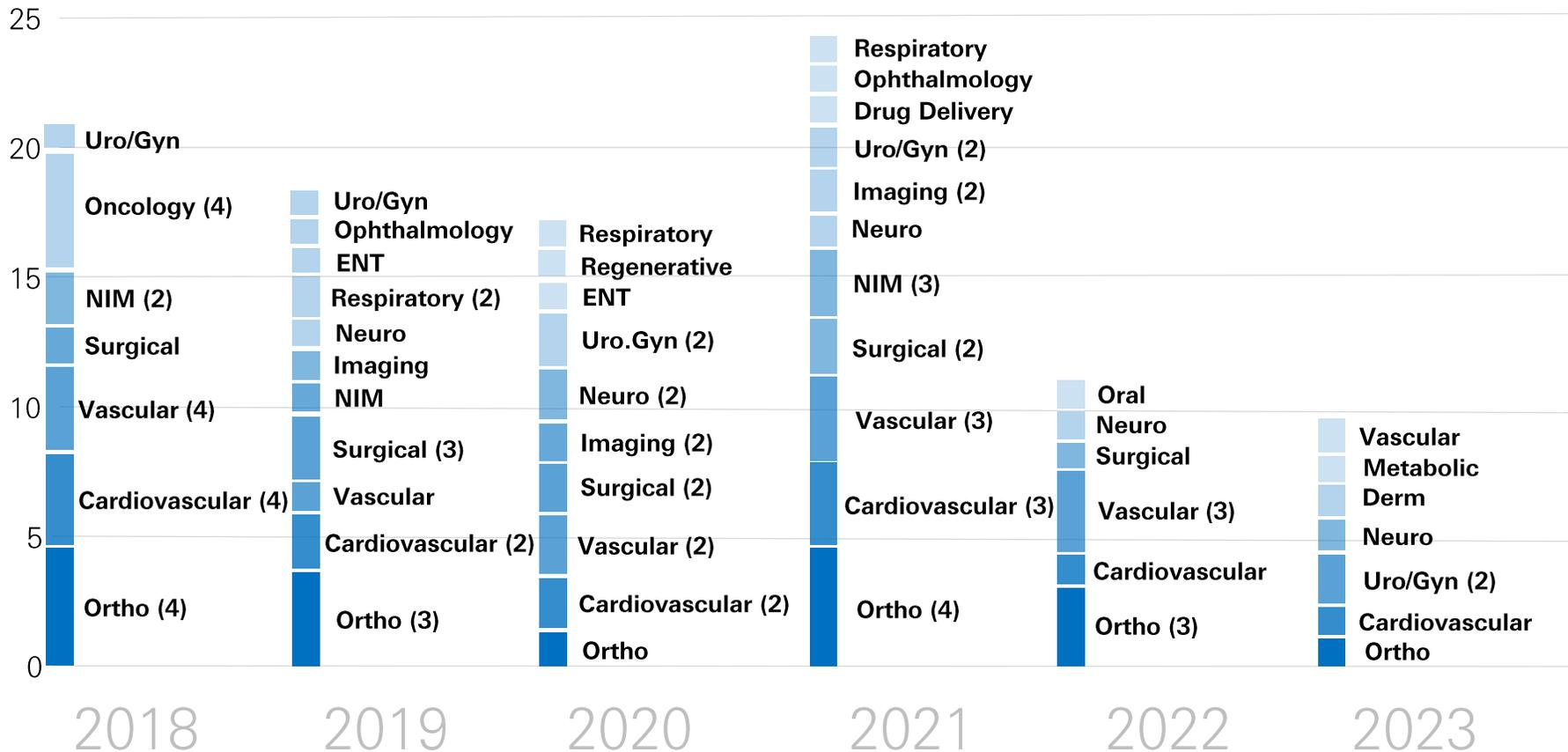
2023 Annual

# Med Device Private VC-Backed M&A<sup>1</sup>

2018 – 2023



**M&A numbers remained depressed; Uro/Gyn demonstrated four-year exit spike**



M&A deal numbers declined from 2018-2021, yet deal values increased.

### Top indications since 2018

Since 2018, orthopedics, vascular and cardiovascular have consistently been the top three indication, each with M&A activity every year. Orthopedic (16) has the highest number of exits through 2023, followed by vascular (14) and cardiovascular (13). NIM activity spiked in 2021 with three large deals, but there was no M&A activity in 2022 or 2023.

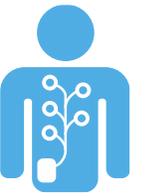
### Spike in men's/women's health

Uro/Gyn indication has emerged as a growing M&A area, with 2 M&A exits each year in 2020, 2021, and 2023.

<sup>1</sup>Med Device M&A defined as private, venture-backed M&A with an upfront payment of at least \$50M. Data Sources: PitchBook, public news articles and conversations with investors and companies.

# Med Device Private VC-Backed M&A<sup>1</sup> by Indication

2018 – 2023



**Later-stage down-rounds that led to big M&A showed opportune down-cycle timing**

## M&A Median Values

Year	Deals	Up-Front (\$M)	Milestone TBE (\$M)	Total Deal (\$M)
2018	20	\$195	\$43	\$223
2019	17	\$120	\$35	\$220
2020	16	\$132	\$100	\$223
2021	23	\$250	-	\$300
2022	11	\$138	\$130	\$255
2023	8	\$400	\$110	\$570

## Notable M&A Deals



### **Strong deal sizes, longer time to exit**

In 2023, we witnessed robust deal values for M&A, however median time to exit (over 9 years from close of first financing) and venture capital invested (\$100M) were at all-time highs. The increased deal sizes were primarily driven by large market, innovative technologies, as five of the eight exits followed the PMA approval pathway. Notably, four of five PMA companies were post PMA approval, marking a departure from prior years.

### **Down-rounds to exits fosters VC FOMO**

Limflow and Relievant both completed down-rounds in 2022 and 2023, respectively, before they achieved strong M&A exits in 2023. We anticipate such exits will encourage VCs to return to making new mid-to-late-stage investments.

### **Laminar bucks trend of slower, time-intensive PMA exits**

Laminar (cardiovascular) demonstrated that PMA pathway companies can quickly reach an exit, securing an M&A prior to pivotal trial enrollment in just four years with under \$25M invested. We hope this encourages more early-stage PMA pathway investment.

<sup>1</sup>Med Device M&A defined as private, venture-backed M&A with an upfront payment of at least \$50M. Data Sources: PitchBook, public news articles and conversations with investors and companies.

# Healthtech Early-Stage: First-Financing Analysis

2023 Annual

# Healthtech First-Financing<sup>1</sup> Analysis

2023, US and Europe



**A shift away from growth at all costs yielded reduced capital needs, round sizes**

## Early-Stage Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN	FEB	MAR
	\$465M   36 Deals	\$146M   15 Deals	\$355M   26 Deals
<b>Q1 Activity \$966M   77 Deals</b>			
Q2 2023	APR	MAY	JUN
	\$140M   10 Deals	\$160M   23 Deals	\$335M   28 Deals
<b>Q2 Activity \$635M   61 Deals</b>			
Q3 2023	JUL	AUG	SEPT
	\$150M   25 Deals	\$132M   21 Deals	\$130M   21 Deals
<b>Q3 Activity \$412M   67 Deals</b>			
Q4 2023 Prelim	OCT	NOV	DEC
	\$160M   20 Deals	\$125M   26 Deals	\$136M   20 Deals
<b>Q4 Activity \$421M   66 Deals</b>			
<b>2023 Total Activity</b>		<b>\$2.4B   271 Deals</b>	

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 25%

2021 23%

2020 13%

2019 25%

First-financing in Q1 marked the second highest investment quarter in the past two years, followed by a 40% investment decline in Q2. The disparity between quarters can be attributed in part to Q1 accounting for all eight financings of \$50 million or more in 1H 2023.

### First-financing deal sizes reduced in 2H

In Q2, the deal volume was comparable with Q3 and Q4, however, the average deal value decreased from \$10.4M in Q2 to \$6.2M in Q3 and Q4. First-financing activity primarily focused on provider ops and alternative care companies.

### Extended runways, focus on strategic growth

In 2023, many companies aimed to raise smaller rounds to create enough value before seeking additional funding in 2024/2025, anticipating that by then access to capital will improve with more favorable valuations. Thus, numerous venture-backed deals transitioned to strategic growth to minimize capital requirements, as opposed to embracing a mentality of unlimited expansion.

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. Healthtech defined as companies or product/solutions that help in delivering care, helping doctors or other forms of medical solution deliver care, or helping the broader ecosystem deliver care. <sup>1</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>2</sup>Using specific PitchBook search functions to approximate sector specific funding from previous years. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Healthtech Investment: All Venture Deals

2023 Annual

# Healthtech VC Investment (All Deals)

2023, US and Europe



2023 saw investors and companies refocus on fundamentals

## Investment and Deal Activity (\$s/Deals)

Q1 2023	JAN	FEB	MAR
	\$1.9B   109 Deals	\$1.1B   64 Deals	\$1.3B   85 Deals
<b>Q1 Activity \$4.3B   258 Deals</b>			
Q2 2023	APR	MAY	JUN
	\$804M   50 Deals	\$1.3B   69 Deals	\$1.3B   72 Deals
<b>Q2 Activity \$3.4B   191 Deals</b>			
Q3 2023	JUL	AUG	SEPT
	\$866M   69 Deals	\$833M   72 Deals	\$982M   64 Deals
<b>Q3 Activity \$2.7B   205 Deals</b>			
Q4 2023 Prelim	OCT	NOV	DEC
	\$1.3B   82 Deals	\$954M   66 Deals	\$260M   46 Deals
<b>Q4 Activity \$2.5B   194 Deals</b>			
<b>2023 Total Activity</b>		<b>\$12.9B   848 Deals</b>	

## Activity vs Previous Years

(Annualized 2023 Investment vs Previous Years<sup>2</sup>)

2022 ↓ 42%

2021 ↓ 70%

2020 ↓ 27%

2019 ↑ 12%

Overall healthtech investment in 2023 followed the same trend as first-financing activity, with a strong Q1 followed by a decline in deals and capital in each subsequent quarter, resulting in a 42% decline in investment compared with 2022.

### Transition back to longer-term investors

In 2023, there was a stabilization of investments reminiscent of pre-pandemic levels. Following several years of heightened interest from traditional tech and later-stage crossover firms, 2023 marked a return to a smaller investor pool, primarily composed of legacy healthcare funds and corporates. Many of these investors with available capital transitioned to a methodical investment approach, focused on fewer deals and smaller check sizes.

### Big deals accounted for 27% of dollars

In 2023, there were 21 investment rounds exceeding \$100M, which accounted for 27% of the total capital raised. These deals were across all stages, however, were predominantly focused on Alternative Care (10) and Provider Operations (7) businesses delivering or enabling Value Based Care arrangements.

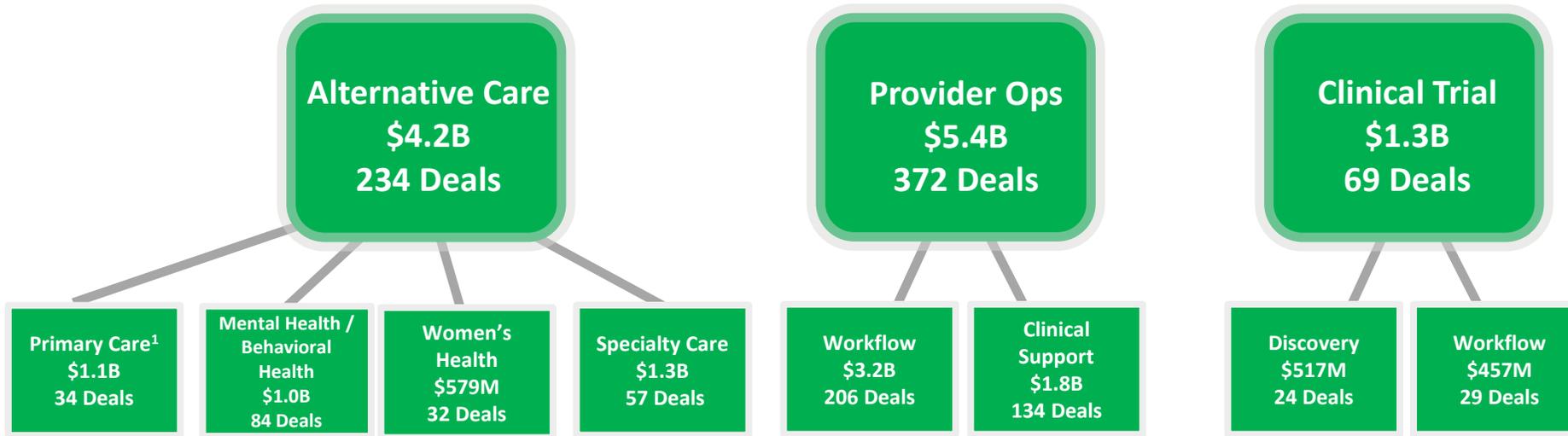
Data from PitchBook as of 12/15/23; Covers private, venture-backed investment. Healthtech defined as companies or product/solutions that help in delivering care, helping doctors or other forms of medical solution deliver care, or helping the broader ecosystem deliver care. Healthtech sector analysis contains companies that overlap with other sectors. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Healthtech VC Investment by Subsector

2023, US and Europe



**Provider Ops remained top subsector, Alternative Care investment plummeted**



In 2023, Provider Operations ("PO") led healthtech investment for the second consecutive year, shifting focus away from Alternative Care, which dominated in 2020 and 2021. Despite advances in service/delivery models, this trend underscores the ongoing significance of addressing gaps in healthcare data, communication, and workflow. Notably, the increased capital costs posed a challenge for capital-intensive alternative care models, which resulted in an investment decline of 40% from 2022 and 80% from 2021.



## Largest Financings in Healthtech



**Acquisition/consolidation in 2024**  
We expect investment within alternative care to remain focused on early-stage specialty care for high-risk, high-cost populations, addressing unmet needs within existing platforms. This shift towards value-based and in-home care have pushed payers to prioritize outcomes through specialty care over traditional primary care models. Consequently, in 2024, we anticipate primary care platforms will consider tuck-in acquisitions of venture-backed specialty care companies facing later-stage funding challenges.

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# Healthtech Most Active Investors<sup>1</sup>

2023, US and Europe



**Strong group of corporates highlight 2023 top investors**

<u>First-Financing<sup>2</sup></u>		<u>All Deals</u>					
All Investors		VC	Growth <sup>3</sup>	Corporate			
5	GENERAL CATALYST	10	GENERAL CATALYST	3	MERCATO PARTNERS	8	CVS Health Ventures
5	High-Tech Gründerfonds	8	Alumni Ventures	3	UI investissement	6	G/
5	Gaingels	8	octopus ventures			6	BI Bertelsmann Investments
4	LRVHEALTH	6	DEFINE VENTURES			5	SAMSUNG
4	BIP VENTURES	6	LRVHEALTH			4	MAYO CLINIC
4	REDESIGN HEALTH	5	andreessen horowitz			4	inflect health
3	andreessen horowitz	5	PLUGANDPLAY			4	NOVARTIS
3	8VC	5	? what if ventures			4	HealthworX
3 <sup>4</sup>	NINA.CAPITAL	5 <sup>4</sup>	High-Tech Gründerfonds				

Data from PitchBook as of 12/15/23. Covers private, venture-backed investment. Healthtech sector analysis contains companies that overlap with other healthcare sectors. <sup>1</sup>Most Active Investors only include first investment into a portfolio company, not follow-on financings. <sup>2</sup>First-financing defined as initial Seed or Series A financing of \$2M+. <sup>3</sup>Growth Investors defined as investment firms that typically invest in later-stage companies that either are revenue scaling or the round is anticipated to be the last before an IPO. <sup>4</sup> Some categories had ties for number of deals, and list was curtailed due to space. Note that families of funds are combined for this slide, as are corporate and corporate venture with the same parent. Data Sources: PitchBook, company websites, internal analysis. Thanks to Mind Machine for slide strategy, creative and design.

# Healthtech Largest Post-Money Values<sup>1</sup>

2023, US and Europe



**Up-rounds and corporate investment highlight highest valued companies**

## Largest Post-Money Valuations by Healthtech Subsector

Subsector	Company	Date	Deal Size (\$M)	Round	Post \$ (\$M)	Focus	Lead Investor(s)
Provider Ops	 Aledade	6/21/23	\$260	F	\$3,500 (Up)	Workflow	VC
Alternative Care	 spring health	4/12/23	\$64	C	\$2,500 (Up)	Mental Health	Undisclosed
Provider Ops	 Nomi Health	6/30/23	\$118	B	\$1,682 (Up)	Workflow	VC
Alternative Care	 Carbon Health	1/10/23	\$100	D2	\$1,400 (Flat)	Primary Care	Corporate
Alternative Care	 FORWARD	11/15/23	\$100	E	\$1,320 (Up)	Primary Care	Growth + Corporate
Medication Management	 Capital Rx	10/11/23	\$72	D	\$1,070 (Up)	Workflow	Corporate
Healthcare Navigation	 Headway	10/5/23	\$125	C	\$1,000 (Up)	Provider Matching	VC
Provider Ops	 Paige	3/16/23	\$20	C1	\$650 (Up)	Clinical Decision Support	Undisclosed

In 2023, despite the general slowdown in healthtech investments, a portion of later-stage high-growth companies continued to secure substantial funding rounds. Valuations for seven of the top eight highest-valued private financings saw step-ups. Corporate investors maintained strong involvement in later-stage healthtech investing, sustaining a three-year emphasis which we expect to persist into 2024.

### Dichotomy of early and later stage interest

Within the investment landscape, a distinct dichotomy emerged, where capital was channeled toward earlier-stage ventures with reasonable valuations, or high-performing later-stage enterprises demonstrating strong business metrics, resulting in heightened valuations.

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# Healthcare Outlook: Moving Forward in 2024

# Healthcare Outlook: Moving Forward in 2024

## General

We expect the current downturn to extend into 2024. Nevertheless, we anticipate top healthcare companies will secure large investment rounds at robust step-up valuations, experience exits with noteworthy M&A<sup>1</sup> deal values (albeit at a reduced volume) and witness opportunistic yet limited IPOs. Most VCs possess substantial new capital available for future investments, and growth investors are expected to become active once again. We predict stable or slightly decreased first-financing activity compared to 2H 2023, as investors will continue to prioritize insider financing for existing portfolio companies, and opportunistically invest in later-stage new deals at revised valuations. The upcoming year will be a crucial phase in this downturn, as many companies must secure new investor-led rounds or face tough consequences. Valuation resets are expected to be widespread. However, the key question in 2024 will be whether the prevalent insider rounds from 2022 and 2023 provide enough runway for companies to reach a value-creation event that justifies new investment.

## Biopharma

The trend of large first-financing deals will continue, marked by the re-emergence of hub (operations parent) and spoke (specific asset spinouts) deals designed to control cost and generate unique M&A opportunities. However, first-financing deals are anticipated to continue trailing overall investment, as investors maintain a restrained deal pace and expand interest towards later-stage deals at reduced valuations. Metabolic and neuro are two indications poised for increased investment. We expect significant drip-feeding, consolidations, and shut-downs for companies that have exhausted insider rounds and have not been able to hit significant value inflection points. Some deals might be too early to capture investor interest, as the focus has shifted significantly to clinical data. M&A interest by big pharma and biotech will remain strong but continue to be divided between the private market and recent IPOs from the last few years.

## Healthtech

In 2024, we anticipate a smaller and more targeted pool of investors, focused on high-performing growth companies while simultaneously revitalizing their early-stage pipeline through new first-financing investments. We expect the continued maturation of generative AI will spur investor interest. Additionally, we foresee increased investments in value-based care, focusing on both specialty care delivery models and provider operations companies dedicated to enhancing provider infrastructure, process and analysis, thus facilitating efficient care delivery. We predict numerous mature companies considering going public in 2024, yet well-funded ventures might choose to wait until the healthtech IPO window reopens. As we progress into early 2024, companies operating on insider bridge rounds will need new investment or must contemplate consolidation through all-equity transactions. This trend may involve larger, more mature companies acquiring smaller entities to expand their platforms and geographical footprints.

## Med Device

We project first-financing activity to involve a combination of smaller 510(k) deals suitable for corporate M&A and larger market PMA-focused deals that will likely have corporate investment from the outset. Imaging companies utilizing hardware/software solutions and neurostim technologies are expected to remain active areas of investment. 2024 will be a challenging year for many mid-stage companies that have depleted their insider rounds and find limited interest from new investors. Contrastingly, companies involved in later-stage pivotal trials and commercialization deals with strong markets and clinical data/approval are expected to secure a mix of traditional VC and growth funds. The deal-value increase in private M&A has started to reinvigorate the later-stage scene. Recent cases of early-stage deals achieving rapid, large exits and later-stage valuation resets that later result in robust M&A deal values have helped bring investors back to the table.

## Dx/Tools

We anticipate challenges to persist in first-financing activity, as many investors in the dx/tools sector are focused on supporting their existing portfolio companies or exploring opportunities in later-stage commercialization plays. Technology focused on gene and cell therapy production and manufacturing should remain a strong area of investment. Companies in the computational biology sector, particularly those focused on discovery or development processes are positioned to sustain increasing investor interest. We also project that many of these companies will likely pivot from providing platforms or engaging in discovery, to developing their own assets. The emergence of IPOs in 2024 appears unlikely, except in one-off scenarios. Thus, many companies with high private valuations from 2020-2021 will need to secure private new investor-led financing. Despite the likelihood of valuation re-sets for many companies, the underlying strength of the technologies is expected to attract new investor interest, likely led by traditional VCs.

Thank you

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